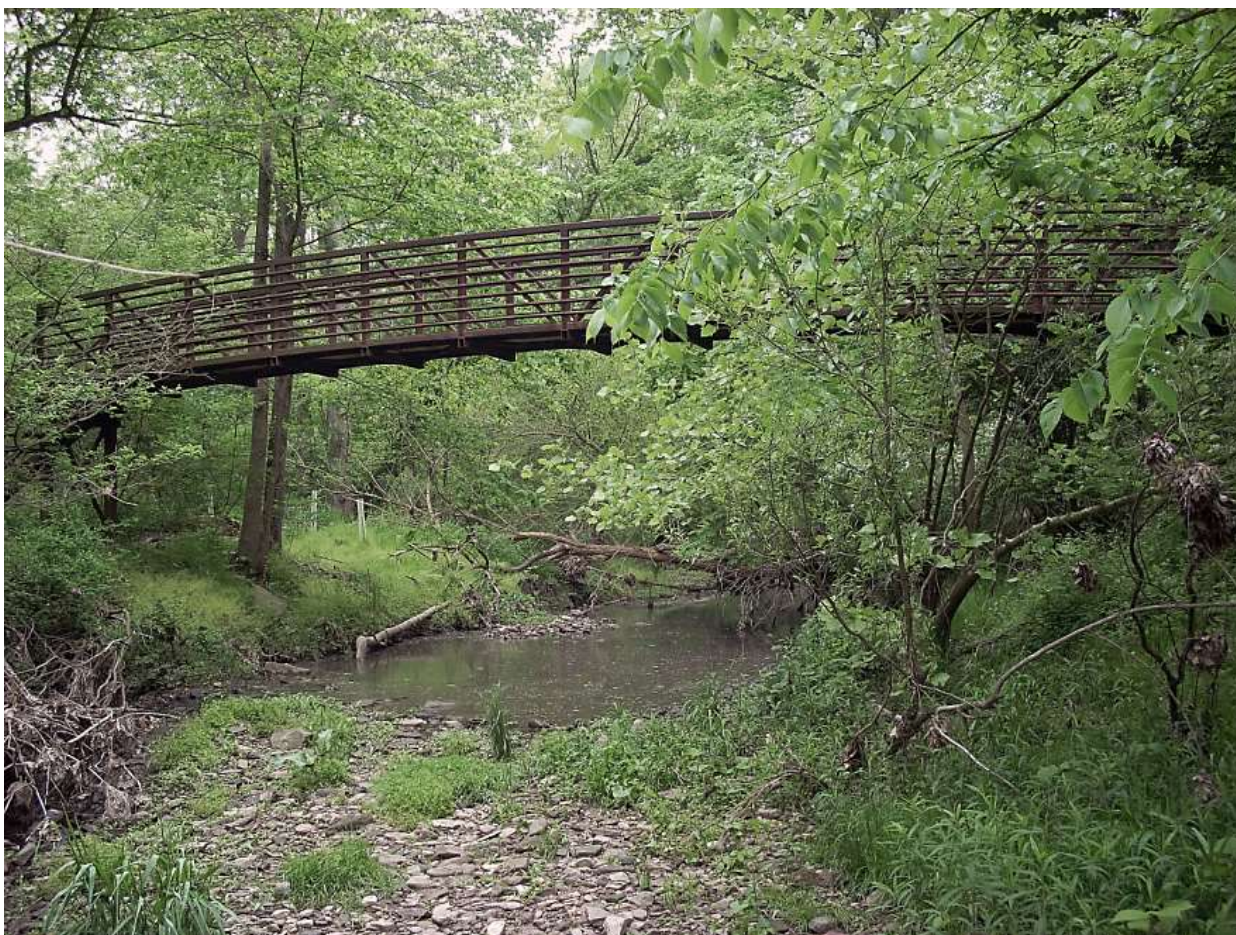


# **Natural Resources Inventory of Wissahickon Valley Watershed Association Preserves and the Green Ribbon Trail**



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**Cover photo: Footbridge over the Wissahickon Creek at the Four Mills Preserve, photographed on May 16, 2013.**

## **Acknowledgements**

We want to acknowledge Dennis Miranda, Executive Director of WVWA for initiating this project, Bob Adams, Director of Stewardship at WVWA for his long-term support, and especially John Ferro, WVWA's Land Manager, for accompanying us and facilitating our site visits, and Peg Shaw for her help and enthusiasm for the natural world.

We also acknowledge the many people who support the Wissahickon Valley Watershed Association and the research mission of the Morris Arboretum of the University of Pennsylvania. We couldn't do what we do without you.

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## Introduction

The purpose of this study is to provide The Wissahickon Valley Watershed Association with baseline information needed to help guide appropriate resource management and education decisions.

### The Study Area

The area under consideration in this study includes the named preserves of the Wissahickon Valley Watershed Association (WVWA) (approximately 331 acres), and the Green Ribbon Trail and associated WVWA-owned lands from the trailhead at the Upper Gwynedd Township Park in North Wales to the boundary of Fort Washington State Park near Skippack Pike, a distance of about 13.1 kilometers (8.14 miles) not counting the trail interruption at the Cedarbrook Country Club.

### Physical Characteristics of the Study Area

The bedrock geology (Figure 1) of the study area consists mostly of sandstone and siltstone of the Stockton Formation. Narrower bands of other Triassic Period Newark Basin sedimentary shale and sandstone of the Brunswick and Lockatong Formations cross the study area towards its northern reaches. Very narrow bands of the Chickies Formation (Cambrian quartzite) and Ledger Formation (Cambrian dolomite) cross the area towards the south.

The dominant feature of the landscape is the main stem of the Wissahickon Creek. The creek drops from approximately 306 feet above sea level at the northern end of the area to approximately 143 feet above sea level at the southern end of the study area. The Wissahickon and its tributaries are classified as TSF (trout stocked fishery) by the Pennsylvania Department of Environmental Protection.

Figure 2 shows the amount of riparian areas of the Wissahickon Creek and its tributaries in and near the study area that fall within the annual floodway, the 100-year flood zone, and the 500-year flood zone.

As is apparent from Figure 3, residential and commercial land use dominate the study area. This results in increased runoff from impervious surfaces. As a result, erosion along the banks of the Wissahickon Creek and its larger tributary streams is an ongoing problem.

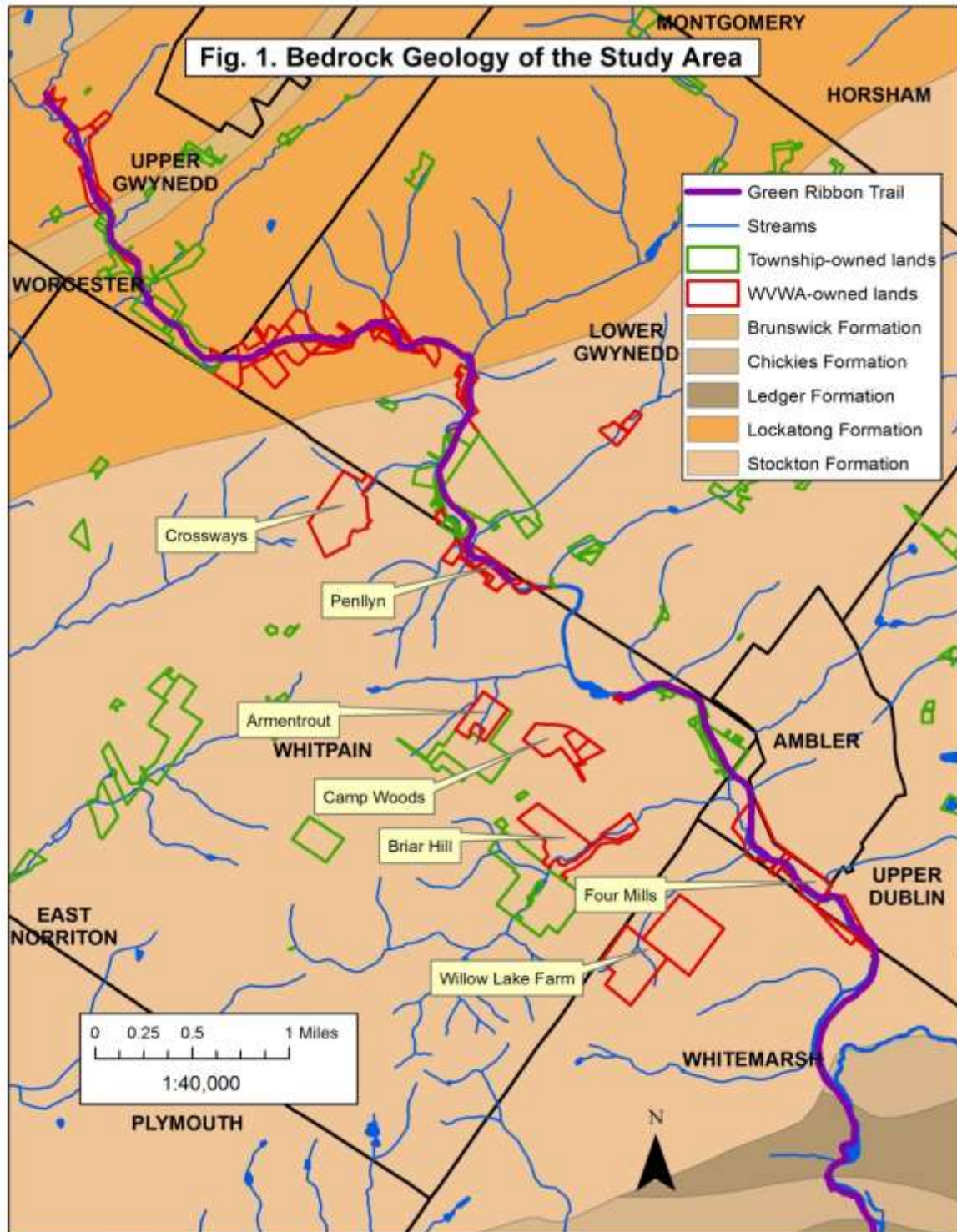


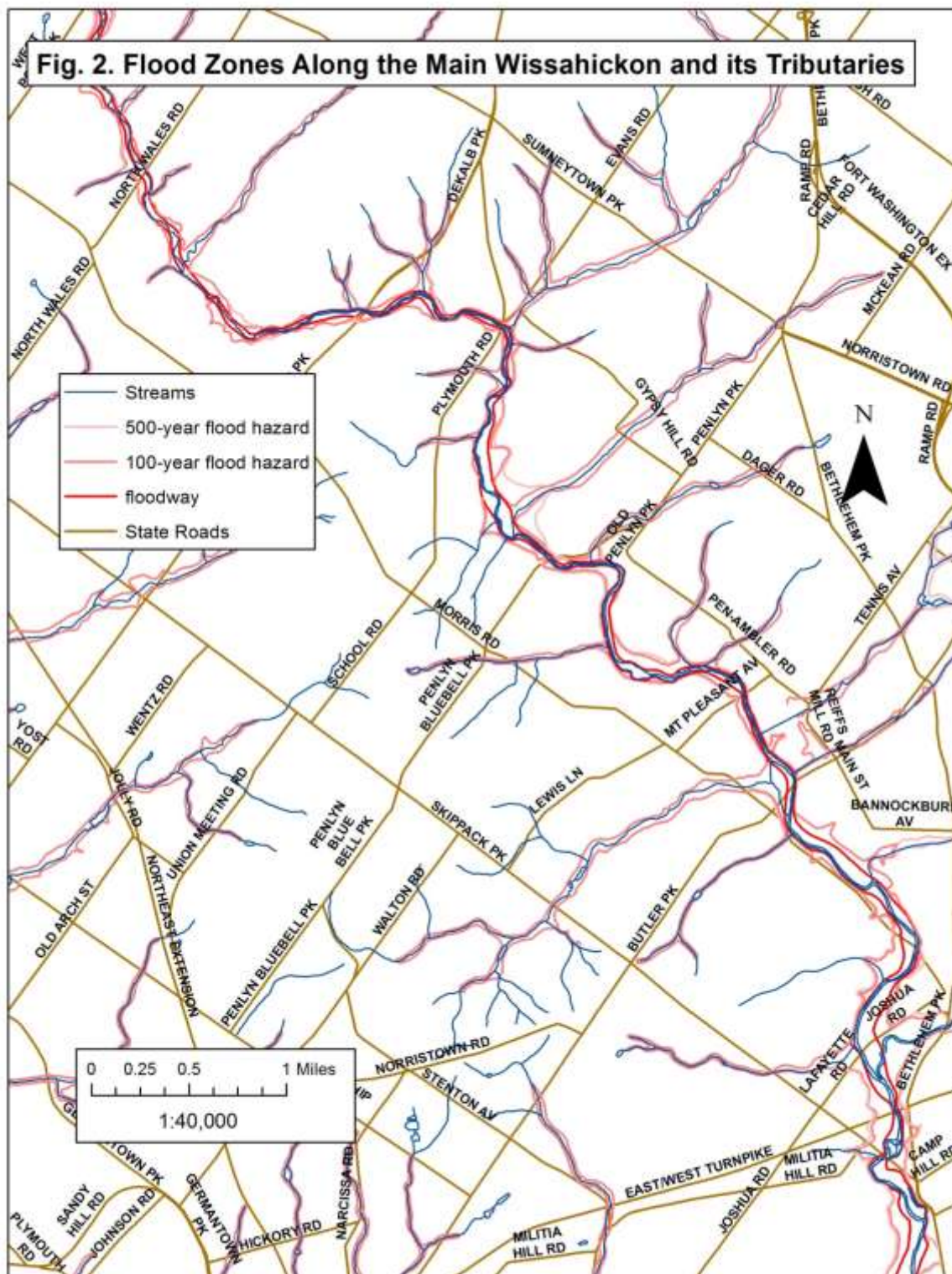
Erosion along the Wissahickon Creek

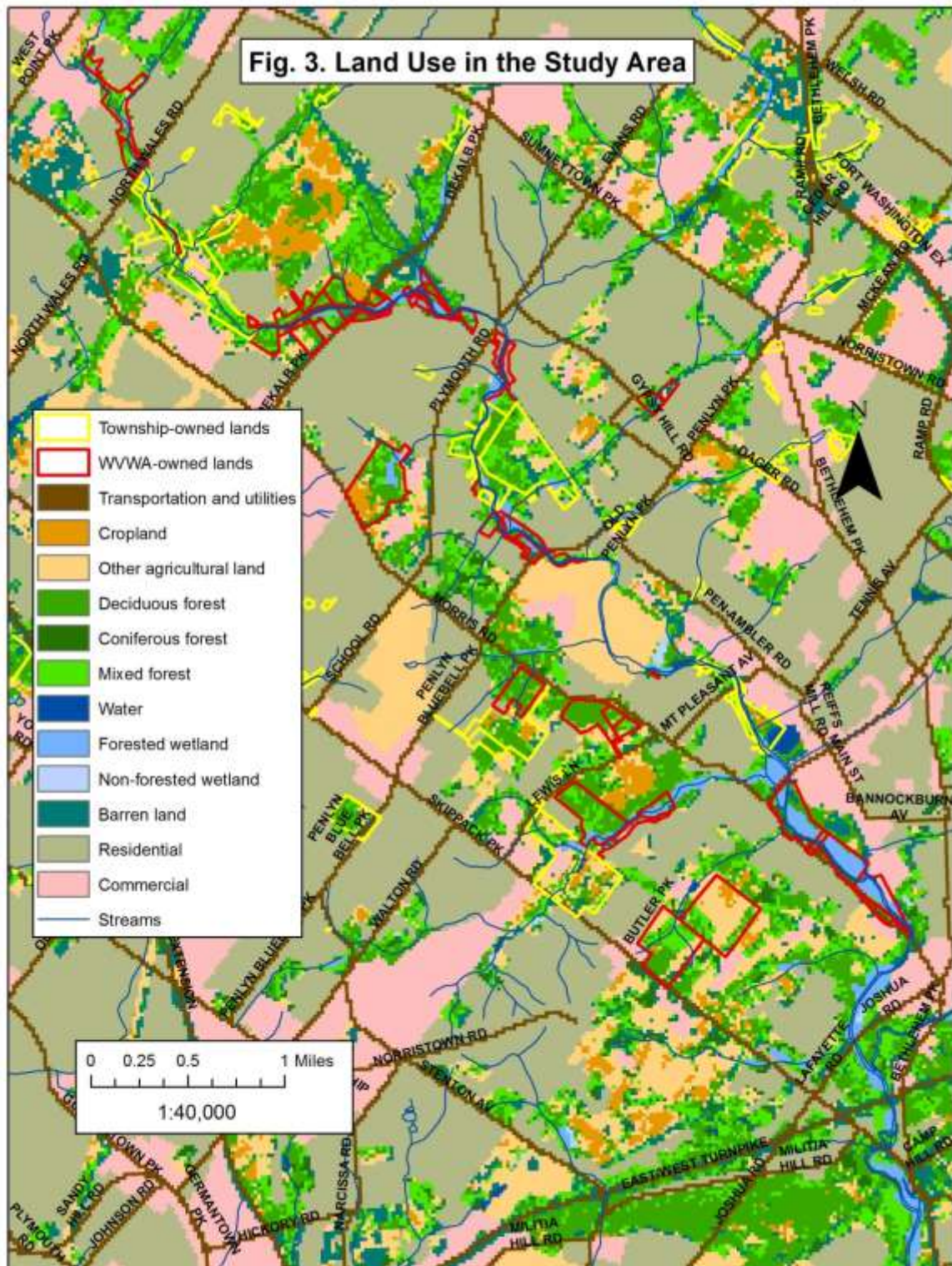
Ground water recharge is also limited due to channeling of storm water directly into streams. The result of this situation is that, in summer, 80% or more of the flow in the Wissahickon Creek consists of sewage effluent from the several municipal treatment plants in the study area. There is a noticeable smell of chlorine, year round, as one walks along the Green Ribbon Trail.

## Land Use

In addition to commercial and residential uses, a limited amount of land in the study area remains in agricultural use. These areas are mostly hay fields. The drastic shift from agricultural to







commercial/residential uses began in the early 1950s. More than 20 mills formerly operated along the Wissahickon Creek and evidence of mill dams and mill races remains in some places.

Approximately 12% of the study area is under tree cover and that percentage could increase as forest/woodland succession proceeds on lands now preserved or with the potential to be preserved. The overabundance of white-tailed deer could, however, limit the ability of open spaces to return to forest/woodland. Prior to the 1960s, much less of the land was tree-covered given the former intensive agricultural uses.

## **Forest Fragmentation**

Most of the study area was cleared for agricultural use by the early 1800s. Even areas of poor drainage were cleared of trees for pasture. No part of the study area contains slopes steep enough to have been considered unsuitable for agriculture, and therefore, remained forested.

As former agricultural land has been converted to residential and commercial uses the potential for reforestation and/or restoration of forest cover has diminished. Most existing tree cover is along riparian strips and in isolated patches.

Forest fragmentation leads to the isolation of small populations of plants and animals in habitat islands. Reduced breeding opportunities and restricted gene flow are serious problems that can result, especially in organisms with restricted mobility. Plants with limited seed dispersal and/or pollen movement are also vulnerable, as are reptiles, amphibians, and small mammals.

Areas of mature forest are found at Camp Woods Preserve, Crossways Preserve, and at some locations on steeper slopes along the Wissahickon, and are described in the site-specific sections below.

## **Edge Effects**

Due to the narrowness of the Wissahickon forested riparian corridor and the isolated nature of the WVWA-owned forested sites the majority of forest cover in the study area is in the form of “wooded edges.”



Edge of invasive sweet autumn clematis

As a general rule, and for the purposes of this study, wooded edges are considered to be wooded areas within 100 meters from any significant opening in the canopy.

Forest edges differ from true forest interior habitat in several ways. For example, more light and wind reach the forest floor causing warming and drying. Soil moisture and relative humidity are lower as a result. Snow loads and wind throw (trees uprooted by wind) are greater. Invasive plant species penetrate the boundary and are often concentrated in the forest edge where they compete with native species. On the other hand, some native species

benefit from the greater light availability at the forest edge; for example, flowering dogwood blooms more prolifically at the edge although it may also occur in the forest understory.

How far the edge effect extends into the forest varies somewhat with the type of forest, the age of the forest, the exposure, and the time since the edge was created. Old edges where understory plants have created a wall of foliage from the ground to the lowest branches of the canopy trees, have less impact than newly created edges. North-facing edges are less affected by light penetration than south or west-facing edges.

## Corridors

One way of mitigating some of the isolating effects of forest fragmentation is to connect smaller tracts with a network of corridors. Corridors can achieve several purposes: allow daily or seasonal movement of wildlife to and from breeding and/or feeding areas, allow genetic exchange among small populations of plants and animals in fragmented habitats, allow movement in response to environmental change or natural disasters, and allow replenishment of populations from other areas.

It has been suggested that corridors might also serve as dispersal channels for invasive plants. However, in one study on species richness, although the number of native species increased in connected patches, there was no detectable effect on the number of exotic species.

Rivers, streams, and associated riparian areas often form natural corridors linking larger habitat patches while at the same time protecting water quality and providing recreation opportunities. Other landscape features that can serve to enhance connectivity include roadside vegetation, fencerows, trail corridors, greenways, and greenbelts.

The Wissahickon Valley Watershed Association has long recognized the value of riparian and other corridors to the plants and animals of this area.

## Invasive Species

Invasive, non-native plants are another serious environmental problem. Introduced species such as honeysuckles (*Lonicera* spp.), multiflora rose (*Rosa multiflora*), Japanese stiltgrass (*Microstegium vimineum*), Norway maple (*Acer platanoides*), common buckthorn (*Rhamnus cathartica*), winged euonymus (*Euonymus alatus*), Chinese photinia (*Photinia villosa*), arthraxon grass (*Arthraxon hispidus*), and many more are found throughout the study area.

Riparian areas are especially vulnerable. Not only are they often narrow forested strips that are entirely edge habitat, but they are also subjected to natural



Invasive Amur honeysuckle

disturbance due to flood scouring and a constant source of seeds and other propagules that are carried in from upstream sources and spread by floodwaters.

Invasive plants compete with native species for space and resources. They alter forest structure and composition and affect the functioning of ecosystems. For example, research at Drew University in New Jersey has shown that the diversity of native species in the forest understory was reduced under a canopy of Norway maple compared to sugar maple. A study of nesting success by Wood Thrushes and Robins found predation of nests was higher in non-native honeysuckle and buckthorn shrubs compared with native shrubs.



Periwinkle (*Vinca minor*) blanketing the ground at Camp Woods

Research at the Stroud Water Research Center in Chester County, Pennsylvania has shown that aquatic ecosystems can be affected by the nature of streamside vegetation. Leaf litter consisting of multiflora rose, Oriental bittersweet (*Celastrus scandens*), and princess tree (*Pawlonia tomentosa*) resulted in reduced survival in mayfly nymphs compared to litter of white ash, hickory, and American beech. Mayflies are aquatic in their immature stages.

Effects of Japanese stiltgrass on forest soils in New Jersey included increased pH and thinned litter and organic layers. Garlic

mustard (*Alliaria petiolata*) has recently been found to suppress the growth of forest trees by inhibiting fungi in the soil that form beneficial associations with the trees' roots known as mycorrhizae.

Deer overabundance compounds the invasive species problem in several ways. Deer clearly prefer native species over non-natives with the result that, as native species disappear due to deer browsing, the forest understory is opened up to the spread of exotics such as winged euonymus, bush honeysuckles, and others. In addition, deer have been shown to serve as dispersers of seed of non-native species including autumn olive (*Elaeagnus umbellata*) and honeysuckles.

### Deer Overabundance

Some generalist wildlife species such as white-tailed deer, cottontail rabbits, gray squirrels, raccoons, and opossums have adapted very successfully to living in close proximity to humans. While this provides opportunities for local residents to view wildlife, it also brings problems. The lack of large predators and limited hunting opportunities have allowed deer to multiply



Young buck deer at Willow Lake Farm

in suburban areas. Damaged home landscaping is a familiar part of living with deer in the Wissahickon Watershed.

The impact of overabundant deer on forested areas is more than a backyard nuisance; it constitutes a serious ecological problem. Throughout the Wissahickon Valley, forested areas show the effects of depletion (or even elimination) of shrub layers and forest floor plants. Some especially vulnerable species, including showy wildflowers, have been lost completely. At all sites a browse line is visible on native woody species, resulting from severe browsing of the vegetation below a height of about five feet.

The forest canopy is also affected by deer browsing; although mature trees are safe from deer browse, their progeny are not. Mature trees, out of reach of hungry deer, continue to produce seeds. The seedlings and sapling trees which grow from these seeds represent the future of the forest, but are very vulnerable to both browsing and buck rub (damage caused by mature male deer scraping their antlers against saplings). The forests of the study area show little or no regeneration of canopy or understory trees as a result.

Loss of forest structure and regeneration potential affect the ability of forest stands to sequester carbon. More carbon is stored in forest communities that retain maximum vertical complexity including well-developed understory, shrub, and ground-level herbaceous layers.



Severely over browsed forest at Camp Woods

Over browsing by deer also affects other forest animals; studies have shown that consumption of acorns by deer can negatively affect small mammals such as squirrels and white-footed mice. Loss of forest understory due to over browsing was shown to affect the diversity of birds in a ten-year study in northwestern Pennsylvania. Birds that nest on the ground (such as Ovenbirds) or in the shrub or understory layers are most vulnerable.

Reducing deer numbers is critical to preserving forest habitat and the diversity of species in the Wissahickon and throughout the region and the state. Several recent publications address current options for managing deer in suburban areas (see References and Addition Sources of Information on page 81).

## **Plant Diversity**

The table in Appendix A lists all plant species observed at all sites during the course of this project. The total plant species count for this study is 574. Of these species 378 are native (65.85%) and 196 are introduced (34.15%). The relatively high species diversity for a study area of less than 1,300 acres is reflective of the variety of habitats present in the study area. Specific habitat types will be noted in the treatments of specific sites below.

**Table 1. Breakdown of plant diversity by nativity and growth habit**

Growth habit	Native	Introduced	Total
Trees	53	26	79
Shrubs	25	27	52
Vines	21	8	29
Perennial herbs	232	77	309
Annual and biennial herbs	47	58	105

Across all growth habits except shrubs, the ratios of introduced to native species are generally in line with those for the flora of Pennsylvania as a whole. For shrubs in all of Pennsylvania, the ratio of introduced to native species is almost exactly 1:2. The slightly higher than 1:1 ratio for shrubs in this study may reflect the long history of non-native species escaping from cultivation in southeastern Pennsylvania. To this point, it is noteworthy that all but six of the introduced shrub species observed in this study are dispersed by birds. The slightly higher than 1:1 ratio for shrubs may also illustrate the effect of high deer abundance and their preference for browsing the shrub layer. Higher browsing pressure on natives could have allowed for a competitive advantage for invasive species to invade this layer. It should be noted that in considering the ecological impact of these introduced species that biomass is a much more critical indicator than species count. For instance, native perennial herbs may outnumber introduced perennial herbs in species count, but those natives are generally rare in the study area and, as such, are far fewer in biomass than the introduced species.



Gamagrass female inflorescence

### Species of Special Concern

Four plant species listed as of special concern in Pennsylvania were encountered in the course of this study.

*Ilex opaca* (American holly) is listed as threatened in Pennsylvania. American holly is a common plant of the Atlantic Coastal Plain, but is also popular as an ornamental. All occurrences of American holly encountered in this study are escapees from cultivated sources and, therefore, do not represent natural populations in need of protection.

*Tripsacum dactyloides* (gamagrass) is listed as tentatively undetermined, but suggested as endangered by the Pennsylvania Biological Survey. This very large grass persists at a few natural sites in Pennsylvania, but is also often a component of warm-season grass mixes. This species is present in the open field area at the Crossways Preserve and in the planted meadow beneath the powerline near the northern trailhead where it was planted and needs no special protection.

*Rhododendron calendulaceum* (flame azalea) is listed as extirpated in Pennsylvania. This species is very popular as a landscape ornamental and has been planted at Four Mills near the driveway. There is no evidence of naturalization occurring.

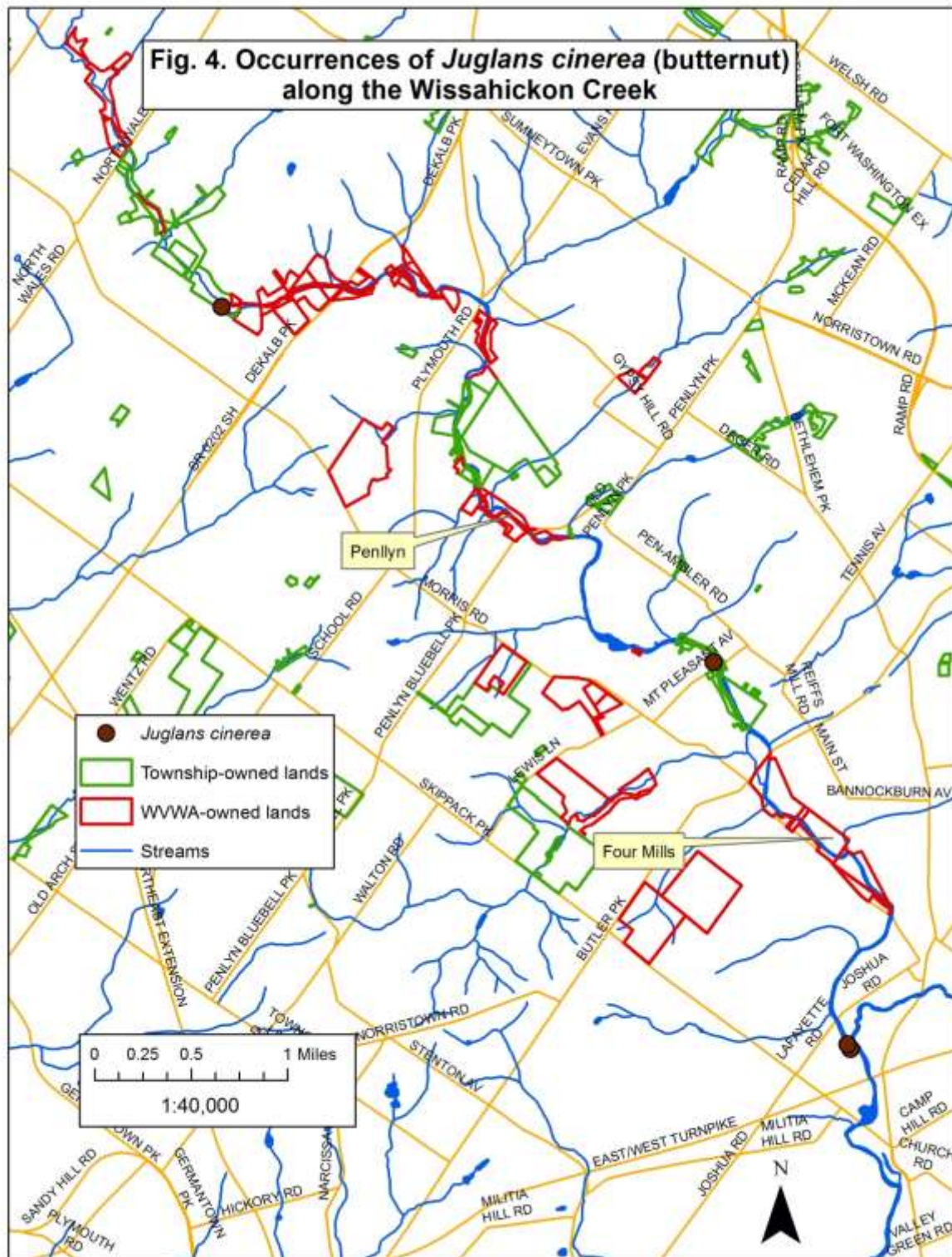


Tennessee bladder fern

*Cystopteris tennesseensis* (Tennessee bladder fern) is not currently listed by the Pennsylvania Natural Heritage Program, but has been suggested as endangered by the Pennsylvania Biological Survey. This limestone-loving fern was found growing in the mortar of the rail bridges between Plymouth Road and the Penllyn Woods Natural Area, and between Plymouth Road and US Route 202. This easily overlooked species has been collected recently from several other locations in our area and probably is much more common than previously thought. It should not be considered rare and is in no need of special protection.

A small population of *Cuscuta campestris* (field dodder) was found in a disturbed area along the Wissahickon just below Lafayette Avenue. This species was recommended for listed as threatened by the Pennsylvania Biological Survey, but probably will not receive that status due to the number of populations discovered recently. This occurrence does not need special protection.

Several individuals of butternut (*Juglans cinerea*) were found along the banks of the Wissahickon Creek (Figure 4). *Juglans cinerea* is under consideration for status as a species of special concern by the Pennsylvania Biological Survey. Butternut trees, while probably never common, have become less so due to a fungal disease known as butternut canker. All of the individuals observed in this study appear to be young, healthy trees. Butternuts are dispersed by small mammals, especially squirrels, and carried longer distances by flood water. We did not, however, find a mature seed-producing specimen that might be the source of these populations. See also the further discussion of this species in the section on the Green Ribbon Trail below.



## Some Other Noteworthy Plant Observations

Two stems of ragged fringed-orchid (*Platanthera lacera*) were found in one of the mowed horse trails at the Crossways Preserve. This rather common native orchid species is often found in just this kind of situation. This find is noteworthy since it is the only occurrence of a native orchid observed in the course of this study. Orchids can be somewhat irregular in appearing, not always showing themselves every year. No special management is needed to protect this small population.

The incredible abundance of Chinese photinia (*Photinia villosa*) as a non-native invasive species throughout the study area was something of a surprise. Although this species had been observed and collected by the authors at Briar Hill in 2006 and as early as 1998 in both Bucks and Philadelphia Counties, the current status of this species as a major problem was not appreciated. The fleshy, bright red fruits of Chinese photinia are eaten by birds who disperse the seeds. Vegetatively, this species is easily confused with another non-native, sapphire-berry (*Symplocos paniculata*), which also grows at some of the study sites.

## Study Methods

Plant diversity surveys were conducted by Drs. Timothy A. Block, Ann F. Rhoads, and Cynthia Skema of the Morris Arboretum's Botany Department. The timed meander method, a standard method for surveying for total plant diversity, was employed. Some of the preserves were visited twice at different seasons to record the maximum number of species (Table 2). Plant identifications follow *The Plants of Pennsylvania: An Illustrated Manual*, second edition, by Rhoads and Block.

Plant specimens were collected as necessary to assist in identification and/or documentation of particularly interesting occurrences. Retained specimens were processed for permanent preservation in the herbarium of the Morris Arboretum of the University of Pennsylvania (listed as MOAR in *Index Herbariorum*; <http://sciweb.nybg.org/science2/IndexHerbariorum.asp>). Occurrences of state-listed plants will be reported to the Pennsylvania Natural Heritage Program as appropriate.

Casual observations of wildlife and other organisms are noted in the sections on specific sites below.

**Table 2. Dates of Site Visits**

May 15, 2013	Four Mills Preserve
May 16, 2013	Four Mills Preserve
May 20, 2013	Willow Lake Farm Preserve
May 21, 2013	Briar Hill Preserve
May 30, 2013	Penllyn Woods Natural Area
May 31, 2013	Camp Woods Preserve
June 18, 2013	Armentrout Preserve
June 19, 2013	Crossways Preserve
June 26, 2013	Crossways Preserve
July 25, 2013	Green Ribbon Trail from Morris Road at Germantown Academy, south to the boundary of Ft. Washington State Park
July 26, 2013	Green Ribbon Trail from Butler Pike to Cedarbrook Golf Course
July 29, 2013	Green Ribbon Trail from Cedarbrook Golf Course to Penllyn-Bluebell Pike

August 5, 2013	Green Ribbon Trail from Penllyn Woods to Plymouth Road
August 6, 2013	Green Ribbon Trail from Plymouth Road to PA Route 202
August 19, 2013	Green Ribbon Trail from PA Route 202 to Swedesford Road
August 20, 2013	Green Ribbon Trail from Swedesford Road to North Wales Road
August 21, 2013	Green Ribbon Trail from North Wales Road to trailhead at Upper Gwynedd Township Park
September 10, 2013	Willow Lake Farm Preserve
September 11, 2013	Crossways Preserve
September 30, 2013	Briar Hill Preserve
October 1, 2013	Armentrout Preserve
October 2, 2013	Four Mills Preserve
October 28, 2013	Camp Woods Preserve

### **Index of Survivability**

Included in the table in Appendix A are values for an Index of Survivability. This index is structured to provide information on the survivability of species in the future given various conditions.

Current and/or expected future conditions considered in the creation of the Index of Survivability include deer browse, competition from non-native species, continued forest succession, and anthropogenic disturbance or other habitat destruction. Immeasurable impacts such as climate change, or pest/disease pressures not currently present in the area have not been taken into consideration for this index.

Following are the definitions assigned to each of the categories in the Index of Survivability, numbered from one to five:

1. Species extremely susceptible to local extirpation due to very small population size and for any reason, predictable or unpredictable, including current and/or future conditions.
2. Species highly susceptible to local extirpation due to current and/or future conditions and/or possibly small population size.
3. Species expected to decline under current and/or expected future conditions if no management actions are taken; species expected to expand if conditions become more favorable.
4. Species somewhat resistant to decline under current and/or future expected conditions whether management actions are taken or not; species expected to expand if conditions become more favorable.
5. Species very unlikely to decline under current and/or future expected conditions whether management actions are taken or not.

## **General Management Recommendations for the Entire Study Area**

- Reduce deer density throughout
- Control invasive species, focusing on early stage infestations where possible
- Educate local residents regarding conservation goals and encourage their cooperation
- Educate the public on the impacts of domestic and feral animals on natural ecosystems
- Provide interpretive materials for users covering natural and cultural history
- Install signs at preserve access points asking people not to dump yard/garden waste and explaining the ecological impacts of non-native plants such as periwinkle, Japanese pachysandra, and English ivy

## Specific Sites

### Armentrout Preserve

The Armentrout Preserve in Whitpain Township is a site of approximately 20.6 acres of which about 6 acres is a wooded stream corridor. The remainder is early successional old fields dominated by goldenrods (*Solidago* spp.) with widely scattered young trees and shrubs. The site is bounded on the northeast by Morris Road, on the southeast and southwest by land owned by the township, and on the northwest by private property. The Whitpain Township-owned tract is approximately 45.5 acres in size, making a combined preserved land total of more than 66 acres in this heavily populated area. The Armentrout Preserve is connected to the Camp Woods Preserve by a trail across private property.

The entire site is underlain by Stockton Formation bedrock. The soils are mainly of the Bowmansville, Lawrenceville, and Readington Silt Loam Series with slopes ranging from 0 to about 8 percent.

The stream which roughly bisects the property is an unnamed tributary of Willow Run and joins Willow Run about 180 meters north of Morris Road. This tributary is mostly dry, carrying water only during and immediately after precipitation events.

The primary users of the Armentrout Preserve appear to be nearby residents who use the site to exercise their dogs. There also is some evidence of occasional equestrian use.

#### Site-specific Management Recommendations

- Remove small population of *Miscanthus sinensis* (eulalia) from old field near parking area
- Remove fruiting plants of *Hedera helix* (English ivy) from barn walls
- Encourage site users to keep their pets on leash

As one would expect, the plant diversity of the Armentrout Preserve is a reflection of the large old field areas and extensive woods edge. Nearly 40% of the species are introduced, and some like *Rhamnus cathartica*, *Photinia villosa*, *Lonicera maackii*, and *Ligustrum obtusifolium* are the dominant shrubs throughout the property, especially along the trails. Table 3 provides the complete list of plant species observed in this study at this site.

