



## **1. INTRODUCTION**

### **The Taylor Tract**

The following summarizes the findings of the brief ecological inventory performed on the Taylor Tract. The information is based on one day of field reconnaissance and a review of background information. A brief description of the site, a natural community map, a plant species list, rare and uncommon species information, and a discussion of the site's ecological significance are all covered below. Methods for field survey and natural community mapping are described in the Methods section of the Town Lands Management Plan on pages 6 and 7.

### **Landscape Overview**

The area of the Taylor Tract is 36 acres, as surveyed by Vermont Survey and Engineering Inc. in August 2001. The majority of this parcel is found on the east side of the Ompompanoosuc River between Route 244 and West Fairlee Road just north of the village of Post Mills. The U.S.G.S. topographic map indicates that the tract is situated at an elevation of 680-700 feet above sea level. Alluvial, or river deposited soils, designated as frequently flooded Limerick and Winooski very fine sandy loam by the soil survey, dominate the flats along the river easterly to a large sandpit found along the east side of the tract. This sandpit was dug into sandy post-glacial river deposits that form the large terrace at the 700- foot elevation. The Post Mills Airport also sits on this terrace. Agawam fine sandy loam is the soil type immediately adjacent the sandpit; only small deposits of this soil type remain along the eastern property boundary north and south of the sandpit. Bedrock outcrops were not observed.

The Ompompanoosuc River is the dominant hydrological and ecological feature of the tract. Its channel, sprinkled with gravel bars, meanders through the west side of the property. The flat portion of the tract is river floodplain; this feature is ecologically significant. Over time, the river channel shifts through the floodplain via a dynamic process of erosion and deposition of sediments, especially during floods. The 2001 topographic survey of the property by Vermont Survey and Engineering, Inc. (dated 08-29-01), the 1999 Flood Insurance Rate Map, and the NRCS soil survey maps all indicate that these flats are within the 100-year floodplain, or the floodway mapped by FEMA. The 2001 topographic survey also indicates that a significant portion of the sandpit west of the roadway running through the sandpit lies within the same elevation as the floodplain. While the Vt Significant Wetlands Inventory does not show a Class 2 wetland on this parcel, the 2001 topographic survey mapped a large wetland area in the floodplain adjacent to the sandpit. Field observations in 2007 corroborate the presence of this wetland.

An un-named intermittent stream enters the north end of the property. This feature is depicted on the U.S.G.S. topographic map and was observed in the field. Though the topographic map shows this stream flowing into the river at the north end of the tract, it is unclear on the ground where this stream joins the river. It may flow through the tract via a flood channel and join the river south of the property.

## **2. NATURAL COMMUNITIES**

Twenty-eight acres, or 77% of the tract, is mapped as floodplain natural communities (see the Taylor Natural Community map). Four natural communities occur in the floodplain: Sugar Maple-Ostrich Fern Floodplain Forest (approximately 13 acres) Wet-mesic Floodplain Forest (approximately 14 acres) Oxbow Marsh/Pond, and the river. Although very young, the floodplain forest natural communities dominate the floodplain. The Wet-mesic Floodplain Forest is not described in the Vermont natural community classification. It was differentiated from the Sugar Maple-Ostrich Fern Floodplain Forest because it occupies a wetter soil within the floodplain and was mapped as wetland on the Vermont Survey and Engineering 2001 topographic map. The Wet-mesic Floodplain Forest is most closely related ecologically to Silver Maple-Sensitive Fern Floodplain Forest type in the Vermont classification.

