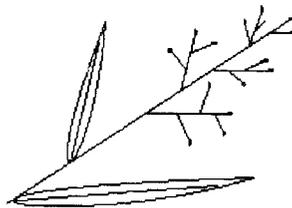


BOTANICAL SURVEY OF  
EAST BRADFORD TOWNSHIP

INCLUDING IDENTIFICATION OF  
EXCEPTIONAL NATURAL AREAS  
AND  
RARE PLANT SPECIES SITES

FIELDWORK CONDUCTED 2009

REPORT PREPARED JUNE, 2010



Survey conducted by Janet Ebert and Jack Holt  
With the assistance of  
The East Bradford Township Environmental Advisory Council  
  
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The Brandywine Conservancy, Environmental Management Center

## EAST BRADFORD TOWNSHIP BOTANICAL SURVEY

### EXECUTIVE SUMMARY

A botanical survey of East Bradford Township was conducted in 2009 by Janet Ebert and Jack Holt under the aegis of the Environmental Advisory Council. The Township was divided into twenty-four sections to facilitate the survey and to ascertain species abundance and distribution. The survey was performed by recording all plant species observed (with habitat notes for higher-quality areas) while walking roadsides, public lands, and private property of willing landowners. Special attention was given to rare plants, Exceptional Natural Areas (areas of relatively intact species-rich and native plant dominated communities), and invasive aliens.

The survey found that the Township still possesses considerable botanical richness, with at least 609 species of native plants, including 16 listed by the state as rare, threatened, or endangered. Many species once recorded as common are now apparently rare. A number of Exceptional Natural Areas were found, including two serpentine barrens, several dry upland woods, barrens, and scrublands, a number of rich tulip poplar forests, and extensive floodplain wetlands. However, this richness is threatened by habitat loss, habitat fragmentation, and encroachment from land development (mostly housing but some commercial), and habitat degradation mostly due to an overabundance of deer and numerous aggressive invasive alien plant species.

In order to retain the Township's remaining botanical diversity the following steps are recommended:

Habitat Loss Some Exceptional Natural Areas are already protected from development by conservation easements. The Township should give priority toward protecting all of the remaining mapped ENAs together with buffers and/or connectors between ENAs. The Township should also make it a priority to protect any forests present in 1937 (the first aerial photographic survey of Chester County) as even fragmented remnants of these older woodlands generally retain a fair amount of native diversity compared to those grown up since that date.

Deer The Township should coordinate (at a minimum) a township-wide management program to reduce the deer population, encouraging all landowners to participate. Efforts should also be made to coordinate this program with those of neighboring townships to make herd reduction regional.

Invasive aliens The Township should try to educate residents about the identification and control of invasive aliens and to manage natural areas to favor native species. Control of invasives could involve research programs by local universities and community volunteer efforts.

Education Uses of this information can include linking it to educational internet sites, inclusion of the data in an environmental information database for evaluating development and land management proposals, and to use as base documentation for monitoring ecological impacts of Township practices. However, care should be taken to ensure that sensitive information, i.e. locations of rare and endangered species or showy species vulnerable to destruction or theft, be made available only to trustworthy partners.

## EAST BRADFORD TOWNSHIP BOTANICAL SURVEY

### PURPOSE

This survey was authorized by the East Bradford Township Board of Supervisors with the recommendation and oversight of the Environmental Advisory Council. The purpose was to inventory the plant species and communities of the Township, paying special attention to the location and quality of native plant communities, the distribution of alien invasives, and the presence of state listed species of special concern. The information gathered in the inventory can be used to help establish conservation priorities including locating, determining, and evaluating specimen vegetation or Exceptional Natural Areas (ENAs) in the township. It can also be useful to guide restoration efforts, in attempts to control alien invasive species, and as a baseline to monitor the botanical and broader ecological health of the township. Specific objectives for conducting a botanical survey in East Bradford Township include:

- Assisting with prioritization of individual land parcels for acquisition of interests in open space.
- Enhancing the competitive position of the Township for potential receipt of State and/or County land preservation funding.
- Achieving a maximum amount of environmental protection with a minimum amount of land.
- Recognizing that natural systems operate in larger patterns and at larger scales than the scale typically represented by individual properties.
- Creating a blueprint for the protection and restoration of contiguous networks of wildlife habitat.
- Providing context and environmental considerations for new subdivision and land development projects, as well as for PENNDOT and Township road projects.
- Offering a focus for East Bradford landowner education and outreach, and for the consideration of Township-provided incentives for landowner participation in land stewardship efforts.

### METHODS

For the purposes of the survey the township was divided into twenty-four sections of more or less equal size (See Map 1 – *Botanical Survey Sections*). The division between sections was made using roads as much as possible, but also streams, utility lines, and property lines when necessary to keep the sections roughly the same size. Dividing the township into separate survey sections provided a better picture of both the frequency and distribution of plant species. More importantly, it insured that the surveyors looked at supposedly less interesting areas as well as the best habitats to develop a better feel for the relative quality and distribution of habitats.

The majority of surveying was performed by repeatedly walking the roads of the township and recording all species encountered along them and in the adjacent habitats. Some landowners gave permission for a more thorough survey of their property, thus providing access to the interior of most sections. Although they were included in the survey section lists, most of the township owned parks and nature areas were also surveyed as separate parcels for botanical baselines for conservation easements. Surveying began in early March and ended in late November, 2009.

**Previous Survey Work and Additional Resources.** East Bradford Township was likely part of the area botanized in the late colonial and early American periods by local botanists such as Humphrey Marshall, who lived in nearby Marshallton, West Bradford township, the Pierce brothers, Samuel and Joshua, from Longwood, and possibly Dr. William Darlington and Dr. Joseph Rothrock, both of West Chester, who collected plants for medicinal compounds in the 19<sup>th</sup> century. H. Stone compiled and published a *Flora of Chester County* in 1945, and in 1983, Dr. William Overlease compiled a *Checklist of the Flora of Chester County* while working at West Chester University.

The authors of this report have conducted several site-level botanical surveys since the late 1980's, the results of which are incorporated into this report. They include easement baseline surveys in Sections 13 (2007), surveys for the township for grant applications in Section 5 - Sugar Bridge (2007) and Section 22 -

Schramm (2008), and an inventory of West Chester University's Gordon Area (Section 23, 2007). Species not observed in 2009 but found during these surveys are included in the list. Lists from several older conservation easement baseline surveys were consulted for field checking but were not included in the final plant list.

Similar township botanical inventories conducted in London Britain (2008-2009), Franklin (2007), London Grove (2006), Wallace (2006), Pocopson (2002), Pennsbury (2001), Chadds Ford (2000), and Kennett (1999) were used to get a broader perspective of the flora of the township, with a special emphasis on areas in the Brandywine watershed. From a review of available literature, a fair amount of botanical work was conducted in East Bradford Township as there are frequent citations in Stone's *Flora* for Sconnelltown, Marshalltown (both serpentine barrens), the Bradford Hills (a portion of South Valley Hill), and Shaw's Bridge, among other locales.

### **THE SETTING**

East Bradford Township, located in south-central Chester County, is approximately 9,664 acres, or 15.1 square miles, in size. Its southern boundaries from east to west abut Westtown, Birmingham, and Pocopson townships, West Bradford is its neighbor to the west, East Caln lies due north, while West Whiteland, West Goshen, and the Borough of West Chester line its eastern border from north to south.

Pre-settlement vegetation consisted almost entirely of deciduous forest punctuated by natural disturbances and burning and clearing by Native Americans, exceptions being several serpentine outcrops in the southern portion of the township, whose thin, metallic, even toxic soils inhibit tree growth and promote fire-tolerant grasses, forbs, and shrubs. European settlers quickly and thoroughly cleared the once-vast forest for farmland, pasture, and timber, and agriculture became the mainstay of the local economy. Both branches of the Brandywine, Valley Creek, Plum Run, and likely Broad and Taylor Runs were dammed to power mills, and the township was more industrialized and farmed in the 1800s than it is today; several old millraces, foundations, and overly broad and large wetlands all hint at the economic past of the township. As marginal farmland was abandoned after the Civil War the percentage of forest cover increased. At the same time, the number of non-native, or alien, plant species increased at an accelerating pace. Recently the conversion of farmland and woodland to residential development has accelerated, creating a shrunken patchwork of 'unused' natural habitats, farmland, and large areas of highly managed landscapes.

Today, the township's habitats are further fragmented by a busy road network. Route 322 and its bypass are the most heavily traveled roads in the township. They serve as conduits between West Chester and Downingtown as well as destinations further east, west, and south. Routes 842, 162, 52/100, and Boot Road (in the far northeast corner) are also important and well-used highways; lesser but important roads include Copeland School Road, Hillsdale Avenue, and Brandywine Creek Road. Commercial development is concentrated near West Chester along Rts. 322 and 162, with a few small retail establishments westward on Rt. 322 and along Rt. 52. A powerline crosses the southwest corner, headed for a substation between the Brandywine and Route 322 below Sugar Bridge. It then zigzags from the substation across the north center, exiting the township just north of Sunset Hollow Road. There are no active railroads, but an abandoned rail line cuts the extreme northeast corner, and a cut for and the bed of an old trolley line that ran from West Chester to Downingtown is still visible along the Brandywine.

The township owns about 540 acres of land, some developed for active recreation, with the majority designated as nature preserves, featuring trails and small parking lots. Most of the township lands are in the process of being placed in conservation easements. Other preserved lands open to the public include Stroud Preserve (Natural Lands Trust), Gordon Natural Area (West Chester University), and West Valley Nature Center (PECO). Elsewhere several land trusts and home owners associations own or hold land with easements restricting land use.

## GEOLOGY, PHYSIOGRAPHY, AND DRAINAGE

Two major rock types underlie East Bradford Township, aligned in bands running roughly east-northeast (see Map 2 – Watersheds & Geology). A small area of metasedimentary Doe Run schist underlies the lower Plum run corridor, but the rest of the southern half of the township is underlain by Precambrian Grenvillean or Baltimore gneiss. The central neck has a smaller strand of gneiss separated from the main mass by a finger of Doe Run schist and in fault contact with slightly younger Peters Creek schist, which underlies the northern part. The northern edge overlooks but does not extend into the Chester or Great Valley, a band of younger limestone. These rocks are all over 500 million years old, and have been involved in several episodes of compression and metamorphism. During one of these episodes, small blobs of ultramafic serpentinite were intruded into the overlying rock mass. In East Bradford Township mapped outcrops are all located near the edges of the gneiss. Several of the northern outcrops are not expressed at the surface, but three have at least fragments of a serpentine barren plant community, and an unmapped slope farther east has a sliver of weathered serpentinite.

East Bradford Township lies entirely within the Brandywine-Christina watershed. The east branch of the Brandywine is the northwest boundary. It then runs through the middle of the township before turning west to join the west branch at Shaw's Bridge. Major tributaries, including Valley Creek, Broad Run, and Plum Run drain south and west toward the Brandywine.

Both the schist and the gneiss are highly weathered and eroded into irregularly hilly topography, but the Peters Creek schist has been warped up slightly, causing ridge tops to rise in elevation from less than 400 feet on the gneiss to slightly over 500 feet in the north, near the crest of South Valley Hill. The streams have cut deeply into this rise, carving out several steep-sided ravines and valleys. The east branch of the Brandywine, following a cross-fault has cut a nearly linear gorge, entering the township at 220 feet or over 300 feet lower than the highest point in East Bradford, 531 feet, east of Skelp Level Road. By the time the main stem Brandywine leaves the township, south of Shaw's Bridge, it has dropped to 170 feet.

The influence of geology on plant distribution and communities is significant but varies considerably. The well-developed serpentine barrens have very poor soil and a distinct suite of species, many of them very rare in southeastern PA because of the limited distribution of serpentinite. The difference between the gneiss and schist is more subtle, and differences in plant communities have become blurred due to human activities, deer browsing, and invading alien plants, all of which contribute to eliminating more specialized species from the flora. However, there are a number of species that are much more common on or only occur on one substrate, such as *Allium tricoccum*, conspicuous on the richer gneiss soils but absent from the Peters Creek schist, and clubmosses and native hawkweeds, which are almost entirely absent on gneiss but thrive on the thinner schist soils. Some species are more influenced by the different weathering profiles of the gneiss and schist. Polypody (rock cap fern) can nestle in the angular cracks and crevices of schist, but does not grow on the smooth round boulders of gneiss. Wetlands tend to be smaller and shadier in the narrow valleys on the schist and more open and broader on the gneiss, causing an uneven distribution of both wetlands and some wetland species. For a number of reasons, ultimately related to the underlying geology, plants that seem to prefer to grow on schist are generally native, while species with a preference for gneiss have a much higher alien component.

## THE FLORA

A total of 902 species of plants were recorded for East Bradford Township either during this survey or during the above-mentioned earlier surveys. Natives include 609 species, or 67.5% of the total, while 293 species, or 32.5%, are alien or introduced, a little below but still close to the average native/alien percentage of the seven townships previously surveyed (66.5% native, 33.5% alien). Included as aliens are 4 introductions (species native to the region but not the township) frequently planted in restorations, woodlots, or gardens.

Of the natives, 174 species, or 28.6% of the total native flora, were observed in only one or two sections, which again is fairly typical for a township survey. There are several reasons for their local rarity. Some require habitats with specific soil chemistries, temperatures, or moisture conditions that are uncommon in

the township. Others are at or near the edge of their ranges (mostly southern species moving north). A number are species once considered frequent or common in the county (See Stone's *Flora of Chester County*, 1945) which have declined drastically and are now in danger of disappearing, not only from the township but in many cases the entire region. Habitat loss from housing development and changes in land management has played a role in their reduction and disappearance, as well as the introduction of invasive aliens, the explosion in the deer population, and a decline in pollinators. Without protection, proper management, and in some cases restoration, the losses will increase. For a complete list of these species, see Appendix 1 - East Bradford Township Plant List.

### GENERAL PLANT COMMUNITIES

A plant community, as defined by Fike (1999) is 'an assemblage of plant populations sharing a common environment and interacting with each other, with animal populations, and with the physical environment'. These interactions occur at a wide range of scales, from those involving regional factors such as climate and geology to those involving chemical reactions and soil microbes. With so many (and often conflicting) influences, plant communities, especially in this area, are not discrete, easily-classified units but more a continuum. In addition, the speed and magnitude of human- (and deer-) caused alterations of the environment appear to have degraded native plant communities faster than they can adjust, and many currently widespread plant communities are unstable and dominated by aliens, especially in the shrub and forb layers. Communities in this area can only be broadly delineated according to available moisture and dominant species.

**Forests** or older woodlands have a closed canopy of trees older than 60-70 years in age. They range from dry chestnut oak-heath, to oak mix, to moister (mesic) combinations of oaks, beech, and tulip, down to swamp forest dominated by red maple and pin oak. Chestnut oak-heath communities are found exclusively on schist on the drier ridges above the Brandywine and Valley Creek, with a good example in the dry parts of the Harmony Hill Nature Area, in what we have identified as Exceptional Natural Area (ENA) 1. ENAs are remnant higher quality botanical areas; see below for a definition of an Exceptional Natural Area.

Oak-mix forests are widespread, as are more mesic beech-tulip-oak or tulip forests. Often larger wooded areas are patchy with oaks and hickories more common on thinner, eroded slopes and beech and tulip dominant on richer deeper soils on lower slopes. Older beech and younger tulip woods indicate past logging, generally for oak, or clearing, although beech is intolerant of fire. Beech-dominated forests generally have little undergrowth; exceptions usually have a dense sapling layer of beech. Tulip-oak or tulip-dominated forests are richer in both shrub and herb diversity and quantity, but are also more likely to have considerable amounts of multiflora rose, garlic mustard, and other invasives, and spicebush is usually the only significant native shrub. Native herbaceous species can vary considerably, depending on canopy dominants, past use, deer pressure, and alien load. Examples include parts of ENA's 1, 8, and 11 on schist, and ENA's 17, 18, and 21 on gneiss.