**Table 3. Plant list for Armentrout Preserve**

Species	Common name	Family	Nativity	USFWS wetland code	Growth habit
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	Native	FACU-	Annual herb
<i>Acer negundo</i>	Box-elder	Sapindaceae	Native	FAC+	Deciduous tree
<i>Acer platanoides</i>	Norway maple	Sapindaceae	Introduced	UPL	Deciduous tree
<i>Acer rubrum</i>	Red maple	Sapindaceae	Native	FAC	Deciduous tree
<i>Acer saccharinum</i>	Silver maple	Sapindaceae	Native	FACW	Deciduous tree
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	Introduced	FACU	Perennial herb
<i>Acorus calamus</i>	Sweet flag	Acoraceae	Introduced	OBL	Perennial herb

<i>Ageratina altissima</i> var. <i>altissima</i>	White-snakeroot	Asteraceae	Native	N	Perennial herb
<i>Agrimonia parviflora</i>	Southern agrimony	Rosaceae	Native	FACW	Perennial herb
<i>Alliaria petiolata</i>	Garlic-mustard	Brassicaceae	Introduced	FACU-	Biennial herb
<i>Allium vineale</i>	Field garlic	Alliaceae	Introduced	FACU-	Perennial herb
<i>Ambrosia artemisiifolia</i>	Common ragweed	Asteraceae	Native	FACU	Annual herb
<i>Ambrosia trifida</i>	Giant ragweed	Asteraceae	Native	FAC	Annual herb
<i>Ampelopsis brevipedunculata</i>	Porcelain-berry	Vitaceae	Introduced	N	Woody vine
<i>Andropogon virginicus</i>	Broom-sedge	Poaceae	Native	FACU	Perennial herb
<i>Anthoxanthum odoratum</i>	Sweet vernalgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Apocynum cannabinum</i>	Indian-hemp	Apocynaceae	Native	FACU	Perennial herb
<i>Arctium minus</i>	Common burdock	Asteraceae	Introduced	FACU-	Biennial herb
<i>Arisaema triphyllum</i> ssp. <i>triphyllum</i>	Jack-in-the-pulpit	Araceae	Native	FACW-	Perennial herb
<i>Arthraxon hispidus</i>	Grass	Poaceae	Introduced	FAC	Annual herb
<i>Asclepias incarnata</i> ssp. <i>incarnata</i>	Swamp milkweed	Apocynaceae	Native	OBL	Perennial herb
<i>Asclepias syriaca</i>	Common milkweed	Apocynaceae	Native	FACU-	Perennial herb
<i>Barbarea vulgaris</i>	Wintercress	Brassicaceae	Introduced	FACU	Biennial herb
<i>Berberis thunbergii</i>	Japanese barberry	Berberidaceae	Introduced	N	Deciduous shrub
<i>Betula nigra</i>	River birch	Betulaceae	Native	FACW	Deciduous tree
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	Native	FACW	Annual herb
<i>Botrychium dissectum</i>	Cut-leaved grape-fern	Ophioglossaceae	Native	FAC	Perennial herb
<i>Bromus arvensis</i>	Field chess	Poaceae	Introduced	N	Annual herb
<i>Bromus commutatus</i>	Hairy chess	Poaceae	Introduced	N	Annual herb
<i>Cardamine impatiens</i>	Bittercress	Brassicaceae	Introduced	N	Perennial herb
<i>Carex amphibola</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex annectens</i>	Sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex cephalophora</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex radiata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex straminea</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carpinus caroliniana</i>	Hornbeam	Betulaceae	Native	FAC	Deciduous tree
<i>Carya cordiformis</i>	Bitternut hickory	Juglandaceae	Native	FACU+	Deciduous tree
<i>Carya ovata</i>	Shagbark hickory	Juglandaceae	Native	FACU	Deciduous tree
<i>Catalpa speciosa</i>	Catalpa	Bignoniaceae	Introduced	FAC	Deciduous tree
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Introduced	UPL	Woody vine
<i>Celtis occidentalis</i>	Dogberry	Cannabaceae	Native	FACU	Deciduous tree
<i>Cercis canadensis</i>	Redbud	Fabaceae	Native	N	Deciduous tree
<i>Chionanthus virginicus</i>	Fringe-tree	Oleaceae	Native	FAC+	Deciduous tree
<i>Cichorium intybus</i>	Blue chicory	Asteraceae	Introduced	N	Perennial herb
<i>Circaea canadensis</i> ssp. <i>canadensis</i>	Enchanter's-nightshade	Onagraceae	Native	FACU	Perennial herb
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	Introduced	FACU	Perennial herb
<i>Clematis virginiana</i>	Virgin's-bower	Ranunculaceae	Native	FAC	Perennial vine
<i>Cornus florida</i>	Flowering dogwood	Cornaceae	Native	FACU-	Deciduous tree

<i>Cornus racemosa</i>	Gray dogwood	Cornaceae	Native	FAC-	Deciduous shrub
<i>Corylus americana</i>	American filbert	Betulaceae	Native	FACU-	Deciduous shrub
<i>Cyperus strigosus</i>	False nutsedge	Cyperaceae	Native	FACW	Perennial herb
<i>Dactylis glomerata</i>	Orchardgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Daucus carota</i>	Queen Anne's-lace	Apiaceae	Introduced	N	Biennial herb
<i>Desmodium perplexum</i>	Tick-trefoil	Fabaceae	Native	N	Perennial herb
<i>Dianthus armeria</i>	Deptford pink	Caryophyllaceae	Introduced	N	Biennial herb
<i>Dichanthelium acuminatum</i>	Panic grass	Poaceae	Native	FAC	Perennial herb
<i>Digitaria ischaemum</i>	Smooth crabgrass	Poaceae	Introduced	UPL	Annual herb
<i>Duchesnea indica</i>	Indian strawberry	Rosaceae	Introduced	FACU-	Perennial herb
<i>Elaeagnus umbellata</i>	Autumn-olive	Elaeagnaceae	Introduced	N	Deciduous shrub
<i>Eleusine indica</i>	Goosegrass	Poaceae	Introduced	FACU-	Annual herb
<i>Epilobium coloratum</i>	Purple-leaved willow-herb	Onagraceae	Native	FACW+	Perennial herb
<i>Erechtites hieraciifolius</i>	Fireweed	Asteraceae	Native	FACU	Annual herb
<i>Erigeron philadelphicus</i>	Daisy fleabane	Asteraceae	Native	FACU	Perennial herb
<i>Euonymus alatus</i>	Winged euonymous	Celastraceae	Introduced	N	Deciduous shrub
<i>Euonymus fortunei</i>	Wintercreeper	Celastraceae	Introduced	N	Woody vine
<i>Euthamia graminifolia</i>	Grass-leaved goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Fagus grandifolia</i>	American beech	Fagaceae	Native	FACU	Deciduous tree
<i>Fallopia scandens</i>	Climbing false-buckwheat	Polygonaceae	Native	FAC	Perennial vine
<i>Fraxinus americana</i> var. <i>americana</i>	White ash	Oleaceae	Native	FACU	Deciduous tree
<i>Galium mollugo</i>	White bedstraw	Rubiaceae	Introduced	N	Perennial herb
<i>Geum canadense</i>	White avens	Rosaceae	Native	FACU	Perennial herb
<i>Gleditsia triacanthos</i>	Honey-locust	Fabaceae	Native	FAC-	Deciduous tree
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	Native	OBL	Perennial herb
<i>Hamamelis virginiana</i>	Witch-hazel	Hamamelidaceae	Native	FACU+	Deciduous shrub
<i>Hesperis matronalis</i>	Dame's-rocket	Brassicaceae	Introduced	N	Perennial herb
<i>Holcus lanatus</i>	Velvetgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Ilex opaca</i>	American holly	Aquifoliaceae	Native	FACU	Evergreen tree
<i>Impatiens capensis</i>	Jewelweed	Balsaminaceae	Native	FACW	Annual herb
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Native	FACU	Deciduous tree
<i>Juncus tenuis</i> var. <i>tenuis</i>	Path rush	Juncaceae	Native	FAC-	Perennial herb
<i>Juniperus virginiana</i>	Eastern red-cedar	Cupressaceae	Native	FACU	Evergreen tree
<i>Leucanthemum vulgare</i>	Ox-eye daisy	Asteraceae	Introduced	N	Perennial herb
<i>Ligustrum obtusifolium</i>	Obtuse-leaved privet	Oleaceae	Introduced	N	Deciduous shrub
<i>Lindera benzoin</i>	Spicebush	Lauraceae	Native	FACW-	Deciduous shrub
<i>Liquidambar styraciflua</i>	Sweetgum	Altingiaceae	Native	FAC	Deciduous tree
<i>Liriodendron tulipifera</i>	Tuliptree	Magnoliaceae	Native	FACU	Deciduous tree
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	Native	FACU	Annual herb
<i>Lolium perenne</i>	Perennial ryegrass	Poaceae	Introduced	FACU-	Perennial herb

<i>Lonicera japonica</i>	Japanese honeysuckle	Caprifoliaceae	Introduced	FAC-	Woody vine
<i>Lonicera maackii</i>	Amur honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lonicera morrowii</i>	Morrow's honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lycopus virginicus</i>	Bugleweed	Lamiaceae	Native	OBL	Perennial herb
<i>Lysimachia nummularia</i>	Creeping-charlie	Myrsinaceae	Introduced	FACW-	Perennial herb
<i>Malus coronaria</i>	Sweet crabapple	Rosaceae	Native	N	Deciduous tree
<i>Malus sp.</i>	Crabapple	Rosaceae	Introduced	N	Deciduous tree
<i>Microstegium vimineum</i>	Stiltgrass	Poaceae	Introduced	FAC	Annual herb
<i>Miscanthus sinensis</i> var. <i>sinensis</i>	Eulalia	Poaceae	Introduced	FACU	Perennial herb
<i>Muhlenbergia schreberi</i>	Dropseed	Poaceae	Native	FAC	Perennial herb
<i>Onoclea sensibilis</i>	Sensitive fern	Polypodiaceae	Native	FACW	Perennial herb
<i>Oxalis stricta</i>	Common yellow wood-sorrel	Oxalidaceae	Native	UPL	Perennial herb
<i>Panicum anceps</i>	Panic grass	Poaceae	Native	FAC	Perennial herb
<i>Panicum dichotomiflorum</i>	Smooth panic grass	Poaceae	Native	FACW-	Annual herb
<i>Panicum virgatum</i>	Switchgrass	Poaceae	Native	FAC	Perennial herb
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	Vitaceae	Native	FACU	Woody vine
<i>Paspalum laeve</i>	Field beadgrass	Poaceae	Native	FAC+	Perennial herb
<i>Persicaria longiseta</i>	Low smartweed	Polygonaceae	Introduced	FACU-	Annual herb
<i>Persicaria punctata</i>	Dotted smartweed	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria virginiana</i>	Jumpseed	Polygonaceae	Native	FAC	Perennial herb
<i>Philadelphus inodorus</i> var. <i>grandiflorus</i>	Mock-orange	Hydrangeaceae	Introduced	N	Deciduous shrub
<i>Phleum pratense</i>	Timothy	Poaceae	Introduced	FACU	Perennial herb
<i>Photinia villosa</i>	Photinia	Rosaceae	Introduced	N	Deciduous tree
<i>Phytolacca americana</i>	Pokeweed	Phytolaccaceae	Native	FACU+	Perennial herb
<i>Picea abies</i>	Norway spruce	Pinaceae	Introduced	N	Evergreen tree
<i>Pilea pumila</i>	Clearweed	Urticaceae	Native	FACW	Annual herb
<i>Pinus strobus</i>	Eastern white pine	Pinaceae	Native	FACU	Evergreen tree
<i>Pinus sylvestris</i>	Scots pine	Pinaceae	Introduced	N	Evergreen tree
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	Introduced	UPL	Perennial herb
<i>Plantago rugelii</i>	Rugel's plantain	Plantaginaceae	Native	FACU	Perennial herb
<i>Platanus occidentalis</i>	Sycamore	Platanaceae	Native	FACW-	Deciduous tree
<i>Poa annua</i>	Annual bluegrass	Poaceae	Introduced	FACU	Annual herb
<i>Poa trivialis</i>	Rough bluegrass	Poaceae	Introduced	FACW	Perennial herb
<i>Potentilla recta</i>	Sulfur cinquefoil	Rosaceae	Introduced	N	Perennial herb
<i>Prunella vulgaris</i> ssp. <i>vulgaris</i>	Heal-all	Lamiaceae	Introduced	FACU+	Perennial herb
<i>Prunus avium</i>	Sweet cherry	Rosaceae	Introduced	N	Deciduous tree
<i>Prunus serotina</i>	Wild black cherry	Rosaceae	Native	FACU	Deciduous tree
<i>Pseudognaphalium obtusifolium</i>	Fragrant cudweed	Asteraceae	Native	N	Annual herb
<i>Pyrus calleryana</i>	Callery pear	Rosaceae	Introduced	N	Deciduous tree
<i>Quercus acutissima</i>	Sawtooth oak	Fagaceae	Introduced	N	Deciduous tree
<i>Quercus alba</i>	White oak	Fagaceae	Native	FACU	Deciduous tree

<i>Quercus bicolor</i>	Swamp white oak	Fagaceae	Native	FACW+	Deciduous tree
<i>Quercus montana</i>	Chestnut oak	Fagaceae	Native	FACW	Deciduous tree
<i>Quercus palustris</i>	Pin oak	Fagaceae	Native	FACW	Deciduous tree
<i>Quercus rubra</i>	Northern red oak	Fagaceae	Native	FACU-	Deciduous tree
<i>Rhamnus cathartica</i>	Buckthorn	Rhamnaceae	Introduced	N	Deciduous shrub
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Native	FACU-	Deciduous tree
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Introduced	FACU	Deciduous shrub
<i>Rubus allegheniensis</i>	Common blackberry	Rosaceae	Native	FACU-	Deciduous shrub
<i>Rubus flagellaris</i>	Prickly dewberry	Rosaceae	Native	FACU	Woody vine
<i>Rubus occidentalis</i>	Black-cap	Rosaceae	Native	N	Deciduous shrub
<i>Rubus phoenicolasius</i>	Wineberry	Rosaceae	Introduced	N	Deciduous shrub
<i>Rudbeckia hirta</i> var. <i>hirta</i>	Black-eyed-susan	Asteraceae	Native	FACU-	Biennial herb
<i>Rumex acetosella</i>	Sheep sorrel	Polygonaceae	Introduced	UPL	Perennial herb
<i>Rumex crispus</i>	Curly dock	Polygonaceae	Introduced	FACU	Perennial herb
<i>Sanicula marilandica</i>	Black snake root	Apiaceae	Native	UPL	Perennial herb
<i>Sassafras albidum</i>	Sassafras	Lauraceae	Native	FACU-	Deciduous tree
<i>Schedonorus arundinaceus</i>	Fescue	Poaceae	Introduced	FACU-	Perennial herb
<i>Schizachyrium scoparium</i> var. <i>scoparium</i>	Little bluestem	Poaceae	Native	FACU	Perennial herb
<i>Setaria faberi</i>	Giant foxtail	Poaceae	Introduced	UPL	Annual herb
<i>Setaria pumila</i>	Yellow foxtail	Poaceae	Introduced	FAC	Annual herb
<i>Sicyos angulatus</i>	Bur cucumber	Cucurbitaceae	Native	FACU	Annual vine
<i>Sisyrinchium angustifolium</i>	Blue-eyed-grass	Iridaceae	Native	FACW-	Perennial herb
<i>Smilax rotundifolia</i>	Catbrier	Smilacaceae	Native	FAC	Woody vine
<i>Solanum carolinense</i>	Horse-nettle	Solanaceae	Native	UPL	Perennial herb
<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago gigantea</i> var. <i>gigantea</i>	Smooth goldenrod	Asteraceae	Native	FACW	Perennial herb
<i>Solidago rugosa</i> ssp. <i>rugosa</i> var. <i>rugosa</i>	Wrinkle-leaf goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Sorghastrum nutans</i>	Indian-grass	Poaceae	Native	UPL	Perennial herb
<i>Symphyotrichum lanceolatum</i> ssp. <i>lanceolatum</i> var. <i>lanceolatum</i>	Panicked aster	Asteraceae	Native	N	Perennial herb
<i>Symphyotrichum novae-angliae</i>	New England aster	Asteraceae	Native	FAC	Perennial herb
<i>Symphyotrichum pilosum</i> var. <i>pilosum</i>	Heath aster	Asteraceae	Native	UPL	Perennial herb
<i>Symplocos paniculata</i>	Sapphire-berry	Symplocaceae	Introduced	N	Deciduous shrub
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	Introduced	FACU-	Perennial herb
<i>Toxicodendron radicans</i>	Poison-ivy	Anacardiaceae	Native	FAC	Woody vine
<i>Tridens flavus</i>	Purpletop	Poaceae	Native	FACU	Perennial herb
<i>Trifolium aureum</i>	Large yellow hop-clover	Fabaceae	Introduced	N	Annual herb
<i>Trifolium pratense</i>	Red clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Trifolium repens</i>	White clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Ulmus americana</i>	American elm	Ulmaceae	Native	FACW-	Deciduous tree

<i>Ulmus rubra</i>	Red elm	Ulmaceae	Native	FAC-	Deciduous tree
<i>Urtica dioica</i> ssp. <i>dioica</i>	Great nettle	Urticaceae	Introduced	FACU	Perennial herb
<i>Verbena urticifolia</i> var. <i>urticifolia</i>	White vervain	Verbenaceae	Native	FACU	Annual herb
<i>Veronicastrum virginicum</i>	Culver's-root	Plantaginaceae	Native	FACU	Perennial herb
<i>Viburnum dentatum</i>	Southern arrow-wood	Adoxaceae	Native	FAC	Deciduous shrub
<i>Viburnum dilatatum</i>	Linden viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum lentago</i>	Nannyberry	Adoxaceae	Native	FAC	Deciduous shrub
<i>Vicia sativa</i> ssp. <i>sativa</i>	Common vetch	Fabaceae	Introduced	FACU-	Annual herb
<i>Vinca minor</i>	Common periwinkle	Apocynaceae	Introduced	N	Perennial herb
<i>Viola sororia</i>	Common blue violet	Violaceae	Native	FAC-	Perennial herb
<i>Vitis riparia</i>	Frost grape	Vitaceae	Native	FACW	Woody vine
<i>Vitis vulpina</i>	Frost grape	Vitaceae	Native	FAC	Woody vine
<i>Xanthium strumarium</i>	Common cocklebur	Asteraceae	Native	FAC	Annual herb

## Briar Hill Preserve

The Briar Hill Preserve is approximately 48.1 acres in size and lies within Whitpain Township adjacent to 79 acres of the township-owned Prophecy Creek Park. The township manages Prophecy Creek Park primarily as a public recreation facility and much of the park is mowed lawns or maintained as hay fields. The Briar Hill Preserve provides a somewhat natural contrast.

Prophecy Creek flows through the preserve and approximately 13.6 acres of the floodplain lies within the 100-year flood zone.

The entire site is underlain by Stockton Formation bedrock. The soils are mainly of the Bowmansville and Lawrenceville Silt Loam Series with slopes ranging from 0 to about 8 percent.

Almost all of the Briar Hill Preserve is wooded and in various stages of early forest/very late old field succession. Red maple (*Acer rubrum*) is the dominant canopy tree in low areas along streams, while



Chinese photinia (*Photinia villosa*), a prominent invasive species at Briar Hill

other trees include sycamore (*Platanus occidentalis*), beech (*Fagus grandifolia*), black walnut (*Juglans nigra*), and hackberry (*Celtis occidentalis*). Spicebush (*Lindera benzoin*), winged euonymus (*Euonymus alatus*), and multiflora rose (*Rosa multiflora*) are prominent in the understory and shrub layers. On upland sites tuliptree (*Liriodendron tulipifera*) is a prominent component of the canopy and the understory/shrub layer consists of Chinese photinia (*Photinia villosa*), winged euonymus (*Euonymus alatus*), multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), Amur honeysuckle (*L. maackii*), Morrow's honeysuckle (*L. morrowii*) and Oriental

bittersweet (*Celastrus orbiculatus*).

Callery pear (*Pyrus calleryana*) has begun to invade openings along the floodplain of Prophecy Creek. We saw only a few young trees, but it will undoubtedly increase with time.

The herbaceous layer contains scattered patches of some of the common native woodland species such as skunk-cabbage (*Symplocarpus foetidus*), mayapple (*Podophyllum peltatum*), Virginia waterleaf (*Hydrophyllum virginianum*), and sensitive fern (*Onoclea sensibilis*), but non-native invasives



Small skunk-cabbage wetland along left side of trail near entrance to the preserve

are also prominent. Lesser celandine (*Ranunculus ficaria*) carpets the ground in low areas along the creeks. Japanese stiltgrass (*Microstegium vimineum*) and Japanese honeysuckle (*Lonicera japonica*) are abundant and bittercress (*Cardamine impatiens*), garlic mustard (*Alliaria petiolata*), field garlic (*Allium vineale*), and Indian-strawberry (*Duchesnea indica*) are present. Dame's-rocket (*Hesperis matronalis*) and yellow iris (*Iris pseudacorus*) are present along Prophecy Creek and the tributary streams.

### Site-specific Management Recommendations

- Remove currently limited population of *Pyrus calleryana* (Callery pear) from floodplain

Approximately 67% of the plant species at Briar Hill are natives. This is consistent with the ratio of natives to non-natives throughout the study area. However, also consistent throughout this study is the biomass dominance of non-native individuals in the understory, shrub, and herbaceous layers. Paths in areas where the canopy is thin or absent are bordered by an impenetrable wall of invasive shrubs 6—8 feet high. Table 4 provides the complete list of plant species observed in this study at this sit

**Table 4. Plant List for Briar Hill Preserve**

Species	Common name	Family	Nativity	USFWS wetland code	Growth habit
<i>Acer negundo</i>	Box-elder	Sapindaceae	Native	FAC+	Deciduous tree
<i>Acer palmatum</i>	Japanese maple	Sapindaceae	Introduced	N	Deciduous tree
<i>Acer platanoides</i>	Norway maple	Sapindaceae	Introduced	UPL	Deciduous tree
<i>Acer rubrum</i>	Red maple	Sapindaceae	Native	FAC	Deciduous tree
<i>Acer saccharinum</i>	Silver maple	Sapindaceae	Native	FACW	Deciduous tree
<i>Acorus calamus</i>	Sweet flag	Acoraceae	Introduced	OBL	Perennial herb
<i>Ageratina altissima</i> var. <i>altissima</i>	White-snakeroot	Asteraceae	Native	N	Perennial herb
<i>Agrimonia parviflora</i>	Southern agrimony	Rosaceae	Native	FACW	Perennial herb
<i>Agrostis perennans</i>	Autumn bent	Poaceae	Native	FACU	Perennial herb
<i>Agrostis scabra</i>	Fly-away grass	Poaceae	Native	FAC	Perennial herb
<i>Alliaria petiolata</i>	Garlic-mustard	Brassicaceae	Introduced	FACU-	Biennial herb
<i>Allium canadense</i>	Wild onion	Alliaceae	Native	FACU	Perennial herb
<i>Allium vineale</i>	Field garlic	Alliaceae	Introduced	FACU-	Perennial herb
<i>Amphicarpaea bracteata</i>	Hog peanut	Fabaceae	Native	FAC	Perennial vine
<i>Andropogon virginicus</i>	Broom-sedge	Poaceae	Native	FACU	Perennial herb
<i>Anthoxanthum odoratum</i>	Sweet vernalgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Apocynum cannabinum</i>	Indian-hemp	Apocynaceae	Native	FACU	Perennial herb
<i>Arisaema triphyllum</i> ssp. <i>triphyllum</i>	Jack-in-the-pulpit	Araceae	Native	FACW-	Perennial herb
<i>Artemisia vulgaris</i>	Common mugwort	Asteraceae	Introduced	N	Perennial herb
<i>Arthraxon hispidus</i>	Grass	Poaceae	Introduced	FAC	Annual herb
<i>Asclepias incarnata</i> ssp. <i>incarnata</i>	Swamp milkweed	Apocynaceae	Native	OBL	Perennial herb
<i>Athyrium filix-femina</i> var. <i>angustum</i>	Lady fern	Polypodiaceae	Native	FAC	Perennial herb
<i>Barbarea vulgaris</i>	Wintercress	Brassicaceae	Introduced	FACU	Biennial herb
<i>Berberis thunbergii</i>	Japanese barberry	Berberidaceae	Introduced	N	Deciduous shrub

<i>Bidens connata</i>	Beggar-ticks	Asteraceae	Native	FACW+	Annual herb
<i>Boehmeria cylindrica</i> var. <i>cylindrica</i>	False nettle	Urticaceae	Native	FACW+	Perennial herb
<i>Cardamine hirsuta</i>	Hairy bittercress	Brassicaceae	Introduced	FACU	Annual herb
<i>Cardamine impatiens</i>	Bittercress	Brassicaceae	Introduced	N	Perennial herb
<i>Cardamine pensylvanica</i>	Pennsylvania bittercress	Brassicaceae	Native	OBL	Perennial herb
<i>Carex amphibola</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex annectens</i>	Sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex blanda</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex gracillima</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex lurida</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex radiata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex scoparia</i>	Broom sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex stipata</i> var. <i>stipata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex straminea</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Catalpa speciosa</i>	Catalpa	Bignoniaceae	Introduced	FAC	Deciduous tree
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Introduced	UPL	Woody vine
<i>Celtis occidentalis</i>	Dogberry	Cannabaceae	Native	FACU	Deciduous tree
<i>Cephalanthus occidentalis</i>	Buttonbush	Rubiaceae	Native	OBL	Deciduous shrub
<i>Cerastium fontanum</i> ssp. <i>triviale</i>	Common mouse-ear chickweed	Caryophyllaceae	Introduced	FACU-	Perennial herb
<i>Cichorium intybus</i>	Blue chicory	Asteraceae	Introduced	N	Perennial herb
<i>Cinna arundinacea</i>	Wood reedgrass	Poaceae	Native	FACW	Perennial herb
<i>Circaea canadensis</i> ssp. <i>canadensis</i>	Enchanter's-nightshade	Onagraceae	Native	FACU	Perennial herb
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	Introduced	FACU	Perennial herb
<i>Cirsium pumilum</i>	Pasture thistle	Asteraceae	Native	N	Biennial herb
<i>Cirsium vulgare</i>	Bull-thistle	Asteraceae	Introduced	FACU-	Biennial herb
<i>Claytonia virginica</i>	Spring-beauty	Portulacaceae	Native	FAC	Perennial herb
<i>Convallaria majalis</i>	Lily-of-the-valley	Ruscaceae	Introduced	N	Perennial herb
<i>Cornus amomum</i> ssp. <i>amomum</i>	Silky dogwood	Cornaceae	Native	FACW	Deciduous shrub
<i>Cornus florida</i>	Flowering dogwood	Cornaceae	Native	FACU-	Deciduous tree
<i>Cryptotaenia canadensis</i>	Honewort	Apiaceae	Native	FAC	Perennial herb
<i>Cyperus strigosus</i>	False nutsedge	Cyperaceae	Native	FACW	Perennial herb
<i>Dactylis glomerata</i>	Orchardgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Daucus carota</i>	Queen Anne's-lace	Apiaceae	Introduced	N	Biennial herb
<i>Dianthus armeria</i>	Deptford pink	Caryophyllaceae	Introduced	N	Biennial herb
<i>Dichanthelium clandestinum</i>	Deer-tongue grass	Poaceae	Native	FAC+	Perennial herb
<i>Dryopteris carthusiana</i>	Spinulose wood fern	Polypodiaceae	Native	FAC+	Perennial herb
<i>Duchesnea indica</i>	Indian strawberry	Rosaceae	Introduced	FACU-	Perennial herb
<i>Elaeagnus umbellata</i>	Autumn-olive	Elaeagnaceae	Introduced	N	Deciduous shrub
<i>Epilobium coloratum</i>	Purple-leaved willow-	Onagraceae	Native	FACW+	Perennial herb

	herb				
<i>Eragrostis spectabilis</i>	Purple lovegrass	Poaceae	Native	UPL	Perennial herb
<i>Erechtites hieraciifolius</i>	Fireweed	Asteraceae	Native	FACU	Annual herb
<i>Erigeron philadelphicus</i>	Daisy fleabane	Asteraceae	Native	FACU	Perennial herb
<i>Erythronium americanum</i>	Yellow trout-lily	Liliaceae	Native	N	Perennial herb
<i>Euonymus alatus</i>	Winged euonymous	Celastraceae	Introduced	N	Deciduous shrub
<i>Euonymus fortunei</i>	Wintercreeper	Celastraceae	Introduced	N	Woody vine
<i>Euthamia graminifolia</i>	Grass-leaved goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Fagus grandifolia</i>	American beech	Fagaceae	Native	FACU	Deciduous tree
<i>Fallopia scandens</i>	Climbing false-buckwheat	Polygonaceae	Native	FAC	Perennial vine
<i>Fraxinus americana</i> var. <i>americana</i>	White ash	Oleaceae	Native	FACU	Deciduous tree
<i>Galium aparine</i>	Bedstraw	Rubiaceae	Native	FACU	Annual herb
<i>Geum canadense</i>	White avens	Rosaceae	Native	FACU	Perennial herb
<i>Geum vernum</i>	Spring avens	Rosaceae	Native	FACU	Perennial herb
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	Native	OBL	Perennial herb
<i>Hedera helix</i>	English ivy	Araliaceae	Introduced	N	Woody vine
<i>Hesperis matronalis</i>	Dame's-rocket	Brassicaceae	Introduced	N	Perennial herb
<i>Holcus lanatus</i>	Velvetgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Hydrophyllum virginianum</i>	Virginia waterleaf	Boraginaceae	Native	FAC	Perennial herb
<i>Ilex opaca</i>	American holly	Aquifoliaceae	Native	FACU	Evergreen tree
<i>Ilex verticillata</i>	Winterberry	Aquifoliaceae	Native	FACW+	Deciduous shrub
<i>Impatiens capensis</i>	Jewelweed	Balsaminaceae	Native	FACW	Annual herb
<i>Iris pseudacorus</i>	Water flag	Iridaceae	Introduced	OBL	Perennial herb
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Native	FACU	Deciduous tree
<i>Juncus effusus</i> var. <i>solutus</i>	Soft rush	Juncaceae	Native	OBL	Perennial herb
<i>Juncus tenuis</i> var. <i>tenuis</i>	Path rush	Juncaceae	Native	FAC-	Perennial herb
<i>Juniperus virginiana</i>	Eastern red-cedar	Cupressaceae	Native	FACU	Evergreen tree
<i>Laportea canadensis</i>	Wood-nettle	Urticaceae	Native	FAC	Perennial herb
<i>Leersia virginica</i>	Cutgrass	Poaceae	Native	FACW	Perennial herb
<i>Ligustrum obtusifolium</i>	Obtuse-leaved privet	Oleaceae	Introduced	N	Deciduous shrub
<i>Lindera benzoin</i>	Spicebush	Lauraceae	Native	FACW-	Deciduous shrub
<i>Liquidambar styraciflua</i>	Sweetgum	Altingiaceae	Native	FAC	Deciduous tree
<i>Liriodendron tulipifera</i>	Tuliptree	Magnoliaceae	Native	FACU	Deciduous tree
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	Native	FACU	Annual herb
<i>Lonicera japonica</i>	Japanese honeysuckle	Caprifoliaceae	Introduced	FAC-	Woody vine
<i>Lonicera maackii</i>	Amur honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lonicera morrowii</i>	Morrow's honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lonicera standishii</i>	Honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Ludwigia palustris</i>	Marsh-purslane	Onagraceae	Native	OBL	Perennial herb
<i>Luzula multiflora</i>	Field woodrush	Juncaceae	Native	FACU	Perennial herb

<i>Lycopus virginicus</i>	Bugleweed	Lamiaceae	Native	OBL	Perennial herb
<i>Lysimachia nummularia</i>	Creeping-charlie	Myrsinaceae	Introduced	FACW-	Perennial herb
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	Introduced	FACW+	Perennial herb
<i>Magnolia tripetala</i>	Umbrella-tree	Magnoliaceae	Native	FACU	Deciduous tree
<i>Maianthemum racemosum</i>	False solomon's-seal	Ruscaceae	Native	N	Perennial herb
<i>Malus sp.</i>	Crabapple	Rosaceae	Introduced	N	Deciduous tree
<i>Microstegium vimineum</i>	Stiltgrass	Poaceae	Introduced	FAC	Annual herb
<i>Muhlenbergia schreberi</i>	Dropseed	Poaceae	Native	FAC	Perennial herb
<i>Myosotis scorpioides</i>	Forget-me-not	Boraginaceae	Introduced	OBL	Perennial herb
<i>Narcissus pseudonarcissus</i>	Daffodil	Alliaceae	Introduced	N	Perennial herb
<i>Onoclea sensibilis</i>	Sensitive fern	Polypodiaceae	Native	FACW	Perennial herb
<i>Ornithogalum nutans</i>	Star-of-Bethlehem	Hyacinthaceae	Introduced	N	Perennial herb
<i>Ornithogalum umbellatum</i>	Star-of-Bethlehem	Hyacinthaceae	Introduced	FACU	Perennial herb
<i>Oxalis stricta</i>	Common yellow wood-sorrel	Oxalidaceae	Native	UPL	Perennial herb
<i>Packera aurea</i>	Golden ragwort	Asteraceae	Native	FACW	Perennial herb
<i>Panicum anceps</i>	Panic grass	Poaceae	Native	FAC	Perennial herb
<i>Panicum dichotomiflorum</i>	Smooth panic grass	Poaceae	Native	FACW-	Annual herb
<i>Panicum philadelphicum</i>	Panic grass	Poaceae	Native	FAC-	Annual herb
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	Vitaceae	Native	FACU	Woody vine
<i>Paspalum laeve</i>	Field beadgrass	Poaceae	Native	FAC+	Perennial herb
<i>Persicaria longiseta</i>	Low smartweed	Polygonaceae	Introduced	FACU-	Annual herb
<i>Persicaria punctata</i>	Dotted smartweed	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria sagittata</i>	Tearthumb	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria virginiana</i>	Jumpseed	Polygonaceae	Native	FAC	Perennial herb
<i>Phalaris arundinacea</i>	Reed canary-grass	Poaceae	Native	FACW	Perennial herb
<i>Photinia villosa</i>	Photinia	Rosaceae	Introduced	N	Deciduous tree
<i>Platanus occidentalis</i>	Sycamore	Platanaceae	Native	FACW-	Deciduous tree
<i>Poa trivialis</i>	Rough bluegrass	Poaceae	Introduced	FACW	Perennial herb
<i>Podophyllum peltatum</i>	Mayapple	Berberidaceae	Native	N	Perennial herb
<i>Polystichum acrostichoides</i>	Christmas fern	Polypodiaceae	Native	N	Perennial herb
<i>Potentilla simplex</i>	Old-field cinquefoil	Rosaceae	Native	FACU-	Perennial herb
<i>Prunella vulgaris</i> ssp. <i>vulgaris</i>	Heal-all	Lamiaceae	Introduced	FACU+	Perennial herb
<i>Prunus avium</i>	Sweet cherry	Rosaceae	Introduced	N	Deciduous tree
<i>Prunus serotina</i>	Wild black cherry	Rosaceae	Native	FACU	Deciduous tree
<i>Pycnanthemum virginianum</i>	Mountain-mint	Lamiaceae	Native	FAC	Perennial herb
<i>Pyrus calleryana</i>	Callery pear	Rosaceae	Introduced	N	Deciduous tree
<i>Quercus palustris</i>	Pin oak	Fagaceae	Native	FACW	Deciduous tree
<i>Ranunculus bulbosus</i>	Bulbous buttercup	Ranunculaceae	Introduced	UPL	Perennial herb
<i>Ranunculus ficaria</i>	Lesser celandine	Ranunculaceae	Introduced	N	Perennial herb
<i>Ranunculus hispidus</i> var. <i>caricetorum</i>	Marsh buttercup	Ranunculaceae	Native	FAC	Perennial herb

<i>Ranunculus micranthus</i>	Small-flowered crowfoot	Ranunculaceae	Native	FACU	Perennial herb
<i>Rhamnus cathartica</i>	Buckthorn	Rhamnaceae	Introduced	N	Deciduous shrub
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Native	FACU-	Deciduous tree
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Introduced	FACU	Deciduous shrub
<i>Rubus allegheniensis</i>	Common blackberry	Rosaceae	Native	FACU-	Deciduous shrub
<i>Rubus enslenii</i>	Southern dewberry	Rosaceae	Native	FACU	Woody vine
<i>Rubus occidentalis</i>	Black-cap	Rosaceae	Native	N	Deciduous shrub
<i>Rubus phoenicolasius</i>	Wineberry	Rosaceae	Introduced	N	Deciduous shrub
<i>Rumex obtusifolius</i>	Bitter dock	Polygonaceae	Introduced	FACU-	Perennial herb
<i>Salix nigra</i>	Black willow	Salicaceae	Native	FACW+	Deciduous tree
<i>Sassafras albidum</i>	Sassafras	Lauraceae	Native	FACU-	Deciduous tree
<i>Saxifraga pensylvanica</i>	Swamp saxifrage	Saxifragaceae	Native	OBL	Perennial herb
<i>Schedonorus arundinaceus</i>	Fescue	Poaceae	Introduced	FACU-	Perennial herb
<i>Schizachyrium scoparium</i> var. <i>scoparium</i>	Little bluestem	Poaceae	Native	FACU	Perennial herb
<i>Scirpus georgianus</i>	Bulrush	Cyperaceae	Native	OBL	Perennial herb
<i>Sicyos angulatus</i>	Bur cucumber	Cucurbitaceae	Native	FACU	Annual vine
<i>Sisyrinchium montanum</i> var. <i>crebrum</i>	Blue-eyed-grass	Iridaceae	Native	FAC	Perennial herb
<i>Smilax rotundifolia</i>	Catbrier	Smilacaceae	Native	FAC	Woody vine
<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago gigantea</i> var. <i>gigantea</i>	Smooth goldenrod	Asteraceae	Native	FACW	Perennial herb
<i>Solidago rugosa</i> ssp. <i>rugosa</i> var. <i>rugosa</i>	Wrinkle-leaf goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Sorghastrum nutans</i>	Indian-grass	Poaceae	Native	UPL	Perennial herb
<i>Symphoricarpos orbiculatus</i>	Coralberry	Caprifoliaceae	Native	UPL	Deciduous shrub
<i>Symphyotrichum lanceolatum</i> ssp. <i>lanceolatum</i> var. <i>lanceolatum</i>	Panicked aster	Asteraceae	Native	N	Perennial herb
<i>Symphyotrichum novae-angliae</i>	New England aster	Asteraceae	Native	FAC	Perennial herb
<i>Symphyotrichum pilosum</i> var. <i>pilosum</i>	Heath aster	Asteraceae	Native	UPL	Perennial herb
<i>Symphyotrichum puniceum</i>	Purple-stemmed aster	Asteraceae	Native	OBL	Perennial herb
<i>Symplocarpus foetidus</i>	Skunk cabbage	Araceae	Native	OBL	Perennial herb
<i>Symplocos paniculata</i>	Sapphire-berry	Symplocaceae	Introduced	N	Deciduous shrub
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	Introduced	FACU-	Perennial herb
<i>Thelypteris noveboracensis</i>	New York fern	Polypodiaceae	Native	FAC	Perennial herb
<i>Tilia americana</i> var. <i>americana</i>	Basswood	Malvaceae	Native	FACU	Deciduous tree
<i>Toxicodendron radicans</i>	Poison-ivy	Anacardiaceae	Native	FAC	Woody vine
<i>Tridens flavus</i>	Purpletop	Poaceae	Native	FACU	Perennial herb
<i>Trifolium arvense</i>	Rabbit's-foot clover	Fabaceae	Introduced	N	Annual herb
<i>Ulmus americana</i>	American elm	Ulmaceae	Native	FACW-	Deciduous tree
<i>Verbena urticifolia</i> var. <i>urticifolia</i>	White vervain	Verbenaceae	Native	FACU	Annual herb
<i>Veronica officinalis</i>	Common speedwell	Plantaginaceae	Native	FACU-	Perennial herb
<i>Veronica peregrina</i> ssp. <i>peregrina</i>	Neckweed	Plantaginaceae	Native	FACU-	Annual herb

<i>Viburnum dentatum</i>	Southern arrow-wood	Adoxaceae	Native	FAC	Deciduous shrub
<i>Viburnum opulus</i>	Guelder-rose	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum plicatum</i>	Doublefile viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum prunifolium</i>	Black-haw	Adoxaceae	Native	FACU	Deciduous shrub
<i>Viburnum sieboldii</i>	Siebold viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viola sororia</i>	Common blue violet	Violaceae	Native	FAC-	Perennial herb
<i>Vitis aestivalis</i>	Summer grape	Vitaceae	Native	FACU	Woody vine
<i>Vitis labrusca</i>	Fox grape	Vitaceae	Native	FACU	Woody vine
<i>Vitis vulpina</i>	Frost grape	Vitaceae	Native	FAC	Woody vine



## Camp Woods Preserve

The Camp Woods Preserve in Whitpain Township is a site of approximately 32.3 acres of which about 21 acres is wooded. The remainder is early successional old fields. The site is bounded on the north and northeast by Morris Road and on all other sides by private property. The Camp Woods Preserve is connected to the Armentrout Preserve by a trail across private property.

The entire site is underlain by Stockton Formation bedrock. The soils are mainly of the Abbottsville, Chalfont, Lawrenceville, and Reaville Silt Loam Series with slopes ranging from 0 to about 8 percent.

The most immediately impressive feature of Camp Woods is the grove of large trees dominated by tuliptree (*Liriodendron tulipifera*), white (*Quercus alba*) and black oak (*Q. velutina*), and American beech (*Fagus grandifolia*). Many of these trees are 3 feet or more in diameter at breast height. However, there are no young trees except a few root shoots of beech and some non-native species which deer avoid, most notably umbrella magnolia (*Magnolia tripetala*). Many very large trees were felled in 2012 by Hurricane Sandy. It remains to be seen if the dense branches of these trees, now on the ground, will provide enough protection from deer browsing to permit some regeneration of native trees.



Striking lack of shrub layer and tree regeneration at Camp Woods



Tip up mound of a large tree felled in 2012 storm

Norway maple (*Acer platanoides*) is invading around the edges and is well established in the interior. Other non-native trees at Camp Woods include sycamore maple (*Acer pseudoplatanus*), European bird cherry (*Prunus avium*), Ohio buckeye (*Aesculus glabra*), Chinese photinia (*Photinia villosa*), Japanese angelica-tree (*Aralia elata*), and princess-tree (*Pawlonia tomentosa*).

The shrub layer contains the natives spicebush (*Lindera benzoin*) and maple-leaf viburnum (*Viburnum acerifolium*), with the latter especially heavily browsed by deer. In addition, numerous non-natives are present including wineberry (*Rubus*

*phoenicolasius*), large colonies of jetbead (*Rhodotypos scandens*), Japanese barberry (*Berberis thunbergii*), and winged euonymus (*Euonymus alatus*). Large areas of the forest floor are covered with common periwinkle (*Vinca minor*). Some native herbaceous species such as mayapple (*Podophyllum*

*peltatum*), jack-in-the-pulpit (*Arisaema triphyllum*), false Solomon's-seal (*Maianthemum racemosum*), and common blue (*Viola sororia*) and yellow violet (*V. pubescens*) are present, but many are suppressed by deer.

### Site-specific Management Recommendations

- Remove previously planted *Aesculus parviflora* (bottlebrush buckeye) from old field
- Remove currently limited populations of *Aralia elata* (Japanese angelica-tree) and *Pauwlonia tomentosa* (princess-tree) in the interior
- Work on removal of *Acer platanoides* (Norway maple) from edges and interior, and address the growing populations of *Rhodotypos scandens* (jetbead)
- Remove limited population of *Conium maculatum* (poison hemlock) from near preserve entrance. This species represents a serious health hazard to humans.

Only about 57% of the plant species at Camp Woods are natives. This is a reflection of the absence of a diversity of native species from the shrub and herb layers due to the long history of over browsing by deer at this site. Table 5 provides the complete list of plant species observed in this study at this site.