The Sugar Maple-Ostrich Fern Floodplain Forest occupies the levee zone, i.e. the higher, well-drained, soil immediately adjacent the river. Currently, part of this higher floodplain is open meadow thick with old field species, such as goldenrod and field grasses, plus a heavy infestation of wild parsnip. This invasive is particularly noxious because contact with all parts of the plant can cause severe skin rashes on some people, especially with sunlight exposure. The wooded portion of this natural community type has an unusual abundance of both American and slippery elms. Additional species typical of the natural community include basswood, butternut, white ash, black cherry, and sugar maple. In other areas, less typical species, such as white pine, paper birch, and balsam poplar dominate the overstory. Conspicuously missing is silver maple, which does not naturally occur along the Ompompanoosuc River this far upstream from the Connecticut River. The groundcover in the well-drained floodplain is very weedy, with the invasive known as Bishop's weed, or goutweed, dominant in places. Many native species typical of this floodplain forest natural community type, including wild-ryes, tall brome, ostrich fern, jack-in-the-pulpit, bloodroot, and the sedge *Carex hirtifolia*, are also found. (See the Appendix for a list of vascular plants, including both common and scientific names, observed at the Taylor Tract during the 2007 inventory.)

The river and Oxbow Marsh/Pond are the other natural communities found in the floodplain. The river channel contains the river itself, which is an aquatic natural community, and very small and unmapped gravel bars, which would technically be classified as River Sand/Gravel Shore natural community type. In the 1998 publication "A Classification of the Aquatic Natural Communities of Vermont" prepared by The Aquatic Classification Workgroup, the reach of the Ompompanoosuc found at the Taylor Tract would best fit into the "Lower reaches of small rivers" running water classification type. Two small (half-acre or less) Oxbow Marsh/Pond natural communities are mapped for the property. The half-acre community is dominated by a very diverse shallow-emergent marsh with standing water in the center. The water is choked with native water starwort, water purslane, and water plantain, while a variety of sedges and swamp candles dominate the wetland margins. At the time of the survey, the smaller oxbow natural

community was a full pond with minimal marsh vegetation.

Less than one quarter of the tract is upland, i.e. above the floodplain. Almost all of this high ground consists of the old sand pit. The gravelly, loamy sand soil in the pit is vegetated with a mosaic of successional forest, shrubland, and open herbaceous types that are artificial rather than natural communities. Common trees and shrubs in the pit include gray birch, quaking aspen, balsam poplar, white pine, black cherry, staghorn sumac, Morrow's honeysuckle (exotic), meadowsweet, and red-osier dogwood. Some of the sand is well- drained, but a considerable amount is somewhat poorly drained. One seep or spring issues from the east side of the pit and spreads out into a seepage zone towards the center of the pit. Herbs such as common scouring-rush, gray goldenrod, redtop, and the sedge *Carex tonsa* dominate some of the dry openings. In contrast, the forest found on the terrace flat and scarp north of the pit is mature old field forest of white pine, black cherry, American elm, and hemlock with a ground layer indicative of somewhat fertile conditions. Given this vegetation and the deep, well-drained, fine sandy loam soil, these un-mined uplands are mapped as White Pine-Northern Hardwood Forest community.

### **3. RARE AND UNCOMMON SPECIES**

#### **Wood Turtle**

Among the natural features of the Taylor Parcel, one of the most significant is the population of wood turtles. These turtles hibernate in the Ompompanoosuc River and spend the summer wandering and foraging 1,000 to sometimes 2,000 feet from the riverbanks. Wood turtles are declining everywhere across their range which has Vermont at its center. These turtles require slow-flowing, gravelly rivers, floodplain habitat and sand-gravel soils in which to lay their eggs. This habitat has almost all been lost to settlement, farming, roads and railways.

Records between 2004 and 2012 document as many wood turtle sightings on the small Taylor parcel as in the rest of the town put together. That alone speaks to the special nature of this place and its value as an intact piece of habitat.

In May, 2007, Steve Parren, director of Vermont Fish and Wildlife Department's Nongame and Natural Heritage Program, and Thetford Conservation Commission members, formally documented wood turtle (*Glyptemys insculpta*) at the Taylor Tract. In Vermont the wood turtle is ranked as an uncommon species according to the Nongame and Natural Heritage Program. While not protected under the law, it has a status of "Special Concern" meaning that it is rare and requires monitoring due to the population decline that will lead to a threatened species status unless preventative measures are taken. A brief report by Parren indicates that the Taylor Tract contains high quality habitat for wood turtle because it includes areas for nesting, foraging, and hibernation, and is uninterrupted by roads.