Floodplain hardwood forests on alluvial soil are usually in small groves or fragments surrounded by younger woodlands with a walnut, ash, and/or box elder maple canopy over impenetrable thickets of multiflora rose and alien herbs and grasses. Older sycamore, silver maple, bitternut hickory, and pin oak sometimes line the stream edge, especially along the Brandywine. Typical floodplain herbs such as Jacob's-ladder, Virginia waterleaf, zigzag goldenrod, Virginia bluebells, and some sedges and grasses have been reduced greatly by choking carpets of lesser celandine. ENAs 8 and 18 have some floodplain hardwoods, and ENAs 14, 19, and 22 have communities typical of the lower slope above the Brandywine.

**Younger woodlands** often have a closed or nearly closed canopy similar to forests, but tend to be dominated by one or two species of native mostly early successional trees, usually tulip, ash, red maple, and black cherry. They rarely have a well-defined understory. Aliens frequently dominate the shrub and herb layers. Common shrubs include autumn olive, multiflora rose, spicebush, black-haw, and brambles (*Rubus spp.*). Vines such as Japanese honeysuckle, bittersweet, grape, poison ivy, and Virginia creeper are generally frequent, both along the ground and climbing up trees along edges or in gaps where there is more light. Garlic mustard, stilt-grass, violets, and white avens are typical common herbs growing in this habitat. Most young woodlands have some native shrubs and herbs present, although isolated blocks are often

entirely lack them. Today it is an unusual young woodland that has more natives than aliens below and / or a significant amount of oaks and hickories in the canopy. Two parallel slopes of similar age in Paradise Farm Camp (ENA 4) have a maple-dominated canopy, but some oaks, few aliens, big patches of clubmosses, and a rich ground cover.

**Wetlands.** Most natural wetlands in East Bradford Township occur as springs and seeps along or at the 'head' of smaller streams and on the 'toes' of slopes and floodplains of larger streams. Man-made wetlands occur below ponds, in old ponds, in storm water detention basins, or where natural drainage has been impeded by roads or railroad beds.

Small wetlands in woods are usually marked in spring by the appearance of skunk cabbage, with violets, jewelweed, and tearthumbs appearing and flowering later in the season. Other typical woodland seep species include golden saxifrage, rough bluegrass, Pennsylvania bittercress, and certain sedges. Spicebush, arrowwood viburnum, elderberry, and winterberry are common shrubs; red maple (occasionally accompanied by black ash) is the typical tree if the wetland is large enough to influence the canopy.

Common marsh or open wetland plants include sensitive fern, jewelweed, tearthumbs, soft rush, purple-stemmed aster, goldenrods, rice cut-grass, reed-canary grass, and numerous sedges. Cattails and arrowhead generally grow only in the wettest areas where the ground is almost permanently inundated. Shrubs and trees such as black alder, swamp rose, buttonbush, red maple, and green ash begin the succession of a marsh to a swamp. The invasive purple loosestrife and giant reed (*Phragmites*) are frequent but patchy in the township, and the European strain of reed-canary grass is a common pest, commonly taking over marshes and open stream corridors, especially where there has been disturbance, and increased nutrient and sediment inflow. ENA 20 has a remnant of upland marsh, and ENA 23 has a large floodplain wetland.

**Aquatic habitats** include streams and ponds. Duckweed (*Lemna minor*) is the most common floating aquatic, found in both streams and ponds, sometimes with water meal or greater duckweed. Few ponds were visited during this survey, so frequency of pond weeds is likely underrepresented in the plant list. The alien water-starwort (*Callitriche stagnalis*) grows in mats along the edges of streams where there is a silty or muddy substrate. Open reaches of the Brandywine and old sloughs can support a number of aquatic or partly aquatic species such as spatterdock, bur-reed, mud plantain, riverweed (*Podostemum ceratophyllum*, SP), water stargrass, and pondweeds. Many of these specialists are hard to find when water levels remain high all summer. Probably the best single area for aquatic diversity seen in this survey is the bend in the Brandywine in ENA 22, but there are probably other pockets of aquatic diversity along the lower east branch.

**Transitional habitats (Edges, hedgerows, thickets, old fields).** These habitats have high light levels and are generally dominated by woody species with mobile seeds (spread by wind, birds, or mammals). Common trees along edges and hedgerows include black cherry, ash, sassafras, red maple, and walnut. They shade a mostly alien-dominated mixture of shrubs including multiflora rose, bush-honeysuckles, spicebush, black haw, crabapple, and brambles. Old hedgerows of Osage orange are the cores of many hedgerows, especially along old farm lanes. Most hedgerows and woodland edges are knit together by a woody suite of vines such as bittersweet, Japanese honeysuckle, poison ivy, grapes, Virginia creeper, and recently mile-a-minute and porcelain-berry. The ground flora is generally low in diversity and dominated by exotics. White avens, garlic mustard, garlic, and stilt-grass are some of the common ground species.

Old fields, or early successional habitat such as abandoned cropfields and pastures, are transitional and ephemeral in nature. As time passes after abandonment, these habitats progress from annual herbs or pasture grasses to perennials such as goldenrods, asters, and broomsedge. In this area they are quickly invaded by woody aliens such as multiflora rose, autumn olive, bittersweet, and Japanese honeysuckle, with natives such as poison ivy, grapes, and tree saplings contributing heavily.

Thickets are old fields where the shrubbery, vines, and tree saplings (especially red maple, black cherry, ash, and tulip) have grown tall or dense enough to form a low but closed canopy. The boundary between old field and thicket is not always clear, and the two habitats often interfinger until the patches of closed canopy merge. Old fields, thickets, and edges once supported a diverse mix of native grasses, sedges,

asters, goldenrods, tick trefoils, clubmosses, and shrubs. Today the majority of these habitats, especially along cropfields and in lowlands, contain a limited number of hardy natives and aggressive aliens.

**Open Lands (Meadows, fields, heavily managed communities, and roadsides).** Since any ground left alone in the region is soon colonized by woody vegetation, all non-wetland areas dominated by herbaceous plants are managed to some extent.

Meadows are areas defined as open ground (but not a full-blown wetland) where the majority of the flora is composed of native forbs, grasses, and sedges, with drainage, soil type, and slope determining the species present. Common wet meadow species include wide variety of sedges along with rushes, joe pye-weed, goldenrods, ironweed, heal-all, swamp milkweed, agrimony, and golden ragwort, with vegetation in less-managed areas frequently growing lush and tall. Drier or lower- and mid-slope meadows, whose vegetation is generally shorter in stature, are commonly dominated by goldenrods, asters, grasses (including fescue, purple top, sweet vernal grass, broomsedge, Indian grass), and sedges mixed with broader-leaved herbs such as dogbane and milkweed. The driest meadows, on upper slopes or hilltops, are generally dominated by warm-season grasses such as broomsedge and little bluestem mixed with shorter grasses like panic-grasses, accompanied by low-growing herbs including dwarf cinquefoil, hawkweeds, ox-eye daisy, tick-trefoils, grey goldenrod, uncommon milkweeds, and hardy sedges. Creepers, especially dewberry, frequently invade this habitat, especially near edges. Patches of bare ground, often the result of mowing practices or less often foot trails, are home to annuals including three-seeded mercury, sheep sorrel, and milkwort. Drier and wetter portions of meadows and stretches along woodland margins tend to have the greatest diversity of species and in general the older the meadow the higher native plant diversity it possesses.

Well-developed meadow habitat is uncommon in the township. Several township lands (Skelp Level and Paradise Valley) have been seeded with a meadow mix and now have a mixture of warm-season and alien pasture grasses, and annual weeds, but not the normal assemblage of native meadow species. Serpentine barrens are a highly specialized meadow habitat. Meadowy areas can be found here and there on steeper slopes, low spots, and infrequently though regularly mowed places. Parts of ENA 22 and the open space of several subdivisions have some meadow.

Unmown meadows are soon invaded by poison ivy, honeysuckle, multiflora rose, and tree and shrub seedlings. On the other hand too-frequent mowing discourages native herbs and grasses and turns a meadow into a Field, or an open area dominated by alien pasture or hay grasses such as orchard grass, fescue, bromes, bluegrass and timothy mixed with mostly alien broad-leaved herbs including clover and thistle. However most fields, even the most heavily utilized or managed, usually possess a few native species, especially along edges, moister areas, or on steep slopes, and the distinction between a meadow and a field is often unclear.

Utility Corridors. East Bradford has several utility corridors, the largest a powerline zig-zagging through the township. By necessity right-of-ways must be kept clear, so as a result those portions not being actively farmed are kept in a state of early succession. Although too often this continually disturbed condition favors the explosive growth of alien invasives and hardy natives, occasionally native-dominated communities develop or persist, especially in dry exposed areas or wetlands. Several of the most outstanding natural communities in the township occur under this power line or in other right-of-ways in ENA 8 and 11.

Sand and gravel bars are the only open habitats in the township currently managed and perpetuated by 'natural' means, flooding and fluctuating water levels. Their substrate varies from coarse cobbles to mud, and if they occur in sunny areas and are not overrun by hops or reed-canary grass these sites can harbor a surprisingly large number of disturbance-tolerant species (both native and alien) in a small area. There is a large gravel bar complex in ENA 18 and smaller ones in ENA 22, but much of the Brandywine has steeply eroded or undercut, frequently shaded banks and scattered barren, rarely exposed cobble bars.

**Heavily managed or ruderal communities** include pastures, active cropland, lawns, roadsides, and golf courses. In addition to cultivated species each of these continually disturbed habitats possess a typical

suite of weedy, mostly alien, and annual species including chickweed, lamb's-quarters, ragweed, thistles, and various grasses. These habitats, characterized by unstructured, low-diversity plant assemblages and compacted and chemically altered soils, allow rapid runoff of rain and nutrients (including organic and inorganic fertilizer), degrading stream and groundwater quality.

Roadsides, especially in sunny areas, are typically dominated by a few hardy and adaptable species including knotweed, ragweed, brome-grass, and chicory which are able to tolerate the harsh environment of temperature and moisture extremes, excessive mowing, pollution, and poisoning. Nonetheless roadsides often possess a surprising diversity of species, both native and alien, just a few feet back from the pavement, especially in undeveloped areas. The richness of a roadside, especially in native species, is often a good indicator of the relative health of a neighboring plant community, open or wooded.

**Barrens and Rock Faces.** East Bradford is fortunate to have several varieties of 'extreme' habitats within its boundaries. Serpentine Barrens, with their unique geology and fire-based ecology and plant life, have been extensively botanized and studied for well over a century. In spring and early summer their open areas become ablaze with color, as showy low-growing herbs including barrens chickweed, moss pink, and barrens ragwort all bloom. As the season advances early-blooming warm-season grasses and drought-tolerant herbs including gamma-grass, whorled milkweed, and rose pink become more prominent. By the end of summer warm-season grasses and a smattering of specialized sedges are dominant. Marshallton and Sconnelltown Barrens are the two main examples present in the township of this ecotype.

Less well studied are the other types of barrens present in the township. Most striking are Heath balds or Barrens. The prime example of this type, more typically found in northern and central Pennsylvania, is in the powerline cut west of Copeland School Road (ENA 11), where huckleberry and blueberry form dense carpets of low greenery over the thin soil and the dry gaps in between host a variety of warm-season grasses and low-growing drought-tolerant herbs; a second smaller version occurs on the utility cut between the two Sugar Bridge Preserves (ENA 8). An even less well-known variety of barren are anthropomorphic, or man-made, barrens, often created when the soil on a site is removed down to bedrock. The old Sonoco site at Harmony Hill (ENA 2) with its bare soil thinly covered with a variety of warm-season poverty grasses and drought-tolerant low herbs is the most notable one in the township.

Rock faces are the last type of 'extreme' habitat found in the township. Schist, with its alternating layers or bands of erosion-resistant or 'weak' rock, frequently forms sizable rock outcrops, especially along the Brandywine. These natural outcrops are home to a distinctive suite of plants, including columbine, early saxifrage, and several ferns. Their droughty tops are also frequently open and support members of barrens communities. The best rock outcrop in the township occurs at Sugar Bridge. Transportation cuts are another type of rock outcrop. Although generally too recent in origin and prone to disturbance to allow many of the natural outcrop species to colonize, they are nonetheless home to a several ferns as well as some weedy drought or disturbance tolerant herbs and creepers. Examples include the old railroad cut along South Valley Hill, the old trolley line south of Downingtown, and portions of Valley Creek Road on Paradise Farm Camp land.

## ALIENS

Aliens are defined as species that did not co-evolve in the area over long periods of time. That is, these species did not naturally occur in the area prior to European settlement but have since become part of the flora. Most are exotics, introduced from other continents, many unintentionally. A few are adventives, native elsewhere in North America, which have moved into the area in response to changes in land use or climate. Many are disturbance species that are abundant only in ruderal habitats, continually disturbed areas such as farm fields, lawns, and roadsides, and other early successional areas. The most ecologically disruptive species are those that aggressively invade natural or less-maintained areas. Unencumbered by pests, predators, or diseases, they reproduce and spread rapidly, out-competing the natives for sunlight and water and frequently reducing the flora in many areas to a small group of contending aliens. Deer speed up this process (and prevent its reversal) by preferentially browsing the natives. Many aliens, including most of the worst woody invaders, were originally introduced as ornamental or landscape plantings that do not

immediately take over - it often takes years after the initial introduction for a plant's population to reach a 'critical mass' and start dramatically expanding its range and numbers.

During this survey, 293 non-native species of plants (32.6% of the flora) were recorded for East Bradford Township, 61 of which are considered invasive. Of the invasives, 31 or half were recorded in at least 20 of 24 sections (and most likely present in all sections). Besides well-known pests such as multiflora rose, autumn olive, bittersweet, garlic mustard, Norway maple, and Japanese stilt-grass, the widespread invasives include privet, barberry, long-bristled smartweed, mile-a-minute, cut-leaved bittercress, and Amur honeysuckle. Species that seem to be increasing rapidly in the area include porcelain berry, Callery pear, the grass *Arthraxon hispidus*, linden viburnum, and Higan or weeping cherry. Asian Hercules-club is still very local but frequently produces a dense seedling carpet near a founder tree. Purple loosestrife is locally abundant in several larger wetlands, especially at Shaw's Bridge, and mitigation wetlands. Lesser celandine has practically eliminated the native herbaceous floodplain communities along the Brandywine, Valley Creek, and Plum Run.

The percent of aliens in a township flora is usually around 33 %, so East Bradford is not notably worse off than the surrounding townships. On a positive note a number of older invaders such as kudzu, several buckthorns, balloon-berry, and privet as well as more recent introductions including snowflake lily, photinia, creeping raspberry, and Japanese magnolia were not seen in this survey, although they may well be present. See Appendix 2: Invasive Aliens in East Bradford Township.

**DEER**

The negative impact of overpopulated deer has been mentioned repeatedly, and is a significant problem throughout the region, but it is severe in East Bradford Township. This represents an almost complete reversal from conditions only about 100 years ago, when deer were virtually eliminated from the area. Many older woodlands have now deteriorated into 'cathedral forests', so stripped of their shrub and ground flora that one can see considerable distances through the living columns of their aging canopy. Other forests that retain some native diversity along roadsides, nurtured and protected by light and traffic, have interiors that are now dominated by invasive shrubs and ground covers. Rare is the woodland with any significant number of sapling oaks, hickory, or even tulip, a worrisome development as older trees die and are not replaced, the gaps created quickly filled with smothering carpets of alien weeds, vines, and 'trash trees.' As long as the deer population remains high, planting native trees and introducing native plants will need costly protection, and their ultimate flourishing will remain compromised. Efforts to drastically reduce the numbers of deer to a sustainable level are critical, and must be cooperative and widespread.