**Table 5. Plant List for Camp Woods Preserve**

Species	Common name	Family	Nativity	USFWS wetland code	Growth habit
<i>Acer platanoides</i>	Norway maple	Sapindaceae	Introduced	UPL	Deciduous tree
<i>Acer pseudoplatanus</i>	Sycamore maple	Sapindaceae	Introduced	N	Deciduous tree
<i>Acer rubrum</i>	Red maple	Sapindaceae	Native	FAC	Deciduous tree
<i>Acer saccharinum</i>	Silver maple	Sapindaceae	Native	FACW	Deciduous tree
<i>Acer saccharum</i>	Sugar maple	Sapindaceae	Native	FACU	Deciduous tree
<i>Aesculus glabra</i>	Ohio buckeye	Sapindaceae	Native	FACU+	Deciduous tree
<i>Aesculus parviflora</i>	Bottlebrush buckeye	Sapindaceae	Introduced	N	Deciduous shrub
<i>Ageratina altissima</i> var. <i>altissima</i>	White-snakeroot	Asteraceae	Native	N	Perennial herb
<i>Agrimonia microcarpa</i>	Small-fruited agrimony	Rosaceae	Native	N	Perennial herb
<i>Agrimonia parviflora</i>	Southern agrimony	Rosaceae	Native	FACW	Perennial herb
<i>Ailanthus altissima</i>	Tree-of-heaven	Simaroubaceae	Introduced	FACU-	Deciduous tree
<i>Alliaria petiolata</i>	Garlic-mustard	Brassicaceae	Introduced	FACU-	Biennial herb
<i>Allium vineale</i>	Field garlic	Alliaceae	Introduced	FACU-	Perennial herb
<i>Ambrosia artemisiifolia</i>	Common ragweed	Asteraceae	Native	FACU	Annual herb
<i>Andropogon virginicus</i>	Broom-sedge	Poaceae	Native	FACU	Perennial herb
<i>Anthoxanthum odoratum</i>	Sweet vernalgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Apocynum cannabinum</i>	Indian-hemp	Apocynaceae	Native	FACU	Perennial herb
<i>Aralia elata</i>	Japanese angelica-tree	Araliaceae	Introduced	N	Deciduous shrub
<i>Arctium minus</i>	Common burdock	Asteraceae	Introduced	FACU-	Biennial herb
<i>Arisaema triphyllum</i> ssp. <i>triphyllum</i>	Jack-in-the-pulpit	Araceae	Native	FACW-	Perennial herb
<i>Arrhenatherum elatius</i> var. <i>elatius</i>	Tall oatgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Athyrium filix-femina</i> var. <i>angustum</i>	Lady fern	Polypodiaceae	Native	FAC	Perennial herb

<i>Barbarea vulgaris</i>	Wintercress	Brassicaceae	Introduced	FACU	Biennial herb
<i>Berberis thunbergii</i>	Japanese barberry	Berberidaceae	Introduced	N	Deciduous shrub
<i>Cardamine hirsuta</i>	Hairy bittercress	Brassicaceae	Introduced	FACU	Annual herb
<i>Cardamine impatiens</i>	Bittercress	Brassicaceae	Introduced	N	Perennial herb
<i>Carex albolutescens</i>	Sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex amphibola</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex blanda</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex digitalis</i>	Sedge	Cyperaceae	Native	UPL	Perennial herb
<i>Carex laxiflora</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex muricata</i> ssp. <i>lamprocarpa</i>	Sedge	Cyperaceae	Introduced	N	Perennial herb
<i>Carex radiata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex swanii</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex virescens</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carya cordiformis</i>	Bitternut hickory	Juglandaceae	Native	FACU+	Deciduous tree
<i>Catalpa speciosa</i>	Catalpa	Bignoniaceae	Introduced	FAC	Deciduous tree
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Introduced	UPL	Woody vine
<i>Cercis canadensis</i>	Redbud	Fabaceae	Native	N	Deciduous tree
<i>Circaea canadensis</i> ssp. <i>canadensis</i>	Enchanter's-nightshade	Onagraceae	Native	FACU	Perennial herb
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	Introduced	FACU	Perennial herb
<i>Cirsium vulgare</i>	Bull-thistle	Asteraceae	Introduced	FACU-	Biennial herb
<i>Claytonia virginica</i>	Spring-beauty	Portulacaceae	Native	FAC	Perennial herb
<i>Conium maculatum</i>	Poison-hemlock	Apiaceae	Introduced	FACW	Biennial herb
<i>Cornus amomum</i> ssp. <i>amomum</i>	Silky dogwood	Cornaceae	Native	FACW	Deciduous shrub
<i>Cornus florida</i>	Flowering dogwood	Cornaceae	Native	FACU-	Deciduous tree
<i>Cyperus strigosus</i>	False nutsedge	Cyperaceae	Native	FACW	Perennial herb
<i>Dactylis glomerata</i>	Orchardgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Daucus carota</i>	Queen Anne's-lace	Apiaceae	Introduced	N	Biennial herb
<i>Dennstaedtia punctilobula</i>	Hay-scented fern	Polypodiaceae	Native	N	Perennial herb
<i>Duchesnea indica</i>	Indian strawberry	Rosaceae	Introduced	FACU-	Perennial herb
<i>Elaeagnus umbellata</i>	Autumn-olive	Elaeagnaceae	Introduced	N	Deciduous shrub
<i>Epilobium coloratum</i>	Purple-leaved willow-herb	Onagraceae	Native	FACW+	Perennial herb
<i>Erechtites hieraciifolius</i>	Fireweed	Asteraceae	Native	FACU	Annual herb
<i>Euonymus alatus</i>	Winged euonymous	Celastraceae	Introduced	N	Deciduous shrub
<i>Euphorbia lathyris</i>	Caper spurge	Euphorbiaceae	Introduced	N	Annual herb
<i>Euthamia graminifolia</i>	Grass-leaved goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Fagus grandifolia</i>	American beech	Fagaceae	Native	FACU	Deciduous tree
<i>Fraxinus americana</i> var. <i>americana</i>	White ash	Oleaceae	Native	FACU	Deciduous tree
<i>Geum canadense</i>	White avens	Rosaceae	Native	FACU	Perennial herb
<i>Geum vernum</i>	Spring avens	Rosaceae	Native	FACU	Perennial herb

<i>Glechoma hederacea</i>	Gill-over-the-ground	Lamiaceae	Introduced	FACU	Perennial herb
<i>Hackelia virginiana</i>	Beggar's-lice	Boraginaceae	Native	FACU	Biennial herb
<i>Ilex opaca</i>	American holly	Aquifoliaceae	Native	FACU	Evergreen tree
<i>Impatiens capensis</i>	Jewelweed	Balsaminaceae	Native	FACW	Annual herb
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Native	FACU	Deciduous tree
<i>Juncus tenuis</i> var. <i>tenuis</i>	Path rush	Juncaceae	Native	FAC-	Perennial herb
<i>Juniperus virginiana</i>	Eastern red-cedar	Cupressaceae	Native	FACU	Evergreen tree
<i>Lamium purpureum</i>	Purple dead-nettle	Lamiaceae	Introduced	N	Annual herb
<i>Leersia virginica</i>	Cutgrass	Poaceae	Native	FACW	Perennial herb
<i>Ligustrum obtusifolium</i>	Obtuse-leaved privet	Oleaceae	Introduced	N	Deciduous shrub
<i>Lindera benzoin</i>	Spicebush	Lauraceae	Native	FACW-	Deciduous shrub
<i>Liquidambar styraciflua</i>	Sweetgum	Altingiaceae	Native	FAC	Deciduous tree
<i>Liriodendron tulipifera</i>	Tuliptree	Magnoliaceae	Native	FACU	Deciduous tree
<i>Lonicera japonica</i>	Japanese honeysuckle	Caprifoliaceae	Introduced	FAC-	Woody vine
<i>Lonicera maackii</i>	Amur honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lycopus uniflorus</i>	Bugleweed	Lamiaceae	Native	OBL	Perennial herb
<i>Magnolia acuminata</i>	Cucumber-tree	Magnoliaceae	Native	N	Deciduous tree
<i>Magnolia tripetala</i>	Umbrella-tree	Magnoliaceae	Native	FACU	Deciduous tree
<i>Maianthemum racemosum</i>	False solomon's-seal	Ruscaceae	Native	N	Perennial herb
<i>Malus coronaria</i>	Sweet crabapple	Rosaceae	Native	N	Deciduous tree
<i>Malus</i> sp.	Crabapple	Rosaceae	Introduced	N	Deciduous tree
<i>Malva neglecta</i>	Cheeses	Malvaceae	Introduced	N	Annual herb
<i>Microstegium vimineum</i>	Stiltgrass	Poaceae	Introduced	FAC	Annual herb
<i>Morus alba</i>	White mulberry	Moraceae	Introduced	UPL	Deciduous tree
<i>Muhlenbergia schreberi</i>	Dropseed	Poaceae	Native	FAC	Perennial herb
<i>Narcissus poeticus</i>	Poet's narcissus	Alliaceae	Introduced	N	Perennial herb
<i>Nyssa sylvatica</i>	Sourgum	Nyssaceae	Native	FAC	Deciduous tree
<i>Onoclea sensibilis</i>	Sensitive fern	Polypodiaceae	Native	FACW	Perennial herb
<i>Ornithogalum umbellatum</i>	Star-of-Bethlehem	Hyacinthaceae	Introduced	FACU	Perennial herb
<i>Oxalis stricta</i>	Common yellow wood-sorrel	Oxalidaceae	Native	UPL	Perennial herb
<i>Pachysandra terminalis</i>	Japanese pachysandra	Buxaceae	Introduced	N	Perennial herb
<i>Panicum anceps</i>	Panic grass	Poaceae	Native	FAC	Perennial herb
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	Vitaceae	Native	FACU	Woody vine
<i>Paulownia tomentosa</i>	Empress-tree	Paulowniaceae	Introduced	N	Deciduous tree
<i>Persicaria arifolia</i>	Halberd-leaf tearthumb	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria longiseta</i>	Low smartweed	Polygonaceae	Introduced	FACU-	Annual herb
<i>Persicaria virginiana</i>	Jumpseed	Polygonaceae	Native	FAC	Perennial herb
<i>Philadelphus inodorus</i> var. <i>grandiflorus</i>	Mock-orange	Hydrangeaceae	Introduced	N	Deciduous shrub
<i>Philadelphus pubescens</i>	Mock-orange	Hydrangeaceae	Introduced	N	Deciduous shrub
<i>Phleum pratense</i>	Timothy	Poaceae	Introduced	FACU	Perennial herb

<i>Photinia villosa</i>	Photinia	Rosaceae	Introduced	N	Deciduous tree
<i>Phytolacca americana</i>	Pokeweed	Phytolaccaceae	Native	FACU+	Perennial herb
<i>Pinus strobus</i>	Eastern white pine	Pinaceae	Native	FACU	Evergreen tree
<i>Plantago major</i>	Broad-leaved plantain	Plantaginaceae	Introduced	FACU	Perennial herb
<i>Plantago rugelii</i>	Rugel's plantain	Plantaginaceae	Native	FACU	Perennial herb
<i>Platanus occidentalis</i>	Sycamore	Platanaceae	Native	FACW-	Deciduous tree
<i>Poa nemoralis</i>	Wood bluegrass	Poaceae	Introduced	FAC	Perennial herb
<i>Poa trivialis</i>	Rough bluegrass	Poaceae	Introduced	FACW	Perennial herb
<i>Podophyllum peltatum</i>	Mayapple	Berberidaceae	Native	N	Perennial herb
<i>Potentilla recta</i>	Sulfur cinquefoil	Rosaceae	Introduced	N	Perennial herb
<i>Potentilla simplex</i>	Old-field cinquefoil	Rosaceae	Native	FACU-	Perennial herb
<i>Prunella vulgaris</i> ssp. <i>vulgaris</i>	Heal-all	Lamiaceae	Introduced	FACU+	Perennial herb
<i>Prunus avium</i>	Sweet cherry	Rosaceae	Introduced	N	Deciduous tree
<i>Prunus serotina</i>	Wild black cherry	Rosaceae	Native	FACU	Deciduous tree
<i>Pyrus calleryana</i>	Callery pear	Rosaceae	Introduced	N	Deciduous tree
<i>Quercus alba</i>	White oak	Fagaceae	Native	FACU	Deciduous tree
<i>Quercus bicolor</i>	Swamp white oak	Fagaceae	Native	FACW+	Deciduous tree
<i>Quercus coccinea</i>	Scarlet oak	Fagaceae	Native	N	Deciduous tree
<i>Quercus palustris</i>	Pin oak	Fagaceae	Native	FACW	Deciduous tree
<i>Quercus rubra</i>	Northern red oak	Fagaceae	Native	FACU-	Deciduous tree
<i>Quercus velutina</i>	Black oak	Fagaceae	Native	N	Deciduous tree
<i>Ranunculus bulbosus</i>	Bulbous buttercup	Ranunculaceae	Introduced	UPL	Perennial herb
<i>Ranunculus ficaria</i>	Lesser celandine	Ranunculaceae	Introduced	N	Perennial herb
<i>Rhamnus cathartica</i>	Buckthorn	Rhamnaceae	Introduced	N	Deciduous shrub
<i>Rhodotypos scandens</i>	Jetbead	Rosaceae	Introduced	N	Deciduous shrub
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Introduced	FACU	Deciduous shrub
<i>Rubus allegheniensis</i>	Common blackberry	Rosaceae	Native	FACU-	Deciduous shrub
<i>Rubus flagellaris</i>	Prickly dewberry	Rosaceae	Native	FACU	Woody vine
<i>Rubus occidentalis</i>	Black-cap	Rosaceae	Native	N	Deciduous shrub
<i>Rubus phoenicolasius</i>	Wineberry	Rosaceae	Introduced	N	Deciduous shrub
<i>Rumex crispus</i>	Curly dock	Polygonaceae	Introduced	FACU	Perennial herb
<i>Rumex obtusifolius</i>	Bitter dock	Polygonaceae	Introduced	FACU-	Perennial herb
<i>Sambucus canadensis</i>	American elder	Adoxaceae	Native	FACW	Deciduous shrub
<i>Sanguinaria canadensis</i>	Bloodroot	Papaveraceae	Native	UPL	Perennial herb
<i>Sassafras albidum</i>	Sassafras	Lauraceae	Native	FACU-	Deciduous tree
<i>Schedonorus arundinaceus</i>	Fescue	Poaceae	Introduced	FACU-	Perennial herb
<i>Setaria faberi</i>	Giant foxtail	Poaceae	Introduced	UPL	Annual herb
<i>Setaria pumila</i>	Yellow foxtail	Poaceae	Introduced	FAC	Annual herb
<i>Sisyrinchium angustifolium</i>	Blue-eyed-grass	Iridaceae	Native	FACW-	Perennial herb
<i>Smilax rotundifolia</i>	Catbrier	Smilacaceae	Native	FAC	Woody vine
<i>Solanum carolinense</i>	Horse-nettle	Solanaceae	Native	UPL	Perennial herb

<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago gigantea</i> var. <i>gigantea</i>	Smooth goldenrod	Asteraceae	Native	FACW	Perennial herb
<i>Solidago rugosa</i> ssp. <i>rugosa</i> var. <i>rugosa</i>	Wrinkle-leaf goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Symphotrichum lanceolatum</i> ssp. <i>lanceolatum</i> var. <i>lanceolatum</i>	Panicked aster	Asteraceae	Native	N	Perennial herb
<i>Symplocos paniculata</i>	Sapphire-berry	Symplocaceae	Introduced	N	Deciduous shrub
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	Introduced	FACU-	Perennial herb
<i>Thelypteris noveboracensis</i>	New York fern	Polypodiaceae	Native	FAC	Perennial herb
<i>Toxicodendron radicans</i>	Poison-ivy	Anacardiaceae	Native	FAC	Woody vine
<i>Tridens flavus</i>	Purpletop	Poaceae	Native	FACU	Perennial herb
<i>Trifolium aureum</i>	Large yellow hop-clover	Fabaceae	Introduced	N	Annual herb
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Trifolium repens</i>	White clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Ulmus americana</i>	American elm	Ulmaceae	Native	FACW-	Deciduous tree
<i>Ulmus rubra</i>	Red elm	Ulmaceae	Native	FAC-	Deciduous tree
<i>Veronica hederifolia</i>	Ivy-leaved speedwell	Plantaginaceae	Introduced	N	Annual herb
<i>Veronica officinalis</i>	Common speedwell	Plantaginaceae	Native	FACU-	Perennial herb
<i>Veronica serpyllifolia</i>	Thyme-leaved speedwell	Plantaginaceae	Introduced	FAC+	Perennial herb
<i>Viburnum acerifolium</i>	Maple-leaved viburnum	Adoxaceae	Native	N	Deciduous shrub
<i>Viburnum dilatatum</i>	Linden viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum recognitum</i>	Northern arrow-wood	Adoxaceae	Native	FACW-	Deciduous shrub
<i>Viburnum setigerum</i>	Tea viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Vinca minor</i>	Common periwinkle	Apocynaceae	Introduced	N	Perennial herb
<i>Viola pubescens</i> var. <i>scabriuscula</i>	Downy yellow violet	Violaceae	Native	N	Perennial herb
<i>Viola sororia</i>	Common blue violet	Violaceae	Native	FAC-	Perennial herb
<i>Vitis vulpina</i>	Frost grape	Vitaceae	Native	FAC	Woody vine
<i>Xanthium strumarium</i>	Common cocklebur	Asteraceae	Native	FAC	Annual herb

## Crossways Preserve

The Crossways Preserve, in Whitpain Township, is an area of approximately 53.1 acres of which 22.6 acres are wooded, 24.9 acres are mowed regularly, and 5.6 acres are successional woodlands. A broad gas pipeline right-of-way crosses the site from southwest to northeast and cuts through the historically wooded area, increasing the amount of forest edge significantly. The core wooded area of more mature trees was maintained as a woodlot in an otherwise agricultural setting as evidenced on aerial photography taken in 1942.

The entire site is underlain by Stockton Formation bedrock. The soils are mainly of the Abbottsville, Bowmansville, Doylestown, Lawrenceville, and Reading Silt Loam Series. There is relatively little topographic variation at the Crossways site and both open and wooded wetlands are present.

A series of small drainages join toward the northern side of the property to form an unnamed tributary to the Wissahickon Creek.

The successional woodland areas consist of dense thickets dominated by Callery pear (*Pyrus calleryana*) and crabapple (*Malus* spp.). Mowed trails provide edge habitat for species such as frost grape (*Vitis vulpine*), Virginia-creeper (*Parthenocissus quinquefolia*), as well as the invasives Japanese honeysuckle (*Lonicera japonica*), Oriental bittersweet (*Celastrus orbiculatus*), multiflora rose (*Rosa multiflora*), and obtuse-leaved privet (*Ligustrum obtusifolium*).

A small open wetland (about 30 x 70 meters) is fed by runoff from the residential development on the other side of Cathcart Road. The most abundant species in this wetland are common cattail (*Typha latifolia*), slender spike-rush (*Eleocharis tenuis*), path rush (*Juncus tenuis*), soft rush (*Juncus effuses*), sedge (*Carex lurida*), and sensitive fern (*Onoclea sensibilis*). Other wetland species present include woolgrass (*Scirpus cyperinus*), tussock sedge (*Carex stricta*), and winterberry holly (*Ilex verticillata*).



Open wetland at Crossways Preserve

A little more than 5.6 acres of the wooded area at Crossways is classified by the National Wetlands Inventory as Freshwater Forested/Shrub Wetland. The wettest areas are dominated by skunk-cabbage (*Symplocarpus foetidus*). Large numbers of mayapple leaves were present only as petioles, their peltate blades having been eaten by deer. The shrub layer consists mainly of severely browsed spicebush (*Lindera benzoin*), reduced to a few leaves per stem, along with some non-native species such as Japanese barberry (*Berberis thunbergii*), wineberry (*Rubus phoenicolasius*), and a large colony of bottlebrush buckeye (*Aesculus parviflora*). Other major invasive species include

Norway maple (*Acer platanoides*), Japanese angelica-tree (*Aralia elata*), garlic mustard (*Alliaria petiolata*), and Japanese stiltgrass (*Microstegium vimineum*).



Giant reed (*Phragmites australis*) in pipeline right-of-way

The regularly mowed areas include the open fields along Morris and Cathcart Roads as well as the pipeline right-of-way. These areas are dominated by tall fescue (*Schedonorus arundinaceus*), orchard grass (*Dactylis glomerata*), path rush (*Juncus tenuis*) and the variety of planted warm-season grasses. Several clumps of gammagrass (*Tripsacum dactyloides*) are present, having been part of the warm-season grass mix planted in the fields. The right-of-way is similar in species composition to the fields with the addition of a large colony of giant reed (*Phragmites australis* var. *australis*), a well-known invasive weed.

### Site-specific Management Recommendations

- Work on control of currently limited population of *Phragmites australis* (giant reed) in pipeline right-of-way
- Every effort should be made to protect the integrity of the open wetland area

Nearly 70% of the plant species at the Crossways Preserve are natives. This relatively higher ratio of natives probably is due to the diversity of habitat types at the site. Table 6 provides the complete list of plant species observed in this study at this site.

**Table 6. Plant List for Crossways Preserve**

Species	Common1	Family	Native	Wetland	Growth
<i>Acer negundo</i>	Box-elder	Sapindaceae	Native	FAC+	Deciduous tree
<i>Acer platanoides</i>	Norway maple	Sapindaceae	Introduced	UPL	Deciduous tree
<i>Acer rubrum</i>	Red maple	Sapindaceae	Native	FAC	Deciduous tree
<i>Acer saccharinum</i>	Silver maple	Sapindaceae	Native	FACW	Deciduous tree
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	Introduced	FACU	Perennial herb
<i>Aesculus parviflora</i>	Bottlebrush buckeye	Sapindaceae	Introduced	N	Deciduous shrub
<i>Agrimonia parviflora</i>	Southern agrimony	Rosaceae	Native	FACW	Perennial herb
<i>Agrostis perennans</i>	Autumn bent	Poaceae	Native	FACU	Perennial herb
<i>Alliaria petiolata</i>	Garlic-mustard	Brassicaceae	Introduced	FACU-	Biennial herb
<i>Allium vineale</i>	Field garlic	Alliaceae	Introduced	FACU-	Perennial herb
<i>Alnus glutinosa</i>	Black alder	Betulaceae	Introduced	FACW-	Deciduous tree
<i>Alopecurus pratensis</i>	Meadow foxtail	Poaceae	Introduced	FACW	Perennial herb
<i>Anthoxanthum odoratum</i>	Sweet vernalgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Apocynum cannabinum</i>	Indian-hemp	Apocynaceae	Native	FACU	Perennial herb
<i>Aralia elata</i>	Japanese angelica-tree	Araliaceae	Introduced	N	Deciduous shrub

<i>Arisaema triphyllum</i> ssp. <i>triphyllum</i>	Jack-in-the-pulpit	Araceae	Native	FACW-	Perennial herb
<i>Arthraxon hispidus</i>	Grass	Poaceae	Introduced	FAC	Annual herb
<i>Asclepias incarnata</i> ssp. <i>incarnata</i>	Swamp milkweed	Apocynaceae	Native	OBL	Perennial herb
<i>Asclepias syriaca</i>	Common milkweed	Apocynaceae	Native	FACU-	Perennial herb
<i>Athyrium filix-femina</i> var. <i>angustum</i>	Lady fern	Polypodiaceae	Native	FAC	Perennial herb
<i>Barbarea verna</i>	Early wintercress	Brassicaceae	Introduced	N	Biennial herb
<i>Berberis thunbergii</i>	Japanese barberry	Berberidaceae	Introduced	N	Deciduous shrub
<i>Betula nigra</i>	River birch	Betulaceae	Native	FACW	Deciduous tree
<i>Boehmeria cylindrica</i> var. <i>cylindrica</i>	False nettle	Urticaceae	Native	FACW+	Perennial herb
<i>Bromus commutatus</i>	Hairy chess	Poaceae	Introduced	N	Annual herb
<i>Bromus pubescens</i>	Canada brome	Poaceae	Native	N	Perennial herb
<i>Callitriche stagnalis</i>	Water-starwort	Plantaginaceae	Introduced	OBL	Perennial herb
<i>Cardamine pensylvanica</i>	Pennsylvania bittercress	Brassicaceae	Native	OBL	Perennial herb
<i>Carex aggregata</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex albolutescens</i>	Sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex annectens</i>	Sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex bushii</i>	Sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex cephalophora</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex debilis</i> var. <i>debilis</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex intumescens</i>	Sedge	Cyperaceae	Native	FACW+	Perennial herb
<i>Carex lurida</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex pensylvanica</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex radiata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex scoparia</i>	Broom sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex stipata</i> var. <i>stipata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex swanii</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex virescens</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex vulpinoidea</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carpinus caroliniana</i>	Hornbeam	Betulaceae	Native	FAC	Deciduous tree
<i>Carya cordiformis</i>	Bitternut hickory	Juglandaceae	Native	FACU+	Deciduous tree
<i>Carya glabra</i>	Pignut hickory	Juglandaceae	Native	FACU-	Deciduous tree
<i>Carya ovata</i>	Shagbark hickory	Juglandaceae	Native	FACU	Deciduous tree
<i>Catalpa bignonioides</i>	Catalpa	Bignoniaceae	Introduced	UPL	Deciduous tree
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Introduced	UPL	Woody vine
<i>Cephalanthus occidentalis</i>	Buttonbush	Rubiaceae	Native	OBL	Deciduous shrub
<i>Chelone glabra</i>	Turtlehead	Plantaginaceae	Native	OBL	Perennial herb
<i>Cinna arundinacea</i>	Wood reedgrass	Poaceae	Native	FACW	Perennial herb
<i>Circaea canadensis</i> ssp. <i>canadensis</i>	Enchanter's-nightshade	Onagraceae	Native	FACU	Perennial herb
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	Introduced	FACU	Perennial herb

<i>Cirsium vulgare</i>	Bull-thistle	Asteraceae	Introduced	FACU-	Biennial herb
<i>Commelina communis</i> var. <i>communis</i>	Asiatic dayflower	Commelinaceae	Introduced	FAC-	Annual herb
<i>Cornus amomum</i> ssp. <i>amomum</i>	Silky dogwood	Cornaceae	Native	FACW	Deciduous shrub
<i>Cornus florida</i>	Flowering dogwood	Cornaceae	Native	FACU-	Deciduous tree
<i>Cornus racemosa</i>	Gray dogwood	Cornaceae	Native	FAC-	Deciduous shrub
<i>Crataegus crus-galli</i>	Cockspur hawthorn	Rosaceae	Native	FACU	Deciduous shrub
<i>Cyperus strigosus</i>	False nutsedge	Cyperaceae	Native	FACW	Perennial herb
<i>Dactylis glomerata</i>	Orchardgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Danthonia spicata</i>	Poverty-grass	Poaceae	Native	N	Perennial herb
<i>Daucus carota</i>	Queen Anne's-lace	Apiaceae	Introduced	N	Biennial herb
<i>Desmodium perplexum</i>	Tick-trefoil	Fabaceae	Native	N	Perennial herb
<i>Dianthus armeria</i>	Deptford pink	Caryophyllaceae	Introduced	N	Biennial herb
<i>Dichanthelium acuminatum</i>	Panic grass	Poaceae	Native	FAC	Perennial herb
<i>Dichanthelium clandestinum</i>	Deer-tongue grass	Poaceae	Native	FAC+	Perennial herb
<i>Diospyros virginiana</i>	Persimmon	Ebenaceae	Native	FAC-	Deciduous tree
<i>Dryopteris carthusiana</i>	Spinulose wood fern	Polypodiaceae	Native	FAC+	Perennial herb
<i>Dryopteris x boottii</i>	Boott's hybrid wood fern	Polypodiaceae	Native	N	Perennial herb
<i>Duchesnea indica</i>	Indian strawberry	Rosaceae	Introduced	FACU-	Perennial herb
<i>Echinochloa crusgalli</i> var. <i>crusgalli</i>	Barnyard-grass	Poaceae	Introduced	FACU	Annual herb
<i>Elaeagnus umbellata</i>	Autumn-olive	Elaeagnaceae	Introduced	N	Deciduous shrub
<i>Eleocharis obtusa</i> var. <i>obtusa</i>	Wright's spike-rush	Cyperaceae	Native	OBL	Annual herb
<i>Eleocharis tenuis</i> var. <i>tenuis</i>	Spike-rush	Cyperaceae	Native	FACW+	Perennial herb
<i>Epifagus virginiana</i>	Beechdrops	Orobanchaceae	Native	N	Annual herb
<i>Epilobium coloratum</i>	Purple-leaved willow-herb	Onagraceae	Native	FACW+	Perennial herb
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Native	FAC	Perennial herb
<i>Eragrostis spectabilis</i>	Purple lovegrass	Poaceae	Native	UPL	Perennial herb
<i>Erechtites hieraciifolius</i>	Fireweed	Asteraceae	Native	FACU	Annual herb
<i>Erigeron strigosus</i> var. <i>strigosus</i>	Daisy fleabane	Asteraceae	Native	FACU+	Annual herb
<i>Euonymus alatus</i>	Winged euonymous	Celastraceae	Introduced	N	Deciduous shrub
<i>Eupatorium perfoliatum</i>	Boneset	Asteraceae	Native	FACW+	Perennial herb
<i>Euthamia graminifolia</i>	Grass-leaved goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Fagus grandifolia</i>	American beech	Fagaceae	Native	FACU	Deciduous tree
<i>Fraxinus americana</i> var. <i>americana</i>	White ash	Oleaceae	Native	FACU	Deciduous tree
<i>Fraxinus pennsylvanica</i>	Red ash	Oleaceae	Native	FACW	Deciduous tree
<i>Galium concinnum</i>	Shining bedstraw	Rubiaceae	Native	UPL	Perennial herb
<i>Galium mollugo</i>	White bedstraw	Rubiaceae	Introduced	N	Perennial herb
<i>Geum canadense</i>	White avens	Rosaceae	Native	FACU	Perennial herb
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	Native	OBL	Perennial herb
<i>Holcus lanatus</i>	Velvetgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Hypericum mutilum</i>	Dwarf St. John's-wort	Hypericaceae	Native	FACW	Perennial herb

<i>Hypericum punctatum</i>	Spotted St. John's-wort	Hypericaceae	Native	FAC-	Perennial herb
<i>Ilex crenata</i>	Japanese Holly	Aquifoliaceae	Introduced	N	Evergreen shrub
<i>Ilex opaca</i>	American holly	Aquifoliaceae	Native	FACU	Evergreen tree
<i>Ilex verticillata</i>	Winterberry	Aquifoliaceae	Native	FACW+	Deciduous shrub
<i>Impatiens capensis</i>	Jewelweed	Balsaminaceae	Native	FACW	Annual herb
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Native	FACU	Deciduous tree
<i>Juncus effusus</i> var. <i>solutus</i>	Soft rush	Juncaceae	Native	OBL	Perennial herb
<i>Juncus tenuis</i> var. <i>tenuis</i>	Path rush	Juncaceae	Native	FAC-	Perennial herb
<i>Juniperus virginiana</i>	Eastern red-cedar	Cupressaceae	Native	FACU	Evergreen tree
<i>Leersia oryzoides</i>	Rice cutgrass	Poaceae	Native	OBL	Perennial herb
<i>Leersia virginica</i>	Cutgrass	Poaceae	Native	FACW	Perennial herb
<i>Leucanthemum vulgare</i>	Ox-eye daisy	Asteraceae	Introduced	N	Perennial herb
<i>Ligustrum obtusifolium</i>	Obtuse-leaved privet	Oleaceae	Introduced	N	Deciduous shrub
<i>Lindera benzoin</i>	Spicebush	Lauraceae	Native	FACW-	Deciduous shrub
<i>Liquidambar styraciflua</i>	Sweetgum	Altingiaceae	Native	FAC	Deciduous tree
<i>Liriodendron tulipifera</i>	Tuliptree	Magnoliaceae	Native	FACU	Deciduous tree
<i>Lonicera japonica</i>	Japanese honeysuckle	Caprifoliaceae	Introduced	FAC-	Woody vine
<i>Lonicera maackii</i>	Amur honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lonicera morrowii</i>	Morrow's honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Ludwigia palustris</i>	Marsh-purslane	Onagraceae	Native	OBL	Perennial herb
<i>Lysimachia nummularia</i>	Creeping-charlie	Myrsinaceae	Introduced	FACW-	Perennial herb
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	Introduced	FACW+	Perennial herb
<i>Magnolia kobus</i>	Kobus magnolia	Magnoliaceae	Introduced	N	Deciduous tree
<i>Maianthemum canadense</i>	Canada mayflower	Ruscaceae	Native	FAC-	Perennial herb
<i>Malus</i> sp.	Crabapple	Rosaceae	Introduced	N	Deciduous tree
<i>Microstegium vimineum</i>	Stiltgrass	Poaceae	Introduced	FAC	Annual herb
<i>Nyssa sylvatica</i>	Sourgum	Nyssaceae	Native	FAC	Deciduous tree
<i>Onoclea sensibilis</i>	Sensitive fern	Polypodiaceae	Native	FACW	Perennial herb
<i>Osmunda cinnamomea</i>	Cinnamon fern	Osmundaceae	Native	FACW	Perennial herb
<i>Osmunda regalis</i>	Royal fern	Osmundaceae	Native	OBL	Perennial herb
<i>Oxalis stricta</i>	Common yellow wood-sorrel	Oxalidaceae	Native	UPL	Perennial herb
<i>Packera aurea</i>	Golden ragwort	Asteraceae	Native	FACW	Perennial herb
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	Vitaceae	Native	FACU	Woody vine
<i>Penstemon digitalis</i>	Tall white beard-tongue	Plantaginaceae	Native	FAC	Perennial herb
<i>Persicaria punctata</i>	Dotted smartweed	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria sagittata</i>	Tearthumb	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria virginiana</i>	Jumpseed	Polygonaceae	Native	FAC	Perennial herb
<i>Phalaris arundinacea</i>	Reed canary-grass	Poaceae	Native	FACW	Perennial herb
<i>Phleum pratense</i>	Timothy	Poaceae	Introduced	FACU	Perennial herb
<i>Phragmites australis</i> ssp. <i>australis</i>	Common reed	Poaceae	Introduced	FACW	Perennial herb

<i>Pilea pumila</i>	Clearweed	Urticaceae	Native	FACW	Annual herb
<i>Pinus strobus</i>	Eastern white pine	Pinaceae	Native	FACU	Evergreen tree
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	Introduced	UPL	Perennial herb
<i>Platanthera lacera</i>	Ragged fringed-orchid	Orchidaceae	Native	FACW	Perennial herb
<i>Poa compressa</i>	Canada bluegrass	Poaceae	Introduced	FACU	Perennial herb
<i>Podophyllum peltatum</i>	Mayapple	Berberidaceae	Native	N	Perennial herb
<i>Potentilla simplex</i>	Old-field cinquefoil	Rosaceae	Native	FACU-	Perennial herb
<i>Prunella vulgaris</i> ssp. <i>vulgaris</i>	Heal-all	Lamiaceae	Introduced	FACU+	Perennial herb
<i>Prunus avium</i>	Sweet cherry	Rosaceae	Introduced	N	Deciduous tree
<i>Prunus serotina</i>	Wild black cherry	Rosaceae	Native	FACU	Deciduous tree
<i>Pycnanthemum tenuifolium</i>	Mountain-mint	Lamiaceae	Native	FACW	Perennial herb
<i>Pycnanthemum virginianum</i>	Mountain-mint	Lamiaceae	Native	FAC	Perennial herb
<i>Pyrus calleryana</i>	Callery pear	Rosaceae	Introduced	N	Deciduous tree
<i>Quercus alba</i>	White oak	Fagaceae	Native	FACU	Deciduous tree
<i>Quercus bicolor</i>	Swamp white oak	Fagaceae	Native	FACW+	Deciduous tree
<i>Quercus montana</i>	Chestnut oak	Fagaceae	Native	FACW	Deciduous tree
<i>Quercus palustris</i>	Pin oak	Fagaceae	Native	FACW	Deciduous tree
<i>Quercus rubra</i>	Northern red oak	Fagaceae	Native	FACU-	Deciduous tree
<i>Quercus velutina</i>	Black oak	Fagaceae	Native	N	Deciduous tree
<i>Rhamnus cathartica</i>	Buckthorn	Rhamnaceae	Introduced	N	Deciduous shrub
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Introduced	FACU	Deciduous shrub
<i>Rubus flagellaris</i>	Prickly dewberry	Rosaceae	Native	FACU	Woody vine
<i>Rubus pensilvanicus</i>	Blackberry	Rosaceae	Native	N	Deciduous shrub
<i>Rubus phoenicolasius</i>	Wineberry	Rosaceae	Introduced	N	Deciduous shrub
<i>Rudbeckia hirta</i> var. <i>hirta</i>	Black-eyed-susan	Asteraceae	Native	FACU-	Biennial herb
<i>Rumex crispus</i>	Curly dock	Polygonaceae	Introduced	FACU	Perennial herb
<i>Salix nigra</i>	Black willow	Salicaceae	Native	FACW+	Deciduous tree
<i>Sambucus canadensis</i>	American elder	Adoxaceae	Native	FACW	Deciduous shrub
<i>Sassafras albidum</i>	Sassafras	Lauraceae	Native	FACU-	Deciduous tree
<i>Schedonorus arundinaceus</i>	Fescue	Poaceae	Introduced	FACU-	Perennial herb
<i>Schedonorus pratensis</i>	Meadow fescue	Poaceae	Introduced	FACU-	Perennial herb
<i>Schizachyrium scoparium</i> var. <i>scoparium</i>	Little bluestem	Poaceae	Native	FACU	Perennial herb
<i>Scirpus cyperinus</i>	Wool-grass	Cyperaceae	Native	FACW+	Perennial herb
<i>Scirpus georgianus</i>	Bulrush	Cyperaceae	Native	OBL	Perennial herb
<i>Setaria pumila</i>	Yellow foxtail	Poaceae	Introduced	FAC	Annual herb
<i>Smilax rotundifolia</i>	Catbrier	Smilacaceae	Native	FAC	Woody vine
<i>Solanum carolinense</i>	Horse-nettle	Solanaceae	Native	UPL	Perennial herb
<i>Solanum dulcamara</i> var. <i>dulcamara</i>	Trailing nightshade	Solanaceae	Introduced	FAC	Woody vine
<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago gigantea</i> var. <i>gigantea</i>	Smooth goldenrod	Asteraceae	Native	FACW	Perennial herb

<i>Solidago rugosa</i> ssp. <i>rugosa</i> var. <i>rugosa</i>	Wrinkle-leaf goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Sorghastrum nutans</i>	Indian-grass	Poaceae	Native	UPL	Perennial herb
<i>Stellaria longifolia</i>	Long-leaved stitchwort	Caryophyllaceae	Native	FACW	Perennial herb
<i>Symplocarpus foetidus</i>	Skunk cabbage	Araceae	Native	OBL	Perennial herb
<i>Symplocos paniculata</i>	Sapphire-berry	Symplocaceae	Introduced	N	Deciduous shrub
<i>Thelypteris noveboracensis</i>	New York fern	Polypodiaceae	Native	FAC	Perennial herb
<i>Thelypteris palustris</i>	Marsh fern	Polypodiaceae	Native	FACW+	Perennial herb
<i>Tilia americana</i> var. <i>americana</i>	Basswood	Malvaceae	Native	FACU	Deciduous tree
<i>Toxicodendron radicans</i>	Poison-ivy	Anacardiaceae	Native	FAC	Woody vine
<i>Tridens flavus</i>	Purpletop	Poaceae	Native	FACU	Perennial herb
<i>Trifolium aureum</i>	Large yellow hop-clover	Fabaceae	Introduced	N	Annual herb
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Trifolium pratense</i>	Red clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Trifolium repens</i>	White clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Tripsacum dactyloides</i>	Gammagrass	Poaceae	Native	FACW	Perennial herb
<i>Typha latifolia</i>	Common cat-tail	Typhaceae	Native	OBL	Perennial herb
<i>Ulmus americana</i>	American elm	Ulmaceae	Native	FACW-	Deciduous tree
<i>Ulmus rubra</i>	Red elm	Ulmaceae	Native	FAC-	Deciduous tree
<i>Vaccinium corymbosum</i>	Highbush blueberry	Ericaceae	Native	FACW-	Deciduous shrub
<i>Verbena hastata</i>	Blue vervain	Verbenaceae	Native	FACW+	Perennial herb
<i>Verbena stricta</i>	Hoary vervain	Verbenaceae	Introduced	N	Perennial herb
<i>Verbena urticifolia</i> var. <i>urticifolia</i>	White vervain	Verbenaceae	Native	FACU	Annual herb
<i>Vernonia noveboracensis</i>	New York ironweed	Asteraceae	Native	FACW+	Perennial herb
<i>Veronica officinalis</i>	Common speedwell	Plantaginaceae	Native	FACU-	Perennial herb
<i>Viburnum dentatum</i>	Southern arrow-wood	Adoxaceae	Native	FAC	Deciduous shrub
<i>Viburnum prunifolium</i>	Black-haw	Adoxaceae	Native	FACU	Deciduous shrub
<i>Vicia sativa</i> ssp. <i>sativa</i>	Common vetch	Fabaceae	Introduced	FACU-	Annual herb
<i>Vicia tetrasperma</i>	Slender vetch	Fabaceae	Introduced	N	Annual herb
<i>Vitis aestivalis</i>	Summer grape	Vitaceae	Native	FACU	Woody vine
<i>Vitis vulpina</i>	Frost grape	Vitaceae	Native	FAC	Woody vine



## Four Mills Preserve

The Four Mills Preserve, in Upper Dublin and Whitemarsh Townships, is a site of approximately 77.6 acres. All of the preserve is wooded with the exception of the edge along the asbestos contamination site and some small openings.