#### **Plants**

Two uncommon plants in Vermont – Wiegand's wild-rye (*Elymus wiegandii*) and loose-

stemmed sedge (*Carex laxiculmis*) – were found on the property during the 2007 inventory. The Wiegand’s wild-rye grows with other species of wild-rye in the lush, open floodplain habitat at the north end of the property. A small population of loose-stemmed sedge was found in the remnant White Pine-Northern Hardwood Forest at the north end of the property. This species of sedge typically is found in moist, fertile soils of upland hardwood forests.

The large population of slippery, or red, elm (*Ulmus rubra*) at the Taylor Tract is notable. In some places in the floodplain, elms are prevalent, and split equally between slippery and American. Though not listed as an uncommon or rare species by the Nongame and Natural Heritage Program, slippery elm is an uncommonly encountered tree in Vermont. Like the American elm, slippery elm is susceptible to Dutch elm disease.

#### **4. SPECIFIC MANAGEMENT OBJECTIVES**

- ☞ Protect riparian ecosystems, soil, water and nutrient cycles.
- ☞ Protect fragile conditions, sensitive areas and rare plants and animals.
- ☞ Encourage the re-population of the floodplain forest.
- ☞ Consider maintaining a portion of the property (e.g. the gravel pit) in early successional habitat for diversity.
- ☞ Develop a plan to control invasive plants.

#### **Prescription**

Restoring native natural plant communities is a high priority on this tract. Invasive plant control is an integral component of restoration. Explore funding options via federal cost-sharing programs such as the Wildlife Habitat Improvement Program (WHIP) and the Environmental Quality Improvement Program (EQIP). Recruit and train individuals to hand pick small plants. Utilize herbicides to control invasives in the manner proven most appropriate and consistent with the labeled use of the applicable chemical. Consult knowledgeable and experienced applicators to determine optimum control methods for the various invasives found on the tract. Begin invasive control as soon as possible. Perform invasive control in 5 to 10 acre blocks annually. Re-treat areas two years after initial treatment. Monitor population levels and perform subsequent treatments as necessary. Planting native shrubs and trees suited to the site is another critical restoration need. Some invasive species require sunlight and creating shade could contribute to their decline. Maintain a portion of the tract in early successional species and in bare ground habitat. Evaluate the site further to determine the appropriate areas and the extent to which early successional and bare ground habitats should be maintained and/or expanded.

There are few trees of any consequence on this parcel; therefore forestry and timber harvesting are not considered in this plan.

## **5. SPECIFIC MANAGEMENT AREAS**

### **5.A Floodplain Forest**

Floodplain forests are unique because of their periodic flooding. These regular disturbances, which deposit silt and sand along the banks of waterways, help create and maintain unique communities of plants that tolerate flooding and require nutrient-rich soils. Floodplain forests contribute many free ecological services to our society: they help filter pollutants to prevent them from entering streams, improve water quality, are critical in controlling erosion, and help buffer rivers against catastrophic flooding.

Floodplains are home to a diversity of wildlife. The damp soils create rich insect and amphibian breeding habitats, and these species in turn become prey for birds such as woodcock and barred owl, for mammals such as mink and raccoon, and for reptiles such as smooth green snake and wood turtle.

Much floodplain forest, both in the region and in the country as a whole, has been converted to agricultural fields. Over time, untended fields revert to forest, and in their current condition fields provide a different kind of habitat (hayfield, cropland) used by many wildlife species.

Invasive plant species spread easily in the frequent disturbances created by flooding and tend to thrive in the rich soils of floodplain forests. Buckthorn, honeysuckle, knotweed, goutweed, barberry and poison parsnip are particularly in evidence in the Taylor Floodplain Preserve. Invasive plants outcompete native vegetation that is the basis of the floodplain ecosystem and may also directly impact floodplain wildlife. Research shows that berries from invasive plants such as bittersweet and buckthorn are lower in nutrition—like junk food for birds—than berries from native shrubs.

**Guideline:** Management in floodplain forest areas should aim to regenerate floodplain species such as silver maple, balsam fir/sugarmaple, or red maple. Some active management (plantings) should be considered.