**RARE PLANT SPECIES**

The Pennsylvania Natural Diversity Inventory (PNDI) keeps track of all species in the state determined to be of special concern. Endangered species (PE) are those in danger of becoming extinct in the state; Threatened species (PT) may become endangered if their habitats and populations are not maintained at current levels, while Rare species (PR) are uncommon or restricted in range or numbers. Undetermined species (PU) are believed to be in danger of population decline but currently not enough is known of their range or population dynamics to categorize them as endangered, threatened, or rare. Vulnerable (PV) species are being actively gathered by commercial collectors, while Extirpated species (PX) are believed to be extinct in the state. Special Population (SP) includes 'watchlist' species for which more information is wanted, species that indicate special habitats, species that host uncommon insects, and species with a restricted distribution in PA. There are no plant species of federal concern known to occur in East Bradford Township.

Two Endangered, nine Threatened, and five Rare species of special concern were found during the survey, six of them at more than one site, as shown on the following chart:

Scientific Name	Common Name	# Sites	State Status	Habitat
<i>Poa autumnalis</i>	Late bluegrass	1*	PE	Woodland
<i>Tripsacum dactyloides</i>	Gamma grass	1	PE	Open

<i>Bouteloua curtipendula</i>	Side-oats grama grass	1*	PT	Serpentine
<i>Cuscuta campestris</i>	Dodder	3	PT	Open
<i>Dichanthelium oligosanthes</i>	Heller's witch-grass	2*	PT	Serpentine
<i>Fimbristylis annua</i>	Annual fimbry	2*	PT	Serpentine
<i>Phemeranthus teretifolius</i>	Fame-flower	2*	PT	Serpentine
<i>Scleria pauciflora</i>	Few-flowered nut-rush	2*	PT	Serpentine
<i>Symphyotrichum depauperatum</i>	Serpentine aster	1*	PT	Serpentine
<i>Trillium cernuum</i> v. <i>cernuum</i>	Nodding trillium	1*	PT	Woodland
<i>Woodwardia areolata</i>	Netted chain-fern	1	PT	Wetland
<i>Andropogon gyrans</i>	Elliott's beard-grass	5*	PR	Open
<i>Elephantopus carolinianus</i>	Elephant's-foot	1	PR	Open
<i>Packera anonyma</i>	Barrens ragwort	1*	PR	Serpentine
<i>Tiipularia discolor</i>	Crane-fly orchid	1*	PR	Woodland
<i>Zizania aquatica</i>	Wild rice	1*	PR	Wetland

In addition, fourteen Special Population species were observed in the township:

Scientific Name	Common Name	# Sites	
<i>Allium tricoccum</i>	Wild leeks	9*	Woodland
<i>Carex conjuncta</i>	A sedge	10	Open
<i>Carex davisii</i>	Davis' sedge	3	Woodland
<i>Carex jamesii</i>	James' sedge	2*	Woodland
<i>Carex planispicata</i>	A sedge	3	Woodland
<i>Carex striatula</i>	A sedge	5	Woodland
<i>Carex tomsa</i>	A sedge	2	Barren
<i>Cerastium velutinum</i> var. <i>velutinum</i>	Barrens chickweed	2*	Serpentine
<i>Dichanthelium polyanthes</i>	A panic-grass	1	Woodland
<i>Ipomoea lacunosa</i>	Small white morning-glory	2	Open
<i>Juglans cinerea</i>	Butternut	4	Woodland
<i>Nuttallanthus canadensis</i>	Old-field toadflax	2*	Open
<i>Pellaea glabella</i>	Blue cliffbrake fern	1	Barren
<i>Podostemum ceratophyllum</i>	Riverweed	2*	Aquatic

\* indicates that at least one population for that species was known before 2009

Of the 30 species, ten prefer woodlands, while fourteen can be loosely described as 'meadow' species, eight of which are restricted to serpentine barrens. Two (*Carex tomsa*, *Pellaea glabella*) can be described as non-serpentine 'Barrens' species, while *Podostemum ceratophyllum* is aquatic. Only two plants (*Woodwardia areolata*, *Zizania aquatica*) can be considered wetland species. Thirteen are southern species at or near the northern end of their range in Chester County. See Maps 3, 4 or 5 for rare plant locations. Following are brief descriptions of each species and their habitats:

***Allium tricoccum* (Wild leeks or ramps) – Special Population**

Wild leek is becoming more common in rich woods in southern Chester County, partly because it is not bothered by deer. Locally abundant in rich woodlands and wooded slopes, especially on gneiss, it is not of special concern in Chester County.

***Andropogon gyrans* (Elliott's beard-grass) – Rare SOUTHERN**

Grows on infrequently mown dry upland meadows and banks, usually found with (but almost always less common) than its close relative broomsedge (*Andropogon virginicus*). Five populations were observed in the township in the far north and south, though not on gneiss. In PA it is only found in the southeast, and is vulnerable to natural succession and loss of habitat.

***Bouteloua curtipendula* (Side-oats grama grass) – Threatened PRAIRIE**

Restricted in southeastern Pennsylvania to open serpentine barrens (found on limestone barrens further west). It is common on the Marshalltown barren, where it is under threat by Kentucky bluegrass and other cool-season grasses and weeds.

***Carex conjuncta* (A sedge) – Special population**

This sedge usually grows in small populations on moist roadsides and disturbed ground including pastures, and is underreported rather than uncommon.

***Carex davisii* (Davis sedge) – Special population**

Three populations of this sedge were observed growing in floodplain forests (its preferred habitat) of the lower Brandywine in the southwestern part of the township.

***Carex jamesii* (James' sedge) – Special population**

This unusual few-flowered sedge, with grass-like leaves and globular perigynia, were seen twice in the township; a large population in rich woodlands on gneiss west of the Brandywine, and a smaller colony on a rich loamy shaded roadbank further west.

***Carex planispicata* (A sedge) - Special Population**

This sedge only grows on rich well-drained wooded slopes and ridges, usually above a major watercourse. Two small populations were found in this habitat overlooking the Brandywine.

***Carex striatula* (A sedge) – Special population**

This sedge of rich woods and wooded slopes is frequent in Chester County, and really should not be of special concern.

***Carex tonsa* (A sedge) – Special population**

This low-growing sedge prefers extremely dry barren open ground, although not necessarily serpentine soil. Two populations were seen growing along a powerline cut in the northern part of the township.

***Cerastium velutinum* var. *velutinum* (Barrens chickweed) – Special Population**

As its name implies barrens chickweed is entirely restricted to barrens and bare bluffs, mostly on serpentinite. Although only observed in two sections there are three separate occurrences; Marshalltown Barren, Scanneltown Barren, and Strodes Mill, where it is being crowded out by Kentucky Bluegrass and crown vetch. It is vulnerable to succession and management change.

***Cuscuta campestris* (Dodder) – Threatened**

Occasional found near the banks of larger streams, this obscure parasitic vine was seen three times growing along the East Branch Brandywine.

***Dichanthelium oligosanthes* (Heller's witch-grass) – Threatened SOUTHERN**

This bushy low-growing grass of dry meadows and serpentine barrens, was found on Scanneltown Barren and the Strodes Mill serpentine remnant. Both populations are vulnerable to succession and management change.

***Dichanthelium polyanthes* (A panic-grass) – Special Population SOUTHERN**

This grass is found in low open woods and edges, frequently on or just above floodplains, gravel bars, and rich open meadows. A small colony was seen growing along a utility cut in the northern part of the township near the East Branch of the Brandywine.

***Elephantopus carolinianus* (Elephant's-foot) – Rare SOUTHERN**

A small population of this distinctive late-blooming member of the aster family was discovered in a pasture in the southwestern part of the township. Once considered threatened in the state (and quite rare in Chester County), it has recently been downgraded to rare because of a recently documented propensity to invade and thrive in overgrazed pastures, especially in western Pennsylvania. It may be making a similar habitat and range extension in this part of the state.

*Fimbristylis annua* (**Annual fimbry**) – **Threatened**                      **SOUTHERN**

This tiny sedge thrives on bare, seasonally moist rocky soil and gravel of serpentine barrens, to which it is entirely restricted in southern Pennsylvania. It is somewhat eruptive in wet summers, and was present on both Scconnelltown and Marshalltown Barrens in 2009.

*Ipomoea lacunosa* (**Small white morning-glory**) – **Special Population**                      **SOUTHERN**

This morning glory is not of concern unless it is growing in a native habitat. In southeastern Pennsylvania it occurs only as a weed at the edges of cornfields or highly disturbed bare ground.

*Juglans cinerea* (**Butternut**) – **Special Population**

A tree of rich low or floodplain woods, rarely present in any sizable quantity but sometimes overlooked due to a superficial resemblance to its much more common relative black walnut. Four individual trees were observed in the township. It is threatened throughout its range by a canker disease.

*Nuttallanthus canadensis* (**Old-field toadflax**) – **Special Population**                      **SOUTHERN**

A small perennial herb with spikes of small but showy bluish flowers, this plant prefers sandy dry sunny soil with little competition. Populations were found in two separate sections in appropriate (albeit man-made) habitat, a dry stretch of powerline cut and in sandy dry ground near an old house site

*Packera anonyma* (**Barrens ragwort**) – **Rare**                      **SOUTHERN**

This late spring-blooming member of the aster family, almost entirely restricted to serpentine barrens in southeastern Pennsylvania, is common at Scconnelltown Barren but apparently no longer present at Strodes Mill or Marshalltown Barren.

*Pellaea glabella* (**Blue cliffbrake fern**) – **Special Population**

This relatively small fern of dry limestone or calcareous exposed cliffs and outcrops seems to be entirely restricted to cracks in masonry walls and bridges in southeastern Pennsylvania, as is the case in East Bradford Township, on what is now a foot bridge over the East Branch Brandywine Creek. There is also one site for the slightly more common purple cliff-brake (*Pellaea atropurpurea*), on an active road bridge over the Brandywine.

*Poa autumnalis* (**Late bluegrass**) – **Endangered**                      **SOUTHERN**

This low-growing grass of moist rich wooded bottomlands and floodplains (which despite its name actually blooms in June, still late for a *Poa*) seems to be on the increase in southeastern Pennsylvania. A small population of this species was observed growing just above the floodplain of the Brandywine in 2007.

*Podostemum ceratophyllum* (**Riverweed**) – **Special Population**

River weed clings tightly to large rocks in fast-moving water in sunny stretches of a stream. It is widespread but has become uncommon due to declines in water quality.

*Scleria pauciflora* (**Few-flowered nutrush**) – **Threatened**                      **SOUTHERN**

This small unusual sedge, with tiny globular seeds resembling golf balls, is almost entirely restricted to serpentine barrens in southeastern Chester County. It occurs at both Marshalltown and Scconnelltown Barrens.

*Symphotrichum depauperatum* (**Serpentine aster**) – **Threatened**

This aster is entirely restricted to serpentine barrens. It is abundant at the remnant of the Scconnelltown Barren but surprisingly is not present at the Marshalltown Barren and apparently is no longer present at Strodes Mill.

*Tipularia discolor* (**Crane-fly orchid**) – **Rare**                      **SOUTHERN**

This winter-leaving orchid of young to middle-aged woodlands has definitely expanded its range and abundance in the last 50 years in PA in the township. Unless it flowers, which only does irregularly, it is only visible from November to April. Only a single plant was seen in the township, in 2007 in the far southeast corner, but there is almost certainly more *Tipularia* in the township.

*Trillium cernuum* v. *cernuum* (**Nodding trillium**) – **Threatened**

This woodland herb favors moist rich woods, frequently growing on the upper edges of floodplains or in lower slopes of woodlands. Once considered frequent, it is a species of concern because of deer predation, and the only population observed in the township was small with mostly non-flowering plants.

*Tripsacum dactyloides* (**Gamma grass**) – **Threatened**      **SOUTHERN**

A small population of this tall husky grass was observed growing along Brandywine Creek Road south of Route 162. Once promoted as a favored forage crop for cattle, known native occurrences in the state are rare. A roadside population in PA is probably introduced, but gamma grass often occurs in ditches farther south, so the origin of this population is problematical.

*Woodwardia areolata* (**Netted chain-fern**) – **Threatened**      **SOUTHERN**

A small population of this acidic seep specialist was found growing near the mouth of a wooded rivulet just west of Valley Creek in ENA 4.

*Zizania aquatica* (**Wild rice**) - **Rare**

This tall annual grass, more common in freshwater tidal marshes, has been known from the wetlands south of Shaw's Bridge for some time, but the population has fluctuated widely, so it was a pleasant surprise to see close to a hundred plants flowering and fruiting in 2009.

**OTHER NOTABLE SPECIES, COMMENTS AND MYSTERIES**

During every township survey there are unexpected finds, identification problems, and discoveries of species with broader significance or interest. Following are some of these findings for East Bradford Township:

*Actaea pachypoda* – Doll's-eyes or white baneberry - CC=7 (see definition of 'CC' below).

*Actaea pachypoda* is frequent in PA except in the extreme southeast. Vegetatively it closely resembles its larger cousin *Actaea (Cimicifuga) racemosa*. As the small plants seen in Sections 1 and 2 did not flower, its identification was not absolutely confirmed. It is included in the list since the ID is probably correct, and it is a significant species for the township, being of northern affinity. Both sites are somewhat protected due to terrain and remoteness.

*Apocynum androsaemifolium* - Pink dogbane - CC=4

A combination of development, open land management changes, and 'tidying up' of edges and roadbanks has made this already uncommon but showy relative of the milkweeds almost extinct in the area. A possible population of this species was observed on the eastern edge of the South Valley Hill (ENA 5), but it was in the shade and did not flower.

*Asclepias incarnata* var. *incarnata* vs. var. *pulchra* – Swamp milkweed – CC=4

The two varieties of swamp milkweed differ in leaf shape and pubescence and are mapped separately in the PA flora atlas. The range of the varieties is what makes this species interesting, as var. *pulchra* is seen exclusively in southern Chester County while var. *incarnata* grows uncommon south of the Great Valley, with little overlap. East Bradford Township is apparently in the narrow overlap zone, with both varieties fairly common and seen together in several sites.

*Crataegus pensylvanica* – Pennsylvania hawthorn – CC=6 = State Rank of PT (Threatened)

A sapling of what might be this threatened small thorny tree was observed in the township, but a positive identification could not be made as it did not flower or fruit.

*Didiplis diandra* – Water purslane – Adventive

This was a “what is that?” plant for the surveyors when they found it growing with snailseed pondweed in a shallow pond/depression at the old Sonoco industrial site. A member of the loosestrife family, it is a mid-western species, reported once in Virginia, but never before in PA. This is an inconspicuous plant, and may be overlooked, but how it got into a temporary pond in southeastern PA far out of its native range is a mystery.

*Galium pedemontanum* – Piedmont bedstraw – Alien

This is a rare alien in Pennsylvania, only seen twice before in the state by the surveyors, in York County and more recently in Tredyffrin Township, Chester County. It is a ruderal species and does not appear to be a threat, but it may be extending its range.

*Lapsana communis* – Nipplewort – Alien

Nipplewort, an inconspicuous plant of moist to dry roadsides, is fairly frequent in East Bradford and eastward, but is uncommon westward in Chester County.

*Malus coronaria* – Crabapple

Our native crabapple, already an uncommon species by the 1940's, has become even rarer with both the takeover of its preferred habitat, hedgerows and edges, by non-native hybrids, multiflora rose, autumn olive, and other woody invasives. A single plant of what might have been this species was seen, but no positive ID could be made.