The entire site is underlain by Stockton Formation bedrock. The soils are mainly of the Bowmansville, Lawrenceville, and Rowland Silt Loam Series.

There is relatively little topographic variation at the Four Mills Preserve as most of the site is floodplain of the Wissahickon Creek. 41.5 acres of the preserve lie in the annual floodway, while nearly all of the site lies within the 100-year flood hazard zone. Prophecy Creek, Stuart Farm Creek, and Spring Run are all significant tributary streams that join the Wissahickon Creek on the Four Mills Preserve.

The forest canopy is dominated by red maple (*Acer rubrum*), box elder (*Acer negundo*), and Norway maple (*Acer platanoides*), with sycamore (*Platanus occidentalis*), Osage-orange (*Maclura pomifera*), bitternut hickory (*Carya cordiformis*), and American elm (*Ulmus americana*) also abundant.



Siebold's viburnum in flower at Four Mills

The understory and shrub layers at Four Mills are dominated by non-native invasive species such as Siebold's viburnum (*Viburnum sieboldii*), many 15—30 feet tall, obtuse-leaved privet (*Ligustrum obtusifolium*), Amur honeysuckle (*Lonicera maackii*), Chinese photinia (*Photinia villosa*), and winged euonymus (*Euonymus alatus*). We noted that a few trunks of Siebold's viburnum along the trail had been cut but were resprouting even though the cut surface appeared to have been painted with something. The only native shrub

species present in large numbers is spicebush (*Lindera benzoin*).

Some native herbaceous species such as Wild leek (*Allium tricoccum*) and white snakeroot (*Ageratina altissima*) are abundant throughout the site and are resistant to deer browsing, while many others such as mayapple (*Podophyllum peltatum*) and jack-in-the-pulpit (*Arisaema triphyllum*) are present only in small numbers and will continue to decline in the presence of a large deer population. Among the most abundant non-native invasive



Wild leek (*Allium tricoccum*) in flower

herbaceous species are lesser celandine (*Ranunculus ficaria*), field garlic (*Allium vineale*), garlic mustard (*Alliaria petiolata*), dame's-rocket (*Hesperis matronalis*), and goutweed (*Aegopodium podagraria*).

A large wetland on the Morris Road side of the trail below the stream crossing is a noteworthy feature of the preserve. Among the native species in this wooded wetland not seen elsewhere at the preserve are skunk-cabbage (*Symplocarpus foetidus*), tussock sedge (*Carex stricta*), floating mannagrass (*Glyceria septentrionalis*), sharp-fruited rush (*Juncus acuminatus*), and fringed loosestrife (*Lysimachia ciliata*).

### Site-specific Management Recommendations

- Every effort should be made to protect the integrity of the wooded wetland area described above
- Maintain existing deer enclosure along the trail as an educational exhibit. Growth of woody species, and perhaps herbaceous species, should make the enclosure readily interpretable for trail users.

Exactly 60% of the plant species of the Four Mills Preserve are natives. This relatively low percentage is due to the elimination of native shrub and herb species by deer browsing and the limited variety of habitat types at the site. Table 7 provides the complete list of plant species observed in this study at this site.

**Table 7. Plant List for Four Mills Preserve**

Species	Common name	Family	Nativity	USFWS wetland code	Growth habit
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	Native	FACU-	Annual herb
<i>Acer negundo</i>	Box-elder	Sapindaceae	Native	FAC+	Deciduous tree
<i>Acer palmatum</i>	Japanese maple	Sapindaceae	Introduced	N	Deciduous tree
<i>Acer platanoides</i>	Norway maple	Sapindaceae	Introduced	UPL	Deciduous tree
<i>Acer rubrum</i>	Red maple	Sapindaceae	Native	FAC	Deciduous tree
<i>Acer saccharinum</i>	Silver maple	Sapindaceae	Native	FACW	Deciduous tree
<i>Acer saccharum</i>	Sugar maple	Sapindaceae	Native	FACU	Deciduous tree
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	Introduced	FACU	Perennial herb
<i>Aegopodium podagraria</i>	Goutweed	Apiaceae	Introduced	FACU	Perennial herb
<i>Ageratina altissima</i> var. <i>altissima</i>	White-snakeroot	Asteraceae	Native	N	Perennial herb
<i>Agrimonia parviflora</i>	Southern agrimony	Rosaceae	Native	FACW	Perennial herb
<i>Ailanthus altissima</i>	Tree-of-heaven	Simaroubaceae	Introduced	FACU-	Deciduous tree
<i>Albizia julibrissin</i>	Mimosa	Fabaceae	Introduced	N	Deciduous tree
<i>Alliaria petiolata</i>	Garlic-mustard	Brassicaceae	Introduced	FACU-	Biennial herb
<i>Allium tricoccum</i>	Ramp	Alliaceae	Native	FACU+	Perennial herb
<i>Allium vineale</i>	Field garlic	Alliaceae	Introduced	FACU-	Perennial herb
<i>Ambrosia trifida</i>	Giant ragweed	Asteraceae	Native	FAC	Annual herb
<i>Amorpha fruticosa</i>	False-indigo	Fabaceae	Native	FACW	Deciduous shrub
<i>Anchusa azurea</i>	Showy bugloss	Boraginaceae	Introduced	N	Biennial herb

<i>Anthoxanthum odoratum</i>	Sweet vernalgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Apocynum cannabinum</i>	Indian-hemp	Apocynaceae	Native	FACU	Perennial herb
<i>Arctium minus</i>	Common burdock	Asteraceae	Introduced	FACU-	Biennial herb
<i>Arisaema triphyllum</i> ssp. <i>triphyllum</i>	Jack-in-the-pulpit	Araceae	Native	FACW-	Perennial herb
<i>Artemisia annua</i>	Sweet wormwood	Asteraceae	Introduced	FACU	Annual herb
<i>Artemisia vulgaris</i>	Common mugwort	Asteraceae	Introduced	N	Perennial herb
<i>Arthraxon hispidus</i>	Grass	Poaceae	Introduced	FAC	Annual herb
<i>Asarum canadense</i>	Wild ginger	Aristolochiaceae	Native	FACU-	Perennial herb
<i>Asclepias incarnata</i> ssp. <i>incarnata</i>	Swamp milkweed	Apocynaceae	Native	OBL	Perennial herb
<i>Asclepias syriaca</i>	Common milkweed	Apocynaceae	Native	FACU-	Perennial herb
<i>Athyrium filix-femina</i> var. <i>angustum</i>	Lady fern	Polypodiaceae	Native	FAC	Perennial herb
<i>Atriplex patula</i>	Spreading orach	Amaranthaceae	Native	FACW	Annual herb
<i>Barbarea vulgaris</i>	Wintercress	Brassicaceae	Introduced	FACU	Biennial herb
<i>Berberis thunbergii</i>	Japanese barberry	Berberidaceae	Introduced	N	Deciduous shrub
<i>Betula nigra</i>	River birch	Betulaceae	Native	FACW	Deciduous tree
<i>Bidens bipinnata</i>	Spanish needles	Asteraceae	Native	N	Annual herb
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	Native	FACW	Annual herb
<i>Boehmeria cylindrica</i> var. <i>cylindrica</i>	False nettle	Urticaceae	Native	FACW+	Perennial herb
<i>Bromus tectorum</i>	Downy chess	Poaceae	Introduced	N	Annual herb
<i>Buddleja davidii</i>	Butterfly-bush	Scrophulariaceae	Introduced	N	Deciduous shrub
<i>Callitriche stagnalis</i>	Water-starwort	Plantaginaceae	Introduced	OBL	Perennial herb
<i>Cardamine concatenata</i>	Toothwort	Brassicaceae	Native	FACU	Perennial herb
<i>Cardamine hirsuta</i>	Hairy bittercress	Brassicaceae	Introduced	FACU	Annual herb
<i>Cardamine impatiens</i>	Bittercress	Brassicaceae	Introduced	N	Perennial herb
<i>Carex amphibola</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex blanda</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex crinita</i> var. <i>crinita</i>	Short hair sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex grisea</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex hirtifolia</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex laxiflora</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex lurida</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex muricata</i> ssp. <i>lamprocarpa</i>	Sedge	Cyperaceae	Introduced	N	Perennial herb
<i>Carex pensylvanica</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex radiata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex scoparia</i>	Broom sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex squarrosa</i>	Sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex swanii</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carpinus caroliniana</i>	Hornbeam	Betulaceae	Native	FAC	Deciduous tree
<i>Carya cordiformis</i>	Bitternut hickory	Juglandaceae	Native	FACU+	Deciduous tree
<i>Carya ovata</i>	Shagbark hickory	Juglandaceae	Native	FACU	Deciduous tree

<i>Catalpa bignonioides</i>	Catalpa	Bignoniaceae	Introduced	UPL	Deciduous tree
<i>Catalpa speciosa</i>	Catalpa	Bignoniaceae	Introduced	FAC	Deciduous tree
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Introduced	UPL	Woody vine
<i>Cerastium fontanum</i> ssp. <i>triviale</i>	Common mouse-ear chickweed	Caryophyllaceae	Introduced	FACU-	Perennial herb
<i>Chelidonium majus</i>	Greater celandine	Papaveraceae	Introduced	UPL	Biennial herb
<i>Chenopodium album</i> var. <i>album</i>	Lamb's quarters	Amaranthaceae	Introduced	FACU+	Annual herb
<i>Circaea canadensis</i> ssp. <i>canadensis</i>	Enchanter's-nightshade	Onagraceae	Native	FACU	Perennial herb
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	Introduced	FACU	Perennial herb
<i>Cirsium vulgare</i>	Bull-thistle	Asteraceae	Introduced	FACU-	Biennial herb
<i>Claytonia virginica</i>	Spring-beauty	Portulacaceae	Native	FAC	Perennial herb
<i>Clematis terniflora</i>	Sweet autumn clematis	Ranunculaceae	Introduced	FACU-	Perennial vine
<i>Commelina communis</i> var. <i>communis</i>	Asiatic dayflower	Commelinaceae	Introduced	FAC-	Annual herb
<i>Conium maculatum</i>	Poison-hemlock	Apiaceae	Introduced	FACW	Biennial herb
<i>Convallaria majalis</i>	Lily-of-the-valley	Ruscaceae	Introduced	N	Perennial herb
<i>Cornus alternifolia</i>	Alternate-leaved dogwood	Cornaceae	Native	N	Deciduous tree
<i>Cornus amomum</i> ssp. <i>amomum</i>	Silky dogwood	Cornaceae	Native	FACW	Deciduous shrub
<i>Cornus florida</i>	Flowering dogwood	Cornaceae	Native	FACU-	Deciduous tree
<i>Coronilla varia</i>	Crown-vetch	Fabaceae	Introduced	N	Perennial herb
<i>Crataegus macrosperma</i>	Fanleaf hawthorn	Rosaceae	Native	N	Deciduous shrub
<i>Cryptotaenia canadensis</i>	Honewort	Apiaceae	Native	FAC	Perennial herb
<i>Cyperus strigosus</i>	False nutsedge	Cyperaceae	Native	FACW	Perennial herb
<i>Dactylis glomerata</i>	Orchardgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Daucus carota</i>	Queen Anne's-lace	Apiaceae	Introduced	N	Biennial herb
<i>Dichanthelium clandestinum</i>	Deer-tongue grass	Poaceae	Native	FAC+	Perennial herb
<i>Digitaria ciliaris</i>	Southern crabgrass	Poaceae	Introduced	N	Annual herb
<i>Dryopteris carthusiana</i>	Spinulose wood fern	Polypodiaceae	Native	FAC+	Perennial herb
<i>Duchesnea indica</i>	Indian strawberry	Rosaceae	Introduced	FACU-	Perennial herb
<i>Echinochloa crusgalli</i> var. <i>crusgalli</i>	Barnyard-grass	Poaceae	Introduced	FACU	Annual herb
<i>Echinocystis lobata</i>	Prickly cucumber	Cucurbitaceae	Native	FAC	Annual vine
<i>Elaeagnus umbellata</i>	Autumn-olive	Elaeagnaceae	Introduced	N	Deciduous shrub
<i>Eleusine indica</i>	Goosegrass	Poaceae	Introduced	FACU-	Annual herb
<i>Elymus hystrix</i>	Bottlebrush-grass	Poaceae	Native	N	Perennial herb
<i>Elymus riparius</i>	Riverbank wild-rye	Poaceae	Native	FACW	Perennial herb
<i>Epifagus virginiana</i>	Beechdrops	Orobanchaceae	Native	N	Annual herb
<i>Epilobium coloratum</i>	Purple-leaved willow-herb	Onagraceae	Native	FACW+	Perennial herb
<i>Erechtites hieraciifolius</i>	Fireweed	Asteraceae	Native	FACU	Annual herb
<i>Erigeron annuus</i>	Daisy fleabane	Asteraceae	Native	FACU	Annual herb
<i>Erigeron philadelphicus</i>	Daisy fleabane	Asteraceae	Native	FACU	Perennial herb
<i>Erythronium americanum</i>	Yellow trout-lily	Liliaceae	Native	N	Perennial herb

<i>Euonymus alatus</i>	Winged euonymous	Celastraceae	Introduced	N	Deciduous shrub
<i>Euonymus fortunei</i>	Wintercreeper	Celastraceae	Introduced	N	Woody vine
<i>Eurybia divaricata</i>	White wood aster	Asteraceae	Native	N	Perennial herb
<i>Fagus grandifolia</i>	American beech	Fagaceae	Native	FACU	Deciduous tree
<i>Fallopia japonica</i>	Japanese knotweed	Polygonaceae	Introduced	FACU-	Perennial herb
<i>Festuca obtusa</i>	Nodding fescue	Poaceae	Native	FACU	Perennial herb
<i>Fraxinus americana</i> var. <i>americana</i>	White ash	Oleaceae	Native	FACU	Deciduous tree
<i>Galinsoga parviflora</i> var. <i>parviflora</i>	Small-flowered quickweed	Asteraceae	Introduced	N	Annual herb
<i>Galium aparine</i>	Bedstraw	Rubiaceae	Native	FACU	Annual herb
<i>Geranium maculatum</i>	Wood geranium	Geraniaceae	Native	FACU	Perennial herb
<i>Geum canadense</i>	White avens	Rosaceae	Native	FACU	Perennial herb
<i>Geum vernum</i>	Spring avens	Rosaceae	Native	FACU	Perennial herb
<i>Glechoma hederacea</i>	Gill-over-the-ground	Lamiaceae	Introduced	FACU	Perennial herb
<i>Gleditsia triacanthos</i>	Honey-locust	Fabaceae	Native	FAC-	Deciduous tree
<i>Glyceria septentrionalis</i>	Floating mannagrass	Poaceae	Native	OBL	Perennial herb
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	Native	OBL	Perennial herb
<i>Gymnocladus dioicus</i>	Kentucky coffee-tree	Fabaceae	Native	N	Deciduous tree
<i>Hamamelis virginiana</i>	Witch-hazel	Hamamelidaceae	Native	FACU+	Deciduous shrub
<i>Hedera helix</i>	English ivy	Araliaceae	Introduced	N	Woody vine
<i>Hemerocallis fulva</i>	Orange day-lily	Hemerocallidaceae	Introduced	UPL	Perennial herb
<i>Hesperis matronalis</i>	Dame's-rocket	Brassicaceae	Introduced	N	Perennial herb
<i>Hibiscus syriacus</i>	Rose-of-sharon	Malvaceae	Introduced	N	Deciduous shrub
<i>Humulus japonicus</i>	Japanese hops	Cannabaceae	Introduced	FACU	Perennial herb
<i>Hydrophyllum virginianum</i>	Virginia waterleaf	Boraginaceae	Native	FAC	Perennial herb
<i>Hypericum punctatum</i>	Spotted St. John's-wort	Hypericaceae	Native	FAC-	Perennial herb
<i>Impatiens capensis</i>	Jewelweed	Balsaminaceae	Native	FACW	Annual herb
<i>Iris pseudacorus</i>	Water flag	Iridaceae	Introduced	OBL	Perennial herb
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Native	FACU	Deciduous tree
<i>Juncus acuminatus</i>	Sharp-fruited rush	Juncaceae	Native	OBL	Perennial herb
<i>Juncus effusus</i> var. <i>solutus</i>	Soft rush	Juncaceae	Native	OBL	Perennial herb
<i>Juncus tenuis</i> var. <i>tenuis</i>	Path rush	Juncaceae	Native	FAC-	Perennial herb
<i>Juniperus virginiana</i>	Eastern red-cedar	Cupressaceae	Native	FACU	Evergreen tree
<i>Lactuca canadensis</i>	Wild lettuce	Asteraceae	Native	FACU-	Annual herb
<i>Lamium purpureum</i>	Purple dead-nettle	Lamiaceae	Introduced	N	Annual herb
<i>Laportea canadensis</i>	Wood-nettle	Urticaceae	Native	FAC	Perennial herb
<i>Lapsana communis</i>	Nipplewort	Asteraceae	Introduced	N	Annual herb
<i>Leersia virginica</i>	Cutgrass	Poaceae	Native	FACW	Perennial herb
<i>Lemna minor</i>	Duckweed	Araceae	Native	OBL	Perennial herb
<i>Lepidium virginicum</i>	Poor-man's-pepper	Brassicaceae	Native	FACU-	Annual herb

<i>Ligustrum obtusifolium</i>	Obtuse-leaved privet	Oleaceae	Introduced	N	Deciduous shrub
<i>Lindera benzoin</i>	Spicebush	Lauraceae	Native	FACW-	Deciduous shrub
<i>Liquidambar styraciflua</i>	Sweetgum	Altingiaceae	Native	FAC	Deciduous tree
<i>Liriodendron tulipifera</i>	Tuliptree	Magnoliaceae	Native	FACU	Deciduous tree
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	Native	FACU	Annual herb
<i>Lonicera japonica</i>	Japanese honeysuckle	Caprifoliaceae	Introduced	FAC-	Woody vine
<i>Lonicera maackii</i>	Amur honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lonicera morrowii</i>	Morrow's honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lonicera standishii</i>	Honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lunaria annua</i>	Honesty	Brassicaceae	Introduced	N	Biennial herb
<i>Luzula multiflora</i>	Field woodrush	Juncaceae	Native	FACU	Perennial herb
<i>Lycopus virginicus</i>	Bugleweed	Lamiaceae	Native	OBL	Perennial herb
<i>Lysimachia ciliata</i>	Fringed loosestrife	Myrsinaceae	Native	FACW	Perennial herb
<i>Lysimachia nummularia</i>	Creeping-charlie	Myrsinaceae	Introduced	FACW-	Perennial herb
<i>Maclura pomifera</i>	Osage-orange	Moraceae	Introduced	UPL	Deciduous tree
<i>Maianthemum racemosum</i>	False solomon's-seal	Ruscaceae	Native	N	Perennial herb
<i>Matteuccia struthiopteris</i>	Ostrich fern	Polypodiaceae	Native	FACW	Perennial herb
<i>Microstegium vimineum</i>	Stiltgrass	Poaceae	Introduced	FAC	Annual herb
<i>Monarda fistulosa</i>	Horsemint	Lamiaceae	Native	UPL	Perennial herb
<i>Monotropa uniflora</i>	Indian-pipe	Ericaceae	Native	FACU-	Perennial herb
<i>Morus alba</i>	White mulberry	Moraceae	Introduced	UPL	Deciduous tree
<i>Muhlenbergia schreberi</i>	Dropseed	Poaceae	Native	FAC	Perennial herb
<i>Myosotis scorpioides</i>	Forget-me-not	Boraginaceae	Introduced	OBL	Perennial herb
<i>Narcissus pseudonarcissus</i>	Daffodil	Alliaceae	Introduced	N	Perennial herb
<i>Oenothera biennis</i>	Evening-primrose	Onagraceae	Native	FACU-	Biennial herb
<i>Onoclea sensibilis</i>	Sensitive fern	Polypodiaceae	Native	FACW	Perennial herb
<i>Ornithogalum umbellatum</i>	Star-of-Bethlehem	Hyacinthaceae	Introduced	FACU	Perennial herb
<i>Ostrya virginiana</i>	Hop-hornbeam	Betulaceae	Native	FACU-	Deciduous tree
<i>Oxalis stricta</i>	Common yellow wood-sorrel	Oxalidaceae	Native	UPL	Perennial herb
<i>Panicum dichotomiflorum</i>	Smooth panic grass	Poaceae	Native	FACW-	Annual herb
<i>Panicum gattingeri</i>	Witchgrass	Poaceae	Native	FAC	Annual herb
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	Vitaceae	Native	FACU	Woody vine
<i>Paulownia tomentosa</i>	Empress-tree	Paulowniaceae	Introduced	N	Deciduous tree
<i>Persicaria longiseta</i>	Low smartweed	Polygonaceae	Introduced	FACU-	Annual herb
<i>Persicaria punctata</i>	Dotted smartweed	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria virginiana</i>	Jumpseed	Polygonaceae	Native	FAC	Perennial herb
<i>Phalaris arundinacea</i>	Reed canary-grass	Poaceae	Native	FACW	Perennial herb
<i>Phlox paniculata</i>	Summer phlox	Polemoniaceae	Native	FACU	Perennial herb
<i>Photinia villosa</i>	Photinia	Rosaceae	Introduced	N	Deciduous tree
<i>Phragmites australis</i> ssp. <i>australis</i>	Common reed	Poaceae	Introduced	FACW	Perennial herb

<i>Physalis subglabrata</i>	Ground-cherry	Solanaceae	Native	N	Perennial herb
<i>Phytolacca americana</i>	Pokeweed	Phytolaccaceae	Native	FACU+	Perennial herb
<i>Pilea pumila</i>	Clearweed	Urticaceae	Native	FACW	Annual herb
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	Introduced	UPL	Perennial herb
<i>Plantago major</i>	Broad-leaved plantain	Plantaginaceae	Introduced	FACU	Perennial herb
<i>Platanus occidentalis</i>	Sycamore	Platanaceae	Native	FACW-	Deciduous tree
<i>Poa annua</i>	Annual bluegrass	Poaceae	Introduced	FACU	Annual herb
<i>Poa nemoralis</i>	Wood bluegrass	Poaceae	Introduced	FAC	Perennial herb
<i>Poa sylvestris</i>	Woodland bluegrass	Poaceae	Native	FACW	Perennial herb
<i>Poa trivialis</i>	Rough bluegrass	Poaceae	Introduced	FACW	Perennial herb
<i>Podophyllum peltatum</i>	Mayapple	Berberidaceae	Native	N	Perennial herb
<i>Polemonium reptans</i>	Spreading Jacob's-ladder	Polemoniaceae	Native	FACU	Perennial herb
<i>Polygonatum pubescens</i>	Solomon's-seal	Ruscaceae	Native	N	Perennial herb
<i>Polygonum bellardii</i>	Needle-leaf knotweed	Polygonaceae	Introduced	N	Annual herb
<i>Polystichum acrostichoides</i>	Christmas fern	Polypodiaceae	Native	N	Perennial herb
<i>Populus alba</i>	White poplar	Salicaceae	Introduced	N	Deciduous tree
<i>Potentilla recta</i>	Sulfur cinquefoil	Rosaceae	Introduced	N	Perennial herb
<i>Potentilla simplex</i>	Old-field cinquefoil	Rosaceae	Native	FACU-	Perennial herb
<i>Prunella vulgaris</i> ssp. <i>vulgaris</i>	Heal-all	Lamiaceae	Introduced	FACU+	Perennial herb
<i>Prunus avium</i>	Sweet cherry	Rosaceae	Introduced	N	Deciduous tree
<i>Prunus serotina</i>	Wild black cherry	Rosaceae	Native	FACU	Deciduous tree
<i>Quercus alba</i>	White oak	Fagaceae	Native	FACU	Deciduous tree
<i>Quercus palustris</i>	Pin oak	Fagaceae	Native	FACW	Deciduous tree
<i>Quercus rubra</i>	Northern red oak	Fagaceae	Native	FACU-	Deciduous tree
<i>Ranunculus abortivus</i>	Small-flowered crowfoot	Ranunculaceae	Native	FACW-	Annual herb
<i>Ranunculus acris</i>	Common meadow buttercup	Ranunculaceae	Introduced	FAC+	Perennial herb
<i>Ranunculus ficaria</i>	Lesser celandine	Ranunculaceae	Introduced	N	Perennial herb
<i>Rhamnus cathartica</i>	Buckthorn	Rhamnaceae	Introduced	N	Deciduous shrub
<i>Rhododendron calendulaceum</i>	Flame azalea	Ericaceae	Native	N	Deciduous shrub
<i>Rhus typhina</i>	Staghorn sumac	Anacardiaceae	Native	N	Deciduous shrub
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Native	FACU-	Deciduous tree
<i>Rorippa sylvestris</i>	Creeping yellowcress	Brassicaceae	Introduced	FACW	Perennial herb
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Introduced	FACU	Deciduous shrub
<i>Rubus enslenii</i>	Southern dewberry	Rosaceae	Native	FACU	Woody vine
<i>Rubus flagellaris</i>	Prickly dewberry	Rosaceae	Native	FACU	Woody vine
<i>Rubus occidentalis</i>	Black-cap	Rosaceae	Native	N	Deciduous shrub
<i>Rubus pensilvanicus</i>	Blackberry	Rosaceae	Native	N	Deciduous shrub
<i>Rubus phoenicolasius</i>	Wineberry	Rosaceae	Introduced	N	Deciduous shrub
<i>Rudbeckia laciniata</i> var. <i>laciniata</i>	Cutleaf coneflower	Asteraceae	Native	FACW	Perennial herb

<i>Rumex crispus</i>	Curly dock	Polygonaceae	Introduced	FACU	Perennial herb
<i>Rumex obtusifolius</i>	Bitter dock	Polygonaceae	Introduced	FACU-	Perennial herb
<i>Salix nigra</i>	Black willow	Salicaceae	Native	FACW+	Deciduous tree
<i>Schedonorus arundinaceus</i>	Fescue	Poaceae	Introduced	FACU-	Perennial herb
<i>Schoenoplectus fluviatilis</i>	River bulrush	Cyperaceae	Native	OBL	Perennial herb
<i>Schoenoplectus tabernaemontani</i>	Great bulrush	Cyperaceae	Native	OBL	Perennial herb
<i>Scirpus georgianus</i>	Bulrush	Cyperaceae	Native	OBL	Perennial herb
<i>Scrophularia marilandica</i>	Eastern figwort	Scrophulariaceae	Native	FACU-	Perennial herb
<i>Senecio vulgaris</i>	Common groundsel	Asteraceae	Introduced	FACU	Annual herb
<i>Setaria faberi</i>	Giant foxtail	Poaceae	Introduced	UPL	Annual herb
<i>Setaria pumila</i>	Yellow foxtail	Poaceae	Introduced	FAC	Annual herb
<i>Sicyos angulatus</i>	Bur cucumber	Cucurbitaceae	Native	FACU	Annual vine
<i>Solanum carolinense</i>	Horse-nettle	Solanaceae	Native	UPL	Perennial herb
<i>Solidago altissima</i>	Late goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago caesia</i>	Bluestem goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago gigantea</i> var. <i>gigantea</i>	Smooth goldenrod	Asteraceae	Native	FACW	Perennial herb
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	Native	N	Perennial herb
<i>Solidago rugosa</i> ssp. <i>rugosa</i> var. <i>rugosa</i>	Wrinkle-leaf goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Sonchus asper</i>	Spiny-leaved sow-thistle	Asteraceae	Introduced	FAC	Annual herb
<i>Stellaria media</i>	Common chickweed	Caryophyllaceae	Introduced	N	Annual herb
<i>Styrax japonicus</i>	Japanese styrax	Styracaceae	Introduced	N	Deciduous tree
<i>Symphoricarpos orbiculatus</i>	Coralberry	Caprifoliaceae	Native	UPL	Deciduous shrub
<i>Symphyotrichum lateriflorum</i>	Calico aster	Asteraceae	Native	FACW-	Perennial herb
<i>Symphyotrichum puniceum</i>	Purple-stemmed aster	Asteraceae	Native	OBL	Perennial herb
<i>Symplocarpus foetidus</i>	Skunk cabbage	Araceae	Native	OBL	Perennial herb
<i>Symplocos paniculata</i>	Sapphire-berry	Symplocaceae	Introduced	N	Deciduous shrub
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	Introduced	FACU-	Perennial herb
<i>Teucrium canadense</i> var. <i>virginicum</i>	Wild germander	Lamiaceae	Native	FACW	Perennial herb
<i>Thalictrum pubescens</i>	Tall meadow-rue	Ranunculaceae	Native	FACW+	Perennial herb
<i>Thlaspi alliaceum</i>	Garlic pennycress	Brassicaceae	Introduced	N	Annual herb
<i>Tilia americana</i> var. <i>americana</i>	Basswood	Malvaceae	Native	FACU	Deciduous tree
<i>Toxicodendron radicans</i>	Poison-ivy	Anacardiaceae	Native	FAC	Woody vine
<i>Tridens flavus</i>	Purpletop	Poaceae	Native	FACU	Perennial herb
<i>Trifolium dubium</i>	Little hop-clover	Fabaceae	Introduced	UPL	Annual herb
<i>Trifolium pratense</i>	Red clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Trifolium repens</i>	White clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Ulmus americana</i>	American elm	Ulmaceae	Native	FACW-	Deciduous tree
<i>Ulmus rubra</i>	Red elm	Ulmaceae	Native	FAC-	Deciduous tree
<i>Urtica dioica</i> ssp. <i>dioica</i>	Great nettle	Urticaceae	Introduced	FACU	Perennial herb

<i>Verbena urticifolia</i> var. <i>urticifolia</i>	White vervain	Verbenaceae	Native	FACU	Annual herb
<i>Vernonia noveboracensis</i>	New York ironweed	Asteraceae	Native	FACW+	Perennial herb
<i>Veronica chamaedrys</i>	Bird's-eye	Plantaginaceae	Introduced	UPL	Perennial herb
<i>Veronica hederifolia</i>	Ivy-leaved speedwell	Plantaginaceae	Introduced	N	Annual herb
<i>Viburnum lentago</i>	Nannyberry	Adoxaceae	Native	FAC	Deciduous shrub
<i>Viburnum opulus</i>	Guelder-rose	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum plicatum</i>	Doublefile viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum prunifolium</i>	Black-haw	Adoxaceae	Native	FACU	Deciduous shrub
<i>Viburnum recognitum</i>	Northern arrow-wood	Adoxaceae	Native	FACW-	Deciduous shrub
<i>Viburnum sieboldii</i>	Siebold viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Vicia tetrasperma</i>	Slender vetch	Fabaceae	Introduced	N	Annual herb
<i>Vinca minor</i>	Common periwinkle	Apocynaceae	Introduced	N	Perennial herb
<i>Viola pubescens</i> var. <i>pubescens</i>	Downy yellow violet	Violaceae	Native	FACU-	Perennial herb
<i>Viola pubescens</i> var. <i>scabriuscula</i>	Downy yellow violet	Violaceae	Native	N	Perennial herb
<i>Viola sororia</i>	Common blue violet	Violaceae	Native	FAC-	Perennial herb
<i>Viola striata</i>	Striped violet	Violaceae	Native	FACW	Perennial herb
<i>Vitis labrusca</i>	Fox grape	Vitaceae	Native	FACU	Woody vine
<i>Vitis vulpina</i>	Frost grape	Vitaceae	Native	FAC	Woody vine
<i>Xanthium strumarium</i>	Common cocklebur	Asteraceae	Native	FAC	Annual herb
<i>Zizia aurea</i>	Golden-alexander	Apiaceae	Native	FAC	Perennial herb



## Penllyn Woods Natural Area

The Penllyn Woods Natural Area is a preserve of approximately 25.6 acres in Whitpain Township. The preserve is adjacent to Lower Gwynedd Township's 77-acre Penllyn Woods Park. While part of the township's park is dedicated to active recreation, a considerable portion is wooded.

The entire site is underlain by Stockton Formation bedrock. The soils are mainly of the Bowmansville and Lawrenceville Silt Loam Series.

The main stem of the Wissahickon Creek flows through the preserve and is joined by Willow Run and two unnamed tributary streams on the site. There is little topographic variation on the site and approximately 12.3 acres of the floodplain are on the annual floodway. Nearly all of the site lies within the 100-year flood hazard zone.

The canopy of the floodplain forest here, as elsewhere along the Wissahickon, is dominated by red



Severely over browsed woods at Penllyn Natural Area

maple (*Acer rubrum*) and box-elder (*A. negundo*) with sycamore (*Platanus occidentalis*), silver maple (*A. saccharinum*), white ash (*Fraxinus americana*), pin oak (*Quercus palustris*), American elm (*Ulmus americana*), and Norway maple (*A. platanooides*) also common. As throughout the study area, there is no evidence of native tree regeneration.

The shrub layer consists of the native spicebush (*Lindera benzoin*) in abundance, with the non-native invasives winged euonymus (*Euonymus alatus*), obtuse-leaved privet (*Ligustrum obtusifolium*), and Siebold's viburnum (*Viburnum sieboldii*) also common.

The herbaceous layer is dominated by lesser celandine (*Ranunculus ficaria*), garlic mustard (*Alliaria petiolata*), dame's-rocket (*Hesperis matronalis*), field garlic (*Allium vineale*), and a number of other non-native invasive species.

There are massive piles of yard and garden trimmings piled in the edge of the woods along Township Line Road. An effort should be undertaken to educate the neighbors about the ecological problems caused by this practice.

### Site-specific Management Recommendations

- Remove the several species of relatively limited invasives
- Strongly discourage neighbors from dumping yard and garden waste into the woods

In spite of somewhat less total plant diversity (156 total species) at this site, 66% of all plant species are natives. Table 8 provides the complete list of plant species observed in this study at this site.

**Table 8. Plant List for Penllyn Preserve**

Species	Common name	Family	Nativity	USFWS wetland code	Growth habit
<i>Acer negundo</i>	Box-elder	Sapindaceae	Native	FAC+	Deciduous tree
<i>Acer platanoides</i>	Norway maple	Sapindaceae	Introduced	UPL	Deciduous tree
<i>Acer rubrum</i>	Red maple	Sapindaceae	Native	FAC	Deciduous tree
<i>Actaea racemosa</i>	Black snakeroot	Ranunculaceae	Native	N	Perennial herb
<i>Ageratina altissima</i> var. <i>altissima</i>	White-snakeroot	Asteraceae	Native	N	Perennial herb
<i>Alliaria petiolata</i>	Garlic-mustard	Brassicaceae	Introduced	FACU-	Biennial herb
<i>Allium canadense</i>	Wild onion	Alliaceae	Native	FACU	Perennial herb
<i>Allium vineale</i>	Field garlic	Alliaceae	Introduced	FACU-	Perennial herb
<i>Ambrosia artemisiifolia</i>	Common ragweed	Asteraceae	Native	FACU	Annual herb
<i>Amorpha fruticosa</i>	False-indigo	Fabaceae	Native	FACW	Deciduous shrub
<i>Apocynum cannabinum</i>	Indian-hemp	Apocynaceae	Native	FACU	Perennial herb
<i>Arctium minus</i>	Common burdock	Asteraceae	Introduced	FACU-	Biennial herb
<i>Arisaema dracontium</i>	Green-dragon	Araceae	Native	FACW	Perennial herb
<i>Artemisia vulgaris</i>	Common mugwort	Asteraceae	Introduced	N	Perennial herb
<i>Asclepias syriaca</i>	Common milkweed	Apocynaceae	Native	FACU-	Perennial herb
<i>Barbarea verna</i>	Early wintercress	Brassicaceae	Introduced	N	Biennial herb
<i>Berberis thunbergii</i>	Japanese barberry	Berberidaceae	Introduced	N	Deciduous shrub
<i>Boehmeria cylindrica</i> var. <i>cylindrica</i>	False nettle	Urticaceae	Native	FACW+	Perennial herb
<i>Bromus commutatus</i>	Hairy chess	Poaceae	Introduced	N	Annual herb
<i>Callitriche heterophylla</i>	Water-starwort	Plantaginaceae	Native	OBL	Perennial herb
<i>Cardamine impatiens</i>	Bittercress	Brassicaceae	Introduced	N	Perennial herb
<i>Carex amphibola</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex blanda</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex cephalophora</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex crinita</i> var. <i>crinita</i>	Short hair sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex festucacea</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex glaucoidea</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex gracillima</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex granularis</i> var. <i>granularis</i>	Sedge	Cyperaceae	Native	FACW+	Perennial herb
<i>Carex hirsutella</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex hirtifolia</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex laxiculmis</i> var. <i>laxiculmis</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex laxiflora</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex lurida</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex molesta</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex pensylvanica</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex radiata</i>	Sedge	Cyperaceae	Native	N	Perennial herb

<i>Carex squarrosa</i>	Sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex stipata</i> var. <i>stipata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex straminea</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex styloflexa</i>	Sedge	Cyperaceae	Native	FACW-	Perennial herb
<i>Carex swanii</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex vulpinoidea</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carpinus caroliniana</i>	Hornbeam	Betulaceae	Native	FAC	Deciduous tree
<i>Carya cordiformis</i>	Bitternut hickory	Juglandaceae	Native	FACU+	Deciduous tree
<i>Carya ovata</i>	Shagbark hickory	Juglandaceae	Native	FACU	Deciduous tree
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Introduced	UPL	Woody vine
<i>Cerastium fontanum</i> ssp. <i>triviale</i>	Common mouse-ear chickweed	Caryophyllaceae	Introduced	FACU-	Perennial herb
<i>Chelidonium majus</i>	Greater celandine	Papaveraceae	Introduced	UPL	Biennial herb
<i>Chelone glabra</i>	Turtlehead	Plantaginaceae	Native	OBL	Perennial herb
<i>Chenopodium album</i> var. <i>album</i>	Lamb's quarters	Amaranthaceae	Introduced	FACU+	Annual herb
<i>Circaea canadensis</i> ssp. <i>canadensis</i>	Enchanter's-nightshade	Onagraceae	Native	FACU	Perennial herb
<i>Commelina communis</i> var. <i>communis</i>	Asiatic dayflower	Commelinaceae	Introduced	FAC-	Annual herb
<i>Conium maculatum</i>	Poison-hemlock	Apiaceae	Introduced	FACW	Biennial herb
<i>Cornus amomum</i> ssp. <i>amomum</i>	Silky dogwood	Cornaceae	Native	FACW	Deciduous shrub
<i>Cornus florida</i>	Flowering dogwood	Cornaceae	Native	FACU-	Deciduous tree
<i>Cryptotaenia canadensis</i>	Honewort	Apiaceae	Native	FAC	Perennial herb
<i>Dactylis glomerata</i>	Orchardgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Danthonia spicata</i>	Poverty-grass	Poaceae	Native	N	Perennial herb
<i>Dichanthelium clandestinum</i>	Deer-tongue grass	Poaceae	Native	FAC+	Perennial herb
<i>Dryopteris marginalis</i>	Marginal wood fern	Polypodiaceae	Native	FACU-	Perennial herb
<i>Duchesnea indica</i>	Indian strawberry	Rosaceae	Introduced	FACU-	Perennial herb
<i>Erigeron philadelphicus</i>	Daisy fleabane	Asteraceae	Native	FACU	Perennial herb
<i>Euonymus alatus</i>	Winged euonymous	Celastraceae	Introduced	N	Deciduous shrub
<i>Eurybia divaricata</i>	White wood aster	Asteraceae	Native	N	Perennial herb
<i>Fagus grandifolia</i>	American beech	Fagaceae	Native	FACU	Deciduous tree
<i>Fallopia japonica</i>	Japanese knotweed	Polygonaceae	Introduced	FACU-	Perennial herb
<i>Festuca obtusa</i>	Nodding fescue	Poaceae	Native	FACU	Perennial herb
<i>Fraxinus americana</i> var. <i>americana</i>	White ash	Oleaceae	Native	FACU	Deciduous tree
<i>Galium aparine</i>	Bedstraw	Rubiaceae	Native	FACU	Annual herb
<i>Geum canadense</i>	White avens	Rosaceae	Native	FACU	Perennial herb
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	Native	OBL	Perennial herb
<i>Hamamelis virginiana</i>	Witch-hazel	Hamamelidaceae	Native	FACU+	Deciduous shrub
<i>Hedera helix</i>	English ivy	Araliaceae	Introduced	N	Woody vine
<i>Hesperis matronalis</i>	Dame's-rocket	Brassicaceae	Introduced	N	Perennial herb
<i>Hibiscus syriacus</i>	Rose-of-sharon	Malvaceae	Introduced	N	Deciduous shrub