**Guideline:** Refrain from adding new trails in floodplain forests without a strong reason. (Several trails exist.) Trails can deter wildlife movement between wetland and upland habitats, especially during spring and early summer, when birds, amphibians and reptiles breed and young disperse from the river into the surrounding upland areas. Trails can also provide an avenue for invasive plants to enter floodplain forests.

**Guideline:** Where feasible, consider controlling populations of invasive plants, recognizing that control will be necessary both upstream and downstream to prevent ongoing re-infestation. Monitor for new invasive plant species such as Garlic Mustard.

### **5.B Wetlands**

In a 2007 site visit the district wetland ecologist Rebecca Chalmers determined that the wetlands on the property are Significant Wetlands. The wetlands have significant functions and values, including at least the following: wildlife habitat, flood storage,

erosion control, water quality protection, recreational and economic values, and open space and aesthetics. The wetlands, like many forested wetlands, are not mapped on the Vermont Significant Wetland Inventory map. Fishing, bird watching and wildlife observation, walking trails, and educational signs are recreational activities that would not have undue impacts on these wetlands.

The 2012 Thetford Wetlands Inventory performed by Arrowwood Environmental determined that the wetlands on this parcel are part of the Post Mills Alluvial Wetlands Complex. Situated along the banks of the Ompompanoosuc River, these wetlands with their dense, persistent vegetation stabilize the banks and prevent erosion. Being in this floodplain position, they also have the function of attenuating floodwaters by providing an expandable basin. These wetlands also have the potential to filter out nutrients making them important for surface water protection (water quality).

**Guideline:** Similar to Floodplain Forest guidelines. Aim to allow regeneration of floodplain forest and alluvial shrub swamp. Control invasive plants. Maintain a 50 ft undisturbed buffer zone.

### **5.C Wood Turtles**

The orange-legged terrestrial turtle with the sculpted shell



Wood turtle in late May 2007 on the Taylor Floodplain Preserve. Note the concentric rings on the shell plates, the orange legs and black head.



Steve Parren of the VT Non-Game Wildlife Natural Heritage Program holds a female wood turtle to show off its underside (plastron) and orange legs on the Taylor Floodplain Reserve, late May 2007.

The Wood Turtle (*Glyptemys insculpta*) is a medium-sized turtle, recognizable by its rough or sculpted shell and orange coloration on the neck and forelimbs. Wood turtles require both aquatic and terrestrial habitats to complete their life cycle. During the late fall, winter and early spring they are closely associated with rivers and streams. This aquatic habitat is important for mating, basking, foraging and overwintering. Terrestrial habitat becomes important in the late spring and summer for females looking for nest sites, for juveniles and adults foraging on land, and for hatchlings emerging from their nests.

Wood Turtles are associated with forested areas, particularly mixed forests that have good shrub canopy cover and open areas such as agricultural fields. Females usually move farther away from streams and spend more time within terrestrial habitats than males. Most Wood Turtles stay within 1000 feet of their home stream and a wood turtle can move 1000ft in a day or two. Individual Wood Turtles can use an area of land up to several hundred acres in size. The amount of land needed to maintain a local population is even greater.

Under natural conditions a wood turtle can live 40-50 years. They are slow to reproduce, becoming sexually mature at 14-18 years old. A female lays on average 7 eggs every one to two years and the mortality of eggs and hatchlings is very high, often over 80%. A long life together with multiple years of reproduction compensates for low rates of hatchling and juvenile survival. However, this reproductive strategy makes turtles exceptionally vulnerable to any increase in the rate of adult mortality. Long-term studies of turtle populations as well as population dynamics models indicate that increasing the

mortality rates of adults by as little as 2-3% annually may lead to the ultimate extinction of a local population.

Therefore the primary concern about management activities and recreation within Wood Turtle habitat is direct mortality of adults due to crushing or other injury by vehicles. The following management requirements and guidelines are written with guidance from the Vermont Non-Game Wildlife Natural Heritage Program.