*Monarda fistulosa* – Wild bergamot – CC=4

Wild bergamot was once considered frequent in Chester County (Stone, 1945) and northern Delaware (Tatnall, 1946), but has become rare. The only confirmed site in East Bradford was obviously introduced. Three sites where it may occur naturally were seen too early in the season to positively identify (flowers and fruits are necessary), and were either not revisited at the proper time or the populations were sterile.

*Prunus americana* – American wild plum – CC=5

Our native plum is another species once considered frequent that has vanished throughout much of its range. Only one confirmed specimen of this shrub exists in the entire county, and it is under threat by succession. Two small potential populations of this species were observed in the township, one on the west bank of Copeland School Road, the other on the north side of the Plum Run Marsh, but neither flowered or fruited, leaving their identity a mystery.

*Rubus pascuus* (?) a blackberry

This very stout heavily-armored and aggressive blackberry of uncertain identification (or origin) was seen in three places in the northern part of the township, twice in planted meadows, which leaves some questions about how it got there. It should be watched carefully, as it has already taken over large portions of Valley Forge National Historical Park.

*Rumex altissimus* – Pale dock – CC=6

In this area pale dock is only found along the banks of the lower Brandywine. It was seen once in the township at the confluence of the east and west branches, and earlier on the west branch in Pocopson Township. Apparently it does not go any farther upstream on the east branch, or its habitat has been destroyed.

*Prenanthes trifoliolata* – Gall-of-the-earth – CC=7

*Prenanthes* species can only be identified by flowers or seeds, as the leaves are variable in shape, especially on young plants. However, many plants do not flower, and larger plants often grow on roadbanks, where they are subject to mowing. Potential members of this species were seen twice but never confirmed.

## EXCEPTIONAL NATURAL AREAS

An Exceptional Natural Area (ENA) is defined as an area composed of relatively intact, species rich, native plant dominated communities. ENAs are reservoirs of biodiversity. They may contain more than one type of plant community, including woodland, meadow, and wetland, and can vary widely in size and configuration. ENAs may also contain managed landscapes including occasionally mowed or grazed meadows or utility cuts which exhibit one or more of the characteristics noted below, and which would disappear without continued management or human intervention. The following are some biological community characteristics used to locate and determine ENAs in East Bradford Township:

- Communities containing species uncommon or declining in the township, region, or state.
- Communities that are unusually rich and diverse examples of characteristic plant communities in the township, or are the only remaining examples of these communities in the township.
- Communities that reflect unusual or regionally uncommon geologic features or structures
- Communities with a high number of species with limited ranges of ecological tolerance, or high degree of fidelity to narrow ranges of habitat condition, indicating a specialized or long-established community (Coefficient of Conservatism of 7 or greater).

Starting in the late 1970's two professors in the Chicago area developed and expanded a method for evaluating natural areas for quality and environmental integrity. Several years ago Bowman's Hill Wildlife Preserve adapted this method for use in Pennsylvania. The first and most important step in this method is to assign a Coefficient of Conservatism (CC) to every native plant found in the specified region. Bowman's Hill, in consultation with regional botanists, created lists of species with CC's for southeastern PA, which is available on their website: [www.bhwp.org](http://www.bhwp.org)

The criteria for assigning coefficients are:

- 0 to 3 Plants with a high range of ecological tolerances, found in a variety of communities
- 4 to 6 Plants with an intermediate range of ecological tolerances, usually associated with a specific plant community
- 7 to 8 Plants with a narrow range of ecological tolerances or associated with an advanced stage of plant community succession
- 9 to 10 Plants with a high degree of fidelity to a narrow range of habitats

Species with a CC of 7 or greater are used as indicators of high quality habitat and potential Exceptional Natural Areas (see *Appendix 3 - Species with a Coefficient of Conservatism of 7 or Greater*).

In East Bradford Township, 28 ENAs were identified during this survey (see maps 3, 4 or 5 for ENA locations). Their approximate size ranges from less than one acre to well over 100 acres, with an average size of about 15 acres each (see table below). Most of the areas are wooded, although many sites are mixed and there are wetland and meadow ENAs as well. It is well worth noting that, although many ENAs are legally protected either by conservation ownership or conservation easement, they still need active management of especially invasives and deer to maintain their high quality condition. New sources of erosion or pollution, modification to site hydrology, climate change impacts, new utility corridor projects, potentially even new trails, the recreating public or certain adjacent land uses may also affect them adversely. Ideally, all would receive nurturing management and monitoring.

Due to time and accessibility constraints not all parts of the township were thoroughly surveyed, so some areas that might qualify as ENAs were probably not observed. Woods that existed in the 1937 aerial photo

should also receive preservation priority, even if they are not designated as ENAs (see Map 4 for ENAs superimposed on a 1937 aerial of the Township).

<b>East Bradford Exceptional Natural Areas</b>			
<b>I.D. Number</b>	<b>Acreage</b>	<b>I.D. Number</b>	<b>Acreage</b>
1	131.2	15	5.9
2	2.3	16	1.8
3	17.0	17	10.7
4	2.3	18	17.2
5	9.4	19	2.4
6	5.0	20	0.4
7	4.6	21	11.6
8	34.8	22	63.4
9	3.0	23	17.8
10	1.8	24	1.4
11	27.4	25	0.8
12	1.1	26	23.7
13	3.6	27	13.7
14	12.6	28	2.2
		<b>Total</b>	<b>428.9</b>

## 1. HARMONY HILL BRANDYWINE SLOPES

Following an old fault, the Brandywine has carved a straight deep valley through North Valley Hill. The rocky sides of the gorge have been further dissected by small streams into narrow side valleys. Upper slopes, especially in the south, host chestnut oak-heath forest, with sizable amounts of mountain laurel, which downslope grade into more mesic oak-beech woods; the side valleys are mostly canopied by tulip shading thorn-choked slopes. Closer to the Brandywine several rocky slopes above the old trolley cut have small stands of native hemlock along with a few spring seeps. In the north the edges of and phone cuts near the old Downingtown water works are home to patches of dry upland meadow and thin woods. The two sections of the ENA are split by an overgrown stream corridor draining a former industrial site.

Section 1 Township owned - Harmony Hill Nature Area, and privately owned

DRAINAGE: East branch Brandywine GEOLOGY: Peters Creek schist

APPROX. SIZE: 131.2 acres

<u>NOTABLE SPECIES</u>	<u>Habitat</u>	<u>CC</u>	<u>Twp. Freq.</u>	<u>PA Rank</u>
Actaea pachypoda	Wooded ravines	7	2	
Cryosplenium americanum	Wooded seeps	7	3	
Diphasiastrum digitatum	Barrens, dry woods	5	4	
Epigaea repens	Dry banks	7	3	
Floerkea proserpinacoides	Floodplain woods	4	2	
Goodyera pubescens	Rocky woods	6	3	
Lycopodium hickeyi	Open woods	7	3	
Melampyrum lineare	Dry woods	7	3	
Pteridium aquilinum	Barrens, dry edges	4	3	
Pyrola elliptica	Rich woods	6	1	
Sceptridium dissectum	Rich woods	3	1	
Tsuga canadensis	Cool woods	6	3	

## 2. HARMONY HILL SONOCO BARREN

This former industrial site (Sonoco Paper), had its soil cleaned off down to bedrock. A unique mix of native successional species has grown up on the site on dry sandy areas interspersed with poorly drained clay-lined depressions. An attempt to revegetate the lower portion of the site has resulted in a weedy mix of alien shrubs and cool-season grasses, and coarse herbs. The site is being swallowed by autumn olive.

Section 1 Township owned - Harmony Hill Nature Area  
 DRAINAGE: East branch Brandywine GEOLOGY: Peters Creek schist  
 APPROX. SIZE: 2.3 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Andropogon gyrans</i>	Dry fields, meadows	6	4	PR
<i>Antennaria neodioica</i> ssp. <i>neod.</i>	Barrens, dry edges	3	3	
<i>Aristida dichotoma</i> v. <i>dichotoma</i>	Barrens, dry edges	0	3	
<i>Betula populifolia</i>	Dry upland edges	2	2	
<i>Desmodium marilandicum</i>	Dry edges, fields	5	1	
<i>Didiplis diandra</i>	Muddy puddles	NA	1	
<i>Eupatorium altissimum</i>	Waste ground	NA	2	
<i>Hypericum gentianoides</i>	Barrens, dry edges	4	3	
<i>Potamogeton diversifolius</i>	Streams, stagnant water	4	1	
<i>Solidago bicolor</i>	Dry meadows	6	5	
<i>Spiranthes cernua</i>	Poorly drained soil	6	4	
<i>Strophostyles helvola</i>	Dry edges	4	1	

### 3. PARADISE FARM CAMP YOUNG WOODLANDS

Two adjacent ravines draining southeast into Valley Creek have similar young maple-oak woods on their western slopes. The mid-slopes are not dominated by aliens and have large patches of club mosses and other native early to mid-successional species. Occasional spring seeps along the rock-filled watercourses are home to a specialized flora.

Section 2 Privately owned - Paradise Farm Camps  
 DRAINAGE: Valley Creek GEOLOGY: Peters Creek schist  
 APPROX. SIZE: 17.0 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Chamaelirium luteum</i>	Rich woods	8	2	
<i>Danthonia compressa</i>	Dry woods	7	3	
<i>Diphasistrum digitatum</i>	Dry young woods	5	4	
<i>Goodyera pubescens</i>	Rich woods	6	3	
<i>Hydrocotyle americana</i>	Spring seeps	7	1	
<i>Isotria verticillata</i>	Dry woods	7	1	
<i>Lonicera sempervirens</i>	Dry woods	5	2	
<i>Lycopodium hickeyi</i>	Dry young woods	7	3	
<i>Lycopodium obscurum</i>	Dry open woods	5	5	
<i>Thalictrum dioicum</i>	Rich woods	6	3	

### 4. PARADISE FARM CAMP SOUTH RAVINE

Near the mouth of the most southerly stream draining Paradise Farm Camp a wooded streamside seep hosts a small population of netted chain fern, a state rarity. Just north of the stream the land rises abruptly, forming a spectacular nearly vertical face plunging straight down into Valley Creek. Above the cliff and on the slope down to the stream is a remnant oak-heath mix woodland that has been mostly stripped by deer, with occasional uncommon species present near and on rock outcrops where they are somewhat protected from browsing.

Section 2 Privately owned - Paradise Farm Camp  
 DRAINAGE: Valley Creek GEOLOGY: Peters Creek schist  
 APPROX. SIZE: 2.3 acres

<u>NOTABLE SPECIES</u>	<u>Habitat</u>	<u>CC</u>	<u>Twp. Freq.</u>	<u>PA Rank</u>
Carex gracillima	Moist woods	5	2	
Lonicera sempervirens	Dry woods & banks	5	2	
Muhlenbergia sobolifera	Dry wooded slopes	5	2	
Solidago ulmifolia	Dry woods, edges	6	5	
Woodwardia aerolata	Wet woods	8	1	PT

## 5. SOUTH VALLEY HILL RIDGE AND RAILROAD CUT

East of Boot Road near the crest of South Valley runs an old railroad bed in a deep cut. Much of the railroad bed is overgrown by a mixture of alien shrubs and drought-tolerant grasses and herbs, and the extremely steep cliff-like north side of the cut is relatively barren and festooned with vines and creepers, with some less common herbs growing out of cracks. North of this cut and overlooking it is a narrow strip of open dry oak woods. Although infested with Amur honeysuckle, this dwarfed woodland is home to a variety of uncommon herbs, several not found elsewhere in the township.

Section 3 Privately owned

DRAINAGE: Valley Creek GEOLOGY: Peters Creek schist

APPROX. SIZE: 9.4 acres

<u>NOTABLE SPECIES</u>	<u>Habitat</u>	<u>CC</u>	<u>Twp. Freq.</u>	<u>PA Rank</u>
Baptisia tinctoria	Dry edges, openings	7	2	
Boechera laevigata	Dry woods	7	3	
Boechera canadensis	Dry woods & banks	5	1	
Calystegia spithamea	Dry meadows	4	1	
Carex tonsa	Dry ground	7	1	SP
Comandra umbellata	Dry woods, edges	7	2	
Galium pilosum	Dry ground	5	2	
Lespedeza capitata	Dry meadows, edges	6	2	
Paronychia fastigiata	Dry ground	7	3	
Populus tremuloides	Dry upland edges	4	1	
Pteridium aquilinum	Dry open woods, edges	4	3	
Rosa carolina	Dry fields, edges	5	3	
Quercus ilicifolia	Dry edges, barrens	8	3	

## 6. PARADISE VALLEY/VALLEY CREEK MITIGATION WETLANDS

These wetlands along both sides of Valley Creek between Ravine Road and Paradise Valley Nature Area were created to mitigate for wetlands destroyed by the Rt. 30 bypass. Over time some of these wetlands have been taken over by giant reed, especially in the south (Township owned, and not of ENA quality), while others are threatened by invasions of purple loosestrife and black alder. Despite the artificial nature of these wetlands a surprising amount of natives has either survived, survived introduction, or naturally spread into them, especially northward.

Section 4 Privately owned - Paradise Farm Camp

DRAINAGE: Valley Creek GEOLOGY: Peters Creek schist

APPROX. SIZE: 5.0 acres

<u>NOTABLE SPECIES</u>	<u>Habitat</u>	<u>CC</u>	<u>Twp. Freq.</u>	<u>PA Rank</u>
Carex debilis	Moist woods	6	2	
Carex hystricina	Wetlands	8	1	
Cyperus erythrorhizos	Wet ground	3	2	
Cyperus odoratus	Wet ground	3	1	
Heteranthera reniformis	Streambanks, rivulets	4	4	
Mimulus alatus	Streambanks, rivulets	6	5	
Saururus cernuus	Wetlands	7	1	
Scirpus atrovirens	Marshes	4	4	
Sparganium eurycarpum	Open wetlands	8	2	

## 7. PARADISE VALLEY NATURE AREA SOUTH

At the south edge of Paradise Valley Nature Area a steep ridge and protruding rock outcrop support a number of uncommon plants. Richer habitat continues upslope along the edge of a planted meadow and in a wet edge and old road in the nature area.

Section 4 Township owned - Paradise Valley Nature Area, and Privately Owned  
 DRAINAGE: Valley Creek GEOLOGY: Peters Creek schist  
 APPROX. SIZE: 4.6 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Carex communis</i>	Dry woods	5	1	
<i>Carex planispicata</i>	Dry woods	9	3	SP
<i>Cerastium nutans</i>	Dry wooded banks	5	2	
<i>Epigaea repens</i>	Dry woods	7	3	
<i>Dichanthelium boscii</i>	Dry woods	5	5	
<i>Lechea pulchella</i>	Dry edges	6	2	
<i>Lespedeza intermedia</i>	Dry fields, edges	4	4	
<i>Huperzia lucidula</i>	Rich woods	6	1	
<i>Polemonium reptans</i>	Floodplain woods	6	5	
<i>Solidago ulmifolia</i>	Dry woods, edges	6	5	
<i>Thalictrum dioicum</i>	Rocky rich woods	6	3	
<i>Trichophorum planifolium</i>	Dry rich woods	6	5	

## 8. SUGAR BRIDGE NATURE AREA AND R.O.W.

The floodplain and slope above the Brandywine south of Harmony Hill Road is home to a wide variety of specialized habitats. The floodplain near Harmony Hill Road has a meadowy area, partly open to shady wetlands, an old pond, and a dry open sandy disturbed edge with a grove of oak saplings partly shading a grass-dominated flora full of uncommon low-growing herbs. Farther south, a powerline R.O.W. has both meadow and xeric habitats. A rock outcrop looming over the Brandywine has unusual ferns growing on its lower edge and an open dry woods community on top.