<i>Hosta lancifolia</i>	Narrow-leaved plantain-lily	Agavaceae	Introduced	N	Perennial herb
<i>Humulus japonicus</i>	Japanese hops	Cannabaceae	Introduced	FACU	Perennial herb
<i>Impatiens capensis</i>	Jewelweed	Balsaminaceae	Native	FACW	Annual herb
<i>Iris pseudacorus</i>	Water flag	Iridaceae	Introduced	OBL	Perennial herb
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Native	FACU	Deciduous tree
<i>Juncus tenuis</i> var. <i>tenuis</i>	Path rush	Juncaceae	Native	FAC-	Perennial herb
<i>Lactuca canadensis</i>	Wild lettuce	Asteraceae	Native	FACU-	Annual herb
<i>Leersia virginica</i>	Cutgrass	Poaceae	Native	FACW	Perennial herb
<i>Ligustrum obtusifolium</i>	Obtuse-leaved privet	Oleaceae	Introduced	N	Deciduous shrub
<i>Lindera benzoin</i>	Spicebush	Lauraceae	Native	FACW-	Deciduous shrub
<i>Liriodendron tulipifera</i>	Tuliptree	Magnoliaceae	Native	FACU	Deciduous tree
<i>Lonicera japonica</i>	Japanese honeysuckle	Caprifoliaceae	Introduced	FAC-	Woody vine
<i>Lonicera maackii</i>	Amur honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Ludwigia palustris</i>	Marsh-purslane	Onagraceae	Native	OBL	Perennial herb
<i>Luzula multiflora</i>	Field woodrush	Juncaceae	Native	FACU	Perennial herb
<i>Lysimachia ciliata</i>	Fringed loosestrife	Myrsinaceae	Native	FACW	Perennial herb
<i>Lysimachia nummularia</i>	Creeping-charlie	Myrsinaceae	Introduced	FACW-	Perennial herb
<i>Maianthemum racemosum</i>	False solomon's-seal	Ruscaceae	Native	N	Perennial herb
<i>Microstegium vimineum</i>	Stiltgrass	Poaceae	Introduced	FAC	Annual herb
<i>Morus alba</i>	White mulberry	Moraceae	Introduced	UPL	Deciduous tree
<i>Narcissus poeticus</i>	Poet's narcissus	Alliaceae	Introduced	N	Perennial herb
<i>Nyssa sylvatica</i>	Sourgum	Nyssaceae	Native	FAC	Deciduous tree
<i>Oenothera biennis</i>	Evening-primrose	Onagraceae	Native	FACU-	Biennial herb
<i>Onoclea sensibilis</i>	Sensitive fern	Polypodiaceae	Native	FACW	Perennial herb
<i>Ornithogalum umbellatum</i>	Star-of-Bethlehem	Hyacinthaceae	Introduced	FACU	Perennial herb
<i>Ostrya virginiana</i>	Hop-hornbeam	Betulaceae	Native	FACU-	Deciduous tree
<i>Oxalis stricta</i>	Common yellow wood-sorrel	Oxalidaceae	Native	UPL	Perennial herb
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	Vitaceae	Native	FACU	Woody vine
<i>Persicaria virginiana</i>	Jumpseed	Polygonaceae	Native	FAC	Perennial herb
<i>Phalaris arundinacea</i>	Reed canary-grass	Poaceae	Native	FACW	Perennial herb
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	Introduced	UPL	Perennial herb
<i>Plantago major</i>	Broad-leaved plantain	Plantaginaceae	Introduced	FACU	Perennial herb
<i>Platanus occidentalis</i>	Sycamore	Platanaceae	Native	FACW-	Deciduous tree
<i>Poa trivialis</i>	Rough bluegrass	Poaceae	Introduced	FACW	Perennial herb
<i>Podophyllum peltatum</i>	Mayapple	Berberidaceae	Native	N	Perennial herb
<i>Polystichum acrostichoides</i>	Christmas fern	Polypodiaceae	Native	N	Perennial herb
<i>Potentilla simplex</i>	Old-field cinquefoil	Rosaceae	Native	FACU-	Perennial herb
<i>Prunus avium</i>	Sweet cherry	Rosaceae	Introduced	N	Deciduous tree
<i>Prunus serotina</i>	Wild black cherry	Rosaceae	Native	FACU	Deciduous tree
<i>Pyrus calleryana</i>	Callery pear	Rosaceae	Introduced	N	Deciduous tree

<i>Quercus alba</i>	White oak	Fagaceae	Native	FACU	Deciduous tree
<i>Quercus bicolor</i>	Swamp white oak	Fagaceae	Native	FACW+	Deciduous tree
<i>Quercus palustris</i>	Pin oak	Fagaceae	Native	FACW	Deciduous tree
<i>Quercus rubra</i>	Northern red oak	Fagaceae	Native	FACU-	Deciduous tree
<i>Quercus velutina</i>	Black oak	Fagaceae	Native	N	Deciduous tree
<i>Ranunculus ficaria</i>	Lesser celandine	Ranunculaceae	Introduced	N	Perennial herb
<i>Ranunculus hispidus</i> var. <i>caricetorum</i>	Marsh buttercup	Ranunculaceae	Native	FAC	Perennial herb
<i>Ranunculus micranthus</i>	Small-flowered crowfoot	Ranunculaceae	Native	FACU	Perennial herb
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Native	FACU-	Deciduous tree
<i>Rorippa palustris</i>	Marsh watercress	Brassicaceae	Native	OBL	Annual herb
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Introduced	FACU	Deciduous shrub
<i>Rubus allegheniensis</i>	Common blackberry	Rosaceae	Native	FACU-	Deciduous shrub
<i>Rubus occidentalis</i>	Black-cap	Rosaceae	Native	N	Deciduous shrub
<i>Rubus pensilvanicus</i>	Blackberry	Rosaceae	Native	N	Deciduous shrub
<i>Rubus phoenicolasius</i>	Wineberry	Rosaceae	Introduced	N	Deciduous shrub
<i>Rumex obtusifolius</i>	Bitter dock	Polygonaceae	Introduced	FACU-	Perennial herb
<i>Sambucus canadensis</i>	American elder	Adoxaceae	Native	FACW	Deciduous shrub
<i>Senecio vulgaris</i>	Common groundsel	Asteraceae	Introduced	FACU	Annual herb
<i>Sicyos angulatus</i>	Bur cucumber	Cucurbitaceae	Native	FACU	Annual vine
<i>Sisyrinchium angustifolium</i>	Blue-eyed-grass	Iridaceae	Native	FACW-	Perennial herb
<i>Solanum dulcamara</i> var. <i>dulcamara</i>	Trailing nightshade	Solanaceae	Introduced	FAC	Woody vine
<i>Solidago caesia</i>	Bluestem goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Sphenopholis obtusata</i> var. <i>obtusata</i>	Prairie wedgegrass	Poaceae	Native	FAC-	Perennial herb
<i>Stellaria media</i>	Common chickweed	Caryophyllaceae	Introduced	N	Annual herb
<i>Symplocarpus foetidus</i>	Skunk cabbage	Araceae	Native	OBL	Perennial herb
<i>Symplocos paniculata</i>	Sapphire-berry	Symplocaceae	Introduced	N	Deciduous shrub
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	Introduced	FACU-	Perennial herb
<i>Thalictrum pubescens</i>	Tall meadow-rue	Ranunculaceae	Native	FACW+	Perennial herb
<i>Toxicodendron radicans</i>	Poison-ivy	Anacardiaceae	Native	FAC	Woody vine
<i>Trifolium aureum</i>	Large yellow hop-clover	Fabaceae	Introduced	N	Annual herb
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Ulmus rubra</i>	Red elm	Ulmaceae	Native	FAC-	Deciduous tree
<i>Viburnum dilatatum</i>	Linden viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum opulus</i>	Guelder-rose	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum prunifolium</i>	Black-haw	Adoxaceae	Native	FACU	Deciduous shrub
<i>Viburnum sieboldii</i>	Siebold viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Vicia sativa</i> ssp. <i>sativa</i>	Common vetch	Fabaceae	Introduced	FACU-	Annual herb
<i>Viola sororia</i>	Common blue violet	Violaceae	Native	FAC-	Perennial herb
<i>Vitis vulpina</i>	Frost grape	Vitaceae	Native	FAC	Woody vine



## Willow Lake Farm Preserve

The Willow Lake Farm Preserve is approximately 106 acres in size. About 28.25 acres is successional woodland, 15.4 acres is successional old field, and the rest is maintained as hay fields. The preserve is in Whitemarsh Township at the intersection of Skippack Pike and Butler Pike.

The entire site is underlain by Stockton Formation bedrock. The soils are mainly of the Bowmansville, Croton, Lawrenceville, and Reaville Silt Loam Series. Topographically, the site rises slightly from north to south.

Willow Lake Farm lies at or near the headwaters of Spring Run and an unnamed tributary. Spring Run runs northeast across the property, while the tributary stream enters from the southeast. Approximately five acres of the site lies within the 100-year flood hazard zone.

The canopy of all of the wooded area of Willow Lake Farm is dominated by young red maple (*Acer rubrum*) with occasional box elder (*A. negundo*), white ash (*Fraxinus americana*), and American elm (*Ulmus americana*). Aerial photography from 1942 shows the entire site in pasture or hay fields with only fencerows showing any sign of woody vegetation.



Sparse forest understory and shrub layers

The sparse shrub layer mostly consists of multiflora rose (*Rosa multiflora*) and scattered spicebush (*Lindera benzoin*). The forest ground layer is dominated by poison-ivy (*Toxicodendron radicans*), Japanese honeysuckle (*Lonicera japonica*), white avens (*Geum canadense*), and sensitive fern (*Onoclea sensibilis*). It is surprisingly devoid of common woodland wildflowers including jack-in-the-pulpit (*Arisaema triphyllum*), spring-beauty (*Claytonia virginica*) (saw one plant in the old field portion of the site), and

trout-lily (*Erythronium americanum*). It is likely that spring ephemerals were locally extirpated by the long-term, heavy grazing that occurred over the time the site was historically pastured .

The old field areas at Willow Lake Farm range from more open goldenrod (*Solidago* spp.) dominated areas to dense thickets of multiflora rose and other shrubs. The trails through these areas are lined with common buckthorn (*Rhamnus cathartica*) and non-native honeysuckles (*Lonicera* spp.).

### Site-specific Management Recommendations

- Remove less common invasive plant species

About 64% of the plant species at Willow Lake Farm are natives. Table 9 provides the complete list of plant species observed in this study at this site.

**Table 9. Plant List for Willow Lake Farm Preserve**

Species	Common name	Family	Nativity	USFWS wetland code	Growth habit
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	Native	FACU-	Annual herb
<i>Acer negundo</i>	Box-elder	Sapindaceae	Native	FAC+	Deciduous tree
<i>Acer platanoides</i>	Norway maple	Sapindaceae	Introduced	UPL	Deciduous tree
<i>Acer rubrum</i>	Red maple	Sapindaceae	Native	FAC	Deciduous tree
<i>Acer saccharinum</i>	Silver maple	Sapindaceae	Native	FACW	Deciduous tree
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	Introduced	FACU	Perennial herb
<i>Aesculus parviflora</i>	Bottlebrush buckeye	Sapindaceae	Introduced	N	Deciduous shrub
<i>Ageratina altissima</i> var. <i>altissima</i>	White-snakeroot	Asteraceae	Native	N	Perennial herb
<i>Agrimonia parviflora</i>	Southern agrimony	Rosaceae	Native	FACW	Perennial herb
<i>Alliaria petiolata</i>	Garlic-mustard	Brassicaceae	Introduced	FACU-	Biennial herb
<i>Allium vineale</i>	Field garlic	Alliaceae	Introduced	FACU-	Perennial herb
<i>Ampelopsis brevipedunculata</i>	Porcelain-berry	Vitaceae	Introduced	N	Woody vine
<i>Anthoxanthum odoratum</i>	Sweet vernalgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Apocynum cannabinum</i>	Indian-hemp	Apocynaceae	Native	FACU	Perennial herb
<i>Arctium minus</i>	Common burdock	Asteraceae	Introduced	FACU-	Biennial herb
<i>Asclepias syriaca</i>	Common milkweed	Apocynaceae	Native	FACU-	Perennial herb
<i>Athyrium filix-femina</i> var. <i>angustum</i>	Lady fern	Polypodiaceae	Native	FAC	Perennial herb
<i>Barbarea verna</i>	Early wintercress	Brassicaceae	Introduced	N	Biennial herb
<i>Berberis thunbergii</i>	Japanese barberry	Berberidaceae	Introduced	N	Deciduous shrub
<i>Betula lenta</i>	Black birch	Betulaceae	Native	FACU	Deciduous tree
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	Native	FACW	Annual herb
<i>Boehmeria cylindrica</i> var. <i>cylindrica</i>	False nettle	Urticaceae	Native	FACW+	Perennial herb
<i>Bromus arvensis</i>	Field chess	Poaceae	Introduced	N	Annual herb
<i>Cardamine hirsuta</i>	Hairy bittercress	Brassicaceae	Introduced	FACU	Annual herb
<i>Cardamine impatiens</i>	Bittercress	Brassicaceae	Introduced	N	Perennial herb
<i>Carex amphibola</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex annectens</i>	Sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex atlantica</i> ssp. <i>atlantica</i>	Bog sedge	Cyperaceae	Native	FACW+	Perennial herb
<i>Carex blanda</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex crinita</i> var. <i>crinita</i>	Short hair sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex gracillima</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex lurida</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex radiata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex stipata</i> var. <i>stipata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex swanii</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Catalpa bignonioides</i>	Catalpa	Bignoniaceae	Introduced	UPL	Deciduous tree

<i>Catalpa ovata</i>	Chinese catalpa	Bignoniaceae	Introduced	N	Deciduous tree
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Introduced	UPL	Woody vine
<i>Cerastium fontanum</i> ssp. <i>triviale</i>	Common mouse-ear chickweed	Caryophyllaceae	Introduced	FACU-	Perennial herb
<i>Cercis canadensis</i>	Redbud	Fabaceae	Native	N	Deciduous tree
<i>Cichorium intybus</i>	Blue chicory	Asteraceae	Introduced	N	Perennial herb
<i>Circaea canadensis</i> ssp. <i>canadensis</i>	Enchanter's-nightshade	Onagraceae	Native	FACU	Perennial herb
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	Introduced	FACU	Perennial herb
<i>Cirsium discolor</i>	Field thistle	Asteraceae	Native	UPL	Biennial herb
<i>Claytonia virginica</i>	Spring-beauty	Portulacaceae	Native	FAC	Perennial herb
<i>Clematis terniflora</i>	Sweet autumn clematis	Ranunculaceae	Introduced	FACU-	Perennial vine
<i>Clematis virginiana</i>	Virgin's-bower	Ranunculaceae	Native	FAC	Perennial vine
<i>Commelina communis</i> var. <i>communis</i>	Asiatic dayflower	Commelinaceae	Introduced	FAC-	Annual herb
<i>Conyza canadensis</i> var. <i>canadensis</i>	Horseweed	Asteraceae	Native	UPL	Annual herb
<i>Cornus amomum</i> ssp. <i>amomum</i>	Silky dogwood	Cornaceae	Native	FACW	Deciduous shrub
<i>Cornus florida</i>	Flowering dogwood	Cornaceae	Native	FACU-	Deciduous tree
<i>Crataegus macrosperma</i>	Fanleaf hawthorn	Rosaceae	Native	N	Deciduous shrub
<i>Cyperus strigosus</i>	False nutsedge	Cyperaceae	Native	FACW	Perennial herb
<i>Dactylis glomerata</i>	Orchardgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Daucus carota</i>	Queen Anne's-lace	Apiaceae	Introduced	N	Biennial herb
<i>Dichanthelium clandestinum</i>	Deer-tongue grass	Poaceae	Native	FAC+	Perennial herb
<i>Digitaria ischaemum</i>	Smooth crabgrass	Poaceae	Introduced	UPL	Annual herb
<i>Dryopteris carthusiana</i>	Spinulose wood fern	Polypodiaceae	Native	FAC+	Perennial herb
<i>Duchesnea indica</i>	Indian strawberry	Rosaceae	Introduced	FACU-	Perennial herb
<i>Elaeagnus umbellata</i>	Autumn-olive	Elaeagnaceae	Introduced	N	Deciduous shrub
<i>Epilobium coloratum</i>	Purple-leaved willow-herb	Onagraceae	Native	FACW+	Perennial herb
<i>Erechtites hieraciifolius</i>	Fireweed	Asteraceae	Native	FACU	Annual herb
<i>Erigeron philadelphicus</i>	Daisy fleabane	Asteraceae	Native	FACU	Perennial herb
<i>Euonymus alatus</i>	Winged euonymous	Celastraceae	Introduced	N	Deciduous shrub
<i>Euonymus fortunei</i>	Wintercreeper	Celastraceae	Introduced	N	Woody vine
<i>Eupatorium perfoliatum</i>	Boneset	Asteraceae	Native	FACW+	Perennial herb
<i>Euthamia graminifolia</i>	Grass-leaved goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Fallopia scandens</i>	Climbing false-buckwheat	Polygonaceae	Native	FAC	Perennial vine
<i>Fraxinus americana</i> var. <i>americana</i>	White ash	Oleaceae	Native	FACU	Deciduous tree
<i>Galium aparine</i>	Bedstraw	Rubiaceae	Native	FACU	Annual herb
<i>Geum canadense</i>	White avens	Rosaceae	Native	FACU	Perennial herb
<i>Geum vernum</i>	Spring avens	Rosaceae	Native	FACU	Perennial herb
<i>Glyceria melicaria</i>	Slender mannagrass	Poaceae	Native	OBL	Perennial herb
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	Native	OBL	Perennial herb
<i>Hackelia virginiana</i>	Beggar's-lice	Boraginaceae	Native	FACU	Biennial herb

<i>Hedera helix</i>	English ivy	Araliaceae	Introduced	N	Woody vine
<i>Hieracium caespitosum</i>	King-devil	Asteraceae	Introduced	N	Perennial herb
<i>Holcus lanatus</i>	Velvetgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Ilex opaca</i>	American holly	Aquifoliaceae	Native	FACU	Evergreen tree
<i>Ilex verticillata</i>	Winterberry	Aquifoliaceae	Native	FACW+	Deciduous shrub
<i>Impatiens capensis</i>	Jewelweed	Balsaminaceae	Native	FACW	Annual herb
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Native	FACU	Deciduous tree
<i>Juncus effusus</i> var. <i>solutus</i>	Soft rush	Juncaceae	Native	OBL	Perennial herb
<i>Juncus tenuis</i> var. <i>tenuis</i>	Path rush	Juncaceae	Native	FAC-	Perennial herb
<i>Juniperus virginiana</i>	Eastern red-cedar	Cupressaceae	Native	FACU	Evergreen tree
<i>Krigia biflora</i>	Dwarf dandelion	Asteraceae	Native	FACW	Perennial herb
<i>Leersia oryzoides</i>	Rice cutgrass	Poaceae	Native	OBL	Perennial herb
<i>Leucanthemum vulgare</i>	Ox-eye daisy	Asteraceae	Introduced	N	Perennial herb
<i>Ligustrum obtusifolium</i>	Obtuse-leaved privet	Oleaceae	Introduced	N	Deciduous shrub
<i>Lindera benzoin</i>	Spicebush	Lauraceae	Native	FACW-	Deciduous shrub
<i>Liquidambar styraciflua</i>	Sweetgum	Altingiaceae	Native	FAC	Deciduous tree
<i>Liriodendron tulipifera</i>	Tuliptree	Magnoliaceae	Native	FACU	Deciduous tree
<i>Lonicera japonica</i>	Japanese honeysuckle	Caprifoliaceae	Introduced	FAC-	Woody vine
<i>Lonicera maackii</i>	Amur honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lonicera morrowii</i>	Morrow's honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Ludwigia alternifolia</i>	False loosestrife	Onagraceae	Native	FACW+	Perennial herb
<i>Lysimachia ciliata</i>	Fringed loosestrife	Myrsinaceae	Native	FACW	Perennial herb
<i>Lysimachia nummularia</i>	Creeping-charlie	Myrsinaceae	Introduced	FACW-	Perennial herb
<i>Maianthemum racemosum</i>	False solomon's-seal	Ruscaceae	Native	N	Perennial herb
<i>Malus coronaria</i>	Sweet crabapple	Rosaceae	Native	N	Deciduous tree
<i>Malus</i> sp.	Crabapple	Rosaceae	Introduced	N	Deciduous tree
<i>Microstegium vimineum</i>	Stiltgrass	Poaceae	Introduced	FAC	Annual herb
<i>Mimulus alatus</i>	Winged monkey-flower	Phrymaceae	Native	OBL	Perennial herb
<i>Morus alba</i>	White mulberry	Moraceae	Introduced	UPL	Deciduous tree
<i>Muhlenbergia schreberi</i>	Dropseed	Poaceae	Native	FAC	Perennial herb
<i>Nyssa sylvatica</i>	Sourgum	Nyssaceae	Native	FAC	Deciduous tree
<i>Oenothera biennis</i>	Evening-primrose	Onagraceae	Native	FACU-	Biennial herb
<i>Onoclea sensibilis</i>	Sensitive fern	Polypodiaceae	Native	FACW	Perennial herb
<i>Osmunda cinnamomea</i>	Cinnamon fern	Osmundaceae	Native	FACW	Perennial herb
<i>Osmunda regalis</i>	Royal fern	Osmundaceae	Native	OBL	Perennial herb
<i>Oxalis stricta</i>	Common yellow wood-sorrel	Oxalidaceae	Native	UPL	Perennial herb
<i>Panicum anceps</i>	Panic grass	Poaceae	Native	FAC	Perennial herb
<i>Panicum dichotomiflorum</i>	Smooth panic grass	Poaceae	Native	FACW-	Annual herb
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	Vitaceae	Native	FACU	Woody vine
<i>Persicaria arifolia</i>	Halberd-leaf tearthumb	Polygonaceae	Native	OBL	Annual herb

<i>Persicaria pensylvanica</i>	Smartweed	Polygonaceae	Native	FACW	Annual herb
<i>Persicaria punctata</i>	Dotted smartweed	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria sagittata</i>	Tearthumb	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria virginiana</i>	Jumpseed	Polygonaceae	Native	FAC	Perennial herb
<i>Phalaris arundinacea</i>	Reed canary-grass	Poaceae	Native	FACW	Perennial herb
<i>Philadelphus inodorus</i> var. <i>grandiflorus</i>	Mock-orange	Hydrangeaceae	Introduced	N	Deciduous shrub
<i>Phragmites australis</i> ssp. <i>australis</i>	Common reed	Poaceae	Introduced	FACW	Perennial herb
<i>Physalis subglabrata</i>	Ground-cherry	Solanaceae	Native	N	Perennial herb
<i>Phytolacca americana</i>	Pokeweed	Phytolaccaceae	Native	FACU+	Perennial herb
<i>Pilea pumila</i>	Clearweed	Urticaceae	Native	FACW	Annual herb
<i>Pinus strobus</i>	Eastern white pine	Pinaceae	Native	FACU	Evergreen tree
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	Introduced	UPL	Perennial herb
<i>Plantago major</i>	Broad-leaved plantain	Plantaginaceae	Introduced	FACU	Perennial herb
<i>Plantago rugelii</i>	Rugel's plantain	Plantaginaceae	Native	FACU	Perennial herb
<i>Platanus occidentalis</i>	Sycamore	Platanaceae	Native	FACW-	Deciduous tree
<i>Poa palustris</i>	Fowl bluegrass	Poaceae	Native	FACW	Perennial herb
<i>Poa sylvestris</i>	Woodland bluegrass	Poaceae	Native	FACW	Perennial herb
<i>Poa trivialis</i>	Rough bluegrass	Poaceae	Introduced	FACW	Perennial herb
<i>Potentilla recta</i>	Sulfur cinquefoil	Rosaceae	Introduced	N	Perennial herb
<i>Potentilla simplex</i>	Old-field cinquefoil	Rosaceae	Native	FACU-	Perennial herb
<i>Prunella vulgaris</i> ssp. <i>vulgaris</i>	Heal-all	Lamiaceae	Introduced	FACU+	Perennial herb
<i>Prunus avium</i>	Sweet cherry	Rosaceae	Introduced	N	Deciduous tree
<i>Prunus serotina</i>	Wild black cherry	Rosaceae	Native	FACU	Deciduous tree
<i>Pyrus calleryana</i>	Callery pear	Rosaceae	Introduced	N	Deciduous tree
<i>Quercus bicolor</i>	Swamp white oak	Fagaceae	Native	FACW+	Deciduous tree
<i>Quercus imbricaria</i>	Shingle oak	Fagaceae	Native	FAC	Deciduous tree
<i>Quercus palustris</i>	Pin oak	Fagaceae	Native	FACW	Deciduous tree
<i>Quercus rubra</i>	Northern red oak	Fagaceae	Native	FACU-	Deciduous tree
<i>Ranunculus bulbosus</i>	Bulbous buttercup	Ranunculaceae	Introduced	UPL	Perennial herb
<i>Ranunculus ficaria</i>	Lesser celandine	Ranunculaceae	Introduced	N	Perennial herb
<i>Ranunculus hispidus</i> var. <i>caricetorum</i>	Marsh buttercup	Ranunculaceae	Native	FAC	Perennial herb
<i>Rhamnus cathartica</i>	Buckthorn	Rhamnaceae	Introduced	N	Deciduous shrub
<i>Rhus copallinum</i> var. <i>copallinum</i>	Shining sumac	Anacardiaceae	Native	N	Deciduous shrub
<i>Rhus glabra</i>	Smooth sumac	Anacardiaceae	Native	N	Deciduous shrub
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Native	FACU-	Deciduous tree
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Introduced	FACU	Deciduous shrub
<i>Rubus allegheniensis</i>	Common blackberry	Rosaceae	Native	FACU-	Deciduous shrub
<i>Rubus laciniatus</i>	Cut-leaved blackberry	Rosaceae	Introduced	UPL	Deciduous shrub
<i>Rubus occidentalis</i>	Black-cap	Rosaceae	Native	N	Deciduous shrub
<i>Rubus pensilvanicus</i>	Blackberry	Rosaceae	Native	N	Deciduous shrub
<i>Rubus phoenicolasius</i>	Wineberry	Rosaceae	Introduced	N	Deciduous shrub

<i>Rumex acetosella</i>	Sheep sorrel	Polygonaceae	Introduced	UPL	Perennial herb
<i>Rumex obtusifolius</i>	Bitter dock	Polygonaceae	Introduced	FACU-	Perennial herb
<i>Sassafras albidum</i>	Sassafras	Lauraceae	Native	FACU-	Deciduous tree
<i>Schizachyrium scoparium</i> var. <i>scoparium</i>	Little bluestem	Poaceae	Native	FACU	Perennial herb
<i>Scirpus cyperinus</i>	Wool-grass	Cyperaceae	Native	FACW+	Perennial herb
<i>Scirpus pedicellatus</i>	Wool-grass	Cyperaceae	Native	OBL	Perennial herb
<i>Senecio vulgaris</i>	Common groundsel	Asteraceae	Introduced	FACU	Annual herb
<i>Setaria faberi</i>	Giant foxtail	Poaceae	Introduced	UPL	Annual herb
<i>Smilax rotundifolia</i>	Catbrier	Smilacaceae	Native	FAC	Woody vine
<i>Solanum americanum</i>	Black nightshade	Solanaceae	Native	FACU-	Annual herb
<i>Solanum dulcamara</i> var. <i>dulcamara</i>	Trailing nightshade	Solanaceae	Introduced	FAC	Woody vine
<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago gigantea</i> var. <i>gigantea</i>	Smooth goldenrod	Asteraceae	Native	FACW	Perennial herb
<i>Solidago rugosa</i> ssp. <i>rugosa</i> var. <i>rugosa</i>	Wrinkle-leaf goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Sorghastrum nutans</i>	Indian-grass	Poaceae	Native	UPL	Perennial herb
<i>Stellaria media</i>	Common chickweed	Caryophyllaceae	Introduced	N	Annual herb
<i>Symphoricarpos orbiculatus</i>	Coralberry	Caprifoliaceae	Native	UPL	Deciduous shrub
<i>Symplocarpus foetidus</i>	Skunk cabbage	Araceae	Native	OBL	Perennial herb
<i>Symplocos paniculata</i>	Sapphire-berry	Symplocaceae	Introduced	N	Deciduous shrub
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	Introduced	FACU-	Perennial herb
<i>Taxus baccata</i>	English yew	Taxaceae	Native	FAC	Evergreen shrub
<i>Thelypteris palustris</i>	Marsh fern	Polypodiaceae	Native	FACW+	Perennial herb
<i>Tilia americana</i> var. <i>americana</i>	Basswood	Malvaceae	Native	FACU	Deciduous tree
<i>Toxicodendron radicans</i>	Poison-ivy	Anacardiaceae	Native	FAC	Woody vine
<i>Tridens flavus</i>	Purpletop	Poaceae	Native	FACU	Perennial herb
<i>Trifolium campestre</i>	Low hop-clover	Fabaceae	Introduced	N	Annual herb
<i>Trifolium dubium</i>	Little hop-clover	Fabaceae	Introduced	UPL	Annual herb
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Trifolium pratense</i>	Red clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Trifolium repens</i>	White clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Ulmus americana</i>	American elm	Ulmaceae	Native	FACW-	Deciduous tree
<i>Ulmus rubra</i>	Red elm	Ulmaceae	Native	FAC-	Deciduous tree
<i>Verbena urticifolia</i> var. <i>urticifolia</i>	White vervain	Verbenaceae	Native	FACU	Annual herb
<i>Vernonia noveboracensis</i>	New York ironweed	Asteraceae	Native	FACW+	Perennial herb
<i>Veronica americana</i>	American brooklime	Plantaginaceae	Native	OBL	Perennial herb
<i>Veronica anagallis-aquatica</i>	Brook-pimpernel	Plantaginaceae	Introduced	OBL	Biennial herb
<i>Veronica officinalis</i>	Common speedwell	Plantaginaceae	Native	FACU-	Perennial herb
<i>Veronica peregrina</i> ssp. <i>peregrina</i>	Neckweed	Plantaginaceae	Native	FACU-	Annual herb
<i>Veronica serpyllifolia</i>	Thyme-leaved speedwell	Plantaginaceae	Introduced	FAC+	Perennial herb
<i>Viburnum dentatum</i>	Southern arrow-wood	Adoxaceae	Native	FAC	Deciduous shrub

<i>Viburnum dilatatum</i>	Linden viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum opulus</i>	Guelder-rose	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum prunifolium</i>	Black-haw	Adoxaceae	Native	FACU	Deciduous shrub
<i>Viburnum sieboldii</i>	Siebold viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Vicia sativa</i> ssp. <i>sativa</i>	Common vetch	Fabaceae	Introduced	FACU-	Annual herb
<i>Vinca minor</i>	Common periwinkle	Apocynaceae	Introduced	N	Perennial herb
<i>Viola cucullata</i>	Blue marsh violet	Violaceae	Native	FACW+	Perennial herb
<i>Viola sororia</i>	Common blue violet	Violaceae	Native	FAC-	Perennial herb
<i>Vitis aestivalis</i>	Summer grape	Vitaceae	Native	FACU	Woody vine
<i>Vitis labrusca</i>	Fox grape	Vitaceae	Native	FACU	Woody vine
<i>Vitis riparia</i>	Frost grape	Vitaceae	Native	FACW	Woody vine
<i>Vitis vulpina</i>	Frost grape	Vitaceae	Native	FAC	Woody vine
<i>Xanthium strumarium</i>	Common cocklebur	Asteraceae	Native	FAC	Annual herb



## Green Ribbon Trail; Including the Timoney Preserve

The portion of the Green Ribbon Trail included in this study reaches from the northern trailhead at the Upper Gwynedd Township Park in North Wales to the boundary of Fort Washington State Park near Skippack Pike, a distance of about 13.1 kilometers (8.14 miles) not counting the trail interruption at the Cedarbrook Country Club.

Figure 1 of this report shows the changes in bedrock geology along the length of the trail. Although in most cases geology has a significant influence on the vegetation composition of an area, in this case, the effects of geology and soils is less influential than past land use. Virtually all of the study area was manipulated for industrial, commercial, and/or agricultural purposes in the past. The vegetation present today bears little, if any, resemblance to what was there prior to European settlement.

Our observations along the trail were conducted in eight sections (exclusive of the trail sections through the Four Mills Preserve and the Penllyn Woods Natural Area). Variations in the vegetation are noted by section from south to north as appropriate below.

### Skippack Pike to Morris Road

The most abundant trees in this section are bitternut hickory (*Carya cordiformis*) and box-elder (*Acer negundo*).

We found a small colony of a dodder (*Cuscuta campestris*) on the scoured gravel area in the creek bottom just below Lafayette Ave. Dodder is a parasitic plant; in this case it was growing on common mugwort (*Artemisia vulgaris*). *Cuscuta campestris* is currently recommended for listing as a threatened plant (PT) in Pennsylvania (PNHP 2013); however it will probably be delisted due to the number of sites that have been documented in the last few years.

Another interesting find are the three butternut trees (*Juglans cinerea*) growing along the creek bank in the section between Lafayette Ave. and the Pennsylvania Turnpike bridge (see also Figure 4). Since the early 1900s butternut has been afflicted by a canker disease caused by the introduced pathogenic fungus *Siricoccus clavignenti-juglandacearum*. The rapid decimation of butternut populations has



Ohio buckeye fruit

been so severe that the U. S. Fish and Wildlife Service has listed the species as a "species of federal concern" (Schlarbaum et al. 2013). In Pennsylvania it is recommended for special population (SP) status (PNHP 2013).

In the same area is an extensive naturalized population of Ohio buckeye (*Aesculus glabra*) containing trees from approximately 12 inches DBH to seedlings. Although native to southwestern Pennsylvania, this species has spread from cultivation in the eastern part of the state. A population of the highly invasive tree-of-heaven (*Ailanthus altissima*) has become

established in the immediate vicinity of the turnpike bridge and is producing ample amounts of seed.

Between Lafayette Ave. and the Pennsylvania Turnpike bridge much of the floodplain forest is extremely depauperate. At this time it consists of a canopy of box-elder (*Acer negundo*) with occasional Ohio buckeye (*Aesculus glabra*). There is no shrub layer. The ground is bare except for dead stems of garlic mustard (*Alliaria petiolata*) and dame's-rocket (*Hesperis matronalis*) and a carpet of lesser celandine (*Ranunculus ficaria*) tubers. Worm castings several inches thick cover the soil surface.

### Butler Pike to Cedarbrook Country Club

A single butternut tree (*Juglans cinerea*) is along the trail just above Mount Pleasant Ave. (see Figure 4). In addition, we found a butternut (huskless nut) lying in the trail just below the golf course. We were unable to find a tree in that vicinity, but the presence of a nut indicated that a mature, fruiting tree is present somewhere in the landscape.

An interesting feature of this section is several small wet areas along the sewerline right-of-way that the trail follows (or parallels). These spots support a collection of wetland plants indicating that they contain standing water most of the time. Species present in these mini wetlands but not seen elsewhere along this section include:

*Alisma subcordatum* – water-plantain  
*Asclepias incarnata* – swamp milkweed  
*Callitriche stagnalis* – water-starwort  
*Heteranthera reniformis* – mud-plantain  
*Impatiens capensis* – jewelweed  
*Leersia oryzoides* – rice cutgrass  
*Lindernia dubia* – false pimpernel  
*Ludwigia palustris* – water-purslane  
*Mimulus alatus* – monkey-flower  
*Myosotis laxa* – forget-me-not  
*Persicaria sagittata* – sagittate-leaved tearthumb  
*Typha latifolia* – common cat-tail



*Mimulus alatus*

The central portion of this section, south of Mount Pleasant Ave., has a more upland character. The trail is bordered by some fairly large trees including red maple (*Acer rubrum*), swamp white oak (*Quercus bicolor*), beech (*Fagus grandifolia*), red oak (*Quercus rubra*), and basswood (*Tilia americana*).

### Cedarbrook Country Club to Penllyn-Bluebell Pike

The southern half of this section is mostly upland forest of beech (*Fagus grandifolia*), tuliptree (*Liriodendron tulipifera*), white oak (*Quercus alba*), red oak (*Q. rubra*), and black oak (*Q. velutina*). The largest trees are in the 30 inch DBH size range. The understory is mostly spicebush (*Lindera benzoin*), but a single large clump of witch-hazel (*Hamamelis virginiana*) on a steep, rocky slope along the Wissahickon and severely chewed remnants of maple-leaved viburnum (*Viburnum acerifolium*) are tantalizing evidence of what should be more prominent. We saw evidence of a few surviving native

wildflower plants that the deer had not eradicated including false Solomon's-seal (*Maianthemum racemosum*), mayapple (*Podophyllum peltatum*), *Actaea* sp., white wood aster (*Eurybia divaricata*), and wreath goldenrod (*Solidago caesia*). Small patches of marsh fern (*Thelypteris noveboracensis*), and hay-scented fern (*Dennstaedtia punctilobula*) are present. A steep slope along the creek supports a patch of Christmas fern (*Polystichum acrostichoides*).

Invasive species in this section are mainly garlic mustard (*Alliaria petiolata*), Japanese honeysuckle (*Lonicera japonica*), and Norway maple (*Acer platanoides*). Piles of old asphalt paving have been dumped in the woods along the edge of the golf course in several locations.

There is also an upland field dominated by tall fescue (*Schedonorus arundinaceus*).

The northern half of this section is floodplain with obvious scouring, back channels, and piles of debris left by recent flooding. Box-elder (*Acer negundo*) is the dominant tree; some were as tall as 80 feet with a DBH in the 30 inch range. Other trees include silver maple (*Acer saccharinum*), white ash (*Fraxinus americana*), American elm (*Ulmus americana*), shagbark hickory (*Carya ovata*), and the non-native Norway maple (*Acer platanoides*). Non-native plants dominate the shrub layer including obtuse-leaved privet (*Ligustrum obtusifolium*), Amur honeysuckle (*Lonicera maackii*), wineberry (*Rubus phoenicolasius*), multiflora rose (*Rosa multiflora*), and winged euonymus (*Euonymus alatus*). However, a few scattered spicebush plants (*Lindera benzoin*), a large-seed hawthorn (*Crataegus macrosperma*), several severely browsed specimens of arrow viburnum (*Viburnum dentatum*), and a single plant of winterberry holly (*Ilex verticillata*) hanging out over the bank of the Wissahickon Creek are reminders of what should be more abundant. Lesser celandine (*Ranunculus ficaria*) tubers cover the ground.

#### **Penllyn Woods Natural Area to Plymouth Road**

The southern portion of this section of trail passes through low, seasonally wet woods dominated by American elm (*Ulmus americana*), white ash (*Fraxinus americana*), pin oak (*Quercus palustris*), black walnut (*Juglans nigra*), shagbark hickory (*Carya ovata*), bitternut hickory (*C. cordiformis*), red maple (*Acer rubrum*), silver maple (*A. saccharinum*), blackgum (*Nyssa sylvatica*), and sycamore (*Platanus occidentalis*). Spicebush (*Lindera benzoin*) is common in the shrub layer along with non-native invasives such as multiflora rose (*Rosa multiflora*), obtuse-leaved privet (*Ligustrum obtusifolium*), burning-bush (*Euonymus alatus*), and wineberry (*Rubus phoenicolasius*). Native herbaceous species include riverbank wild-rye (*Elymus riparius*), fowl mannagrass (*Glyceria striata*), false nettle (*Boehmeria cylindrica*), soft rush (*Juncus effusus*), several sedges (*Carex typhina*, *C. crinita*), jack-in-the-pulpit (*Arisaema triphyllum*), sensitive fern (*Onoclea sensibilis*), New York fern (*Thelypteris noveboracensis*), and lady fern (*Athyrium filix-femina*).

Just beyond the sewerline building, a grove of mature trees, including American beech (*Fagus grandifolia*) and tuliptree (*Liriodendron tulipifera*), is a notable feature. The shrub layer is reduced to a few large plants of the non-native, invasive burning-bush (*Euonymus alatus*). The herbaceous layer in this area is minimal.

There is a large old white oak (*Quercus alba*) along a side trail between the right-of-way and the



*Heteranthera reniformis*

Wissahickon. An extensive colony of wild ginger (*Asarum canadense*) is present in the same area.

Several low, wet spots along the trail/right-of-way support populations of wetland species including mud-plantain (*Heteranthera reniformis*), false pimpernel (*Lindernia dubia*), water-purslane (*Ludwigia palustris*) and water-plantain (*Alisma subcordatum*), monkey-flower (*Mimulus alatus*), forget-me-not (*Myosotis scorpioides*), and slender spike-rush (*Eleocharis tenuis*). Similar areas are present in the stretch of trail just upstream from Butler Pike.

The northern-most stretch of the trail/pipeline right-of-way is bordered by several patches of summer blooming natives such as cutleaf coneflower (*Rudbeckia laciniata*), wild germander (*Teucrium canadense*), and swamp milkweed (*Asclepias incarnata*). Reducing the width of the mowed area immediately along the trail during the summer season would further enhance the aesthetic impact of these plants.

The railroad bridge supports a small population of Tennessee bladder fern (*Cystopteris tennesseensis*) growing in mortar joints of the masonry.

Ohio buckeye (*Aesculus glabra*) is found at several sites along this section, most notably at the Plymouth Road end where several large fruiting specimens are present along the bank of the Wissahickon.

### **Plymouth Road to US Route 202**

The initial section of this part of the trail (immediately north of Plymouth Road) is a slope dominated by tree-of-heaven (*Ailanthus altissima*), Amur honeysuckle (*Lonicera maackii*) and garlic mustard (*Alliaria petiolata*). This collection of invasives grades into a low, wet woods in which black walnut (*Juglans nigra*), American elm (*Ulmus americana*), white ash (*Fraxinus americana*), pin oak (*Quercus palustris*), shagbark hickory (*Carya ovata*), red maple (*Acer rubrum*), silver maple (*Acer saccharum*), spicebush (*Lindera benzoin*), and the non-native shrubs obtuse-leaved privet (*Ligustrum obtusifolium*), and wineberry (*Rubus phoenicolasius*) were present. Native herbaceous species include Jack-in-the-pulpit (*Arisaema triphyllum*), clearweed (*Pilea pumila*), a sedge (*Carex crinita*), wood-nettle (*Laportea canadensis*), wood reed grass (*Cinna arundinacea*), jumpseed (*Persicaria virginiana*), false nettle (*Boehmeria cylindrica*), and jewelweed (*Impatiens capensis*).

The railroad bridge supports a small population of Tennessee bladder fern (*Cystopteris tennesseensis*) on the one wall where the joints in the masonry are crumbling.



Mature beech forest along the Wissahickon

Above the railroad bridge the Wissahickon is bordered by mature beech forest for several stretches. On a steep slope, maple-leaved viburnum (*Viburnum acerifolium*) has persisted as low, browsed shoots and Christmas fern (*Polystichum acrostichoides*), white wood aster (*Eurybia divaricata*), and wild ginger (*Asarum canadense*) are locally abundant. There are even several large witch-hazel (*Hamamelis virginiana*) shrubs. Traces of other native wildflowers included mayapple (*Podophyllum peltatum*), partridgeberry (*Mitchella repens*), false Solomon's seal (*Maianthemum racemosum*), yellow-flowered sanicle (*Sanicula odorata*), blue wood aster (*Symphyotrichum cordifolium*), and nodding

fescue (*Festuca obtusa*). Where the slope is less severe, browsing intensity has thinned the ground layer vegetation severely.