**Vehicles and Mowers** are a threat to turtles. Mowing in particular has been documented as the highest cause of turtle mortality. When the mower blade is set to 6 inches, sickle bar mowers caused 50% less mortality than rotary or other types of mowers. However, in the same study the tires of the tractor powering the mower caused 43% mortality. Mortality from ATVs and riding lawn mowers has also been documented. Alteration of aquatic, riparian, and nesting habitats directly or indirectly by vehicles is also a concern.

To avoid direct mortality, it is required that motorized vehicles be allowed only when Wood Turtles are inactive during the winter or when they are not occupying the terrestrial habitat. Therefore, seasonal distance restrictions will apply to areas on either side of perennial streams up to 600 feet from the edge of the stream bank (see Table 1.)

**Restricted Operation Times of Mowers and Other Vehicles**

Motorized vehicle use within the 600-foot forested corridor on either side of perennial streams, brooks or rivers identified as habitat for Wood Turtles may proceed according to the following time and distance requirements:

**TABLE 1**

**Restricted Operation Times of Motorized Vehicles Including Mowers**

<b>Distance from Stream Edge</b>	<b>Time Periods when Accessible to Vehicles</b>
0-50 ft	Nov 15 <sup>th</sup> – Feb 28 <sup>th</sup>
51-300 ft	Nov 1 <sup>st</sup> – March 31 <sup>st</sup>
301-600 ft	Oct 15 <sup>th</sup> – May 15 <sup>th</sup>
601 ft +	See specified conditions*

*\*Distance restrictions may be extended beyond 600 feet to a maximum of 1000 feet for habitat features such as wetlands and nesting and early-successional habitat.*

**Required practice:** If management practices utilizing vehicles are to be carried out between April 1<sup>st</sup> and October 31<sup>st</sup>, the boundary of the 50, 300, and 600-foot management areas from the river/perennial stream shall be clearly identified by flagging

or marking prior to mowing or cutting. The cutting/mowing plan must be approved by the conservation commission. The time restrictions shown in Table 1 shall be followed.

**Guideline:** A 25-foot no-cut, no mow area within the buffer zone along perennial streams and rivers is recommended in order to minimize runoff, streambed disturbance and erosion, maintain microclimate conditions of the stream, and to provide a source of future large woody debris.

**Guideline:** If trail clearing must be done during the period when wood turtles are on land it should be done by hand (e.g. scythe) or with a sickle bar mower WITH THE BLADE HEIGHT SET TO 6 INCHES. The Natural Heritage Program recommends that someone walk ahead of the mower to move any turtles out of the way.

**Guideline:** Leave limbs and tops in the forest, consistent with other laws, regulations, and best management practices, in order to provide cover areas with cooler microclimates.

**Guideline:** Avoid leaving brush piles in open areas close to the stream. These open areas might be used for nesting; thus they need to remain exposed to sunlight.

**Guideline:** Any seed used to stabilize stream banks at crossings should be a mix of species native to Vermont when used within 200 feet of rivers, streams, and brooks.

**Guideline:** Protect open, sandy or gravelly areas that are exposed to sunlight and elevated at least 3 feet above the water level. These are potential nesting sites.

**Guideline:** Leave fallen trees in the river channel, they can provide hibernation niches.

### **5.D Early-Successional Shrubland Bird Habitat**

In 2008 Vermont Audubon conducted a habitat assessment of this parcel. They concluded that it contained about 6 acres of early successional habitat, important for a group of species known as shrubland birds.

Shrubland birds (a.k.a. scrub-shrub birds) are a group of species that breed in or depend upon early successional areas with low, thick woody growth. They typically nest in thick cover on the ground up to about 10 feet high depending upon the species. They are primarily songbirds but also include species such as grouse and woodcock. Twenty one of the forty one species in New England show long and short term population declines. Priority species in Vermont include golden-winged warbler, eastern towhee field sparrow, brown thrasher, chestnut-sided warbler and more.

Even today, many consider this group of species to be “edge” species but in fact, most shrubland birds avoid edges and, with a few exceptions, prefer large (> 2.5 acre), blocky patches of habitat. Thus, landowners and land managers should focus attention on large management units instead of just the “edges.”