Section 5 Township owned - Sugar Bridge Nature Area, and powerline R.O.W.  
 DRAINAGE: East branch Brandywine GEOLOGY: Peters Creek schist  
 APPROX. SIZE: 34.8 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Asplenium trichomanes</i>	Large rock outcrops	8	1	
<i>Arisaema dracontium</i>	Floodplain woods, edges	7	2	
<i>Boechera laevigata</i>	Rich woods	7	3	
<i>Callitriche heterophylla</i>	Sloughs, vernal pools	5	1	
<i>Carex muhlenbergii</i>	Dry banks, edges	5	1	
<i>Carex tomsa</i>	Dry banks, woods	7	1	SP
<i>Cephalanthus occidentalis</i>	Wetlands	7	3	
<i>Comptonia peregrina</i>	Dry edges	7	1	
<i>Danthonia compressa</i>	Dry woods	7	3	
<i>Dichanthelium latifolium</i>	Dry woods	5	2	
<i>Dichanthelium polyanthes</i>	Edges	8	1	SP
<i>Diodia teres</i>	Dry ground	6	1	
<i>Epigaea repens</i>	Dry woods, banks	7	3	
<i>Eragrostis hypnoides</i>	Vernal puddles	7	1	
<i>Glyceria septentrionalis</i>	Vernal pools	6	1	
<i>Hypoxis hirsuta</i>	Woods, edges	5	1	
<i>Krigia virginica</i>	Dry ground	6	1	
<i>Lechea pulchella</i>	Dry ground	6	2	
<i>Lechea racemulosa</i>	Dry ground	7	1	

<i>Lespedeza procumbens</i>	Dry ground	4	1	
<i>Lespedeza repens</i>	Dry ground	4	1	
<i>Lycopodium clavatum</i>	Dry edges	7	1	
<i>Nuttallanthus canadensis</i>	Dry ground	7	2	SP
<i>Ostrya virginiana</i>	Woods	6	3	
<i>Paronychia fastigiata</i>	Dry ground	7	3	
<i>Quercus stellata</i>	Dry woods	7	2	
<i>Scutellaria elliptica</i>	Rich dry woods	6	3	
<i>Scutellaria integrifolia</i>	Low meadows	5	2	
<i>Viburnum lentago</i>	Moist woods	5	1	

## 9. VALLEY CREEK ROAD WOODS

Along and above Valley Creek north of Sunset Hollow Road is a stretch of dry open youngish oak woods facing Valley Creek. This strip, with a steep dry roadbank cut by a phone line, possesses one of the richest assemblages of dry rich woods and edges species in the township, including several rarities not seen elsewhere.

Section 6A Privately owned

DRAINAGE: Valley Creek GEOLOGY: Peters Creek schist

APPROX. SIZE: 3.0 acres

<u>NOTABLE SPECIES</u>	<u>Habitat</u>	<u>CC</u>	<u>Twp. Freq.</u>	<u>PA Rank</u>
<i>Endodeca (Aristolochia) serpentaria</i>	Dry woods, edges	6	1	
<i>Aureolaria virginica</i>	Dry woods	6	1	
<i>Cardamine parviflora v. arenicola</i>	Dry woods	6	1	
<i>Cunila origanoides</i>	Dry woods	6	5	
<i>Dichanthelium latifolium</i>	Dry woods	5	2	
<i>Eurybia macrophylla</i>	Rocky rich woods	5	2	
<i>Ipomoea pandurata</i>	Dry fields, edges	4	2	
<i>Lespedeza intermedia</i>	Dry fields, edges	4	4	
<i>Paronychia canadensis</i>	Dry woods, edges	6	6	
<i>Scrophularia lanceolata</i>	Dry woods, edges	6	3	
<i>Solidago arguta v. arguta</i>	Rocky rich woods	6	6	
<i>Solidago ulmifolia</i>	Dry woods, edges	6	5	
<i>Trichophorum planifolium</i>	Dry woods	6	5	

## 10. SUNSET HOLLOW PARK WETLAND

The eastern portion of Sunset Hollow Park is perhaps East Bradford's best example of a small stream wetland complex, with red maple above and spicebush and skunk cabbage below as the dominant species. Although overrun by lesser celandine in spring and stilt-grass and long-bristled smartweed later in the season, this swamp still retains a wide diversity of wetland ferns, herbs, sedges, and shrubs. Scattered specimens of plants typically found in more open wetlands indicate this site was once an open marsh

Section 6A Township owned – Sunset Hollow Park

DRAINAGE: Broad Run GEOLOGY: Peters Creek schist

APPROX. SIZE: 1.8 acres

<u>NOTABLE SPECIES</u>	<u>Habitat</u>	<u>CC</u>	<u>Twp. Freq.</u>	<u>PA Rank</u>
<i>Alnus serrulata</i>	Marshes, swamps	7	4	
<i>Cardamine bulbosa</i>	Seeps, wetlands	6	6	
<i>Dryopteris cristata</i>	Wetlands	6	4	
<i>Lobelia cardinalis</i>	Wetlands	6	1	
<i>Osmunda cinnamomea</i>	Wet woods, swamps	5	5	
<i>Osmunda regalis</i>	Wet woods	7	2	
<i>Pilea fontana</i>	Wooded seeps	8	4	
<i>Quercus bicolor</i>	Wet woods	7	4	

Rosa palustris	Wetlands	7	4
Rubus hispidus	Wet woods	6	2
Sparganium americanum	Marshes, swamps	7	5

### 11. SUNSET HOLLOW WOODS AND POWERLINE CUT

The section of powerline southwest of the junction of Copeland School and Sunset Hollow Roads contains the finest and largest example of scrub shrub heathland in the township. The view from the west down the open boulder slope towards Copeland School is spectacular, especially in early autumn when the huckleberries are turning color. Breaks in the shrub cover are home to clubmosses, uncommon grasses, sedges, and numerous unusual herbs including the only township population of birds'-foot violet. A wet seepage slope downslope from a promontory is home to sphagnum and violets. Jutting out from the side of one outcrop is a large specimen of bear oak (*Quercus ilicifolia*).

Section 6B Privately owned

DRAINAGE: Broad Run GEOLOGY: Peters Creek schist

APPROX. SIZE: 27.4 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Asclepias tuberosa</i>	Dry fields, meadows	6	4	
<i>Baptisia tinctoria</i>	Barrens, dry edges	7	2	
<i>Bulbostylis capillaries</i>	Barrens, dry edges	4	3	
<i>Carex lucorum</i>	Barrens, dry edges	6	1	
<i>Carex tonsa</i>	Barrens, dry edges	7	2	SP
<i>Dichanthelium depauperatum</i>	Dry woods & edges	5	4	
<i>Diphasiastrum digitatum</i>	Barrens, dry edges	5	4	
<i>Eupatorium hyssopifolium</i>	Barrens, dry edges	4	1	
<i>Galium pilosum</i>	Barrens, dry edges	5	2	
<i>Hypericum gentianoides</i>	Barrens, dry edges	4	3	
<i>Lechea pulchella</i>	Barrens, dry edges	6	2	
<i>Lespedeza capitata</i>	Barrens, dry edges	6	2	
<i>Lycopodium hickeyi</i>	Dry open woods	7	3	
<i>Lycopodium obscurum</i>	Dry open woods	5	5	
<i>Melampyrum lineare</i>	Dry woods & edges	7	3	
<i>Nuttallanthus canadensis</i>	Barrens, dry edges	7	2	
<i>Paronychia fastigiata</i>	Dry woods & edges	7	3	
<i>Quercus ilicifolia</i>	Barrens, dry edges	8	3	
<i>Rhus copallina</i>	Barrens, dry edges	4	2	
<i>Rubus hispidus</i>	Swamps, boggy pockets	6	2	
<i>Viola fimbriatula</i>	Dry woods & edges	7	2	
<i>Viola pedata</i>	Barrens, dry edges	8	1	
<i>Viola primulifolia</i>	Wet boggy pockets	6	2	

### 12. BROAD RUN MARSH

This small stretch of open marsh and meadow east of Copeland School Road under the powerline contains a good diversity of sedges and tall herbaceous species. The edges are currently growing in, but powerline maintenance will keep woody species in check. Eastward the wetland and meadow grade into a patchy mosaic of thickets and disturbed meadows, the latter planted in meadow species presumably as part of a reclamation or mitigation project.

Section 7 Privately owned - PECO

DRAINAGE: Broad Run GEOLOGY: Peters Creek schist

APPROX. SIZE: 1.1 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Carex crinita</i>	Marshes, swamps	5	8	
<i>Eutrochium dubium</i>	Marshes, wet meadows	6	5	

Rhynchospora capitellata	Meadows, wet edges	8	1
Rosa palustris	Marshes	7	4
Thelypteris palustris	Marshes	5	8

### 13. SUNSET HOLLOW ROAD EAST / GREEN COUNTRIE ROADBANK

This small stretch of woods along Sunset Hollow between Copeland School Road and Green Countrie Lane, especially in the east, is an outstanding example of open dry oak-heath woodland. Large stretches of roadbank, partly protected from browsing by a wire fence separating it from the forest interior, are composed of heaths. Both the roadbank and the more open interior support considerable quantities of less common herbs, including sizable populations of bastard toadflax and cow-wheat.

Section 7 Privately owned

DRAINAGE: Broad Run

GEOLOGY: Peters Creek schist

APPROX. SIZE: 3.6 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq. PA Rank
Cerastium nutans	Dry wooded roadbank	5	2
Comandra umbellata	Dry wooded roadbank	7	2
Hieracium venosum	Dry open woods	6	5
Ipomoea pandurata	Dry wooded roadbank	4	2
Melampyrum lineare	Dry wooded roadbank	7	3
Solidago bicolor	Dry wooded roadbank	6	5
Trichophorum planifolium	Dry woods	6	5
Viola sagittata v. sagittata	Dry woods & edges	6	8

### 14. INGRAMS MILL / CREEK ROAD WOODED SLOPE AND SWAMP

Opposite Ingrams Mill is a scenic stretch of boulder-strewn woods above the road whose steep slopes and scenic rock outcrops have become a refuge for a number of less common rocky rich woods species. Further north towards Route 322 is a separate stretch of moderately steep and dry open oak mix woodland with a scattering of less common dry woodland and edge herbs and shrubs. North of the Ingrams Mills parking lot is a swampy low woods that hosts several uncommon floodplain wetland plants; south of Ingrams Mills, below the road, is a strip of floodplain woods and low wooded slope with yet more floodplain specialists.

Section 9 Privately owned – Natural Lands Trust and Ingram’s Mill Nature Area

DRAINAGE: East branch Brandywine

GEOLOGY: Doe Run schist

APPROX. SIZE: 12.6 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq. PA Rank
Boechera laevigata	Rocky slopes & outcrops	7	3
Carex grisea	Floodplain woods	7	8
Carex lupulina	Floodplain swamps	7	7
Carex torta	Streambanks	7	2
Cunila organoides	Dry open woods	6	5
Dicentra cucullaria	Rich wooded slopes	7	5
Eurybia schreberi	Rich wooded slopes	5	4
Mertensia virginica	Floodplain woods	7	10
Peltandra virginica	Floodplain swamps	6	2
Ranunculus caricetorum	Swamp buttercup	7	1
Rosa carolina	Dry edges, roadbanks	5	3
Scrophularia lanceolata	Dry woods, edges	6	3
Scutellaria elliptica	Dry open wods	6	3
Sedum ternatum	Floodplain woods	7	1
Silene stellata	Rocky rich woods	6	9
Solidago arguta v. arguta	Rocky rich woods	6	6
Solidago ulmifolia	Dry woods, edges	6	5

<i>Symphotrichum undulatum</i>	Barrens, dry edges	6	2
<i>Thalictrum dioicum</i>	Rocky rich woods	6	3
<i>Vaccinium stamineum</i>	Dry woods	7	9

### 15. JANE REED PARK

This small sliver of woodland tucked between Route 322 and Frank Road is a good example of rich upland woods on Baltimore gneiss. The steep roadbank and phone cut along Frank Road provides additional habitat for woodland edge species. The park has some aliens including a number of ornamental escapes, but may have been spared heavy deer traffic because of its location and frequent foot traffic.

Section 10 Township owned

DRAINAGE: East branch Brandywine GEOLOGY: Baltimore gneiss

APPROX. SIZE: 5.9 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Agastache nepetoides</i>	Rich edges	4	3	
<i>Anemone americana</i>	Rich woods	5	5	
<i>Phegopteris hexagonoptera</i>	Rich woods	6	2	
<i>Thalictrum dioicum</i>	Rich woods	6	3	
<i>Veronicastrum virginicum</i>	Rich woods, edges	8	2	

### 16. MARSHALLTON SERPENTINE BARREN

Despite recent burning this small but notable serpentine barren is being overgrown with pasture grasses and species that threaten its diversity. Nonetheless it still retains most of its barrens flora, including five state-listed species.

Section 11 Privately owned – Natural Lands Trust Stroud Preserve

DRAINAGE: East branch Brandywine GEOLOGY: Serpentinite

APPROX. SIZE: 1.8 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Arabidopsis lyrata</i>	Serpentine barrens	8	3	
<i>Asclepias verticillata</i>	Serpentine barrens	9	1	
<i>Bouteloua curtipendula</i>	Serpentine barrens	9	1	PT
<i>Cerastium velutinum</i> var. <i>velutinum</i>	Serpentine barrens	9	2	SP
<i>Cyperus lupulinus</i>	Dry fields barrens	3	2	
<i>Dichanthelium oligosanthes</i>	Serpentine barrens	7	2	PT
<i>Dichanthelium sphaerocarpon</i>	Barrens, dry edges	4	2	
<i>Fimbristylis annua</i>	Serpentine barrens	9	2	PT
<i>Juncus secundus</i>	Barrens	6	3	
<i>Phemeranthus teretifolius</i>	Serpentine barrens	10	2	PT
<i>Polygonum tenue</i>	Serpentine barrens	7	2	
<i>Sabatia angularis</i>	Serpentine barrens	7	2	
<i>Scleria pauciflora</i>	Serpentine barrens	8	2	PT

### 17. STROUD PRESERVE WOODED VALLEY

This is another good example of rich older wooded slopes on gneiss with a relatively alien-free shrub layer and forest floor.

Section 11 Privately owned – Natural Lands Trust Stroud Preserve

DRAINAGE: East branch Brandywine GEOLOGY: Baltimore gneiss

APPROX. SIZE: 10.7 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Agrimonia pubescens</i>	Rich woods	4	4	
<i>Eurybia schreberi</i>	Rich wooded slopes	5	4	

Thalictrum thalictroides Rich wooded slopes 6 6

**18. MIDDLE BRANDYWINE WOODLAND/FLOODPLAIN COMPLEX**

This rich rocky wooded lower slope is a classic example of Brandywine slope forest, with an oak-mix canopy and understory, a thin spicebush-maple-leaved viburnum shrub layer, and an enormous variety of herbs, grasses, and sedges. The upper slopes of the woods have been heavily browsed by deer, but still retain some diversity, including a huge population of the state-listed sedge *Carex jamesii*. On the floodplain the Brandywine has several channels lined with gravel bars. The island in the Brandywine has become overrun by non-natives, but again retains some of its native flora. The floodplain woodland on the east side of the Brandywine by Creek Road is less compromised and has a greater diversity of floodplain forest specialists.