Close to Route 202 the shrub and ground layers are a tangle of non-native, invasive shrubs and vines including Amur honeysuckle (*Lonicera maackii*), obtuse-leaved privet (*Ligustrum obtusifolium*), Japanese honeysuckle (*Lonicera japonica*), doublefile viburnum (*Viburnum plicatum*), Oriental bittersweet (*Celastrus orbiculatus*), burning-bush (*Euonymus alatus*), wintercreeper (*Euonymus fortunei*), buckthorn (*Rhamnus cathartica*), and dame's-rocket (*Hesperis matronalis*).

Scoured areas along the creek are dominated by sycamore (*Platanus occidentalis*) with the herbaceous species including natives such as: clearweed (*Pilea pumila*), false nettle (*Boehmeria cylindrica*), eastern figwort (*Scrophularia marilandica*), white-snakeroot (*Ageratina altissima*), water-purslane (*Ludwigia palustris*), riverbank wild-rye (*Elymus riparius*), and Virginia wild-rye (*E. virginicus*). Non-native, invasive species including Japanese stiltgrass (*Microstegium vimineum*), low smartweed (*Persicaria longiseta*), and common mugwort (*Artemisia vulgaris*) are also abundant. In this area there is very little Japanese hops (*Humulus japonicus*), a species which dominates the riparian areas further downstream.

In addition to the Christmas fern and Tennessee bladder fern mentioned above, there are colonies of seven additional fern species: lady fern (*Athyrium filix-femina*), New York fern (*Thelypteris noveboracensis*), sensitive fern (*Onoclea sensibilis*), marginal wood fern (*Dryopteris marginalis*), spinulose wood fern (*D. carthusiana*), evergreen wood fern (*D. intermedia*), and fragile fern (*Cystopteris fragilis*).

### US Route 202 to Swedesford Road

The riparian corridor in this stretch is best characterized as a successional thicket dominated by white ash (*Fraxinus Americana*), crabapple (*Malus* sp.), and common buckthorn (*Rhamnus cathartica*). A few more mature trees are present along the creek bank in spots including shagbark hickory (*Carya ovata*), bitternut hickory (*C. cordiformis*), beech (*Fagus grandifolia*), and pin oak (*Quercus palustris*).

The shrub and understory layers throughout are dominated by common buckthorn (*Rhamnus cathartica*) with only minor exceptions where obtuse-leaved privet (*Ligustrum obtusifolium*) has gained an upper hand.

A wet meadow immediately below Swedesford Road provides habitat for native shrub and herbaceous species including:

*Asclepias incarnata* – swamp milkweed  
*Boehmeria cylindrica* – false nettle  
*Carex lurida* – sedge  
*Cephalanthus occidentalis* – buttonbush  
*Chelone glabra* – turtlehead  
*Euthamia graminifolia* – grass-leaved goldenrod  
*Impatiens capensis* – touch-me-not  
*Leersia oryzoides* – rice cutgrass  
*Leersia virginica* – whitegrass  
*Mimulus ringens* – monkeyflower  
*Onoclea sensibilis* – sensitive fern  
*Panicum anceps* – panic grass  
*Persicaria punctata* – dotted smartweed  
*Persicaria sagittata* – tearthumb  
*Pycnanthemum virginianum* – mountain mint  
*Scirpus cyperinus* – wool-grass  
*Scirpus georgianus* – bulrush  
*Vernonia noveboracensis* – New York ironweed



Wet meadow below Swedesford Road

Japanese stiltgrass (*Microstegium vimineum*) is abundant throughout but otherwise, non-native species including purple loosestrife (*Lythrum salicaria*), yellow iris (*Iris pseudacorus*), forget-me-not (*Myosotis scorpioides*), and reed canary-grass (*Phalaris arundinacea*) are a minor part of this wet meadow community. According to Bob Adams, purple loosestrife, which was formerly abundant, has been reduced to a few scattered plants following release of a weevil that feeds exclusively on that species.

Plants present on a scoured bar along the creek include native species silver maple (*Acer saccharinum*), wood reedgrass (*Cinna arundinacea*), Virginia wild-rye (*Elymus virginicus*), dotted smartweed (*Persicaria punctata*), clearweed (*Pilea pumila*), and black willow (*Salix nigra*); and non-natives common mugwort (*Artemisia vulgaris*), Asiatic dayflower (*Commelina communis*), poison hemlock (*Conium maculata*), barnyard grass (*Echinochloa crusgalli*), Japanese hops (*Humulus japonicus*), forget-me-not (*Myosotis scorpioides*), waterfringe (*Nymphoides peltata*), mile-a-minute (*Persicaria perfoliata*), and giant foxtail (*Setaria faberi*).

Notable invasives present, but not yet widespread (in this section) include:

*Humulus japonicus* – 1 scoured bar  
*Nymphoides peltata* – upstream end of scoured bar  
*Persicaria perfoliata* – 1 patch along the creek  
*Pyrus calleryana* (Callery pear) – a few trees close to the Route 202 end, in a semi-open area along the loop trail

## Swedesford Road to North Wales Road

Immediately north of Swedesford Road common buckthorn (*Rhamnus cathartica*) dominates understory/shrub and ground layers, as it does the next section downstream.

This section contains the first true aquatic plant community that we saw. It consists of waterweed (*Elodea nuttallii*), arrowhead (*Sagittaria latifolia*), water-plantain (*Alisma subcordatum*), water-purslane (*Ludwigia palustris*) and the non-native water-starwort (*Callitriche stagnalis*), in tributaries and back channels mostly. Frequent severe scouring during floods likely prevents other aquatics from maintaining a presence along the Wissahickon.

There are plantings of river birch (*Betula nigra*), pin oak (*Quercus palustris*), red maple (*Acer rubrum*), arrow-wood viburnum (*Viburnum dentatum*), and highbush cranberry (*Viburnum trilobum*) in the vicinity of two huge spreading sycamores (*Platanus occidentalis*) with a diameter at breast height of 40+ inches. Black walnut (*Juglans nigra*) is abundant throughout.

Scoured areas along Wissahickon are characterized by native species including clearweed (*Pilea pumila*), dotted smartweed (*Persicaria punctata*), Virginia wild rye (*Elymus virginicus*), dogbane (*Apocynum cannabinum*), common ragweed (*Ambrosia artemisiifolia*), and wood reedgrass (*Cinna arundinacea*). Non-native species include low smartweed (*Persicaria longisetata*), which is present throughout, along with small patches of Japanese hops (*Humulus japonicus*) and mugwort (*Artemisia vulgaris*).

A mid-portion of this section of trail contains a steep slope with mature trees and shrubs on the lower slope along the Wissahickon bearing remnants of barbed wire. Tree species along this slope include American elm (*Ulmus americana*), beech (*Fagus grandifolia*), red oak (*Quercus rubra*), sugar maple (*Acer saccharum*), bitternut hickory (*Carya cordiformis*), hornbeam (*Carpinus caroliniana*), hop-hornbeam (*Ostrya virginiana*), maple-leaved viburnum (*Viburnum acerifolium*), and witch-hazel (*Hamamelis virginiana*). The native ferns marginal wood fern (*Dryopteris marginalis*), Christmas fern (*Polystichum acrostichoides*) and ebony spleenwort (*Asplenium platyneuron*) are represented as are a few native wildflowers such as aniseroot (*Osmorhiza longistylis*), Solomon's-seal (*Polygonatum biflorum*), and rattlesnake-root (*Prenanthes altissima*). The upper slope consists of a successional woodland dominated by white ash (*Fraxinus americana*), sugar maple (*Acer saccharum*), and bitternut hickory (*Carya cordiformis*) with a shrub/vine layer dominated by Japanese honeysuckle (*Lonicera japonica*) and multiflora rose (*Rosa multiflora*).



*Persicaria perfoliata* under powerline

The powerline right-of-way on both sides of the stream crossing in this section is a mass of mile-a-minute (*Persicaria perfoliata*). Native shrubs and vines including swamp rose (*Rosa palustris*), silky dogwood (*Cornus amomum*), and virgin's-bower (*Clematis virginiana*) form an almost impenetrable thicket.

The northern-most portion of this section follows a sewerline right-of-way and

contains areas of recent plantings. Several wetland seepage areas support populations of mud-plantain (*Heteranthera reniformis*), duckweed (*Lemna minor*), and common dodder (*Cuscuta gronovii*).

### North Wales Road to Trailhead

The corridor just above North Wales Road has much of the same character as the section just below. The riparian corridor adjacent to the sewerline right-of-way is, essentially, a successional thicket in which the shrub layer is almost totally dominated by common buckthorn (*Rhamnus cathartica*). Red maple (*Acer rubrum*) dominates the tree layer with a few additions, such as honey-locust (*Gleditsia*



*Nymphoides peltata* in the Wissahickon Creek

*triacanthos*) and swamp white oak (*Quercus bicolor*). A pond along the west side of the right-of-way is covered with duckweed (*Lemna minor*) and also supports a large stand of watercress (*Nasturtium officinale*), suggesting that it is spring-fed.

A large patch of waterfringe (*Nymphoides peltata*), a non-native aquatic plant, is present just above the stream crossing. A small patch of this species that we documented in the section between Swedesford Road and Route 202 likely originated with a fragment that washed downstream from this site. Waterfringe is native to Eurasia. It was introduced to

North America as an ornamental for use in water gardens and has spread from cultivation.

A prominent feature of this section is the recently established meadow in a utility right-of-way. A stand of native grasses, including Indian grass (*Sorghastrum nutans*), little bluestem (*Schizachyrium scoparium*), purpletop (*Tridens flavus*), switch grass (*Panicum virgatum*), has become established. Native herbaceous species include several species of mountain-mint (*Pycnanthemum tenuifolium*, *P. virginianum*, and *P. muticum*), soft rush (*Juncus effusus*), and goldenrods (*Solidago rugosa*, *S. gigantea*, and *Euthamia graminifolia*) among others.



Planted meadow beneath powerline

Unfortunately, the meadow has been invaded by numerous seedlings of Callery pear (*Pyrus calleryana*) originating from fruits produced by trees growing along the rear property lines of the adjacent residential area. These young trees will turn the meadow into a thicket of pear if not controlled soon.

The northern-most portion of this trail contains a stand of mature shagbark hickory (*Carya ovata*) behind a residential area and a diverse, native wetland shrub community along the connecting path to the parking lot.

### Specific Management Recommendations

- Make every effort to protect the integrity of wet woods and meadows
- Remove currently less common invasives as appropriate
- Remove Callery pear from meadow beneath powerline near trailhead
- Reduce the width of the mowed area immediately along the trail just south of Plymouth Road

Table 10 provides the complete list of plant species observed in this study along the Green Ribbon Trail, including the Timoney Preserve.

**Table 10. Plant List for the Green Ribbon Trail**

Species	Common name	Family	Native	Wetland	Growth
<i>Abutilon theophrasti</i>	Butter-print	Malvaceae	Introduced	UPL	Annual herb
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	Native	FACU-	Annual herb
<i>Acer negundo</i>	Box-elder	Sapindaceae	Native	FAC+	Deciduous tree
<i>Acer palmatum</i>	Japanese maple	Sapindaceae	Introduced	N	Deciduous tree
<i>Acer platanoides</i>	Norway maple	Sapindaceae	Introduced	UPL	Deciduous tree
<i>Acer rubrum</i>	Red maple	Sapindaceae	Native	FAC	Deciduous tree
<i>Acer saccharinum</i>	Silver maple	Sapindaceae	Native	FACW	Deciduous tree
<i>Acer saccharum</i>	Sugar maple	Sapindaceae	Native	FACU	Deciduous tree
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	Introduced	FACU	Perennial herb
<i>Actaea racemosa</i>	Black snakeroot	Ranunculaceae	Native	N	Perennial herb
<i>Aegopodium podagraria</i>	Goutweed	Apiaceae	Introduced	FACU	Perennial herb
<i>Aesculus glabra</i>	Ohio buckeye	Sapindaceae	Native	FACU+	Deciduous tree
<i>Aesculus parviflora</i>	Bottlebrush buckeye	Sapindaceae	Introduced	N	Deciduous shrub
<i>Ageratina altissima</i> var. <i>altissima</i>	White-snakeroot	Asteraceae	Native	N	Perennial herb
<i>Agrimonia parviflora</i>	Southern agrimony	Rosaceae	Native	FACW	Perennial herb
<i>Agrimonia pubescens</i>	Downy agrimony	Rosaceae	Native	N	Perennial herb
<i>Agrostis perennans</i>	Autumn bent	Poaceae	Native	FACU	Perennial herb
<i>Ailanthus altissima</i>	Tree-of-heaven	Simaroubaceae	Introduced	FACU-	Deciduous tree
<i>Ajuga reptans</i>	Carpet bugleweed	Lamiaceae	Introduced	N	Perennial herb
<i>Albizia julibrissin</i>	Mimosa	Fabaceae	Introduced	N	Deciduous tree
<i>Alisma subcordatum</i>	Broad-leaved water-plantain	Alismataceae	Native	OBL	Perennial herb
<i>Alliaria petiolata</i>	Garlic-mustard	Brassicaceae	Introduced	FACU-	Biennial herb
<i>Allium vineale</i>	Field garlic	Alliaceae	Introduced	FACU-	Perennial herb
<i>Alnus glutinosa</i>	Black alder	Betulaceae	Introduced	FACW-	Deciduous tree
<i>Ambrosia artemisiifolia</i>	Common ragweed	Asteraceae	Native	FACU	Annual herb
<i>Ambrosia trifida</i>	Giant ragweed	Asteraceae	Native	FAC	Annual herb

<i>Amorpha fruticosa</i>	False-indigo	Fabaceae	Native	FACW	Deciduous shrub
<i>Ampelopsis brevipedunculata</i>	Porcelain-berry	Vitaceae	Introduced	N	Woody vine
<i>Amphicarpaea bracteata</i>	Hog peanut	Fabaceae	Native	FAC	Perennial vine
<i>Anagallis arvensis</i>	Scarlet pimpernel	Myrsinaceae	Introduced	UPL	Annual herb
<i>Anthriscus sylvestris</i>	Chervil	Apiaceae	Introduced	N	Biennial herb
<i>Apocynum cannabinum</i>	Indian-hemp	Apocynaceae	Native	FACU	Perennial herb
<i>Arctium minus</i>	Common burdock	Asteraceae	Introduced	FACU-	Biennial herb
<i>Arisaema triphyllum</i> ssp. <i>triphyllum</i>	Jack-in-the-pulpit	Araceae	Native	FACW-	Perennial herb
<i>Artemisia annua</i>	Sweet wormwood	Asteraceae	Introduced	FACU	Annual herb
<i>Artemisia vulgaris</i>	Common mugwort	Asteraceae	Introduced	N	Perennial herb
<i>Arthraxon hispidus</i>	Grass	Poaceae	Introduced	FAC	Annual herb
<i>Asarum canadense</i>	Wild ginger	Aristolochiaceae	Native	FACU-	Perennial herb
<i>Asclepias incarnata</i> ssp. <i>incarnata</i>	Swamp milkweed	Apocynaceae	Native	OBL	Perennial herb
<i>Asclepias syriaca</i>	Common milkweed	Apocynaceae	Native	FACU-	Perennial herb
<i>Asplenium platyneuron</i>	Ebony spleenwort	Polypodiaceae	Native	FACU	Perennial herb
<i>Athyrium filix-femina</i> var. <i>angustum</i>	Lady fern	Polypodiaceae	Native	FAC	Perennial herb
<i>Barbarea verna</i>	Early wintercress	Brassicaceae	Introduced	N	Biennial herb
<i>Barbarea vulgaris</i>	Wintercress	Brassicaceae	Introduced	FACU	Biennial herb
<i>Berberis thunbergii</i>	Japanese barberry	Berberidaceae	Introduced	N	Deciduous shrub
<i>Betula nigra</i>	River birch	Betulaceae	Native	FACW	Deciduous tree
<i>Boehmeria cylindrica</i> var. <i>cylindrica</i>	False nettle	Urticaceae	Native	FACW+	Perennial herb
<i>Callitriche stagnalis</i>	Water-starwort	Plantaginaceae	Introduced	OBL	Perennial herb
<i>Calystegia sepium</i>	Hedge bindweed	Convolvulaceae	Native	FAC-	Perennial vine
<i>Campsis radicans</i>	Trumpet-vine	Bignoniaceae	Native	FAC	Woody vine
<i>Cardamine hirsuta</i>	Hairy bittercress	Brassicaceae	Introduced	FACU	Annual herb
<i>Cardamine impatiens</i>	Bittercress	Brassicaceae	Introduced	N	Perennial herb
<i>Carex amphibola</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex annectens</i>	Sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex blanda</i>	Sedge	Cyperaceae	Native	FAC	Perennial herb
<i>Carex cephaloidea</i>	Sedge	Cyperaceae	Native	FAC+	Perennial herb
<i>Carex cephalophora</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex comosa</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex crinita</i> var. <i>crinita</i>	Short hair sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex gracillima</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex hirtifolia</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex intumescens</i>	Sedge	Cyperaceae	Native	FACW+	Perennial herb
<i>Carex laxiculmis</i> var. <i>laxiculmis</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex laxiflora</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex lupulina</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex lurida</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carex molesta</i>	Sedge	Cyperaceae	Native	N	Perennial herb

<i>Carex pensylvanica</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex radiata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex rosea</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex squarrosa</i>	Sedge	Cyperaceae	Native	FACW	Perennial herb
<i>Carex stipata</i> var. <i>stipata</i>	Sedge	Cyperaceae	Native	N	Perennial herb
<i>Carex swanii</i>	Sedge	Cyperaceae	Native	FACU	Perennial herb
<i>Carex tribuloides</i> var. <i>tribuloides</i>	Sedge	Cyperaceae	Native	FACW+	Perennial herb
<i>Carex vulpinoidea</i>	Sedge	Cyperaceae	Native	OBL	Perennial herb
<i>Carpinus caroliniana</i>	Hornbeam	Betulaceae	Native	FAC	Deciduous tree
<i>Carya cordiformis</i>	Bitternut hickory	Juglandaceae	Native	FACU+	Deciduous tree
<i>Carya ovata</i>	Shagbark hickory	Juglandaceae	Native	FACU	Deciduous tree
<i>Catalpa speciosa</i>	Catalpa	Bignoniaceae	Introduced	FAC	Deciduous tree
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Introduced	UPL	Woody vine
<i>Celastrus scandens</i>	American bittersweet	Celastraceae	Native	FACU-	Woody vine
<i>Celtis tenuifolia</i>	Dwarf hackberry	Cannabaceae	Native	N	Deciduous tree
<i>Cephalanthus occidentalis</i>	Buttonbush	Rubiaceae	Native	OBL	Deciduous shrub
<i>Cercis canadensis</i>	Redbud	Fabaceae	Native	N	Deciduous tree
<i>Chamaecrista fasciculata</i>	Partridge-pea	Fabaceae	Native	FACU	Annual herb
<i>Chasmanthium latifolium</i>	Sea-oats	Poaceae	Native	FACU	Perennial herb
<i>Chelidonium majus</i>	Greater celandine	Papaveraceae	Introduced	UPL	Biennial herb
<i>Chelone glabra</i>	Turtlehead	Plantaginaceae	Native	OBL	Perennial herb
<i>Chenopodium album</i> var. <i>album</i>	Lamb's quarters	Amaranthaceae	Introduced	FACU+	Annual herb
<i>Cichorium intybus</i>	Blue chicory	Asteraceae	Introduced	N	Perennial herb
<i>Cicuta maculata</i> var. <i>maculata</i>	Beaver-poison	Apiaceae	Native	OBL	Perennial herb
<i>Cinna arundinacea</i>	Wood reedgrass	Poaceae	Native	FACW	Perennial herb
<i>Circaea canadensis</i> ssp. <i>canadensis</i>	Enchanter's-nightshade	Onagraceae	Native	FACU	Perennial herb
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	Introduced	FACU	Perennial herb
<i>Cirsium discolor</i>	Field thistle	Asteraceae	Native	UPL	Biennial herb
<i>Cirsium vulgare</i>	Bull-thistle	Asteraceae	Introduced	FACU-	Biennial herb
<i>Clematis terniflora</i>	Sweet autumn clematis	Ranunculaceae	Introduced	FACU-	Perennial vine
<i>Clematis virginiana</i>	Virgin's-bower	Ranunculaceae	Native	FAC	Perennial vine
<i>Cleome hassleriana</i>	Spider-flower	Cleomaceae	Introduced	N	Annual herb
<i>Collinsonia canadensis</i>	Horse balm	Lamiaceae	Native	FAC+	Perennial herb
<i>Commelina communis</i> var. <i>communis</i>	Asiatic dayflower	Commelinaceae	Introduced	FAC-	Annual herb
<i>Conium maculatum</i>	Poison-hemlock	Apiaceae	Introduced	FACW	Biennial herb
<i>Conyza canadensis</i> var. <i>canadensis</i>	Horseweed	Asteraceae	Native	UPL	Annual herb
<i>Cornus amomum</i> ssp. <i>amomum</i>	Silky dogwood	Cornaceae	Native	FACW	Deciduous shrub
<i>Cornus florida</i>	Flowering dogwood	Cornaceae	Native	FACU-	Deciduous tree
<i>Cornus racemosa</i>	Gray dogwood	Cornaceae	Native	FAC-	Deciduous shrub
<i>Coronilla varia</i>	Crown-vetch	Fabaceae	Introduced	N	Perennial herb

<i>Crataegus crus-galli</i>	Cockspur hawthorn	Rosaceae	Native	FACU	Deciduous shrub
<i>Crataegus macrosperma</i>	Fanleaf hawthorn	Rosaceae	Native	N	Deciduous shrub
<i>Cryptotaenia canadensis</i>	Honewort	Apiaceae	Native	FAC	Perennial herb
<i>Cuphea viscosissima</i>	Blue waxweed	Lythraceae	Native	FAC-	Annual herb
<i>Cuscuta campestris</i>	Dodder	Convolvulaceae	Native	N	Annual vine
<i>Cuscuta gronovii</i> var. <i>gronovii</i>	Common dodder	Convolvulaceae	Native	N	Annual vine
<i>Cynoglossum officinale</i>	Hound's-tongue	Boraginaceae	Introduced	N	Biennial herb
<i>Cyperus erythrorhizos</i>	Redroot flatsedge	Cyperaceae	Native	FACW+	Annual herb
<i>Cyperus strigosus</i>	False nutsedge	Cyperaceae	Native	FACW	Perennial herb
<i>Cystopteris fragilis</i>	Fragile fern	Polypodiaceae	Native	FACU	Perennial herb
<i>Cystopteris tennesseensis</i>	Tennessee bladder fern	Polypodiaceae	Native	N	Perennial herb
<i>Dactylis glomerata</i>	Orchardgrass	Poaceae	Introduced	FACU	Perennial herb
<i>Daucus carota</i>	Queen Anne's-lace	Apiaceae	Introduced	N	Biennial herb
<i>Dennstaedtia punctilobula</i>	Hay-scented fern	Polypodiaceae	Native	N	Perennial herb
<i>Desmodium perplexum</i>	Tick-trefoil	Fabaceae	Native	N	Perennial herb
<i>Dichanthelium acuminatum</i>	Panic grass	Poaceae	Native	FAC	Perennial herb
<i>Dichanthelium clandestinum</i>	Deer-tongue grass	Poaceae	Native	FAC+	Perennial herb
<i>Dichanthelium microcarpon</i>	Panic grass	Poaceae	Native	FACU	Perennial herb
<i>Dioscorea villosa</i>	Wild yam	Dioscoreaceae	Native	FAC+	Perennial vine
<i>Dipsacus sativus</i>	Fuller's teasel	Dipsacaceae	Introduced	N	Biennial herb
<i>Dipsacus sylvestris</i>	Teasel	Dipsacaceae	Introduced	N	Biennial herb
<i>Dryopteris carthusiana</i>	Spinulose wood fern	Polypodiaceae	Native	FAC+	Perennial herb
<i>Dryopteris intermedia</i>	Evergreen wood-fern	Polypodiaceae	Native	FACU	Perennial herb
<i>Dryopteris marginalis</i>	Marginal wood fern	Polypodiaceae	Native	FACU-	Perennial herb
<i>Duchesnea indica</i>	Indian strawberry	Rosaceae	Introduced	FACU-	Perennial herb
<i>Echinochloa crusgalli</i> var. <i>crusgalli</i>	Barnyard-grass	Poaceae	Introduced	FACU	Annual herb
<i>Echinocystis lobata</i>	Prickly cucumber	Cucurbitaceae	Native	FAC	Annual vine
<i>Elaeagnus umbellata</i>	Autumn-olive	Elaeagnaceae	Introduced	N	Deciduous shrub
<i>Eleocharis tenuis</i> var. <i>tenuis</i>	Spike-rush	Cyperaceae	Native	FACW+	Perennial herb
<i>Elymus hystrix</i>	Bottlebrush-grass	Poaceae	Native	N	Perennial herb
<i>Elymus riparius</i>	Riverbank wild-rye	Poaceae	Native	FACW	Perennial herb
<i>Elymus virginicus</i>	Virginia wild-rye	Poaceae	Native	FACW-	Perennial herb
<i>Epilobium coloratum</i>	Purple-leaved willow-herb	Onagraceae	Native	FACW+	Perennial herb
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Native	FAC	Perennial herb
<i>Eragrostis spectabilis</i>	Purple lovegrass	Poaceae	Native	UPL	Perennial herb
<i>Erechtites hieraciifolius</i>	Fireweed	Asteraceae	Native	FACU	Annual herb
<i>Erigeron strigosus</i> var. <i>strigosus</i>	Daisy fleabane	Asteraceae	Native	FACU+	Annual herb
<i>Euonymus alatus</i>	Winged euonymous	Celastraceae	Introduced	N	Deciduous shrub
<i>Euonymus fortunei</i>	Wintercreeper	Celastraceae	Introduced	N	Woody vine
<i>Eupatorium perfoliatum</i>	Boneset	Asteraceae	Native	FACW+	Perennial herb

<i>Eupatorium serotinum</i>	Late eupatorium	Asteraceae	Introduced	FAC-	Perennial herb
<i>Euphorbia maculata</i>	Spotted spurge	Euphorbiaceae	Native	FACU-	Annual herb
<i>Eurybia divaricata</i>	White wood aster	Asteraceae	Native	N	Perennial herb
<i>Eurybia macrophylla</i>	Bigleaf aster	Asteraceae	Native	N	Perennial herb
<i>Euthamia graminifolia</i>	Grass-leaved goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Eutrochium fistulosum</i>	Joe-pye-weed	Asteraceae	Native	FACW	Perennial herb
<i>Eutrochium purpureum</i>	Joe-pye-weed	Asteraceae	Native	N	Perennial herb
<i>Fagus grandifolia</i>	American beech	Fagaceae	Native	FACU	Deciduous tree
<i>Fallopia japonica</i>	Japanese knotweed	Polygonaceae	Introduced	FACU-	Perennial herb
<i>Festuca obtusa</i>	Nodding fescue	Poaceae	Native	FACU	Perennial herb
<i>Forsythia suspensa</i>	Forsythia	Oleaceae	Introduced	N	Deciduous shrub
<i>Fraxinus americana</i> var. <i>americana</i>	White ash	Oleaceae	Native	FACU	Deciduous tree
<i>Fraxinus pennsylvanica</i>	Red ash	Oleaceae	Native	FACW	Deciduous tree
<i>Galium mollugo</i>	White bedstraw	Rubiaceae	Introduced	N	Perennial herb
<i>Galium tinctorium</i>	Bedstraw	Rubiaceae	Native	OBL	Perennial herb
<i>Gaura biennis</i>	Gaura	Onagraceae	Native	FACU	Annual herb
<i>Geranium maculatum</i>	Wood geranium	Geraniaceae	Native	FACU	Perennial herb
<i>Geum canadense</i>	White avens	Rosaceae	Native	FACU	Perennial herb
<i>Glechoma hederacea</i>	Gill-over-the-ground	Lamiaceae	Introduced	FACU	Perennial herb
<i>Gleditsia triacanthos</i>	Honey-locust	Fabaceae	Native	FAC-	Deciduous tree
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	Native	OBL	Perennial herb
<i>Gymnocladus dioica</i>	Kentucky coffee-tree	Fabaceae	Native	N	Deciduous tree
<i>Hackelia virginiana</i>	Beggar's-lice	Boraginaceae	Native	FACU	Biennial herb
<i>Hamamelis virginiana</i>	Witch-hazel	Hamamelidaceae	Native	FACU+	Deciduous shrub
<i>Hedera helix</i>	English ivy	Araliaceae	Introduced	N	Woody vine
<i>Heliopsis helianthoides</i>	Ox-eye	Asteraceae	Native	N	Perennial herb
<i>Hemerocallis fulva</i>	Orange day-lily	Hemerocallidaceae	Introduced	UPL	Perennial herb
<i>Hesperis matronalis</i>	Dame's-rocket	Brassicaceae	Introduced	N	Perennial herb
<i>Heteranthera reniformis</i>	Mud-plantain	Pontederiaceae	Native	OBL	Perennial herb
<i>Hibiscus syriacus</i>	Rose-of-sharon	Malvaceae	Introduced	N	Deciduous shrub
<i>Humulus japonicus</i>	Japanese hops	Cannabaceae	Introduced	FACU	Perennial herb
<i>Hypericum mutilum</i>	Dwarf St. John's-wort	Hypericaceae	Native	FACW	Perennial herb
<i>Hypericum perforatum</i>	St. John's-wort	Hypericaceae	Introduced	N	Perennial herb
<i>Hypericum punctatum</i>	Spotted St. John's-wort	Hypericaceae	Native	FAC-	Perennial herb
<i>Ilex opaca</i>	American holly	Aquifoliaceae	Native	FACU	Evergreen tree
<i>Ilex verticillata</i>	Winterberry	Aquifoliaceae	Native	FACW+	Deciduous shrub
<i>Impatiens capensis</i>	Jewelweed	Balsaminaceae	Native	FACW	Annual herb
<i>Impatiens pallida</i>	Pale jewelweed	Balsaminaceae	Native	FACW	Annual herb
<i>Iris pseudacorus</i>	Water flag	Iridaceae	Introduced	OBL	Perennial herb
<i>Juglans cinerea</i>	Butternut	Juglandaceae	Native	FACU+	Deciduous tree

<i>Juglans nigra</i>	Black walnut	Juglandaceae	Native	FACU	Deciduous tree
<i>Juncus effusus</i> var. <i>solutus</i>	Soft rush	Juncaceae	Native	OBL	Perennial herb
<i>Juncus tenuis</i> var. <i>tenuis</i>	Path rush	Juncaceae	Native	FAC-	Perennial herb
<i>Juniperus virginiana</i>	Eastern red-cedar	Cupressaceae	Native	FACU	Evergreen tree
<i>Kummerowia striata</i>	Japanese clover	Fabaceae	Introduced	FACU	Annual herb
<i>Lactuca canadensis</i>	Wild lettuce	Asteraceae	Native	FACU-	Annual herb
<i>Laportea canadensis</i>	Wood-nettle	Urticaceae	Native	FAC	Perennial herb
<i>Lapsana communis</i>	Nipplewort	Asteraceae	Introduced	N	Annual herb
<i>Leersia oryzoides</i>	Rice cutgrass	Poaceae	Native	OBL	Perennial herb
<i>Leersia virginica</i>	Cutgrass	Poaceae	Native	FACW	Perennial herb
<i>Lemna minor</i>	Duckweed	Araceae	Native	OBL	Perennial herb
<i>Lepidium virginicum</i>	Poor-man's-pepper	Brassicaceae	Native	FACU-	Annual herb
<i>Ligustrum obtusifolium</i>	Obtuse-leaved privet	Oleaceae	Introduced	N	Deciduous shrub
<i>Lindera benzoin</i>	Spicebush	Lauraceae	Native	FACW-	Deciduous shrub
<i>Lindernia dubia</i> var. <i>dubia</i>	False pimpernel	Plantaginaceae	Native	OBL	Annual herb
<i>Liquidambar styraciflua</i>	Sweetgum	Altingiaceae	Native	FAC	Deciduous tree
<i>Liriodendron tulipifera</i>	Tuliptree	Magnoliaceae	Native	FACU	Deciduous tree
<i>Lobelia cardinalis</i>	Cardinal-flower	Campanulaceae	Native	FACW+	Perennial herb
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	Native	FACU	Annual herb
<i>Lobelia siphilitica</i>	Great blue lobelia	Campanulaceae	Native	FACW+	Perennial herb
<i>Lolium perenne</i>	Perennial ryegrass	Poaceae	Introduced	FACU-	Perennial herb
<i>Lonicera japonica</i>	Japanese honeysuckle	Caprifoliaceae	Introduced	FAC-	Woody vine
<i>Lonicera maackii</i>	Amur honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lonicera morrowii</i>	Morrow's honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	Introduced	FACU-	Perennial herb
<i>Ludwigia alternifolia</i>	False loosestrife	Onagraceae	Native	FACW+	Perennial herb
<i>Ludwigia palustris</i>	Marsh-purslane	Onagraceae	Native	OBL	Perennial herb
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	Native	OBL	Perennial herb
<i>Lycopus virginicus</i>	Bugleweed	Lamiaceae	Native	OBL	Perennial herb
<i>Lysimachia ciliata</i>	Fringed loosestrife	Myrsinaceae	Native	FACW	Perennial herb
<i>Lysimachia nummularia</i>	Creeping-charlie	Myrsinaceae	Introduced	FACW-	Perennial herb
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	Introduced	FACW+	Perennial herb
<i>Maclura pomifera</i>	Osage-orange	Moraceae	Introduced	UPL	Deciduous tree
<i>Maianthemum racemosum</i>	False solomon's-seal	Ruscaceae	Native	N	Perennial herb
<i>Malus coronaria</i>	Sweet crabapple	Rosaceae	Native	N	Deciduous tree
<i>Malus</i> sp.	Crabapple	Rosaceae	Introduced	N	Deciduous tree
<i>Matteuccia struthiopteris</i>	Ostrich fern	Polypodiaceae	Native	FACW	Perennial herb
<i>Melilotus albus</i>	White sweet-clover	Fabaceae	Introduced	FACU	Biennial herb
<i>Mentha arvensis</i>	Field mint	Lamiaceae	Native	FACW	Perennial herb
<i>Mentha x piperita</i>	Peppermint	Lamiaceae	Introduced	FACW+	Perennial herb
<i>Mentha x verticillata</i>	Mint	Lamiaceae	Introduced	N	Perennial herb

<i>Microstegium vimineum</i>	Stiltgrass	Poaceae	Introduced	FAC	Annual herb
<i>Mikania scandens</i>	Climbing hempweed	Asteraceae	Native	FACW+	Perennial vine
<i>Mimulus alatus</i>	Winged monkey-flower	Phrymaceae	Native	OBL	Perennial herb
<i>Mimulus ringens</i>	Allegheny monkey-flower	Phrymaceae	Native	OBL	Perennial herb
<i>Mitchella repens</i>	Partridge-berry	Rubiaceae	Native	FACU	Perennial herb
<i>Monarda fistulosa</i>	Horsemint	Lamiaceae	Native	UPL	Perennial herb
<i>Morus alba</i>	White mulberry	Moraceae	Introduced	UPL	Deciduous tree
<i>Myosotis laxa</i>	Wild forget-me-not	Boraginaceae	Native	OBL	Perennial herb
<i>Myosotis scorpioides</i>	Forget-me-not	Boraginaceae	Introduced	OBL	Perennial herb
<i>Myriophyllum spicatum</i>	Eurasian water-milfoil	Haloragaceae	Introduced	OBL	Perennial herb
<i>Nasturtium officinale</i>	Watercress	Brassicaceae	Introduced	OBL	Perennial herb
<i>Nymphoides peltata</i>	Waterfringe	Menyanthaceae	Introduced	OBL	Perennial herb
<i>Nyssa sylvatica</i>	Sourgum	Nyssaceae	Native	FAC	Deciduous tree
<i>Oenothera biennis</i>	Evening-primrose	Onagraceae	Native	FACU-	Biennial herb
<i>Onoclea sensibilis</i>	Sensitive fern	Polypodiaceae	Native	FACW	Perennial herb
<i>Osmorhiza longistylis</i>	Anise root	Apiaceae	Native	FACU	Perennial herb
<i>Ostrya virginiana</i>	Hop-hornbeam	Betulaceae	Native	FACU-	Deciduous tree
<i>Oxalis stricta</i>	Common yellow wood-sorrel	Oxalidaceae	Native	UPL	Perennial herb
<i>Pachysandra terminalis</i>	Japanese pachysandra	Buxaceae	Introduced	N	Perennial herb
<i>Panicum anceps</i>	Panic grass	Poaceae	Native	FAC	Perennial herb
<i>Panicum virgatum</i>	Switchgrass	Poaceae	Native	FAC	Perennial herb
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	Vitaceae	Native	FACU	Woody vine
<i>Parthenocissus tricuspidata</i>	Boston ivy	Vitaceae	Introduced	N	Woody vine
<i>Paspalum laeve</i>	Field beadgrass	Poaceae	Native	FAC+	Perennial herb
<i>Pellaea atropurpurea</i>	Purple cliffbrake	Polypodiaceae	Native	N	Perennial herb
<i>Penstemon digitalis</i>	Tall white beard-tongue	Plantaginaceae	Native	FAC	Perennial herb
<i>Perilla frutescens</i>	Perilla	Lamiaceae	Introduced	FACU+	Annual herb
<i>Persicaria arifolia</i>	Halberd-leaf tearthumb	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria longisetia</i>	Low smartweed	Polygonaceae	Introduced	FACU-	Annual herb
<i>Persicaria maculosa</i>	Lady's-thumb	Polygonaceae	Introduced	FACW	Annual herb
<i>Persicaria pensylvanica</i>	Smartweed	Polygonaceae	Native	FACW	Annual herb
<i>Persicaria perfoliata</i>	Mile-a-minute weed	Polygonaceae	Introduced	FAC	Annual herb
<i>Persicaria punctata</i>	Dotted smartweed	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria robustior</i>	Large water-smartweed	Polygonaceae	Native	OBL	Perennial herb
<i>Persicaria sagittata</i>	Tearthumb	Polygonaceae	Native	OBL	Annual herb
<i>Persicaria virginiana</i>	Jumpseed	Polygonaceae	Native	FAC	Perennial herb
<i>Petasites japonicus</i>	Japanese sweet coltsfoot	Asteraceae	Introduced	N	Perennial herb

<i>Phalaris arundinacea</i>	Reed canary-grass	Poaceae	Native	FACW	Perennial herb
<i>Phleum pratense</i>	Timothy	Poaceae	Introduced	FACU	Perennial herb
<i>Phlox paniculata</i>	Summer phlox	Polemoniaceae	Native	FACU	Perennial herb
<i>Phragmites australis</i> ssp. <i>australis</i>	Common reed	Poaceae	Introduced	FACW	Perennial herb
<i>Physalis subglabrata</i>	Ground-cherry	Solanaceae	Native	N	Perennial herb
<i>Physalis virginiana</i>	Virginia ground-cherry	Solanaceae	Native	N	Perennial herb
<i>Phytolacca americana</i>	Pokeweed	Phytolaccaceae	Native	FACU+	Perennial herb
<i>Picea abies</i>	Norway spruce	Pinaceae	Introduced	N	Evergreen tree
<i>Pilea pumila</i>	Clearweed	Urticaceae	Native	FACW	Annual herb
<i>Pinus strobus</i>	Eastern white pine	Pinaceae	Native	FACU	Evergreen tree
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	Introduced	UPL	Perennial herb
<i>Plantago major</i>	Broad-leaved plantain	Plantaginaceae	Introduced	FACU	Perennial herb
<i>Plantago rugelii</i>	Rugel's plantain	Plantaginaceae	Native	FACU	Perennial herb
<i>Platanus occidentalis</i>	Sycamore	Platanaceae	Native	FACW-	Deciduous tree
<i>Podophyllum peltatum</i>	Mayapple	Berberidaceae	Native	N	Perennial herb
<i>Polygonatum biflorum</i> var. <i>biflorum</i>	Solomon's-seal	Ruscaceae	Native	FACU	Perennial herb
<i>Polygonatum pubescens</i>	Solomon's-seal	Ruscaceae	Native	N	Perennial herb
<i>Polystichum acrostichoides</i>	Christmas fern	Polypodiaceae	Native	N	Perennial herb
<i>Populus deltoides</i>	Eastern cottonwood	Salicaceae	Native	FACU-	Deciduous tree
<i>Portulaca oleracea</i>	Purslane	Portulacaceae	Native	FAC	Annual herb
<i>Potentilla recta</i>	Sulfur cinquefoil	Rosaceae	Introduced	N	Perennial herb
<i>Potentilla simplex</i>	Old-field cinquefoil	Rosaceae	Native	FACU-	Perennial herb
<i>Prenanthes altissima</i>	Rattlesnake-root	Asteraceae	Native	FACU-	Perennial herb
<i>Prunella vulgaris</i> ssp. <i>vulgaris</i>	Heal-all	Lamiaceae	Introduced	FACU+	Perennial herb
<i>Prunus avium</i>	Sweet cherry	Rosaceae	Introduced	N	Deciduous tree
<i>Prunus serotina</i>	Wild black cherry	Rosaceae	Native	FACU	Deciduous tree
<i>Pycnanthemum muticum</i>	Mountain-mint	Lamiaceae	Native	FACW	Perennial herb
<i>Pycnanthemum tenuifolium</i>	Mountain-mint	Lamiaceae	Native	FACW	Perennial herb
<i>Pycnanthemum virginianum</i>	Mountain-mint	Lamiaceae	Native	FAC	Perennial herb
<i>Pyrus calleryana</i>	Callery pear	Rosaceae	Introduced	N	Deciduous tree
<i>Pyrus communis</i>	Pear	Rosaceae	Introduced	N	Deciduous tree
<i>Quercus alba</i>	White oak	Fagaceae	Native	FACU	Deciduous tree
<i>Quercus bicolor</i>	Swamp white oak	Fagaceae	Native	FACW+	Deciduous tree
<i>Quercus palustris</i>	Pin oak	Fagaceae	Native	FACW	Deciduous tree
<i>Quercus rubra</i>	Northern red oak	Fagaceae	Native	FACU-	Deciduous tree
<i>Quercus velutina</i>	Black oak	Fagaceae	Native	N	Deciduous tree
<i>Ranunculus ficaria</i>	Lesser celandine	Ranunculaceae	Introduced	N	Perennial herb
<i>Rhamnus cathartica</i>	Buckthorn	Rhamnaceae	Introduced	N	Deciduous shrub
<i>Rhus typhina</i>	Staghorn sumac	Anacardiaceae	Native	N	Deciduous shrub
<i>Ribes rubrum</i>	Garden red currant	Grossulariaceae	Introduced	N	Deciduous shrub
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Native	FACU-	Deciduous tree