Within the Taylor Floodplain preserve this habitat is colonizing what was a sand/gravel pit in the not too distant past. The young, densely stocked stands of predominately pioneer tree species that make up this habitat unit comprise 18% of the total acreage (about 6 acres). Tree species include gray birch, elm species, speckled alder, and willow species mostly in the sapling size class (1-3.9 inch dbh), although there are pole timber size (4-11.9 inch dbh) trees. A few apple trees are scattered throughout. Non-native buckthorn and Japanese knotweed are in high abundance. As to be expected in young stands, snags and coarse woody debris are in low abundance.

### **Assessment of Current Habitat Conditions:**

Young, regenerating forest habitats such as this are less common throughout Vermont and the rest of northern New England today than they were 40+ years ago. Areas such as these provide critical breeding habitat for declining bird species including chestnut-sided warblers and white-throated sparrows. Recent research also indicates that early-successional habitats, particularly those with fruit producing trees and shrubs, are used by interior forest species, including scarlet tanager and wood thrush, as post-breeding habitat. The useful lifespan of early-successional habitat varies, but in the big picture it is a relatively short period of time – generally up to 20 years after they are created. The apple trees are an excellent habitat feature for many species of wildlife, although their utility to priority bird species is generally low. Buckthorn does produce fruits that are eaten by birds however the nutritional value is lower than that found in the berries of native plant species. Furthermore buckthorn is reportedly a laxative. High quality fruits and berries are particularly important as migratory bird species prepare for the fall migration.

**Guideline:** Early-successional conditions can be maintained over time by clearing the woody vegetation on a frequency of 10-15 years, dependent upon the rate at which the vegetation grows. Initially clearing this habitat unit will require a significant investment of resources (manual labor or equipment such as a Brontosaurus). Future clearing could be achieved with a heavy-duty brush hog. Specifically, manage the entirety of this habitat unit as two separate units. Alternate the clearing/brush-hogging between the two units so that there are always approximately 3 acres of early-successional habitat within the habitat unit (e.g. clear unit #1 in year 1, unit #2 in year 5-7, returning to unit #1 in year 10-15).

**Guideline:** The time to conduct clearing shall be determined by the requirements for protecting Wood turtles (Table 1.) (Otherwise clearing may be done once the majority of the migrant birds have departed and at the end of the fruiting season, with September being a good month.)

Wildlife Habitat Incentive Program (WHIP) funds may be available to help cover the costs associated with maintaining early-successional conditions. (Currently not available to municipalities.)

**Guideline:** When clearing leave apple trees and small clumps of larger residual trees to

serve as perch sites.

**Guideline:** Control and work towards eradication of invasive plant species.

## **6. TRAILS AND RECREATION**

The parcel incorporates wetlands and fragile riverbanks and an intricate mosaic of habitats and natural communities. Recreational activities that are suited to this preserve are fishing, bird watching, photography, wildlife observation, walking, snowshoeing, cross-country skiing and outdoors education. Hunting on foot is permitted.

Certain recreational activities such as horses and mountain bikes are likely to inflict damage and erosion on soft, wet or crumbly terrain. Another prime concern is that these uses have potential to injure or kill juvenile and adult wood turtles when they are on land between the beginning of March and end of October. The hoof of an average horse exerts a pressure of 1250 pounds or so. The weight exerted on a bicycle wheel by a rider could easily exceed 100 pounds, concentrated in a very small area of contact. A turtle's shell is simply not strong enough to withstand these forces.

As detailed above, horses, bicycles and other vehicles are not allowed, with the exception of emergency vehicles with town permission. The town, at its discretion, allows snowmobiles on frozen ground on permitted trails only.

Trails may visit the edges of wetlands and the river, but they must not hug the shoreline for any distance. The recommended distance between trails and the river edge is 100 feet (minimum 50 ft) to protect wood turtles from illegal collectors and trampling. Mowing of trails by motorized vehicle within the 600-foot forested corridor on either side of the river identified as the most important habitat for Wood Turtles may proceed according to the time and distance requirements detailed in Table 1.