Section 13 Privately owned, conservation easement  
 DRAINAGE: East branch Brandywine GEOLOGY: Baltimore gneiss  
 APPROX. SIZE: 17.2 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
Adiantum pedatum	Rich woods	6	1	
Anemone americana	Rich woods	5	5	
Carex gracilescens	Low moist woods	4	2	
Carex grisea	Floodplain woods	7	8	
Carex jamesii	Rich woods	7	2	SP
Carex lupulina	Floodplain swamps	7	7	
Ceratophyllum demersum	Sloughs	6	2	
Desmodium glutinosum	Rich wooded slopes	5	3	
Dicentra cucullaria	Rich wooded slopes	7	5	
Eutrochium purpureum	Rich wooded slopes	5	3	
Galearis spectabilis	Rich woods	6	1	
Lilium canadense	Rich woods	6	1	
Mimulus alatus	Wooded streambanks	6	5	
Mitella diphylla	Wooded banks	8	1	
Nuphar advena	Sloughs, ponds	7	3	
Obolaria virginica	Rich woods	7	1	
Phegopteris hexagonoptera	Rich woods	6	2	
Poa autumnalis	Low woods	7	1	PE
Poa cuspidata	Rich wooded slopes	6	3	
Podostemum ceratophyllum	Rocky streams	6	2	SP
Polemonium reptans	Floodplain woods	6	5	
Trillium cernuum	Rich woods	6	1	PT
Scirpus expansus	Marshes, streambanks	6	2	
Symphyotrichum prenanthoides	Floodplain woods	6	3	
Stellaria alsine	Seeps, gravel bars	6	2	
Symphyotrichum prenanthoides	Stream banks	6	3	
Viola blanda	Rich woods	5	2	
Veratrum viride	Floodplain woods	6	2	

**19. CREEK ROAD ROADBANK**

The steep rocky roadbank along Creek Road opposite Harry Waite Nature Area is home to a quality diversity of showy Brandywine Slope and floodplain species. Unfortunately the high-quality habitat does not extend into the nature area, which has been overrun by lesser celandine.

Section 14 Privately owned  
 DRAINAGE: East Br. Brandywine GEOLOGY: Baltimore gneiss  
 APPROX. SIZE: 2.4 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
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<i>Tradescantia virginiana</i>	Floodplain woods, banks	4	2
<i>Mertensia virginica</i>	Rich wooded slopes	7	10
<i>Dicentra cucullaria</i>	Rich wooded slopes	7	5
<i>Poa cuspidata</i>	Rocky wooded slopes	6	3
<i>Solidago bicolor</i>	Dry wooded banks	6	5

## 20. MINER STREET WETLAND

A tiny seepage wetland by a silted-up pond is still has a good assemblage of wet meadow / wetland species.

Section 14 Township owned

DRAINAGE: Black Horse Creek GEOLOGY: Baltimore gneiss

APPROX. SIZE: 0.4 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Juncus marginatus</i>	Wet meadows	3	2	
<i>Scirpus expansus</i>	Wetlands	6	2	
<i>Spiranthes cernua</i>	Wet meadows	6	4	

## 21. ALLERTON ROAD WOODS

This upland forest has a nice variety of rich upland woodland species typically found growing on Baltimore gneiss. Notable also for its size in a portion of the township with few quality woodlands along with a relative lack of alien invasives.

Section 16 Privately owned, conservation easement

DRAINAGE: East branch Brandywine GEOLOGY: Baltimore gneiss

APPROX. SIZE: 11.6 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Agrimonia pubescens</i>	Rich woods	4	4	
<i>Sanicula trifoliata</i>	Rich woods	5	2	
<i>Brachyelytrum erectum</i>	Rocky rich woods	5	4	
<i>Carex davisii</i>	Wooded roadbank	7	3	SP
<i>Carex striatula</i>	Rich woods	6	5	SP

## 22. SHAWS BRIDGE NORTH BRANDYWINE SLOPE WOODS & MEADOWS (Rt 842)

Much of the wooded uphill side of this long stretch of ENA along Route 842 has almost no shrub layer, but a carpet of native herbs, especially spring ephemerals. The roadbank, with more light and fewer deer, is more diverse. Below Rt. 842 is a sweeping field / meadow that varies from dry to wet as it approaches the Brandywine, with several old sloughs near the bottom.

Section 17 Privately owned

Section 20 Privately owned, Brandywine River Estates open space

DRAINAGE: East branch Brandywine GEOLOGY: Baltimore gneiss

APPROX. SIZE: 63.4 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Anemone americana</i>	Rich wooded slopes	5	5	
<i>Anemone quinquefolia</i>	Low moist woods	5	4	
<i>Asclepias incarnata v. incarnata</i>	Marshes, wet meadows	4	9	
<i>Asclepias incarnata v. pulchra</i>	Marshes, wet meadows	4	6	
<i>Bromus pubescens</i>	Rich wooded slopes	5	2	
<i>Carex grisea</i>	Floodplain woods	7	8	
<i>Carex lupulina</i>	Floodplain sloughs	7	7	
<i>Carex planispicata</i>	Rich wooded slopes	9	3	SP
<i>Cephalanthus occidentalis</i>	Marshes	7	3	
<i>Cuscuta campestris</i>	Open streambanks	6	3	PT

Dicentra cucullaria	Rich wooded slopes	7	5
Erigeron pulchellus	Rich open wooded slopes	3	2
Eutrochium purpureum	Rich wooded slopes	5	3
Heteranthera dubia	Streams, flowing water	6	1
Mertensia virginica	Floodplain woods	7	10
Muhlenbergia sobolifera	Rocky rich woods	5	2
Ostrya virginiana	Rocky rich woods	6	3
Paronychia canadensis	Dry woods & edges	6	6
Poa cuspidata	Rocky rich woods	6	3
Poa sylvestris	Rich wooded slopes	4	6
Podostemum ceratophyllum	Rocky flowing water	6	2
Scutellaria elliptica	Dry open woods	6	3
Solidago nemoralis	Dry wooded roadbanks	6	5
Veronicastrum virginicum	Dry wooded roadbanks	8	2
Zizia aptera	Dry wooded roadbanks	7	1

### 23. SHAW'S BRIDGE SOUTH FLOODPLAIN WETLAND COMPLEX

The floodplain of the Brandywine from the confluence of the two branches to Lenape is broad and contains extensive stretches of wetland. Sedimentation and nutrient loading tend to degrade such wetlands and leave them vulnerable to invasion by reed canary grass and purple loosestrife. High-quality habitat still exists from the shallow pond at the southern end of Shaw's Bridge Park to the end of the wetlands in back of the athletic fields. The first stretch of wetland, in the park, is a seasonally flooded open pond, with wetland grasses and herbs, a large quantity of bur-reed, and a few buttonbushes. South across Cottage Lane is an older scrub-shrub marsh dominated by scattered large old willows shading a relatively permanent pond dotted by tussock sedges and rimmed by tangles of shrubs. Downstream this pond gives way to path-veined thicket. Yet further south the shrubbery yields to an open floodplain marsh and meadow complex, the centerpiece of which is a more or less permanent pond and ditch that in wet years is lined with wild rice. The south end of the complex is another wet meadow, recently cleared of most of its shrubbery, which is home to a variety of meadow herbs, grasses, and sedges. A red maple thicket and swamp between the western soccer field and the Brandywine is of lower quality and diversity.

Section 19 Township owned park and privately owned  
 DRAINAGE: East branch Brandywine GEOLOGY: Doe Run schist  
 APPROX. SIZE: 17.8 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq. PA Rank
<i>Asclepias incarnata</i> v. <i>incarnata</i>	Marshes, wet meadows	4	9
<i>Asclepias incarnata</i> v. <i>pulchra</i>	Marshes, wet meadows	4	6
<i>Campanula aparinoides</i>	Marshes	6	2
<i>Carex caroliniana</i>	Moist meadows	5	3
<i>Carex lupulina</i>	Floodplain sloughs	7	7
<i>Carex pellita</i>	Marshes, wet meadows	7	3
<i>Carex squarrosa</i>	Floodplain marshes	6	2
<i>Carex stricta</i> v. <i>strictior</i>	Floodplain marshes	5	3
<i>Cephalanthus occidentalis</i>	Marshes	7	3
<i>Cicuta maculata</i>	Marshes, swamps	5	2
<i>Cyperus erythrorhizos</i>	Marshes, drawdowns	3	2
<i>Dulichium arundinaceum</i>	Marshes	7	1
<i>Echinochloa muricata</i>	Marshes, wet meadows	3	1
<i>Eutrochium dubium</i>	Marshes, wet meadows	6	5
<i>Galium asprellum</i>	Marshes	5	2
<i>Heliopsis helianthoides</i>	Meadows	4	4
<i>Iris versicolor</i>	Marshes	7	1
<i>Nuphar lutea</i>	Floodplain sloughs	7	3
<i>Panicum rigidulum</i>	Floodplain marshes	6	1
<i>Peltandra virginica</i>	Floodplain marshes	6	2

<i>Pilea fontana</i>	Marshes	8	4	
<i>Pycnanthemum muticum</i>	Meadows	5	1	
<i>Rosa palustris</i>	Marshes	7	4	
<i>Sparganium americanum</i>	Marshes	7	5	
<i>Sparganium eurycarpum</i>	Floodplain marshes	8	2	
<i>Zizania aquatica</i>	Floodplain marshes	8	1	PR

#### 24. SCONNELLTOWN SERPENTINE BARREN

This once extensive barren has been greatly reduced in size by housing development. Fortunately the bulk of the remnant has been maintained by its owner as a serpentine barren. As a result it contains large and healthy populations of a number of state rarities and serpentine specialists, with large and showy displays of wildflowers in spring and early summer.

Section 20 Privately owned

DRAINAGE: East branch Brandywine GEOLOGY: Serpentinite

APPROX. SIZE: 1.4 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Arabis lyrata</i>	Serpentine barrens	8	3	
<i>Cerastium velutinum</i> v. <i>velutinum</i>	Serpentine barrens	9	2	SP
<i>Cirsium pumilum</i>	Dry fields	4	2	
<i>Fimbristylis annua</i>	Serpentine barrens	9	2	PT
<i>Juncus secundus</i>	Barrens, bare ground	6	3	
<i>Lobelia spicata</i>	Dry meadows, serpentine	6	1	
<i>Phlox subulata</i> ssp. <i>subulata</i>	Serpentine barrens	8	1	
<i>Packera anonyma</i>	Serpentine barrens	8	1	PR
<i>Phemeranthus teretifolius</i>	Serpentine barrens	10	2	PT
<i>Polygonum tenue</i>	Serpentine barrens	8	2	
<i>Pycnanthemum tenuifolium</i>	Dry fields	4	1	
<i>Quercus stellata</i>	Dry woods, serpentine	7	2	
<i>Rosa carolina</i>	Dry fields, meadows	5	3	
<i>Sabatia angularis</i>	Serpentine barrens	7	2	
<i>Scleria pauciflora</i>	Serpentine barrens	8	2	PT
<i>Scirpus atrovirens</i>	Wet fields, marshes	4	4	
<i>Sisyrinchium mucronatum</i>	Serpentine, meadows	6	1	
<i>Spiranthes lacera</i> v. <i>gracilis</i>	Serpentine, meadows	7	1	
<i>Symphotrichum depauperatum</i>	Serpentine barrens	9	1	PT

#### 25. STRODES MILL SERPENTINE OUTCROP

This tiny highly degraded remnant of a serpentine barren, despite physical abuse and being overrun by aliens, especially bluegrass and crown vetch, still retains a small fraction of its original plant community, including a few red cedars. This site would be a worthy restoration project.

Section 20 Privately owned

DRAINAGE: Plum Run GEOLOGY: Serpentinite

APPROX. SIZE: 0.8 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
<i>Cerastium velutinum</i> v. <i>velutinum</i>	Serpentine barrens	9	2	SP
<i>Dichantherium oligosanthes</i>	Serpentine, dry fields	7	2	PT
<i>Symphotrichum depauperatum</i>	Serpentine barrens	9	1	PT

#### 26. PLUM RUN WEST MARSH

The Plum Run corridor from Strodes Mill to Radley Run Golf Course is an enormous stretch of wet open ground, occasionally interrupted by thickets or hedgerows. Crumbling side walls and traces of old dams

and ditches hint at the origins of this outsized marsh complex, a series of old ponds that silted up over the years and were then abandoned. The east end is dominated by common wetland species such as reed canary grass, goldenrods, and common horse tail. Further west, past the first line of trees, sedges become common, particularly the rhizomatous sedge *Carex trichocarpa*, which forms dense stands. After a small stretch of thickety red maples the wetland opens up again, with more sedges and wetland herbs forming the bulk of the vegetation.

Section 21 Privately owned, open space for Chesterdale Farm  
 DRAINAGE: Plum Run GEOLOGY: Baltimore gneiss  
 APPROX. SIZE: 23.7 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
Cardamine bulbosa	Marshes, spring seeps	6	6	
Carex lupulina	Sloughs, wet thickets	7	7	
Carex trichocarpa	Marshes	5	7	
Lysimachia terrestris	Marshes	8	1	
Quercus bicolor	Low woods, meadows	7	4	
Scirpus hattorianus	Marshes	4	2	
Sparganium americanum	Marshes, sloughs	7	5	

### 27. SCHRAMM ESTATE

A sizable open field/meadow dominated by warm-season grasses grades downslope into a dryish open scrub shrub slope above West Miner Street. Although cut with wooded gullies and heavily overgrown by autumn olive, it is still one of the best remaining example of an early successional dry meadow. Without management it will soon become a dense autumn olive thicket with almost no ground vegetation. Overall the woods is ordinary, but it has a few richer pockets and a few uncommon species.

Section 22 Township owned Schramm Estate  
 DRAINAGE: Black Horse Creek GEOLOGY: Baltimore gneiss  
 APPROX. SIZE: 13.7 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
Andropogon gyrans	Dry fields	6	5	PR
Aralia racemosa	Rich woods	6	1	
Asclepias tuberosa	Dry fields	6	4	
Carex caroliniana	Meadows	5	3	
Carex umbellata	Barrens, dry edges	5	6	
Cirsium pumilum	Dry fields, meadows	4	2	
Dichanthelium depauperatum	Dry woods, edges	5	4	
Fraxinus nigra	Wet woods	7	1	
Viola sagittata v. sagittata	Dry woods & edges	6	8	

### 28. GORDON NATURAL AREA PLUM RUN WETLAND

Between the low weedy field south of Tigie Road and the wooded floodplain of Plum Run lies an extensive lengthy wet area. The north and center are dominated by cattails and other weedy species, but a narrow strip at the edge of red maple woods has a diverse wetland plant assemblage.

Section 23 West Chester University Gordon Natural Area  
 DRAINAGE: Plum Run GEOLOGY: Baltimore gneiss  
 APPROX. SIZE: 2.2 acres

NOTABLE SPECIES	Habitat	CC	Twp. Freq.	PA Rank
Carex bromoides	Swamps	7	1	
Cicuta maculata	Marshes, swamps	5	2	
Dryopteris cristata	Swamps	6	4	
Galium asprellum	Marshes	5	2	
Pilea fontana	Marshes, spring seeps	8	4	

Platanthera lacera	Meadows, wet edges	4	2
Quercus bicolor	Marsh edges, swamps	7	4
Sagittaria latifolia v. pubescens	Marshes, seeps	5	4
Spiranthes cernua	Wet meadows	6	4

### PROTECTION AND MANAGEMENT STRATEGIES

When trying to decide how to conserve and protect the natural resources of the township, both plant communities and land functions must be considered. The ENAs contain examples of the best quality habitats and richest plant communities and, where not already preserved, should be the top priorities for preservation. Virtually all lands that are preserved legally, however, need active management to retain their high quality. Surrounding lands that may not have well-developed native plant communities but which function as buffers or connectors might be critical to the long-term health of contiguous ENAs, and should also be protected if possible. Alternatively, they can be the source of invasive aliens and other kinds of disturbance that are detrimental to vulnerable ENAs.