<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Introduced	FACU	Deciduous shrub
<i>Rosa palustris</i>	Swamp rose	Rosaceae	Native	OBL	Deciduous shrub
<i>Rubus allegheniensis</i>	Common blackberry	Rosaceae	Native	FACU-	Deciduous shrub
<i>Rubus enslenii</i>	Southern dewberry	Rosaceae	Native	FACU	Woody vine
<i>Rubus flagellaris</i>	Prickly dewberry	Rosaceae	Native	FACU	Woody vine
<i>Rubus occidentalis</i>	Black-cap	Rosaceae	Native	N	Deciduous shrub
<i>Rubus pensilvanicus</i>	Blackberry	Rosaceae	Native	N	Deciduous shrub
<i>Rubus phoenicolasius</i>	Wineberry	Rosaceae	Introduced	N	Deciduous shrub
<i>Rudbeckia laciniata</i> var. <i>laciniata</i>	Cutleaf coneflower	Asteraceae	Native	FACW	Perennial herb
<i>Rumex altissimus</i>	Tall dock	Polygonaceae	Native	FACW-	Perennial herb
<i>Rumex crispus</i>	Curly dock	Polygonaceae	Introduced	FACU	Perennial herb
<i>Rumex obtusifolius</i>	Bitter dock	Polygonaceae	Introduced	FACU-	Perennial herb
<i>Sagittaria latifolia</i> var. <i>latifolia</i>	Wapato	Alismataceae	Native	OBL	Perennial herb
<i>Salix babylonica</i> complex	Weeping willow	Salicaceae	Introduced	FACW-	Deciduous tree
<i>Salix fragilis</i>	Crack willow	Salicaceae	Introduced	FAC+	Deciduous tree
<i>Salix nigra</i>	Black willow	Salicaceae	Native	FACW+	Deciduous tree
<i>Sambucus canadensis</i>	American elder	Adoxaceae	Native	FACW	Deciduous shrub
<i>Sanicula odorata</i>	Yellow-flowered sanicle	Apiaceae	Native	FACU	Perennial herb
<i>Saponaria officinalis</i>	Bouncing-bet	Caryophyllaceae	Introduced	FACU-	Perennial herb
<i>Sassafras albidum</i>	Sassafras	Lauraceae	Native	FACU-	Deciduous tree
<i>Saururus cernuus</i>	Lizard's-tail	Saururaceae	Native	OBL	Perennial herb
<i>Schedonorus arundinaceus</i>	Fescue	Poaceae	Introduced	FACU-	Perennial herb
<i>Schizachyrium scoparium</i> var. <i>scoparium</i>	Little bluestem	Poaceae	Native	FACU	Perennial herb
<i>Schoenoplectus subterminalis</i>	Water bulrush	Cyperaceae	Native	OBL	Perennial herb
<i>Schoenoplectus tabernaemontani</i>	Great bulrush	Cyperaceae	Native	OBL	Perennial herb
<i>Scirpus cyperinus</i>	Wool-grass	Cyperaceae	Native	FACW+	Perennial herb
<i>Scirpus georgianus</i>	Bulrush	Cyperaceae	Native	OBL	Perennial herb
<i>Scirpus polyphyllus</i>	Bulrush	Cyperaceae	Native	OBL	Perennial herb
<i>Scrophularia lanceolata</i>	Lanceleaf figwort	Scrophulariaceae	Native	FACU+	Perennial herb
<i>Scrophularia marilandica</i>	Eastern figwort	Scrophulariaceae	Native	FACU-	Perennial herb
<i>Scutellaria lateriflora</i>	Mad-dog skullcap	Lamiaceae	Native	FACW+	Perennial herb
<i>Senecio vulgaris</i>	Common groundsel	Asteraceae	Introduced	FACU	Annual herb
<i>Senna marilandica</i>	Southern wild senna	Fabaceae	Native	FAC+	Perennial herb
<i>Setaria faberi</i>	Giant foxtail	Poaceae	Introduced	UPL	Annual herb
<i>Setaria pumila</i>	Yellow foxtail	Poaceae	Introduced	FAC	Annual herb
<i>Sicyos angulatus</i>	Bur cucumber	Cucurbitaceae	Native	FACU	Annual vine
<i>Smilax herbacea</i>	Carrion-flower	Smilacaceae	Native	FAC	Perennial vine
<i>Smilax rotundifolia</i>	Catbrier	Smilacaceae	Native	FAC	Woody vine
<i>Solanum americanum</i>	Black nightshade	Solanaceae	Native	FACU-	Annual herb
<i>Solanum carolinense</i>	Horse-nettle	Solanaceae	Native	UPL	Perennial herb

<i>Solanum dulcamara</i> var. <i>dulcamara</i>	Trailing nightshade	Solanaceae	Introduced	FAC	Woody vine
<i>Solidago altissima</i>	Late goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago caesia</i>	Bluestem goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada goldenrod	Asteraceae	Native	FACU	Perennial herb
<i>Solidago gigantea</i> var. <i>gigantea</i>	Smooth goldenrod	Asteraceae	Native	FACW	Perennial herb
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	Native	N	Perennial herb
<i>Solidago rugosa</i> ssp. <i>rugosa</i> var. <i>rugosa</i>	Wrinkle-leaf goldenrod	Asteraceae	Native	FAC	Perennial herb
<i>Sonchus arvensis</i> ssp. <i>arvensis</i>	Field sow-thistle	Asteraceae	Introduced	UPL	Perennial herb
<i>Sonchus asper</i>	Spiny-leaved sow-thistle	Asteraceae	Introduced	FAC	Annual herb
<i>Sorghastrum nutans</i>	Indian-grass	Poaceae	Native	UPL	Perennial herb
<i>Spirodela polyrhiza</i>	Greater duckweed	Araceae	Native	OBL	Perennial herb
<i>Symphoricarpos orbiculatus</i>	Coralberry	Caprifoliaceae	Native	UPL	Deciduous shrub
<i>Symphyotrichum cordifolium</i>	Blue wood aster	Asteraceae	Native	N	Perennial herb
<i>Symphyotrichum lanceolatum</i> ssp. <i>lanceolatum</i> var. <i>lanceolatum</i>	Panicked aster	Asteraceae	Native	N	Perennial herb
<i>Symphyotrichum pilosum</i> var. <i>pilosum</i>	Heath aster	Asteraceae	Native	UPL	Perennial herb
<i>Symphyotrichum puniceum</i>	Purple-stemmed aster	Asteraceae	Native	OBL	Perennial herb
<i>Symplocarpus foetidus</i>	Skunk cabbage	Araceae	Native	OBL	Perennial herb
<i>Symplocos paniculata</i>	Sapphire-berry	Symplocaceae	Introduced	N	Deciduous shrub
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	Introduced	FACU-	Perennial herb
<i>Tetradium daniellii</i>	Bee-bee tree	Rutaceae	Introduced	N	Deciduous tree
<i>Teucrium canadense</i> var. <i>virginicum</i>	Wild germander	Lamiaceae	Native	FACW	Perennial herb
<i>Thalictrum pubescens</i>	Tall meadow-rue	Ranunculaceae	Native	FACW+	Perennial herb
<i>Thelypteris noveboracensis</i>	New York fern	Polypodiaceae	Native	FAC	Perennial herb
<i>Tilia americana</i> var. <i>americana</i>	Basswood	Malvaceae	Native	FACU	Deciduous tree
<i>Toxicodendron radicans</i>	Poison-ivy	Anacardiaceae	Native	FAC	Woody vine
<i>Tridens flavus</i>	Purpletop	Poaceae	Native	FACU	Perennial herb
<i>Trifolium aureum</i>	Large yellow hop-clover	Fabaceae	Introduced	N	Annual herb
<i>Trifolium dubium</i>	Little hop-clover	Fabaceae	Introduced	UPL	Annual herb
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Trifolium pratense</i>	Red clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Trifolium repens</i>	White clover	Fabaceae	Introduced	FACU-	Perennial herb
<i>Tripsacum dactyloides</i>	Gammagrass	Poaceae	Native	FACW	Perennial herb
<i>Tsuga canadensis</i>	Canada hemlock	Pinaceae	Native	FACU	Evergreen tree
<i>Typha latifolia</i>	Common cat-tail	Typhaceae	Native	OBL	Perennial herb
<i>Ulmus americana</i>	American elm	Ulmaceae	Native	FACW-	Deciduous tree
<i>Ulmus rubra</i>	Red elm	Ulmaceae	Native	FAC-	Deciduous tree
<i>Urtica dioica</i> ssp. <i>dioica</i>	Great nettle	Urticaceae	Introduced	FACU	Perennial herb
<i>Vaccinium corymbosum</i>	Highbush blueberry	Ericaceae	Native	FACW-	Deciduous shrub
<i>Verbascum blattaria</i>	Moth mullein	Scrophulariaceae	Introduced	UPL	Biennial herb

<i>Verbena hastata</i>	Blue vervain	Verbenaceae	Native	FACW+	Perennial herb
<i>Verbena stricta</i>	Hoary vervain	Verbenaceae	Introduced	N	Perennial herb
<i>Verbena urticifolia</i> var. <i>urticifolia</i>	White vervain	Verbenaceae	Native	FACU	Annual herb
<i>Vernonia noveboracensis</i>	New York ironweed	Asteraceae	Native	FACW+	Perennial herb
<i>Veronica officinalis</i>	Common speedwell	Plantaginaceae	Native	FACU-	Perennial herb
<i>Viburnum acerifolium</i>	Maple-leaved viburnum	Adoxaceae	Native	N	Deciduous shrub
<i>Viburnum dentatum</i>	Southern arrow-wood	Adoxaceae	Native	FAC	Deciduous shrub
<i>Viburnum dilatatum</i>	Linden viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum opulus</i>	Guelder-rose	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum plicatum</i>	Doublefile viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum prunifolium</i>	Black-haw	Adoxaceae	Native	FACU	Deciduous shrub
<i>Viburnum sieboldii</i>	Siebold viburnum	Adoxaceae	Introduced	N	Deciduous shrub
<i>Viburnum trilobum</i>	Highbush-cranberry	Adoxaceae	Native	FACW	Deciduous shrub
<i>Vicia tetrasperma</i>	Slender vetch	Fabaceae	Introduced	N	Annual herb
<i>Vinca minor</i>	Common periwinkle	Apocynaceae	Introduced	N	Perennial herb
<i>Viola pubescens</i> var. <i>pubescens</i>	Downy yellow violet	Violaceae	Native	FACU-	Perennial herb
<i>Viola pubescens</i> var. <i>scabriuscula</i>	Downy yellow violet	Violaceae	Native	N	Perennial herb
<i>Viola sororia</i>	Common blue violet	Violaceae	Native	FAC-	Perennial herb
<i>Vitis labrusca</i>	Fox grape	Vitaceae	Native	FACU	Woody vine
<i>Vitis riparia</i>	Frost grape	Vitaceae	Native	FACW	Woody vine
<i>Vitis vulpina</i>	Frost grape	Vitaceae	Native	FAC	Woody vine
<i>Xanthium strumarium</i>	Common cocklebur	Asteraceae	Native	FAC	Annual herb



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## **Appendix A.**

The following table is a comprehensive list of all plant species observed in the course of this study.

### **Explanation of the Index of Survivability**

This index is structured to provide information on the survivability of species in the future given various conditions.

Current and/or expected future conditions considered in the creation of the Index of Survivability include deer browse, competition from non-native species, continued forest succession, and anthropogenic disturbance or other habitat destruction. Immeasurable impacts such as climate change, or pest/disease pressures not currently present in the area have not been taken into consideration for this index.

Following are the definitions assigned to each of the categories in the Index of Survivability, numbered from one to five:

- 1** Species extremely susceptible to local extirpation due to very small population size and for any reason, predictable or unpredictable, including current and/or future conditions.
- 2** Species highly susceptible to local extirpation due to current and/or future conditions and/or possibly small population size.
- 3** Species expected to decline under current and/or expected future conditions if no management actions are taken; species expected to expand if conditions become more favorable.
- 4** Species somewhat resistant to decline under current and/or future expected conditions whether management actions are taken or not; species expected to expand if conditions become more favorable.
- 5** Species very unlikely to decline under current and/or future expected conditions whether management actions are taken or not.



## Appendix A continued

Species	Common name	Family	Nativity	USFWS wetland code	Growth habit	Index of Survivability	Comment
<i>Abutilon theophrasti</i>	Butter-print	Malvaceae	Introduced	UPL	Annual herb	na	frequent
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	Native	FACU-	Annual herb	5	widespread native species
<i>Acer negundo</i>	Box-elder	Sapindaceae	Native	FAC+	Deciduous tree	5	widespread native species
<i>Acer palmatum</i>	Japanese maple	Sapindaceae	Introduced	N	Deciduous tree	na	occasional
<i>Acer platanoides</i>	Norway maple	Sapindaceae	Introduced	UPL	Deciduous tree	na	abundant weed throughout
<i>Acer pseudoplatanus</i>	Sycamore maple	Sapindaceae	Introduced	N	Deciduous tree	na	occasional
<i>Acer rubrum</i>	Red maple	Sapindaceae	Native	FAC	Deciduous tree	5	widespread native species
<i>Acer saccharinum</i>	Silver maple	Sapindaceae	Native	FACW	Deciduous tree	5	widespread native species
<i>Acer saccharum</i>	Sugar maple	Sapindaceae	Native	FACU	Deciduous tree	5	widespread native species
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
<i>Acorus calamus</i>	Sweet flag	Acoraceae	Introduced	OBL	Perennial herb	na	occasional
<i>Actaea racemosa</i>	Black snakeroot	Ranunculaceae	Native	N	Perennial herb	5	occasional; not heavily impacted by deer browsing
<i>Aegopodium podagraria</i>	Goutweed	Apiaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
<i>Aesculus glabra</i>	Ohio buckeye	Sapindaceae	Native	FACU+	Deciduous tree	na	native to PA; but not native at these sites
<i>Aesculus parviflora</i>	Bottlebrush buckeye	Sapindaceae	Introduced	N	Deciduous shrub	na	occasional; but forming large colonies
<i>Ageratina altissima</i> var. <i>altissima</i>	White-snakeroot	Asteraceae	Native	N	Perennial herb	5	widespread native species
<i>Agrimonia microcarpa</i>	Small-fruited agrimony	Rosaceae	Native	N	Perennial herb	5	widespread native species
<i>Agrimonia parviflora</i>	Southern agrimony	Rosaceae	Native	FACW	Perennial herb	5	widespread native species
<i>Agrimonia pubescens</i>	Downy agrimony	Rosaceae	Native	N	Perennial herb	5	widespread native species
<i>Agrostis perennans</i>	Autumn bent	Poaceae	Native	FACU	Perennial herb	5	widespread native species
<i>Agrostis scabra</i>	Fly-away grass	Poaceae	Native	FAC	Perennial herb	5	widespread native species
<i>Ailanthus altissima</i>	Tree-of-heaven	Simaroubaceae	Introduced	FACU-	Deciduous tree	na	frequent
<i>Ajuga reptans</i>	Carpet bugleweed	Lamiaceae	Introduced	N	Perennial herb	na	abundant weed throughout
<i>Albizia julibrissin</i>	Mimosa	Fabaceae	Introduced	N	Deciduous tree	na	abundant weed throughout
<i>Alisma subcordatum</i>	Broad-leaved water-plantain	Alismataceae	Native	OBL	Perennial herb	4	limited occurrence; probably stable
<i>Alliaria petiolata</i>	Garlic-mustard	Brassicaceae	Introduced	FACU-	Biennial herb	na	abundant weed throughout
<i>Allium canadense</i>	Wild onion	Alliaceae	Native	FACU	Perennial herb	5	not subject to deer browsing
<i>Allium tricoccum</i>	Ramp	Alliaceae	Native	FACU+	Perennial herb	5	not subject to deer browsing
<i>Allium vineale</i>	Field garlic	Alliaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout

## Appendix A continued

<i>Alnus glutinosa</i>	Black alder	Betulaceae	Introduced	FACW-	Deciduous tree	na	occasional
<i>Alopecurus pratensis</i>	Meadow foxtail	Poaceae	Introduced	FACW	Perennial herb	na	garden escapee or planted at Armentrout
<i>Ambrosia artemisiifolia</i>	Common ragweed	Asteraceae	Native	FACU	Annual herb	5	widespread native species
<i>Ambrosia trifida</i>	Giant ragweed	Asteraceae	Native	FAC	Annual herb	5	weedy native species
<i>Amorpha fruticosa</i>	False-indigo	Fabaceae	Introduced	FACW	Deciduous shrub	na	abundant weed throughout
<i>Ampelopsis brevipedunculata</i>	Porcelain-berry	Vitaceae	Introduced	N	Woody vine	na	abundant weed throughout
<i>Amphicarpaea bracteata</i>	Hog peanut	Fabaceae	Native	FAC	Perennial vine	5	widespread native species
<i>Anagallis arvensis</i>	Scarlet pimpernel	Myrsinaceae	Introduced	UPL	Annual herb	na	abundant weed throughout
<i>Anchusa azurea</i>	Showy bugloss	Boraginaceae	Introduced	N	Biennial herb	na	occasional
<i>Andropogon virginicus</i>	Broom-sedge	Poaceae	Native	FACU	Perennial herb	5	widespread native species
<i>Anthoxanthum odoratum</i>	Sweet vernalgrass	Poaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
<i>Anthriscus sylvestris</i>	Chervil	Apiaceae	Introduced	N	Biennial herb	na	abundant weed throughout
<i>Apocynum cannabinum</i>	Indian-hemp	Apocynaceae	Native	FACU	Perennial herb	5	widespread native species
<i>Aralia elata</i>	Japanese angelica-tree	Araliaceae	Introduced	N	Deciduous shrub	na	occasional
<i>Arctium minus</i>	Common burdock	Asteraceae	Introduced	FACU-	Biennial herb	na	abundant weed throughout
<i>Arisaema dracontium</i>	Green-dragon	Araceae	Native	FACW	Perennial herb	2	very small population size; potential impact by deer browsing
<i>Arisaema triphyllum</i> ssp. <i>triphyllum</i>	Jack-in-the-pulpit	Araceae	Native	FACW-	Perennial herb	4	somewhat impacted by deer browsing; large populations
<i>Arrhenatherum elatius</i> var. <i>elatius</i>	Tall oatgrass	Poaceae	Introduced	FACU	Perennial herb	na	garden escapee
<i>Artemisia annua</i>	Sweet wormwood	Asteraceae	Introduced	FACU	Annual herb	na	abundant weed throughout
<i>Artemisia vulgaris</i>	Common mugwort	Asteraceae	Introduced	N	Perennial herb	na	abundant weed throughout
<i>Arthraxon hispidus</i>	Grass	Poaceae	Introduced	FAC	Annual herb	na	abundant weed throughout
<i>Asarum canadense</i>	Wild ginger	Aristolochiaceae	Native	FACU-	Perennial herb	5	occasional; stable
<i>Asclepias incarnata</i> ssp. <i>incarnata</i>	Swamp milkweed	Apocynaceae	Native	OBL	Perennial herb	5	widespread native species
<i>Asclepias syriaca</i>	Common milkweed	Apocynaceae	Native	FACU-	Perennial herb	5	widespread native species
<i>Asplenium platyneuron</i>	Ebony spleenwort	Polypodiaceae	Native	FACU	Perennial herb	5	frequent; stable
<i>Athyrium filix-femina</i> var. <i>angustum</i>	Lady fern	Polypodiaceae	Native	FAC	Perennial herb	5	widespread native species
<i>Atriplex patula</i>	Spreading orach	Amaranthaceae	Native	FACW	Annual herb	5	native species of disturbed areas
<i>Barbarea verna</i>	Early wintercress	Brassicaceae	Introduced	N	Biennial herb	na	abundant weed throughout
<i>Barbarea vulgaris</i>	Wintercress	Brassicaceae	Introduced	FACU	Biennial herb	na	abundant weed throughout
<i>Berberis thunbergii</i>	Japanese barberry	Berberidaceae	Introduced	N	Deciduous shrub	na	abundant weed throughout

## Appendix A continued

Betula lenta	Black birch	Betulaceae	Native	FACU	Deciduous tree	4	occasional in the canopy; lower deer preference than some other tree species
Betula nigra	River birch	Betulaceae	Native	FACW	Deciduous tree	4	widespread along streams and on floodplains; lower deer preference than some other tree species
Bidens bipinnata	Spanish needles	Asteraceae	Native	N	Annual herb	5	occasional in open fields and mowed areas; stable
Bidens connata	Beggar-ticks	Asteraceae	Native	FACW+	Annual herb	5	occasional in open fields and mowed areas; stable
Bidens frondosa	Beggar-ticks	Asteraceae	Native	FACW	Annual herb	5	occasional in open fields and mowed areas; stable
Boehmeria cylindrica var. cylindrica	False nettle	Urticaceae	Native	FACW+	Perennial herb	5	widespread native species
Botrychium dissectum	Cut-leaved grape-fern	Ophioglossaceae	Native	FAC	Perennial herb	5	occasional; stable
Bromus arvensis	Field chess	Poaceae	Introduced	N	Annual herb	na	abundant weed throughout
Bromus commutatus	Hairy chess	Poaceae	Introduced	N	Annual herb	na	abundant weed throughout
Bromus pubescens	Canada brome	Poaceae	Native	N	Perennial herb	5	widespread native species
Bromus tectorum	Downy chess	Poaceae	Introduced	N	Annual herb	na	abundant weed throughout
Buddleja davidii	Butterfly-bush	Scrophulariaceae	Introduced	N	Deciduous shrub	na	frequent
Callitriche heterophylla	Water-starwort	Plantaginaceae	Native	OBL	Perennial herb	5	widespread native species
Callitriche stagnalis	Water-starwort	Plantaginaceae	Introduced	OBL	Perennial herb	na	frequent
Calystegia sepium	Hedge bindweed	Convolvulaceae	Native	FAC-	Perennial vine	5	widespread native species
Campsis radicans	Trumpet-vine	Bignoniaceae	Native	FAC	Woody vine	na	garden escapee
Cardamine concatenata	Toothwort	Brassicaceae	Native	FACU	Perennial herb	5	occasional spring ephemeral; not impacted by deer browsing
Cardamine hirsuta	Hairy bittercress	Brassicaceae	Introduced	FACU	Annual herb	na	abundant weed throughout
Cardamine impatiens	Bittercress	Brassicaceae	Introduced	N	Perennial herb	na	abundant weed throughout
Cardamine pensylvanica	Pennsylvania bittercress	Brassicaceae	Native	OBL	Perennial herb	5	widespread native species
Carex aggregata	Sedge	Cyperaceae	Native	FACU	Perennial herb	5	widespread native species
Carex albolutescens	Sedge	Cyperaceae	Native	FACW	Perennial herb	5	widespread native species
Carex amphibola	Sedge	Cyperaceae	Native	FAC	Perennial herb	5	widespread native species
Carex annectens	Sedge	Cyperaceae	Native	FACW	Perennial herb	5	widespread native species
Carex atlantica ssp. atlantica	Bog sedge	Cyperaceae	Native	FACW+	Perennial herb	5	widespread native species
Carex blanda	Sedge	Cyperaceae	Native	FAC	Perennial herb	5	widespread native species
Carex bushii	Sedge	Cyperaceae	Native	FACW	Perennial herb	5	widespread native species
Carex cephaloidea	Sedge	Cyperaceae	Native	FAC+	Perennial herb	5	occasional; stable

## Appendix A continued

Carex cephalophora	Sedge	Cyperaceae	Native	FACU	Perennial herb	5	widespread native species
Carex comosa	Sedge	Cyperaceae	Native	OBL	Perennial herb	5	widespread native species
Carex crinita var. crinita	Short hair sedge	Cyperaceae	Native	OBL	Perennial herb	5	widespread native species
Carex debilis var. debilis	Sedge	Cyperaceae	Native	FAC	Perennial herb	5	widespread native species
Carex digitalis	Sedge	Cyperaceae	Native	UPL	Perennial herb	5	widespread native species
Carex festucacea	Sedge	Cyperaceae	Native	FAC	Perennial herb	5	widespread native species
Carex glaucoidea	Sedge	Cyperaceae	Native	N	Perennial herb	5	widespread native species
Carex gracillima	Sedge	Cyperaceae	Native	FACU	Perennial herb	5	widespread native species
Carex granularis var. granularis	Sedge	Cyperaceae	Native	FACW+	Perennial herb	5	widespread native species
Carex grisea	Sedge	Cyperaceae	Native	FAC	Perennial herb	5	widespread native species
Carex hirsutella	Sedge	Cyperaceae	Native	N	Perennial herb	5	widespread native species
Carex hirtifolia	Sedge	Cyperaceae	Native	N	Perennial herb	5	widespread native species
Carex intumescens	Sedge	Cyperaceae	Native	FACW+	Perennial herb	5	widespread native species
Carex laxiculmis var. laxiculmis	Sedge	Cyperaceae	Native	N	Perennial herb	5	widespread native species
Carex laxiflora	Sedge	Cyperaceae	Native	FACU	Perennial herb	5	widespread native species
Carex lupulina	Sedge	Cyperaceae	Native	OBL	Perennial herb	5	widespread native species
Carex lurida	Sedge	Cyperaceae	Native	OBL	Perennial herb	5	widespread native species
Carex molesta	Sedge	Cyperaceae	Native	N	Perennial herb	5	occasional; stable
Carex muricata ssp. lamprocarpa	Sedge	Cyperaceae	Introduced	N	Perennial herb	na	occasional
Carex pensylvanica	Sedge	Cyperaceae	Native	N	Perennial herb	5	widespread native species
Carex radiata	Sedge	Cyperaceae	Native	N	Perennial herb	5	widespread native species
Carex rosea	Sedge	Cyperaceae	Native	N	Perennial herb	5	widespread native species
Carex scoparia	Broom sedge	Cyperaceae	Native	FACW	Perennial herb	5	widespread native species
Carex squarrosa	Sedge	Cyperaceae	Native	FACW	Perennial herb	5	widespread native species
Carex stipata var. stipata	Sedge	Cyperaceae	Native	N	Perennial herb	5	widespread native species
Carex straminea	Sedge	Cyperaceae	Native	OBL	Perennial herb	5	occasional; stable
Carex stricta	Tussock sedge	Cyperaceae	Native	OBL	Perennial herb	5	widespread native species
Carex styloflexa	Sedge	Cyperaceae	Native	FACW-	Perennial herb	5	occasional; stable
Carex swanii	Sedge	Cyperaceae	Native	FACU	Perennial herb	5	widespread native species
Carex tribuloides var. tribuloides	Sedge	Cyperaceae	Native	FACW+	Perennial herb	5	widespread native species
Carex virescens	Sedge	Cyperaceae	Native	N	Perennial herb	5	widespread native species
Carex vulpinoidea	Sedge	Cyperaceae	Native	OBL	Perennial herb	5	widespread native species

## Appendix A continued

Carpinus caroliniana	Hornbeam	Betulaceae	Native	FAC	Deciduous tree	4	widespread along streams and on floodplains; lower deer preference than some other tree species
Carya cordiformis	Bitternut hickory	Juglandaceae	Native	FACU+	Deciduous tree	4	heavily impacted by deer browsing when young; large populations
Carya glabra	Pignut hickory	Juglandaceae	Native	FACU-	Deciduous tree	3	heavily impacted by deer browsing when young; small populations
Carya ovata	Shagbark hickory	Juglandaceae	Native	FACU	Deciduous tree	4	heavily impacted by deer browsing when young; large populations
Catalpa bignonioides	Catalpa	Bignoniaceae	Introduced	UPL	Deciduous tree	na	occasional
Catalpa ovata	Chinese catalpa	Bignoniaceae	Introduced	N	Deciduous tree	na	occasional
Catalpa speciosa	Catalpa	Bignoniaceae	Introduced	FAC	Deciduous tree	na	frequent
Celastrus orbiculatus	Oriental bittersweet	Celastraceae	Introduced	UPL	Woody vine	na	abundant weed throughout
Celtis occidentalis	Dogberry	Cannabaceae	Native	FACU	Deciduous tree	4	occasional in the canopy; lower deer preference than some other tree species
Cephalanthus occidentalis	Buttonbush	Rubiaceae	Native	OBL	Deciduous shrub	5	occasional; not heavily impacted by deer browsing
Cerastium fontanum ssp. triviale	Common mouse-ear chickweed	Caryophyllaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout
Cercis canadensis	Redbud	Fabaceae	Native	N	Deciduous tree	na	native to PA; but not at these sites; planted
Chamaecrista fasciculata	Partridge-pea	Fabaceae	Native	FACU	Annual herb	5	widespread native species
Chasmanthium latifolium	Sea-oats	Poaceae	Native	FACU	Perennial herb	na	not native at these sites; garden escapee
Chelidonium majus	Greater celandine	Papaveraceae	Introduced	UPL	Biennial herb	na	abundant weed throughout
Chelone glabra	Turtlehead	Plantaginaceae	Native	OBL	Perennial herb	2	occasional; heavily impacted by deer browsing
Chenopodium album var. album	Lamb's quarters	Amaranthaceae	Introduced	FACU+	Annual herb	na	abundant weed throughout
Chionanthus virginicus	Fringe-tree	Oleaceae	Native	FAC+	Deciduous tree	na	garden escapee; native to PA, but not at these sites
Cichorium intybus	Blue chicory	Asteraceae	Introduced	N	Perennial herb	na	abundant weed throughout
Cicuta maculata var. maculata	Beaver-poison	Apiaceae	Native	OBL	Perennial herb	5	limited occurrence; probably stable
Cinna arundinacea	Wood reedgrass	Poaceae	Native	FACW	Perennial herb	5	widespread native species
Circaea canadensis ssp. canadensis	Enchanter's-nightshade	Onagraceae	Native	FACU	Perennial herb	5	widespread native species
Cirsium arvense	Canada thistle	Asteraceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
Cirsium discolor	Field thistle	Asteraceae	Native	UPL	Biennial herb	5	widespread native species
Cirsium pumilum	Pasture thistle	Asteraceae	Native	N	Biennial herb	5	widespread native species
Cirsium vulgare	Bull-thistle	Asteraceae	Introduced	FACU-	Biennial herb	na	abundant weed throughout
Claytonia virginica	Spring-beauty	Portulacaceae	Native	FAC	Perennial herb	5	widespread native species

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Clematis terniflora	Sweet autumn clematis	Ranunculaceae	Introduced	FACU-	Perennial vine	na	abundant weed throughout
Clematis virginiana	Virgin's-bower	Ranunculaceae	Native	FAC	Perennial vine	5	widespread native species
Cleome hassleriana	Spider-flower	Cleomaceae	Introduced	N	Annual herb	na	occasional
Collinsonia canadensis	Horse balm	Lamiaceae	Native	FAC+	Perennial herb	5	widespread native species
Commelina communis var. communis	Asiatic dayflower	Commelinaceae	Introduced	FAC-	Annual herb	na	abundant weed throughout
Conium maculatum	Poison-hemlock	Apiaceae	Introduced	FACW	Biennial herb	na	occasional
Convallaria majalis	Lily-of-the-valley	Ruscaceae	Introduced	N	Perennial herb	na	occasional
Conyza canadensis var. canadensis	Horseweed	Asteraceae	Native	UPL	Annual herb	5	widespread native species
Cornus alternifolia	Alternate-leaved dogwood	Cornaceae	Native	N	Deciduous tree	1	heavily impacted by deer browsing; small populations
Cornus amomum ssp. amomum	Silky dogwood	Cornaceae	Native	FACW	Deciduous shrub	5	widespread native species
Cornus florida	Flowering dogwood	Cornaceae	Native	FACU-	Deciduous tree	3	occasional in the subcanopy; seedlings heavily impacted by deer browsing
Cornus racemosa	Gray dogwood	Cornaceae	Native	FAC-	Deciduous shrub	5	widespread native species
Coronilla varia	Crown-vetch	Fabaceae	Introduced	N	Perennial herb	na	abundant weed throughout
Corylus americana	American filbert	Betulaceae	Native	FACU-	Deciduous shrub	2	only at Armentrout; one colony; somewhat impacted by deer browsing
Crataegus crus-galli	Cockspur hawthorn	Rosaceae	Native	FACU	Deciduous shrub	4	occasional; somewhat impacted by deer browsing
Crataegus macrosperma	Fanleaf hawthorn	Rosaceae	Native	N	Deciduous shrub	4	occasional; somewhat impacted by deer browsing
Cryptotaenia canadensis	Honewort	Apiaceae	Native	FAC	Perennial herb	5	widespread, somewhat weedy native species
Cuphea viscosissima	Blue waxweed	Lythraceae	Native	FAC-	Annual herb	5	widespread native species
Cuscuta campestris	Dodder	Convolvulaceae	Native	N	Annual vine	5	occasional parasite on other vegetation; stable
Cuscuta gronovii var. gronovii	Common dodder	Convolvulaceae	Native	N	Annual vine	5	occasional parasite on other vegetation; stable
Cyperus erythrorhizos	Redroot flatsedge	Cyperaceae	Native	FACW+	Annual herb	5	widespread native species
Cyperus strigosus	False nutsedge	Cyperaceae	Native	FACW	Perennial herb	5	widespread native species
Cystopteris fragilis	Fragile fern	Polypodiaceae	Native	FACU	Perennial herb	5	frequent; stable
Cystopteris tennesseensis	Tennessee bladder fern	Polypodiaceae	Native	N	Perennial herb	4	occasional on bridge mortar; probably stable or spreading
Dactylis glomerata	Orchardgrass	Poaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
Danthonia spicata	Poverty-grass	Poaceae	Native	N	Perennial herb	5	widespread native species
Daucus carota	Queen Anne's-lace	Apiaceae	Introduced	N	Biennial herb	na	abundant weed throughout

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Dennstaedtia punctilobula	Hay-scented fern	Polypodiaceae	Native	N	Perennial herb	5	widespread native species
Desmodium perplexum	Tick-trefoil	Fabaceae	Native	N	Perennial herb	5	widespread native species
Dianthus armeria	Deptford pink	Caryophyllaceae	Introduced	N	Biennial herb	na	abundant weed throughout
Dichanthelium acuminatum	Panic grass	Poaceae	Native	FAC	Perennial herb	5	widespread native species
Dichanthelium clandestinum	Deer-tongue grass	Poaceae	Native	FAC+	Perennial herb	5	widespread native species
Dichanthelium microcarpon	Panic grass	Poaceae	Native	FACU	Perennial herb	5	widespread native species
Digitaria ciliaris	Southern crabgrass	Poaceae	Introduced	N	Annual herb	na	abundant weed throughout
Digitaria ischaemum	Smooth crabgrass	Poaceae	Introduced	UPL	Annual herb	na	abundant weed throughout
Dioscorea villosa	Wild yam	Dioscoreaceae	Native	FAC+	Perennial vine	5	widespread native species
Diospyros virginiana	Persimmon	Ebenaceae	Native	FAC-	Deciduous tree	4	small populations
Dipsacus sativus	Fuller's teasel	Dipsacaceae	Introduced	N	Biennial herb	na	abundant weed throughout
Dipsacus sylvestris	Teasel	Dipsacaceae	Introduced	N	Biennial herb	na	abundant weed throughout
Dryopteris carthusiana	Spinulose wood fern	Polypodiaceae	Native	FAC+	Perennial herb	5	widespread native species
Dryopteris intermedia	Evergreen wood-fern	Polypodiaceae	Native	FACU	Perennial herb	5	widespread native species
Dryopteris marginalis	Marginal wood fern	Polypodiaceae	Native	FACU-	Perennial herb	5	widespread native species
Dryopteris x boottii	Boott's hybrid wood fern	Polypodiaceae	Native	N	Perennial herb	4	occasional native species
Duchesnea indica	Indian strawberry	Rosaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout
Echinochloa crusgalli var. crusgalli	Barnyard-grass	Poaceae	Introduced	FACU	Annual herb	na	abundant weed throughout
Echinocystis lobata	Prickly cucumber	Cucurbitaceae	Native	FAC	Annual vine	5	widespread native species
Elaeagnus umbellata	Autumn-olive	Elaeagnaceae	Introduced	N	Deciduous shrub	na	abundant weed throughout
Eleocharis obtusa var. obtusa	Wright's spike-rush	Cyperaceae	Native	OBL	Annual herb	5	widespread native species
Eleocharis tenuis var. tenuis	Spike-rush	Cyperaceae	Native	FACW+	Perennial herb	5	occasional in wet openings; stable
Eleusine indica	Goosegrass	Poaceae	Introduced	FACU-	Annual herb	na	abundant weed throughout
Elymus hystrix	Bottlebrush-grass	Poaceae	Native	N	Perennial herb	5	widespread native species
Elymus riparius	Riverbank wild-rye	Poaceae	Native	FACW	Perennial herb	5	widespread native species
Elymus virginicus	Virginia wild-rye	Poaceae	Native	FACW-	Perennial herb	5	widespread native species
Epifagus virginiana	Beechdrops	Orobanchaceae	Native	N	Annual herb	5	widespread native species
Epilobium coloratum	Purple-leaved willow-herb	Onagraceae	Native	FACW+	Perennial herb	5	widespread native species
Equisetum arvense	Field horsetail	Equisetaceae	Native	FAC	Perennial herb	5	occasional; stable
Eragrostis spectabilis	Purple lovegrass	Poaceae	Native	UPL	Perennial herb	5	widespread native species
Erechtites hieraciifolius	Fireweed	Asteraceae	Native	FACU	Annual herb	5	widespread native species

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Erigeron annuus	Daisy fleabane	Asteraceae	Native	FACU	Annual herb	5	widespread native species
Erigeron philadelphicus	Daisy fleabane	Asteraceae	Native	FACU	Perennial herb	5	widespread native species
Erigeron strigosus var. strigosus	Daisy fleabane	Asteraceae	Native	FACU+	Annual herb	5	widespread native species
Erythronium americanum	Yellow trout-lily	Liliaceae	Native	N	Perennial herb	5	widespread native species
Euonymus alatus	Winged euonymous	Celastraceae	Introduced	N	Deciduous shrub	na	abundant weed throughout
Euonymus fortunei	Wintercreeper	Celastraceae	Introduced	N	Woody vine	na	abundant weed throughout
Eupatorium perfoliatum	Boneset	Asteraceae	Native	FACW+	Perennial herb	5	occasional in open fields; stable
Eupatorium serotinum	Late eupatorium	Asteraceae	Introduced	FAC-	Perennial herb	na	occasional
Euphorbia lathyris	Caper spurge	Euphorbiaceae	Introduced	N	Annual herb	na	garden escapee
Euphorbia maculata	Spotted spurge	Euphorbiaceae	Native	FACU-	Annual herb	5	widespread native species
Eurybia divaricata	White wood aster	Asteraceae	Native	N	Perennial herb	4	somewhat impacted by deer browsing; large populations
Eurybia macrophylla	Bigleaf aster	Asteraceae	Native	N	Perennial herb	3	somewhat impacted by deer browsing; small populations
Euthamia graminifolia	Grass-leaved goldenrod	Asteraceae	Native	FAC	Perennial herb	5	widespread native species
Eutrochium fistulosum	Joe-pye-weed	Asteraceae	Native	FACW	Perennial herb	5	widespread native species
Eutrochium purpureum	Joe-pye-weed	Asteraceae	Native	N	Perennial herb	4	occasional
Fagus grandifolia	American beech	Fagaceae	Native	FACU	Deciduous tree	4	somewhat impacted by deer browsing; large populations
Fallopia japonica	Japanese knotweed	Polygonaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout
Fallopia scandens	Climbing false-buckwheat	Polygonaceae	Native	FAC	Perennial vine	5	widespread native species
Festuca obtusa	Nodding fescue	Poaceae	Native	FACU	Perennial herb	5	widespread native species
Forsythia suspensa	Forsythia	Oleaceae	Introduced	N	Deciduous shrub	na	garden escapee
Fraxinus americana var. americana	White ash	Oleaceae	Native	FACU	Deciduous tree	3	frequent in the canopy; seedlings and saplings heavily impacted by deer browsing
Fraxinus pennsylvanica	Red ash	Oleaceae	Native	FACW	Deciduous tree	3	frequent in the canopy; seedlings and saplings heavily impacted by deer browsing
Galinsoga parviflora var. parviflora	Small-flowered quickweed	Asteraceae	Introduced	N	Annual herb	na	occasional
Galium aparine	Bedstraw	Rubiaceae	Native	FACU	Annual herb	5	widespread native species
Galium concinnum	Shining bedstraw	Rubiaceae	Native	UPL	Perennial herb	5	widespread native species
Galium mollugo	White bedstraw	Rubiaceae	Introduced	N	Perennial herb	na	abundant weed throughout
Galium tinctorium	Bedstraw	Rubiaceae	Native	OBL	Perennial herb	5	widespread native species