In this small parcel where various exemplary natural communities occupy relatively limited and delicate areas, campsites and fire areas would create a disproportionately large negative impact. It also would necessitate another layer of regulation, oversight and enforcement to guard against abuses. Camping and fires are not consistent with protecting this small parcel and its intimate mosaic and are not allowed.

## APPENDIX

### Taylor Tract Species List

#### **Of particular note:**

Two rare plant species: Weigand's wild-rye and sedge *Carex laxicaulus*;  
Sugar maple/ostrich fern floodplain forest with unusually high population of slippery elm;  
Wood turtle (listed as Highest Priority for conservation in VT Wildlife Action Plan 2005),

#### **Trees:**

Apple, slippery elm, American elm, white ash, quaking aspen, basswood, beech, gray birch, yellow birch, butternut, black cherry, pin cherry, eastern hemlock, red maple, sugar maple, red oak, white pine, scotch pine, balsam poplar, white spruce, white x crack willow

#### **Shrubs:**

speckled alder, chokecherry, red-osier dogwood, meadowsweet, staghorn sumac, pussy willow

#### **Vines:**

Riverbank grape, poison ivy, Virginia creeper, virgin's bower, wild cucumber

#### **Ferns and allies:**

Bulblet fern, interrupted fern, lady fern, ostrich fern, sensitive fern, evergreen wood fern,  
common horsetail, common scouring rush, dwarf scouring rush, variegated scouring rush,

#### **Herbaceous plants:**

Arrow-head, calico aster, flat-topped aster, heart-leaved aster, purple-stemmed aster, black-eyed susan, bloodroot, red clover, white clover, coltsfoot, swamp dewberry, enchanter's nightshade, dwarf enchanter's nightshade, forget-me-not, wild ginger, goldern alexanders, Canada goldenrod, early goldenrod, gray goldenrod, late goldenrod, rough goldenrod, ground-cherry, hawkweed, honewort, jack-in-the-pulpit, jewelweed, joe pyeweed, lopseed, tall meadow-rue, moneywort, garden phlox, mad-dog skullcap, pale St Johnswort, thinleaf sunflower, swamp candles, downy yellow violet, water purslane, water starwort

#### **Grasses and sedges:**

Creeping bentgrass, Canada bluegrass, woods bluegrass, smooth brome, tall brome, hair-like bulbostylus, black bulrush, red fescue, fowl manna-grass, wirestem Muhlenbergia, quack-grass, redtop, rush species, sedge *Carex crinata*, sedge *Carex verticaria*, graceful sedge, hairy-leaved sedge, long-stalked sedge, hop-like sedge, loose-stemmed sedge,

lucorous sedge, shaved sedge, swollen sedge, needle spike-rush, timothy grass, riverbank wild-rye, Virginia wild-rye, Wiegand's wild-rye, witch-grass, wool-grass

**Invasive plants:**

common buckthorn, Morrow's honeysuckle, goutweed, yellow flag iris, Japanese knotweed, wild parsnip, Japanese barberry

**Animals:**

Wood turtle, moose, bear, beaver, red fox, mink, raccoon, snowshoe hare, snapping turtle, spring peeper, snipe, woodcock, bobolink, song sparrow, catbird, nesting kingfisher, merganser, common loon, veery, Savannah sparrow, alder flycatcher, barn swallow, chipping sparrow, warbling vireo, gold finch, ovenbird, mourning dove, starling, red wing blackbird, chimney swift, tufted titmouse, blue jay, king bird, common yellowthroat, indigo bunting, red-eyed vireo, chestnut-sided warbler, black-throated green warbler, mourning warbler, redstart, ruby-throated hummingbird, rose-breasted grosbeak, hairy woodpecker, pileated woodpecker, phoebe, white-breasted nuthatch, nesting mallard, cardinal, downy woodpecker, northern flicker, least flycatcher, black and white warbler, cedar waxwing, kildeer, white-throated sparrow, song sparrow, chickadee, broad-winged hawk, ruffed grouse