Overall, the outstanding natural features of the township are the serpentinite outcrops and the stream corridors, especially the steep slopes and the large wetlands along the Brandywine. Only one of the three serpentine barrens is now protected, and it is not managed as aggressively as one of the privately owned barrens. The third and smallest barren is privately owned and ignored. Some of the richest areas in the Brandywine corridor are already protected, notably Harmony Hill, Sugar Bridge, and Shaw's Bridge, but there are adjacent lands that are worthy of protection as significant habitats and buffers. There are other stretches, especially along Creek Road and Rt. 842 that have important but unprotected or unappreciated habitat. See Map 5 – Land Status, Exceptional Natural Areas, and Rare Plant Species.

There are other areas in the township besides the designated Exceptional Natural Areas that have significant plant species or communities and are worthy of conversation attention, including both preservation and management. Some of these habitats are undervalued and easily lost by short-sighted management. Some are mapped or included as part of wetlands, woodlands, or riparian buffers, but others are not accounted for. They can be described in rough categories:

- Small wetlands. Wetlands species can be surprisingly resilient, and stream edges, the lower edges of hayfields and pastures, and even ditches can support a diverse native wetlands flora. No wetland should be considered too small for protection, and existing wetlands should be preserved rather than replaced by created wetlands, especially in non-wetland areas. Numerous studies have shown that created wetlands are never as rich in either plant or animal life as naturally-occurring ones.
- Ponds. Ponds, especially shallow ones with fluctuating water tables, usually contain a specialized group of wetland plants growing on their banks and edges, species which often also occur in storm water detention basins and larger stream sand and gravel bars. An unmown or infrequently mown pond edge or detention basin provides habitat for insects and amphibians.
- Floodplain wetlands. All the larger waterways and their tributaries contain stretches of both forested and open floodplain, essential components of a natural flood control system which is increasingly needed with continued development and resultant rapid runoff from hardscapes.
- Meadows. Open areas managed to sustain native grasses and herbs are uncommon in the township. Much more common are pastures and hayfields, especially in the western uplands, and lawns, which are usually extremely sterile habitats. Some of these grasslands, especially in wetter and drier areas, have significant native components that could be encouraged. Esthetic and economic compromises and decisions could easily make parts of these managed habitats more diverse and richer in native species, more resilient under stressful weather conditions, and more easily and cheaply maintained.

- Roadbanks. These infrequently or indifferently managed habitats can support surprisingly rich native plant (and animal) communities, including pockets of dry meadow and woodland edge, the last of which are often richer than adjacent forest interiors. More knowledgeable management could restore dry edge communities which have been nearly eliminated in many places. These communities require less maintenance than close-cut grassy banks and with their variety of plants are more pleasing to the eye.

The biggest threats to all these communities are outright destruction, invasive alien plants, deer, and indifferent or hostile management. The battle with aliens seems unending, but can become less of a war by long-term management plans that emphasize deer control and strengthening native plant communities. Any efforts to manage or restore native plant communities of any size as long as they are kept up or followed through can go a long way towards improving the biological health of the township. It must be emphasized that rescue or restoration, rather than creation of a plant community, should be the preferred strategy for preserving biodiversity; studies have shown that artificial wetlands and other created habitats, even with intensive management, never achieve the richness or diversity of natural plant assemblages. The same is likely true of reforestation efforts, especially in terms of the restoration of the shrub and forb layers, even though a vigorous reforestation campaign is still a well-advised effort for the township to make.

Protection and management of many of these habitats depends on education and cooperation of landowners. Many tracts of older woods in the township, especially in the south have been fragmented and divided into small lots with houses, but generally still have some functioning native plant communities along edges and property lines that are valuable resources for regeneration. Significant plant resources are also found in open spaces of developments controlled by Homeowner Associations that may be unaware of the natural value of the land. Deer and invasive aliens are two of the biggest threats to native plant communities, and education and cooperation are needed to help control them.

- Deer. Fencing, birth control, and hunting are the three main methods used in controlling our native ungulate over-population problem. All have drawbacks, though a regional hunting approach is likely the only viable alternative. Fencing is expensive, since only metal fences erected high enough to keep deer from leaping over them are effective and have the additional drawback of confining deer to smaller areas, with resultant greater devastation to the flora. Birth control has not proven effective except when used in isolated populations, and is also expensive, time-consuming, and requires specialized knowledge and application. Hunting on the present scale has also shown that it cannot control our local deer herds, and in fact may be ironically increasing the population. The only method not yet tried is consistent, sustained, significant herd reduction. The proposed Valley Forge hunt, currently still in litigation, will provide one case study for the effects of this method of control on plant communities.
- Invasives. Many invasive plants such as Japanese honeysuckle and bittersweet have become widespread and thoroughly established, and can only be controlled in small areas by continuous effort. Others, such as lesser celandine buttercup, are thoroughly entrenched in specific habitats such as floodplains but have not yet fully established themselves in less preferred habitats. Still more, including Callery pear and the ornamental viburnums, are just now getting started. Except in isolated instances any major efforts to control invasives should be restricted to more recent or habitat-specific invaders, as this would give the best chance of success. In addition homeowners and businesses should be encouraged to plant only native species for landscaping, since the great majority of our woody invaders, especially the more recent ones, are horticultural escapees. A list of unwanted ornamentals could be made.

The means to control invasives are as varied as the plants themselves. Mechanical means (cutting, girdling) are the preferred methods for shrubs and trees. Spraying is more cost-effective with herbaceous species (although hand-pulling small or isolated populations is preferable), but both drift and non-specificity of sprays have been problems in the past. Biological control has had mixed results. Rose rosette disease, which afflicts multiflora rose, is now established in the area, but although it has seriously weakened local populations of rose it remains to be seen whether this virus will eliminate it. The same goes for the weevil recently introduced to control mile-a-minute and pests brought in for purple loosestrife,

the last of which seem to be less effective this far south. Some biological controls have been counterproductive, such as BT spraying for gypsy moth, which not only does not control that insect but has seriously affected native moths and butterflies and as a result the plants they pollinate. One method that has not been locally tested is fire, which further west has been shown to be effective in reducing the populations of our generally fire-intolerant alien invaders. It must be emphasized when engaging in alien removal that soil disturbance should be kept to a minimum, since freshly broken ground is usually quickly taken over by especially noxious species such as stilt-grass.

Mechanical removal of invasive aliens, especially shrubs and garlic mustard, make good community service projects, but follow-ups should also be planned so the initial effort is not lost. The Sonoco and Schramm properties, both of whom have ENAs under threat by autumn olive, and Jane Reed Park, also afflicted by woody aliens, would be good areas to conduct them. Jane Reed Park, because of its size and proximity to a school, would be ideal for an Adopt-a-Park group.

Several ENAs are in utility R.O.W.s, over which the township has little control. The township could request that the utility inform them of upcoming maintenance and tell the utility about important plant communities.

### **THE BIG PICTURE**

Over the long term the flora of an area is never static, but always adjusting to changes in climate and interactions with animals, insects, diseases, etc. However, since the arrival of Europeans in North America the rate of change has accelerated. The once-most common tree (American chestnut), the once-most common vertebrate (Passenger pigeon), and the once seasonally abundant migratory shad and herring runs are gone, at least functionally so, from the landscape. The trends toward more aliens and fewer natives, both in number of species present and biomass, toward an increase in the number of 'southern' species present are easy to see in the township. A few alien agricultural weeds such as corn cockle (*Agrostemma githago*) and flax dodder (*Linum epithyrum*) have disappeared as the result of changing agricultural practices, but they are far outweighed by the newcomers, many not even listed in Stone's Flora. It is hard to know how many natives have already been lost, but those species only seen once or twice in the township and in very low numbers are in danger of local extinction. Only a small number of natives, mainly more southerly species such as crane fly orchid and autumn blue grass, seem to be on the increase.

Despite all the threats, some quite severe, the land area now known as East Bradford Township still sustains an exceptionally rich native flora. Not only do its 902 total species but also its 609 known natives exceed the totals for any other township surveyed in Chester County, including some surveyed over multiple years. There are several reasons for this diversity, both native and exotic. Geology is of course the biggest single reason, with several major rock types, including serpentinite, a globally rare formation, underlying the township. Another is significant portions of the township, due to the foresight of the township and individual landowners, have been protected.

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APPENDIX 1  
EAST BRADFORD TOWNSHIP PLANT LIST  
2009

	<u>Families</u>	<u>Species</u>	<u>Natives</u>	<u>Aliens</u>
Spore-bearing vascular plants	12	37	36	1
Gymnosperms	3	4	2	2
Basal angiosperms	1	1	1	0
Monocots	31	255	193	62
Magnoliids	4	6	6	0
Dicots	87	599	371	228
<b>TOTAL</b>	<b>137</b>	<b>902</b>	<b>609</b>	<b>293</b>
				32.5 % Aliens

STATUS:      A = Alien      A\* = Invasive Alien      I = Native but locally introduced  
 PE – PA Endangered      PT = PA Threatened      PR = PA Rare  
 TU = PA Undetermined      PV = PA Vulnerable      SP = Special population

CC = Coefficient of Conservatism

- 0 to 3 = Plants with a high range of ecological tolerances / found in a variety of communities
- 4 to 6 = Plants with an intermediate range of ecological tolerances / associated with a specific plant community
- 7 to 8 = Plants with a small range of ecological tolerances / associated with an advanced stage in plant community succession
- 9 to 10 = Plants with a high degree of fidelity to a narrow range of habitats

OCCURANCE CODE FOR SECTIONS

- 09 = Year seen in current survey
- 08, 07, 06, 05, 04, etc. = Year observed during previous surveys

COUNT = Number of sections seen in, from a total of 24 sections

Largest Families

- 101 – ASTERACEAE (Aster family) = 68 natives, 33 aliens
- 100 – POACEAE (Grass family) = 56 natives, 44 aliens
- 82 – CYPERACEAE (Sedge family) = 79 natives, 3 aliens
- 35 – ROSACEAE (Rose family) = 22 natives, 13 aliens
- 34 – FABACEAE (Bean family) = 14 natives, 20 aliens
- 31 – LAMIACEAE (Mint family) = 19 natives, 12 aliens

Largest genera

- 58 – Carex (56 natives, 2 aliens)
- 13 – Viola (11 natives, 2 aliens)
- 11 – Solidago (all native)
- 10 – Dichanthelium (all native)
- 10 – Persicaria (5 native, 5 aliens)
- 10 – Symphyotricium (all native)
- 9 – Quercus (all native)
- 9 – Galium (6 natives, 3 aliens)
- 8 – Veronica (2 native, 6 alien)
- 8 – Viburnum (4 native, 4 alien)

Nomenclature follows Rhoads & Block 2007, The Plants of Pennsylvania, 2<sup>nd</sup> edition, The Flora of North America Vol.2, 1993 for fern families, and Weakley, 2009 for species indicated by (w).

**EAST BRADFORD TOWNSHIP PLANT LIST - 2009**

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT	
<b>Aquatics</b>					<b>17 SPECIES</b>																	<b>3 ALIENS and INTRODUCED</b>								
Alisma subcordatum		4	OBL	Water plantain					09	09				09					07			09	09	09		09			8	
Callitriche heterophylla		5	OBL	Water starwort																									1	
Callitriche sp.	A		OBL	Water-starwort sp.					09	09																			2	
Callitriche stagnalis	A		OBL	Water-starwort	09	09		09	09	09			09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	16	
Ceratophyllum demersum		6	OBL	Hornwort						09																			2	
Elodea nuttallii		5	OBL	Narrow-leaved waterweed	09	09		09	09	09			09		09	09						09	09		09	09			11	
Heteranthera dubia		6	OBL	Water-stargrass																		09							1	
Lemna minor		2	OBL	Duckweed		09	09	09	09			09	09	09	09						09	09	09	09	09	09	09	07	16	
Nuphar lutea		7	OBL	Spatterdock												09	09												3	
Peltandra virginica		6	OBL	Arrow arum									09																2	
Podosternum ceratophyllum	SP	6	OBL	Riverweed													09				09								2	
Potamogeton crispus	A		OBL	Crimped pondweed											09	09						09	09	09					5	
Potamogeton diversifolius		4	OBL	Snailseed pondweed	09																								1	
Potamogeton foliosus		2	OBL	Leafy pondweed											09											09			2	
Spirodela polyrhiza		3	OBL	Greater duckweed					09		09											09			09		09		5	
Vallisneria americana		5	OBL	Wild celery																									1	
Wolffia brasiliensis		3	OBL	Pointed water-meal											09	09													2	
<b>Ferns</b>					<b>37 SPECIES</b>																	<b>1 ALIENS and INTRODUCED</b>								
Adiantum pedatum		6	FAC-	Maidenhair fern																										1
Asplenium platyneuron		3	FACU	Ebony spleenwort	09	09	09	09	09	09	0	09	09	09	09	09	09			09	09	09	09	09	09	09	07		20	
Asplenium trichomanes		8	UPL	Maidenhair spleenwort fern						09																			1	
Athyrium filix-femina v. angustum		3	FAC	Lady fern	09	09		09	09	09	0	09	09	09	09	09				09					09	09	07		16	
Botrypus virginianus		5	FACU	Rattlesnake fern	09	09	09	09	09	09	0	09	09	09	09	07										09	07		9	
Cystopteris tenuis		4	FACU	Fragile fern	09	09	09	09	09	09	0	09	09	09	09	07		09	09						09	08			16	
Dennstaedtia punctilobula		2	UPL	Hay-scented fern	09	09	09	09	09	09	0	09	09	09	09											09			12	
Deparia acrostichoides		4	FAC	Silvery spleenwort	09	09									09	09	09				09	09	09	09	09	07			11	
Diphasiastrum digitatum		5	FACU-	Ground pine	09	09		09	0																				4	
Dryopteris carthusiana		4	FAC+	Spinulose woodfern	09	09	09	09	09	09	0	09			09	09						09					07		12	
Dryopteris celsa x cristata		6	FAC+	Celsa x cristata ?	09																								1	
Dryopteris cristata		6	FACW	Crested fern				09	09					09													09		4	
Dryopteris intermedia		4	FACU	Intermediate woodfern	09	09	09					09			09	09									09	09			8	
Dryopteris marginalis		5	FACU-	Marginal woodfern	09	09	09	09	09	09	0	09	09	09		09									09				12	
Dryopteris x hybrid		6		Hybrid wood-fern					09																				1	
Equisetum arvense		1	FAC	Field horsetail	09	09	09	09	09	0	09	09	09	09	09	09					09	09	09	09	09	09	09		17	
Huperzia lucidula		6	FACW	Shining clubmoss					09																				1	
Lycopodium clavatum		7	FAC	Runing-pine clubmoss					09																				1	