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Gaura biennis	Gaura	Onagraceae	Native	FACU	Annual herb	5	occasional; not heavily impacted by deer browsing
Geranium maculatum	Wood geranium	Geraniaceae	Native	FACU	Perennial herb	5	widespread native species
Geum canadense	White avens	Rosaceae	Native	FACU	Perennial herb	5	widespread native species
Geum vernum	Spring avens	Rosaceae	Native	FACU	Perennial herb	5	widespread native species
Glechoma hederacea	Gill-over-the-ground	Lamiaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
Gleditsia triacanthos	Honey-locust	Fabaceae	Native	FAC-	Deciduous tree	4	occasional in canopy; probably stable
Glyceria melicaria	Slender mannagrass	Poaceae	Native	OBL	Perennial herb	5	widespread native species
Glyceria septentrionalis	Floating mannagrass	Poaceae	Native	OBL	Perennial herb	5	widespread native species
Glyceria striata	Fowl mannagrass	Poaceae	Native	OBL	Perennial herb	5	widespread native species
Gymnocladus dioicus	Kentucky coffee-tree	Fabaceae	Native	N	Deciduous tree	4	occasional in canopy; probably stable
Hackelia virginiana	Beggar's-lice	Boraginaceae	Native	FACU	Biennial herb	5	widespread native species
Hamamelis virginiana	Witch-hazel	Hamamelidaceae	Native	FACU+	Deciduous shrub	4	heavily impacted by deer browsing
Hedera helix	English ivy	Araliaceae	Introduced	N	Woody vine	na	abundant weed throughout
Heliopsis helianthoides	Ox-eye	Asteraceae	Native	N	Perennial herb	5	widespread native species
Hemerocallis fulva	Orange day-lily	Hemerocallidaceae	Introduced	UPL	Perennial herb	na	abundant weed throughout
Hesperis matronalis	Dame's-rocket	Brassicaceae	Introduced	N	Perennial herb	na	abundant weed throughout
Heteranthera reniformis	Mud-plantain	Pontederiaceae	Native	OBL	Perennial herb	5	occasional; stable
Hibiscus syriacus	Rose-of-sharon	Malvaceae	Introduced	N	Deciduous shrub	na	abundant weed throughout
Hieracium caespitosum	King-devil	Asteraceae	Introduced	N	Perennial herb	na	abundant weed throughout
Holcus lanatus	Velvetgrass	Poaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
Hosta lancifolia	Narrow-leaved plantain-lily	Agavaceae	Introduced	N	Perennial herb	na	occasional, but heavily browsed by deer
Humulus japonicus	Japanese hops	Cannabaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
Hydrophyllum virginianum	Virginia waterleaf	Boraginaceae	Native	FAC	Perennial herb	5	widespread native species
Hypericum mutilum	Dwarf St. John's-wort	Hypericaceae	Native	FACW	Perennial herb	5	widespread native species
Hypericum punctatum	Spotted St. John's-wort	Hypericaceae	Native	FAC-	Perennial herb	5	widespread native species
Ilex crenata	Japanese Holly	Aquifoliaceae	Introduced	N	Evergreen shrub	na	occasional
Ilex opaca	American holly	Aquifoliaceae	Native	FACU	Evergreen tree	na	naturalized populations only, not native at these sites
Ilex verticillata	Winterberry	Aquifoliaceae	Native	FACW+	Deciduous shrub	2	heavily impacted by deer browsing; small populations
Impatiens capensis	Jewelweed	Balsaminaceae	Native	FACW	Annual herb	5	widespread native species

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Impatiens pallida	Pale jewelweed	Balsaminaceae	Native	FACW	Annual herb	4	occasional; somewhat impacted by deer browsing
Iris pseudacorus	Water flag	Iridaceae	Introduced	OBL	Perennial herb	na	occasional
Juglans cinerea	Butternut	Juglandaceae	Native	FACU+	Deciduous tree	2	small populations
Juglans nigra	Black walnut	Juglandaceae	Native	FACU	Deciduous tree	5	widespread in the canopy; not heavily impacted by deer browsing
Juncus acuminatus	Sharp-fruited rush	Juncaceae	Native	OBL	Perennial herb	5	widespread native species
Juncus effusus var. solutus	Soft rush	Juncaceae	Native	OBL	Perennial herb	5	widespread native species
Juncus tenuis var. tenuis	Path rush	Juncaceae	Native	FAC-	Perennial herb	5	widespread native species
Juniperus virginiana	Eastern red-cedar	Cupressaceae	Native	FACU	Evergreen tree	5	widespread native species
Krigia biflora	Dwarf dandelion	Asteraceae	Native	FACW	Perennial herb	5	occasional; stable
Kummerowia striata	Japanese clover	Fabaceae	Introduced	FACU	Annual herb	na	abundant weed throughout
Lactuca canadensis	Wild lettuce	Asteraceae	Native	FACU-	Annual herb	5	widespread native species
Lamium purpureum	Purple dead-nettle	Lamiaceae	Introduced	N	Annual herb	na	abundant weed throughout
Laportea canadensis	Wood-nettle	Urticaceae	Native	FAC	Perennial herb	5	widespread native species
Lapsana communis	Nipplewort	Asteraceae	Introduced	N	Annual herb	na	frequent
Leersia oryzoides	Rice cutgrass	Poaceae	Native	OBL	Perennial herb	5	widespread native species
Leersia virginica	Cutgrass	Poaceae	Native	FACW	Perennial herb	5	widespread native species
Lemna minor	Duckweed	Araceae	Native	OBL	Perennial herb	5	limited occurrence; stable
Lepidium virginicum	Poor-man's-pepper	Brassicaceae	Native	FACU-	Annual herb	5	widespread native species
Leucanthemum vulgare	Ox-eye daisy	Asteraceae	Introduced	N	Perennial herb	na	abundant weed throughout
Ligustrum obtusifolium	Obtuse-leaved privet	Oleaceae	Introduced	N	Deciduous shrub	na	abundant weed throughout
Lindera benzoin	Spicebush	Lauraceae	Native	FACW-	Deciduous shrub	4	widespread native species; often heavily browsed by deer
Lindernia dubia var. dubia	False pimpernel	Plantaginaceae	Native	OBL	Annual herb	5	widespread native species
Liquidambar styraciflua	Sweetgum	Altingiaceae	Native	FAC	Deciduous tree	na	native to PA, but not off the Coastal Plain; planted only
Liriodendron tulipifera	Tuliptree	Magnoliaceae	Native	FACU	Deciduous tree	3	frequent in the canopy; seedlings and saplings heavily impacted by deer browsing
Lobelia cardinalis	Cardinal-flower	Campanulaceae	Native	FACW+	Perennial herb	4	limited occurrence; somewhat impacted by deer browsing
Lobelia inflata	Indian-tobacco	Campanulaceae	Native	FACU	Annual herb	5	widespread native species
Lobelia siphilitica	Great blue lobelia	Campanulaceae	Native	FACW+	Perennial herb	3	frequent, but heavily browsed by deer
Lolium perenne	Perennial ryegrass	Poaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout

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Lonicera japonica	Japanese honeysuckle	Caprifoliaceae	Introduced	FAC-	Woody vine	na	abundant weed throughout
Lonicera maackii	Amur honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub	na	abundant weed throughout
Lonicera morrowii	Morrow's honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub	na	abundant weed throughout
Lonicera standishii	Honeysuckle	Caprifoliaceae	Introduced	N	Deciduous shrub	na	occasional
Lotus corniculatus	Bird's-foot trefoil	Fabaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout
Ludwigia alternifolia	False loosestrife	Onagraceae	Native	FACW+	Perennial herb	5	widespread native species
Ludwigia palustris	Marsh-purslane	Onagraceae	Native	OBL	Perennial herb	5	widespread native species
Lunaria annua	Honesty	Brassicaceae	Introduced	N	Biennial herb	na	occasional
Luzula multiflora	Field woodrush	Juncaceae	Native	FACU	Perennial herb	5	widespread native species
Lycopus americanus	Water-horehound	Lamiaceae	Native	OBL	Perennial herb	5	widespread native species
Lycopus uniflorus	Bugleweed	Lamiaceae	Native	OBL	Perennial herb	5	widespread native species
Lycopus virginicus	Bugleweed	Lamiaceae	Native	OBL	Perennial herb	5	widespread native species
Lysimachia ciliata	Fringed loosestrife	Myrsinaceae	Native	FACW	Perennial herb	5	widespread native species
Lysimachia nummularia	Creeping-charlie	Myrsinaceae	Introduced	FACW-	Perennial herb	na	abundant weed throughout
Lythrum salicaria	Purple loosestrife	Lythraceae	Introduced	FACW+	Perennial herb	na	occasional
Maclura pomifera	Osage-orange	Moraceae	Introduced	UPL	Deciduous tree	na	abundant weed throughout
Magnolia acuminata	Cucumber-tree	Magnoliaceae	Native	N	Deciduous tree	2	one small population at Camp Woods; seedlings and saplings heavily impacted by deer browsing
Magnolia kobus	Kobus magnolia	Magnoliaceae	Introduced	N	Deciduous tree	na	occasional
Magnolia tripetala	Umbrella-tree	Magnoliaceae	Native	FACU	Deciduous tree	na	native to PA; but not at these sites
Maianthemum canadense	Canada mayflower	Ruscaceae	Native	FAC-	Perennial herb	4	occasional; somewhat impacted by deer browsing
Maianthemum racemosum	False solomon's-seal	Ruscaceae	Native	N	Perennial herb	2	heavily impacted by deer browsing; small populations
Malus coronaria	Sweet crabapple	Rosaceae	Native	N	Deciduous tree	3	somewhat impacted by deer browsing; small populations
Malus sp.	Crabapple	Rosaceae	Introduced	N	Deciduous tree	na	abundant weed throughout
Malva neglecta	Cheeses	Malvaceae	Introduced	N	Annual herb	na	frequent
Matteuccia struthiopteris	Ostrich fern	Polypodiaceae	Native	FACW	Perennial herb	na	native to PA; but planted or escaped
Melilotus albus	White sweet-clover	Fabaceae	Introduced	FACU	Biennial herb	na	abundant weed throughout
Mentha arvensis	Field mint	Lamiaceae	Native	FACW	Perennial herb	5	widespread native species
Mentha x piperita	Peppermint	Lamiaceae	Introduced	FACW+	Perennial herb	na	occasional

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Mentha x verticillata	Mint	Lamiaceae	Introduced	N	Perennial herb	na	occasional
Microstegium vimineum	Stiltgrass	Poaceae	Introduced	FAC	Annual herb	na	abundant weed throughout
Mikania scandens	Climbing hempweed	Asteraceae	Native	FACW+	Perennial vine	5	occasional; stable
Mimulus alatus	Winged monkey-flower	Phrymaceae	Native	OBL	Perennial herb	4	widespread native species; somewhat susceptible to deer browsing
Mimulus ringens	Allegheny monkey-flower	Phrymaceae	Native	OBL	Perennial herb	4	widespread native species; somewhat susceptible to deer browsing
Miscanthus sinensis var. sinensis	Eulalia	Poaceae	Introduced	FACU	Perennial herb	na	occasional
Mitchella repens	Partridge-berry	Rubiaceae	Native	FACU	Perennial herb	5	widespread native species
Monarda fistulosa	Wild bergamot	Lamiaceae	Native	UPL	Perennial herb	5	widespread native species
Monotropa uniflora	Indian-pipe	Ericaceae	Native	FACU-	Perennial herb	5	occasional; stable
Morus alba	White mulberry	Moraceae	Introduced	UPL	Deciduous tree	na	abundant weed throughout
Muhlenbergia schreberi	Dropseed	Poaceae	Native	FAC	Perennial herb	5	widespread native species
Myosotis laxa	Wild forget-me-not	Boraginaceae	Native	OBL	Perennial herb	5	widespread native species
Myosotis scorpioides	Forget-me-not	Boraginaceae	Introduced	OBL	Perennial herb	na	frequent
Myriophyllum spicatum	Eurasian water-milfoil	Haloragaceae	Introduced	OBL	Perennial herb	na	occasional
Narcissus poeticus	Poet's narcissus	Alliaceae	Introduced	N	Perennial herb	na	persisting at a few sites
Narcissus pseudonarcissus	Daffodil	Alliaceae	Introduced	N	Perennial herb	na	persisting at a few sites
Nasturtium officinale	Watercress	Brassicaceae	Introduced	OBL	Perennial herb	na	occasional
Nymphoides peltata	Waterfringe	Menyanthaceae	Introduced	OBL	Perennial herb	na	garden escapee, or planted in Wissahickon Creek intentionally
Nyssa sylvatica	Sourgum	Nyssaceae	Native	FAC	Deciduous tree	3	frequent in the canopy; seedlings and saplings heavily impacted by deer browsing
Oenothera biennis	Evening-primrose	Onagraceae	Native	FACU-	Biennial herb	5	widespread native species
Onoclea sensibilis	Sensitive fern	Polypodiaceae	Native	FACW	Perennial herb	5	widespread native species
Ornithogalum nutans	Star-of-Bethlehem	Hyacinthaceae	Introduced	N	Perennial herb	na	abundant weed throughout
Ornithogalum umbellatum	Star-of-Bethlehem	Hyacinthaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
Osmorhiza longistylis	Anise root	Apiaceae	Native	FACU	Perennial herb	5	widespread, not subject to deer browsing
Osmunda cinnamomea	Cinnamon fern	Osmundaceae	Native	FACW	Perennial herb	5	widespread native species
Osmunda regalis	Royal fern	Osmundaceae	Native	OBL	Perennial herb	5	widespread native species
Ostrya virginiana	Hop-hornbeam	Betulaceae	Native	FACU-	Deciduous tree	4	occasional; lower deer preference than some other tree species
Oxalis stricta	Common yellow wood-sorrel	Oxalidaceae	Native	UPL	Perennial herb	5	widespread native species
Pachysandra terminalis	Japanese pachysandra	Buxaceae	Introduced	N	Perennial herb	na	occasional; but forming large colonies

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Packera aurea	Golden ragwort	Asteraceae	Native	FACW	Perennial herb	4	occasional and planted; probably stable
Panicum anceps	Panic grass	Poaceae	Native	FAC	Perennial herb	5	widespread native species
Panicum dichotomiflorum	Smooth panic grass	Poaceae	Native	FACW-	Annual herb	5	widespread native species
Panicum gattingeri	Witchgrass	Poaceae	Native	FAC	Annual herb	5	widespread native species
Panicum philadelphicum	Panic grass	Poaceae	Native	FAC-	Annual herb	5	occasional
Panicum virgatum	Switchgrass	Poaceae	Native	FAC	Perennial herb	5	widespread native species
Parthenocissus quinquefolia	Virginia-creeper	Vitaceae	Native	FACU	Woody vine	5	widespread native species
Parthenocissus tricuspidata	Boston ivy	Vitaceae	Introduced	N	Woody vine	na	garden escapee
Paspalum laeve	Field beadgrass	Poaceae	Native	FAC+	Perennial herb	5	widespread native species
Paulownia tomentosa	Empress-tree	Paulowniaceae	Introduced	N	Deciduous tree	na	occasional
Pellaea atropurpurea	Purple cliffbrake	Polypodiaceae	Native	N	Perennial herb	5	occasional; stable
Penstemon digitalis	Tall white beard-tongue	Plantaginaceae	Native	FAC	Perennial herb	5	widespread native species
Perilla frutescens	Perilla	Lamiaceae	Introduced	FACU+	Annual herb	na	abundant weed throughout
Persicaria arifolia	Halberd-leaf tearthumb	Polygonaceae	Native	OBL	Annual herb	5	widespread native species
Persicaria longiseta	Low smartweed	Polygonaceae	Introduced	FACU-	Annual herb	na	abundant weed throughout
Persicaria maculosa	Lady's-thumb	Polygonaceae	Introduced	FACW	Annual herb	na	abundant weed throughout
Persicaria pensylvanica	Smartweed	Polygonaceae	Native	FACW	Annual herb	5	widespread native species
Persicaria perfoliata	Mile-a-minute weed	Polygonaceae	Introduced	FAC	Annual herb	na	occasional; but forming large colonies
Persicaria punctata	Dotted smartweed	Polygonaceae	Native	OBL	Annual herb	5	widespread native species
Persicaria robustior	Large water-smartweed	Polygonaceae	Native	OBL	Perennial herb	5	widespread native species
Persicaria sagittata	Tearthumb	Polygonaceae	Native	OBL	Annual herb	5	widespread native species
Persicaria virginiana	Jumpseed	Polygonaceae	Native	FAC	Perennial herb	5	widespread native species
Petasites japonicus	Japanese sweet coltsfoot	Asteraceae	Introduced	N	Perennial herb	na	garden escapee
Phalaris arundinacea	Reed canary-grass	Poaceae	Introduced	FACW	Perennial herb	na	abundant weed throughout
Philadelphus inodorus var. grandiflorus	Mock-orange	Hydrangeaceae	Introduced	N	Deciduous shrub	na	frequent
Philadelphus pubescens	Mock-orange	Hydrangeaceae	Introduced	N	Deciduous shrub	na	occasional
Phleum pratense	Timothy	Poaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
Phlox paniculata	Summer phlox	Polemoniaceae	Native	FACU	Perennial herb	3	occasional; heavily impacted by deer browsing
Photinia villosa	Photinia	Rosaceae	Introduced	N	Deciduous tree	na	abundant weed throughout
Phragmites australis ssp. australis	Common reed	Poaceae	Introduced	FACW	Perennial herb	na	abundant weed throughout
Physalis subglabrata	Ground-cherry	Solanaceae	Native	N	Perennial herb	5	widespread native species

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Phytolacca americana	Pokeweed	Phytolaccaceae	Native	FACU+	Perennial herb	5	widespread native species
Picea abies	Norway spruce	Pinaceae	Introduced	N	Evergreen tree	na	occasional
Pilea pumila	Clearweed	Urticaceae	Native	FACW	Annual herb	5	widespread native species
Pinus strobus	Eastern white pine	Pinaceae	Native	FACU	Evergreen tree	na	native to PA; but not at these sites
Pinus sylvestris	Scots pine	Pinaceae	Introduced	N	Evergreen tree	na	occasional
Plantago lanceolata	English plantain	Plantaginaceae	Introduced	UPL	Perennial herb	na	abundant weed throughout
Plantago major	Broad-leaved plantain	Plantaginaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
Plantago rugelii	Rugel's plantain	Plantaginaceae	Native	FACU	Perennial herb	5	widespread native species
Platanthera lacera	Ragged fringed-orchid	Orchidaceae	Native	FACW	Perennial herb	1	two stems at Crossways; recurrence unpredictable
Platanus occidentalis	Sycamore	Platanaceae	Native	FACW-	Deciduous tree	4	frequent in the canopy; seedlings and saplings heavily impacted by deer browsing
Poa annua	Annual bluegrass	Poaceae	Introduced	FACU	Annual herb	na	abundant weed throughout
Poa compressa	Canada bluegrass	Poaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
Poa nemoralis	Wood bluegrass	Poaceae	Introduced	FAC	Perennial herb	na	abundant weed throughout
Poa palustris	Fowl bluegrass	Poaceae	Native	FACW	Perennial herb	5	widespread native species
Poa sylvestris	Woodland bluegrass	Poaceae	Native	FACW	Perennial herb	5	widespread native species
Poa trivialis	Rough bluegrass	Poaceae	Introduced	FACW	Perennial herb	na	abundant weed throughout
Podophyllum peltatum	Mayapple	Berberidaceae	Native	N	Perennial herb	3	somewhat impacted by deer browsing; large populations
Polemonium reptans	Spreading Jacob's-ladder	Polemoniaceae	Native	FACU	Perennial herb	4	frequent; somewhat impacted by deer browsing
Polygonatum biflorum var. biflorum	Solomon's-seal	Ruscaceae	Native	FACU	Perennial herb	2	heavily impacted by deer browsing; small populations
Polygonatum pubescens	Solomon's-seal	Ruscaceae	Native	N	Perennial herb	2	heavily impacted by deer browsing; small populations
Polygonum bellardii	Needle-leaf knotweed	Polygonaceae	Introduced	N	Annual herb	na	occasional
Polystichum acrostichoides	Christmas fern	Polypodiaceae	Native	N	Perennial herb	4	widespread native species, but very reduced or missing from areas where it should be abundant
Populus alba	White poplar	Salicaceae	Introduced	N	Deciduous tree	na	occasional
Populus deltoides	Eastern cottonwood	Salicaceae	Native	FACU-	Deciduous tree	4	occasional in the canopy; lower deer preference than some other tree species
Portulaca oleracea	Purslane	Portulacaceae	Native	FAC	Annual herb	5	widespread native species
Potentilla recta	Sulfur cinquefoil	Rosaceae	Introduced	N	Perennial herb	na	abundant weed throughout
Potentilla simplex	Old-field cinquefoil	Rosaceae	Native	FACU-	Perennial herb	5	widespread native species

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							somewhat impacted by deer browsing (browsing inhibits flowering); large populations
Prenanthes altissima	Rattlesnake-root	Asteraceae	Native	FACU-	Perennial herb	3	
Prunella vulgaris ssp. vulgaris	Heal-all	Lamiaceae	Introduced	FACU+	Perennial herb	na	abundant weed throughout
Prunus avium	Sweet cherry	Rosaceae	Introduced	N	Deciduous tree	na	frequent
Prunus serotina	Wild black cherry	Rosaceae	Native	FACU	Deciduous tree	5	common; not heavily impacted by deer browsing
Pseudognaphalium obtusifolium	Fragrant cudweed	Asteraceae	Native	N	Annual herb	5	widespread native species
Pycnanthemum muticum	Mountain-mint	Lamiaceae	Native	FACW	Perennial herb	5	widespread native species
Pycnanthemum tenuifolium	Mountain-mint	Lamiaceae	Native	FACW	Perennial herb	5	widespread native species
Pycnanthemum virginianum	Mountain-mint	Lamiaceae	Native	FAC	Perennial herb	5	widespread native species
Pyrus calleryana	Callery pear	Rosaceae	Introduced	N	Deciduous tree	na	abundant weed throughout
Pyrus communis	Pear	Rosaceae	Introduced	N	Deciduous tree	na	occasional
Quercus acutissima	Sawtooth oak	Fagaceae	Introduced	N	Deciduous tree	na	one population near Morris Rd. at Armentrout
Quercus alba	White oak	Fagaceae	Native	FACU	Deciduous tree	3	heavily impacted by deer browsing when young
Quercus bicolor	Swamp white oak	Fagaceae	Native	FACW+	Deciduous tree	3	heavily impacted by deer browsing when young
Quercus coccinea	Scarlet oak	Fagaceae	Native	N	Deciduous tree	3	heavily impacted by deer browsing when young
Quercus imbricaria	Shingle oak	Fagaceae	Native	FAC	Deciduous tree	2	heavily impacted by deer browsing when young; small population
Quercus montana	Chestnut oak	Fagaceae	Native	FACW	Deciduous tree	3	heavily impacted by deer browsing when young
Quercus palustris	Pin oak	Fagaceae	Native	FACW	Deciduous tree	3	heavily impacted by deer browsing when young
Quercus rubra	Northern red oak	Fagaceae	Native	FACU-	Deciduous tree	3	heavily impacted by deer browsing when young
Quercus velutina	Black oak	Fagaceae	Native	N	Deciduous tree	3	heavily impacted by deer browsing when young
Ranunculus abortivus	Small-flowered crowfoot	Ranunculaceae	Native	FACW-	Annual herb	5	widespread native species
Ranunculus acris	Common meadow buttercup	Ranunculaceae	Introduced	FAC+	Perennial herb	na	abundant weed throughout
Ranunculus bulbosus	Bulbous buttercup	Ranunculaceae	Introduced	UPL	Perennial herb	na	abundant weed throughout
Ranunculus ficaria	Lesser celandine	Ranunculaceae	Introduced	N	Perennial herb	na	abundant weed throughout
Ranunculus hispidus var. caricetorum	Marsh buttercup	Ranunculaceae	Native	FAC	Perennial herb	5	widespread native species
Ranunculus micranthus	Small-flowered crowfoot	Ranunculaceae	Native	FACU	Perennial herb	5	widespread native species

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Rhamnus cathartica	Buckthorn	Rhamnaceae	Introduced	N	Deciduous shrub	na	abundant weed throughout
Rhododendron calendulaceum	Flame azalea	Ericaceae	Native	N	Deciduous shrub	na	native to PA, but planted at Four Mills
Rhodotypos scandens	Jetbead	Rosaceae	Introduced	N	Deciduous shrub	na	occasional; but forming large colonies
Rhus copallinum var. copallinum	Shining sumac	Anacardiaceae	Native	N	Deciduous shrub	4	occasional along edges of mowed areas and trails
Rhus glabra	Smooth sumac	Anacardiaceae	Native	N	Deciduous shrub	4	occasional along edges of mowed areas and trails
Rhus typhina	Staghorn sumac	Anacardiaceae	Native	N	Deciduous shrub	4	occasional along edges of mowed areas and trails
Ribes rubrum	Garden red currant	Grossulariaceae	Introduced	N	Deciduous shrub	na	occasional
Robinia pseudoacacia	Black locust	Fabaceae	Native	FACU-	Deciduous tree	5	widespread native species
Rorippa palustris	Marsh watercress	Brassicaceae	Native	OBL	Annual herb	5	widespread native species
Rorippa sylvestris	Creeping yellowcress	Brassicaceae	Introduced	FACW	Perennial herb	na	occasional
Rosa multiflora	Multiflora rose	Rosaceae	Introduced	FACU	Deciduous shrub	na	abundant weed throughout
Rosa palustris	Swamp rose	Rosaceae	Native	OBL	Deciduous shrub	5	occasional; not heavily impacted by deer browsing
Rubus allegheniensis	Common blackberry	Rosaceae	Native	FACU-	Deciduous shrub	5	widespread native species
Rubus enslenii	Southern dewberry	Rosaceae	Native	FACU	Woody vine	5	widespread native species
Rubus flagellaris	Prickly dewberry	Rosaceae	Native	FACU	Woody vine	5	widespread native species
Rubus laciniatus	Cut-leaved blackberry	Rosaceae	Introduced	UPL	Deciduous shrub	na	occasional; but forming large colonies
Rubus occidentalis	Black-cap	Rosaceae	Native	N	Deciduous shrub	5	widespread native species
Rubus pensilvanicus	Blackberry	Rosaceae	Native	N	Deciduous shrub	5	widespread native species
Rubus phoenicolasius	Wineberry	Rosaceae	Introduced	N	Deciduous shrub	na	abundant weed throughout
Rudbeckia hirta var. hirta	Black-eyed-susan	Asteraceae	Native	FACU-	Biennial herb	5	widespread native species
Rudbeckia laciniata var. laciniata	Cutleaf coneflower	Asteraceae	Native	FACW	Perennial herb	5	widespread native species
Rumex acetosella	Sheep sorrel	Polygonaceae	Introduced	UPL	Perennial herb	na	abundant weed throughout
Rumex altissimus	Tall dock	Polygonaceae	Native	FACW-	Perennial herb	5	widespread native species
Rumex crispus	Curly dock	Polygonaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout
Rumex obtusifolius	Bitter dock	Polygonaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout
Sagittaria latifolia var. latifolia	Wapato	Alismataceae	Native	OBL	Perennial herb	4	limited occurrence; probably stable

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Salix babylonica complex	Weeping willow	Salicaceae	Introduced	FACW-	Deciduous tree	na	occasional
Salix fragilis	Crack willow	Salicaceae	Introduced	FAC+	Deciduous tree	na	frequent
Salix nigra	Black willow	Salicaceae	Native	FACW+	Deciduous tree	5	widespread native species
Sambucus canadensis	American elder	Adoxaceae	Native	FACW	Deciduous shrub	1	small population size; highly susceptible to deer browsing
Sanguinaria canadensis	Bloodroot	Papaveraceae	Native	UPL	Perennial herb	5	widespread native species
Sanicula marilandica	Black snake root	Apiaceae	Native	UPL	Perennial herb	5	widespread, not subject to deer browsing
Sanicula odorata	Yellow-flowered sanicle	Apiaceae	Native	FACU	Perennial herb	5	widespread, not subject to deer browsing
Saponaria officinalis	Bouncing-bet	Caryophyllaceae	Introduced	FACU-	Perennial herb	na	frequent
Sassafras albidum	Sassafras	Lauraceae	Native	FACU-	Deciduous tree	3	frequent in the canopy; seedlings and saplings heavily impacted by deer browsing
Saururus cernuus	Lizard's-tail	Saururaceae	Native	OBL	Perennial herb	5	occasional; stable
Saxifraga pensylvanica	Swamp saxifrage	Saxifragaceae	Native	OBL	Perennial herb	5	occasional; stable
Schedonorus arundinaceus	Fescue	Poaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout
Schedonorus pratensis	Meadow fescue	Poaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout
Schizachyrium scoparium var. scoparium	Little bluestem	Poaceae	Native	FACU	Perennial herb	5	widespread native species
Schoenoplectus tabernaemontani	Great bulrush	Cyperaceae	Native	OBL	Perennial herb	4	occasional in wet openings; probably stable
Scirpus cyperinus	Wool-grass	Cyperaceae	Native	FACW+	Perennial herb	5	widespread native species
Scirpus georgianus	Bulrush	Cyperaceae	Native	OBL	Perennial herb	5	widespread native species
Scirpus pedicellatus	Wool-grass	Cyperaceae	Native	OBL	Perennial herb	4	occasional; probably stable
Scirpus polyphyllus	Bulrush	Cyperaceae	Native	OBL	Perennial herb	4	occasional; probably stable
Scrophularia lanceolata	Lanceleaf figwort	Scrophulariaceae	Native	FACU+	Perennial herb	5	occasional; stable
Scrophularia marilandica	Eastern figwort	Scrophulariaceae	Native	FACU-	Perennial herb	5	occasional; stable
Scutellaria lateriflora	Mad-dog skullcap	Lamiaceae	Native	FACW+	Perennial herb	5	widespread native species
Senecio vulgaris	Common groundsel	Asteraceae	Introduced	FACU	Annual herb	na	abundant weed throughout
Senna marilandica	Southern wild senna	Fabaceae	Native	FAC+	Perennial herb		widespread native species
Setaria faberi	Giant foxtail	Poaceae	Introduced	UPL	Annual herb	na	abundant weed throughout
Setaria pumila	Yellow foxtail	Poaceae	Introduced	FAC	Annual herb	na	abundant weed throughout
Sicyos angulatus	Bur cucumber	Cucurbitaceae	Native	FACU	Annual vine	5	widespread native species
Sisyrinchium angustifolium	Blue-eyed-grass	Iridaceae	Native	FACW-	Perennial herb	5	widespread native species
Sisyrinchium montanum var. crebrum	Blue-eyed-grass	Iridaceae	Native	FAC	Perennial herb	5	widespread native species

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Smilax herbacea	Carrion-flower	Smilacaceae	Native	FAC	Perennial vine	2	heavily impacted by deer browsing; small populations
Smilax rotundifolia	Catbrier	Smilacaceae	Native	FAC	Woody vine	3	heavily impacted by deer browsing; small populations
Solanum americanum	Black nightshade	Solanaceae	Native	FACU-	Annual herb	5	widespread native species
Solanum carolinense	Horse-nettle	Solanaceae	Native	UPL	Perennial herb	5	widespread native species
Solanum dulcamara var. dulcamara	Trailing nightshade	Solanaceae	Introduced	FAC	Woody vine	na	abundant weed throughout
Solidago altissima	Late goldenrod	Asteraceae	Native	FACU	Perennial herb	5	widespread native species
Solidago caesia	Bluestem goldenrod	Asteraceae	Native	FACU	Perennial herb	3	heavily impacted by deer browsing; large populations
Solidago canadensis var. canadensis	Canada goldenrod	Asteraceae	Native	FACU	Perennial herb	5	widespread native species
Solidago gigantea var. gigantea	Smooth goldenrod	Asteraceae	Native	FACW	Perennial herb	5	widespread native species
Solidago juncea	Early goldenrod	Asteraceae	Native	N	Perennial herb	5	widespread native species
Solidago rugosa ssp. rugosa var. rugosa	Wrinkle-leaf goldenrod	Asteraceae	Native	FAC	Perennial herb	5	widespread native species
Sonchus arvensis ssp. arvensis	Field sow-thistle	Asteraceae	Introduced	UPL	Perennial herb	na	abundant weed throughout
Sonchus asper	Spiny-leaved sow-thistle	Asteraceae	Introduced	FAC	Annual herb	na	abundant weed throughout
Sorghastrum nutans	Indian-grass	Poaceae	Native	UPL	Perennial herb	5	widespread native species
Sphenopholis obtusata var. obtusata	Prairie wedgegrass	Poaceae	Native	FAC-	Perennial herb	5	widespread native species
Spirodela polyrhiza	Greater duckweed	Araceae	Native	OBL	Perennial herb	5	limited occurrence; stable
Stellaria longifolia	Long-leaved stitchwort	Caryophyllaceae	Native	FACW	Perennial herb	5	widespread native species
Stellaria media	Common chickweed	Caryophyllaceae	Introduced	N	Annual herb	na	abundant weed throughout
Styrax japonicus	Japanese styrax	Styracaceae	Introduced	N	Deciduous tree	na	occasional
Symphoricarpos orbiculatus	Coralberry	Caprifoliaceae	Native	UPL	Deciduous shrub	na	native to PA, but escaped from cultivation at these sites
Symphyotrichum cordifolium	Blue wood aster	Asteraceae	Native	N	Perennial herb	4	somewhat impacted by deer browsing
Symphyotrichum lanceolatum ssp. lanceolatum var. lanceolatum	Panicked aster	Asteraceae	Native	N	Perennial herb	5	widespread; somewhat impacted by deer browsing
Symphyotrichum lateriflorum	Calico aster	Asteraceae	Native	FACW-	Perennial herb	5	widespread; somewhat impacted by deer browsing
Symphyotrichum novae-angliae	New England aster	Asteraceae	Native	FAC	Perennial herb	4	widespread; somewhat impacted by deer browsing
Symphyotrichum pilosum var. pilosum	Heath aster	Asteraceae	Native	UPL	Perennial herb	5	widespread; somewhat impacted by deer browsing
Symphyotrichum puniceum	Purple-stemmed aster	Asteraceae	Native	OBL	Perennial herb	4	widespread; somewhat impacted by deer browsing

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Symplocarpus foetidus	Skunk cabbage	Araceae	Native	OBL	Perennial herb	5	common in wooded wetlands; not subject to deer browsing
Symplocos paniculata	Sapphire-berry	Symplocaceae	Introduced	N	Deciduous shrub	na	occasional
Taraxacum officinale	Common dandelion	Asteraceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout
Taxus baccata	English yew	Taxaceae	Introduced	FAC	Evergreen shrub	na	occasional, but heavily browsed by deer
Tetradium daniellii	Bee-bee tree	Rutaceae	Introduced	N	Deciduous tree	na	occasional
Teucrium canadense var. virginicum	Wild germander	Lamiaceae	Native	FACW	Perennial herb	5	widespread native species
Thalictrum pubescens	Tall meadow-rue	Ranunculaceae	Native	FACW+	Perennial herb	5	occasional; not heavily impacted by deer browsing
Thelypteris noveboracensis	New York fern	Polypodiaceae	Native	FAC	Perennial herb	5	widespread native species
Thelypteris palustris	Marsh fern	Polypodiaceae	Native	FACW+	Perennial herb	5	widespread native species
Thlaspi alliaceum	Garlic pennycress	Brassicaceae	Introduced	N	Annual herb	na	frequent
Tilia americana var. americana	Basswood	Malvaceae	Native	FACU	Deciduous tree	3	frequent in the canopy; seedlings and saplings heavily impacted by deer browsing
Toxicodendron radicans	Poison-ivy	Anacardiaceae	Native	FAC	Woody vine	5	widespread native species
Tridens flavus	Purpletop	Poaceae	Native	FACU	Perennial herb	5	widespread native species
Trifolium arvense	Rabbit's-foot clover	Fabaceae	Introduced	N	Annual herb	na	abundant weed throughout
Trifolium aureum	Large yellow hop-clover	Fabaceae	Introduced	N	Annual herb	na	abundant weed throughout
Trifolium campestre	Low hop-clover	Fabaceae	Introduced	N	Annual herb	na	abundant weed throughout
Trifolium dubium	Little hop-clover	Fabaceae	Introduced	UPL	Annual herb	na	abundant weed throughout
Trifolium hybridum	Alsike clover	Fabaceae	Introduced	FACU-	Perennial herb	na	
Trifolium pratense	Red clover	Fabaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout
Trifolium repens	White clover	Fabaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout
Tripsacum dactyloides	Gammagrass	Poaceae	Native	FACW	Perennial herb	na	not native at these sites where it was planted as part of a warm-season grass mix
Tsuga canadensis	Canada hemlock	Pinaceae	Native	FACU	Evergreen tree	4	occasional in the canopy; lower deer preference than some other tree species
Typha latifolia	Common cat-tail	Typhaceae	Native	OBL	Perennial herb	5	widespread native species
Ulmus americana	American elm	Ulmaceae	Native	FACW-	Deciduous tree	5	common in the canopy; lower deer preference than some other tree species
Ulmus rubra	Red elm	Ulmaceae	Native	FAC-	Deciduous tree	5	common in the canopy; lower deer preference than some other tree species
Urtica dioica ssp. dioica	Great nettle	Urticaceae	Introduced	FACU	Perennial herb	na	abundant weed throughout

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Vaccinium corymbosum	Highbush blueberry	Ericaceae	Native	FACW-	Deciduous shrub	4	somewhat impacted by deer browsing
Verbascum blattaria	Moth mullein	Scrophulariaceae	Introduced	UPL	Biennial herb	na	abundant weed throughout
Verbena hastata	Blue vervain	Verbenaceae	Native	FACW+	Perennial herb	5	widespread native species
Verbena stricta	Hoary vervain	Verbenaceae	Introduced	N	Perennial herb	na	occasional
Verbena urticifolia var. urticifolia	White vervain	Verbenaceae	Native	FACU	Annual herb	5	widespread native species
Vernonia noveboracensis	New York ironweed	Asteraceae	Native	FACW+	Perennial herb	5	widespread native species
Veronica americana	American brooklime	Plantaginaceae	Native	OBL	Perennial herb	5	widespread native species
Veronica anagallis-aquatica	Brook-pimpernel	Plantaginaceae	Introduced	OBL	Biennial herb	na	frequent
Veronica chamaedrys	Bird's-eye	Plantaginaceae	Introduced	UPL	Perennial herb	na	frequent
Veronica hederifolia	Ivy-leaved speedwell	Plantaginaceae	Introduced	N	Annual herb	na	frequent
Veronica officinalis	Common speedwell	Plantaginaceae	Introduced	FACU-	Perennial herb	na	abundant weed throughout
Veronica peregrina ssp. peregrina	Neckweed	Plantaginaceae	Native	FACU-	Annual herb	5	widespread native species
Veronica serpyllifolia	Thyme-leaved speedwell	Plantaginaceae	Introduced	FAC+	Perennial herb	na	abundant weed throughout
Veronicastrum virginicum	Culver's-root	Plantaginaceae	Native	FACU	Perennial herb	na	planted, not native at these sites
Viburnum acerifolium	Maple-leaved viburnum	Adoxaceae	Native	N	Deciduous shrub	3	heavily impacted by deer browsing
Viburnum dentatum	Southern arrow-wood	Adoxaceae	Native	FAC	Deciduous shrub	4	somewhat impacted by deer browsing
Viburnum dilatatum	Linden viburnum	Adoxaceae	Introduced	N	Deciduous shrub	na	occasional
Viburnum lentago	Nannyberry	Adoxaceae	Native	FAC	Deciduous shrub	na	native to PA, but planted at these sites
Viburnum opulus	Guelder-rose	Adoxaceae	Introduced	N	Deciduous shrub	na	occasional
Viburnum plicatum	Doublefile viburnum	Adoxaceae	Introduced	N	Deciduous shrub	na	abundant weed throughout
Viburnum prunifolium	Black-haw	Adoxaceae	Native	FACU	Deciduous shrub	4	somewhat impacted by deer browsing; large populations
Viburnum recognitum	Northern arrow-wood	Adoxaceae	Native	FACW-	Deciduous shrub	4	somewhat impacted by deer browsing
Viburnum setigerum	Tea viburnum	Adoxaceae	Introduced	N	Deciduous shrub	na	occasional
Viburnum sieboldii	Siebold viburnum	Adoxaceae	Introduced	N	Deciduous shrub	na	abundant weed throughout
Viburnum trilobum	Highbush-cranberry	Adoxaceae	Native	FACW	Deciduous shrub	na	native to PA, but planted at these sites
Vicia sativa ssp. sativa	Common vetch	Fabaceae	Introduced	FACU-	Annual herb	na	abundant weed throughout
Vicia tetrasperma	Slender vetch	Fabaceae	Introduced	N	Annual herb	na	abundant weed throughout

Appendix A continued

Vinca minor	Common periwinkle	Apocynaceae	Introduced	N	Perennial herb	na	abundant weed throughout
Viola cucullata	Blue marsh violet	Violaceae	Native	FACW+	Perennial herb	5	occasional; stable
Viola pubescens var. pubescens	Downy yellow violet	Violaceae	Native	FACU-	Perennial herb	5	occasional; stable
Viola pubescens var. scabriuscula	Downy yellow violet	Violaceae	Native	N	Perennial herb	5	occasional; stable
Viola sororia	Common blue violet	Violaceae	Native	FAC-	Perennial herb	5	widespread native species
Viola striata	Striped violet	Violaceae	Native	FACW	Perennial herb	5	occasional; stable
Vitis aestivalis	Summer grape	Vitaceae	Native	FACU	Woody vine	5	widespread native species
Vitis labrusca	Fox grape	Vitaceae	Native	FACU	Woody vine	5	widespread native species
Vitis riparia	Frost grape	Vitaceae	Native	FACW	Woody vine	5	widespread native species
Vitis vulpina	Frost grape	Vitaceae	Native	FAC	Woody vine	5	widespread native species
Xanthium strumarium	Common cocklebur	Asteraceae	Native	FAC	Annual herb	5	widespread native species
Zizia aurea	Golden-alexander	Apiaceae	Native	FAC	Perennial herb	5	planted, only at Four Mills