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT	
Lycopodium hickeyi			7	FACU	Hickey's tree clubmoss	09	09					0																	3	
Lycopodium obscurum			5	FACU	Tree clubmoss	09	09		09		0															09			5	
Matteuccia struthiopteris	A			FACW	Ostrich fern														09							09	09	09	4	
Onoclea sensibilis			1	FACW	Sensitive fern	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Osmunda cinnamomea			5	FACW	Cinnamon fern		09	09	09		09																	07	5	
Osmunda claytoniana			5	FAC	Interrupted fern		09	09	09			09	09			07													6	
Osmunda regalis			7	OBL	Royal fern					09																	07	2		
Pellaea atropurpurea			9	UPL	Purple cliffbrake fern												09												1	
Pellaea glabella	SP		9	UPL	Blue cliffbrake fern									09															1	
Phegopteris hexagonoptera			6	FAC	Broad beech fern									09		07													2	
Polypodium virginianum			8	UPL	Polypody		09	09	09	09	0	09	09	09											09				10	
Polystichum acrostichoides			3	FACU-	Christmas fern	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	22	
Pteridium aquilinum			4	FACU	Bracken	09	09	09																					3	
Sceptridium dissectum			3	FAC	Cut-leaved grapefern	09																							1	
Selaginella apoda			4	FACW	Creeping spikemoss													09		09				09	09				4	
Thelypteris noveboracensis			4	FAC	New york fern	09	09	09	09	0			09	09	09	07				09						09	07	14		
Thelypteris palustris			5	FACW	Marsh fern		09		09		09							09		09			09	09	09	09			8	
Woodsia obtusa			4	UPL	Blunt-lobed woodsia	09	09	09	09					09	09					09	09								8	
Woodwardia areolata	PT		8	OBL	Netted chain fern	09																							1	
<b>Forbs</b>					<b>483 SPECIES</b>					<b>175 ALIENS and INTRODUCED</b>																				
Abutilon theophrastii	A			UPL	Velvet-leaf	09			09					09	09								09						5	
Acalypha gracilens			3	UPL	Slender 3-seeded mercury			09				09	09																3	
Acalypha rhomboidea			0	UPL	Three-seeded mercury	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23	
Acalypha virginica			2	FACU-	Three-seeded mercury			09	09		09					09													4	
Achillea millefolium	A			UPL	Yarrow	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23	
Acorus calamus	A			OBL	Sweet flag	09		09	09	09		09	09	09	09	09	09			09	09	09	09	09	09	09	07	13		
Actaea pachypoda			7	UPL	White baneberry	09	09																						2	
Actaea racemosa			5	UPL	Black cohosh			09	09			09	09	09	07	09	09						09			07		10		
Aegopodium podagraria	A			FACU	Goutweed	09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		15	
Aethusa cynapium	A			UPL	Fool's-parsley									09					09		09								3	
Agastache nepetoides			4	FACU	Yellow giant hyssop									09	09	07													3	
Ageratina altissima v. altissima			2	UPL	White snakeroot	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Agrimonia parviflora			2	FAC	Small-flowered agrimony	09	09	09	09	0	09		09	09	09		09	09	09	09	09	09	09	09	09	09	09		18	
Agrimonia pubescens			4	UPL	Agrimony		09										09	09		09							07	5		
Alliaria petiolata	A*			FACU-	Garlic mustard	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Allium canadense			4	FACU	Meadow onion	09	09	09	09	09	0	09	09	09	09	09	09						09	09	09			15		
Allium oleraceum	A			X	Wild garlic				09							07													2	
Allium tricoccum	SP		5	FACU	Wild leeks								09	09	09	09	09			09	09	09		09				9		
Allium vineale	A			FACU-	Field garlic	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Amaranthus hybridus	A		UPL	Green amaranth											09					09	09	09		09					5
Amaranthus spinosus	A		FACU	Thorny amaranth					09	0		09			09						09					09			6
Ambrosia artemisiifolia		0	FACU	Common ragweed	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Ambrosia trifida		1	FAC	Great ragweed	09	09	09	09	09	09	0	09	09	09	09	09	09				09	09	09	09	09	09	09	09	23
Anagallis arvensis	A		UPL	Scarlet pimpernel		09	09	09					09								09				09	09			8
Anemone americana		5	UPL	Round-lobed hepatica							0	09	09				07								09				5
Anemone quinquefolia		5	FACU	Wood anemone				09			0														09	08			4
Anemone virginiana		4	FACU	Thimbleweed	09		09	09	09	09		09	09		09												09		9
Antennaria neglecta		2	UPL	Field pussytoes				09																	09	09			3
Antennaria neoioica ssp. neoioica		3	UPL	Small pussytoes	09		09							09															3
Antennaria parlinii ssp. parlinii		3	UPL	Plantain-leaved pussytoes	09		09	09	09			09	09																6
Antennaria plantaginifolia		3	UPL	Plantain-leaved pussytoes	09	09	09	09	09	09	0	09	09	09	09										09	09			13
Anthemis cotula	A		FACU-	Mayweed																							07		1
Apocynum cannabinum		1	FACU	Indian hemp, dogbane	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Apocynum x medium		2	X	Intermediate dogbane											09														1
Aquilegia canadensis		7	UPL	American columbine		09																							1
Arabis lyrata (w)		8	FACU	Lyre-leaved rock cress											09										09	09			3
Arabis thaliana	A		UPL	Mouse-ear cress			09			0	09	09	09	09					09			09					09		9
Aralia nudicaulis		5	FACU	Wild sarsaparilla		09	09	09			0	09																	5
Aralia racemosa		6	UPL	Spikenard																							09		1
Arctium lappa	A		UPL	Great burdock																	09				09	09	07		4
Arctium minus	A		FACU-	Common burdock	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22
Arenaria serpyllifolia	A		FAC	Thyme-leaved sandwort			09					09	09	09							09				09	09	07		8
Arisaema dracontium		7	FACW	Green dragon					09															09					2
Arisaema triphyllum		3	FACW	Jack-in-the-pulpit	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23
Artemisia annua	A		FACU	Annual wormwood		09		09				09												09		09			5
Artemisia vulgaris	A		UPL	Mugwort	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Asarum canadense		4	FACU-	Wild ginger	09	09	09	09	09	09			09	09	09	09	09								09				12
Asclepias incarnata v. incarnata		4	OBL	Northern swamp milkweed			09	09							09	09	09	09	09	09	09	09	09	09	09	09	09		9
Asclepias incarnata v. pulchra		4	OBL	Hairy swamp milkweed								09									09	09	09	09	09		09		6
Asclepias syriaca		1	FACU-	Common milkweed	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Asclepias tuberosa		6	UPL	Butterfly weed						0	09														09	09			4
Asclepias verticillata		9	UPL	Whorled milkweed											09														1
Asparagus officinalis	A		FACU	Asparagus									09	09	09					09					09	09			6
Atriplex patula	A		FACW	Orach	09	09						09						09	09					09	09	09	09		9
Aureolaria virginica		6	UPL	Downy yellow false-foxglove					09																				1
Baptisia tinctoria		7	UPL	Wild indigo		09				0																			2
Barbarea verna	A		UPL	Spring cress																					09				1
Barbarea vulgaris	A		FACU	Wintercress	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Bidens bipinnata		2	UPL	Spanish needles			09							09	09	09			09					09				6
Bidens cernua		4	OBL	Bur-marigold		09		09	09					09	09						09	09						7
Bidens connata		3	FACW	Beggar's-ticks				09	09	09	09			09	09	09	09	09						09		07		11
Bidens frondosa		1	FACW	Beggar's-ticks	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Bidens polylepis	A		FACW	Tickseed sunflower							09																	1
Bidens vulgata		1	WETL	Beggar's-ticks										09														1
Boechera canadensis (w)		5	UPL	Sicklepod			09																					1
Boechera laevigata (w)		7	UPL	Smooth rock-cres			09	09				09																3
Boehmeria cylindrica		3	FACW	False nettle	09	09	09	09	09	09	0	09	09	09	09	09		09		09	09	09		09		09		19
Brassica rapa	A		UPL	Mustard		09							09	09	09	09		09	09	09	09		09	09	09	08		12
Buglossoides arvense	A		UPL	Corn gromwell																			09	09	09			3
Campanula aparinoides		6	OBL	Marsh bellflower																		09	09					2
Capsella bursa-pastoris	A		FACU	Shepherd's purse							09		09	09	09		09		09		09				09			8
Cardamine bulbosa		6	OBL	Spring cress	09		09	09				09										09	09					6
Cardamine concatenata		5	FACU	Cut-leaved toothwort	09	09	09	09			09	09	09		09	09	09					09	08					12
Cardamine hirsuta	A		FACU	Hairy bittercress	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Cardamine impatiens	A*		UPL	Cut-leaved bittercress	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Cardamine parviflora v. arenicola		6	FACU	Small-flowered bittercress						09																		1
Cardamine pensylvanica		5	OBL	Pennsylvania bittercress	09	09	09	09	09			09	09		07			09	09	09	09	09		09				14
Carduus nutans	A		UPL	Nodding thistle		09		09	09	09	09	09	09		09		09						09	09				10
Caulophyllum thalictroides		5	UPL	Blue cohosh									09	07	09							09		07				5
Centaurea jacea	A		UPL	Brown knapweed									09									09						2
Centaureum pulchellum	A		FAC	Centuary			09																					1
Cerastium fontanum	A		FACU-	Mouse-eared chickweed	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Cerastium glomeratum	A		UPL	Mouse-ear chickweed			09	09	0	09	09	09	09						09	09	09	09	09		09			13
Cerastium nutans		5	FAC	Nodding chickweed			09		09																			2
Cerastium velutinum var. velutinum	SP	9	UPL	Barrens chickweed									09									09						2
Chaenorrhinum minus	A		UPL	Dwarf snap-dragon			09																					1
Chamaecrista nictitans		4	UPL	Wild sensitive plant	09	09	09	09			09						09											6
Chamaelirium luteum		8	FAC	Fairy-wand		09			0																			2
Chamaesyce maculata (w)		0	FACU-	Milk purslane			09	09		09		09	09	09	09	09		09		09	09	09	09	09		09		13
Chamaesyce nutans (w)		1	FACU-	Eyebane			09	09		09		09					09	09	09	09	09	09	09					10
Chelidonium majus	A		UPL	Celandine	09	09	09	09	09	0	09	09	09	09	09	09		09	09	09	09	09	09	09	09	09		21
Chelone glabra		5	OBL	Turtlehead	09	09	09	09		09			09				09	09				09	09		09	09		10
Chenopodium album	A		FACU	Lamb's-quarters	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23
Chimaphila maculata		4	UPL	Spotted wintergreen	09	09	09	09	09	0	09	09	09	09	09		09					09	09		09			14
Chrysanthemum leucanthemum	A		UPL	Ox-eye daisy	09	09	09	09	09	0	09	09	09								09	09	09	09	09			15
Chrysosplenium americanum		7	OBL	Golden saxifrage	09	09	09																					3
Cichorium intybus	A		UPL	Chicory		09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		22

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Cicuta maculata			5 OBL	Water hemlock																			09			09		2	
Circaea canadensis ssp canadensis			2 FACU	Enchanter's-nightshade	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Cirsium arvense	A*		FACU	Canada thistle	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Cirsium discolor			2 UPL	Field thistle	09	09	09	09	09	0	09	09		09	09						09	09			09		09	09	16
Cirsium pumilum			4 UPL	Pasture thistle																					09	09		2	
Cirsium vulgare	A		FACU-	Bull thistle	09		09	09	09	0	09	09	09	09	09	09	09	09	09	09		09	09	09	09	09	09	09	22
Claytonia virginica			3 FAC	Spring beauty	09	09	09	09	09	0		09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	08	22
Clinopodium vulgare	A		UPL	Wild basil		09	09	09	09	0		09	09			07										09	09		11
Collinsonia canadensis			5 FAC+	Horse-balm		09	09	09	09	0		09	09	09			07				09			09	09	09	07		14
Comandra umbellata			7 UPL	Bastard toad-flax			09					09																	2
Commelina communis	A		FAC-	Asiatic dayflower	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Conium maculatum	A		FACW	Poison hemlock	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Convallaria majalis	A		UPL	Lily-of-the-valley																						09		1	
Conyza canadensis			0 UPL	Horseweed	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Cryptotaenia canadensis			2 FAC	Honewort	09	09	09	09	09	0		09	09	09	09	09	09	09	09	09	09	09	09	09		09	09	07	21
Cunila origanoides			6 UPL	Dittany	09		09	09	09				09																5
Cymbalaria muralis	A		UPL	Kenilworth-ivy				09														09							2
Daucus carota	A		UPL	Wild carrot	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Desmodium glutinosum			5 UPL	Pointed-leaved tick-trefoil											09	09	09												3
Desmodium marilandicum			5 UPL	Smooth small-leaved tick-trefo	09																								1
Desmodium nudiflorum			5 UPL	Naked-flowered tick-trefoil				09																		09		2	
Desmodium paniculatum			3 UPL	Panicled tick-trefoil	09		09	09	09	0	09	09														09		9	
Desmodium perplexum			3 UPL	Tick-trefoil	09	09		09	09	09	09	09	09		09	09	07			09					09	09	07	15	
Dianthus armeria	A		UPL	Deptford pink	09	09	09	09	09	0	09	09	09	09	09	09		09		09	09	09	09	09	09	09	09	09	20
Dicentra cucullaria			7 UPL	Dutchman's breeches									09				07	09			09			09					5
Didiplis diandra	A		OBL	Water-purslane	09																								1
Diodia teres			6 UPL	Buttonwood					09																				1
Dipsacus sylvestris	A		FACU-	Teasel			09	09	09		09		09		09														6
Draba verna	A		UPL	Whitlow-wort			09			0													09						3
Duchesnea indica	A*		FACU-	Indian strawberry	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Dysphania ambrosioides	A		FACU	Mexican tea						0	09		09				09			09	09					09			7
Eclipta prostrata			2 FAC	Yerba-de-tajo								09			09														2
Elephantopus carolinianus	PR		6 FACU	Elephant's-foot																	09								1
Endodeca serpentaria (w)			6 UPL	Virginia snakeroot					09																				1
Epifagus virginiana			6 UPL	Beechdrops	09	09	09	09	09	0	09	09		09	09		09	09		09	09				09	09		16	
Epigaea repens			7 UPL	Trailing arbutus	09		09	09																					3
Epilobium coloratum			2 OBL	Willow herb	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	24
Epipactis helleborine	A		X	Heleborine orchid								09					09			09	09								4
Eranthis hyemalis	A		X	Winter aconite																	09								1

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT	
Erechtites hieracifolia		0	FACU	Pilewort	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Erigeron annuus		0	FACU	Daisy fleabane	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Erigeron philadelphicus		1	FACU	Common fleabane	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Erigeron pulchellus		3	FACU	Robin's-plantain																				09		07		2		
Erigeron strigosus		0	FACU	Fleabane	09	09		07		09			09	09											09		09		8	
Erythronium americanum		4	FAC	Trout lily	09		09	09	09	0			09	09	09		09	09	09			09			09	08			14	
Eupatorium altissimum	A		X	Tall thoroughwort	09	09																							2	
Eupatorium hyssopifolium		4	UPL	Hyssop-leaved thoroughwort							0																		1	
Eupatorium perfoliatum		3	FACW	Boneset		09	09	09	07	09	0	09		09	09	09	07	09	09	09	09			09		07			17	
Eupatorium serotinum	A		FAC-	Late thoroughwort	09	09			09																	09			4	
Euphorbia corollata		4	UPL	Flowering spurge																						09			1	
Euphorbia cyparissias	A		X	Cypress spurge									09																1	
Eurybia divaricata		3	UPL	White wood aster	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09		09	09			09	09	09	09		21
Eurybia macrophylla		5	X	Bigleaf aster				09	09	0																			3	
Eurybia schreberi		5	UPL	Bigleaf aster				09		0			09	09											09				5	
Euthamia graminifolia		3	FAC	Grass-leaved goldenrod	09	09	09	09	09		0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		22
Eutrochium dubium		6	FACW	Marsh joe-pye weed			09			0	09			09										09					5	
Eutrochium fistulosum		3	FACW	Hollow joe-pye weed	09		09	09							09	07							09				07		8	
Eutrochium purpureum		5	UPL	Woodland joe-pye weed											09	07								09					3	
Fallopia japonica	A*		FACU-	Japanese knotweed	09	09	09	09	09				09	09	09				09							09			10	
Ficaria verna (w)	A*		FAC	Lesser celandine	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		23
Floerkea proserpinacoides		4	FAC	False mermaid-weed	09												09												2	
Fragaria virginiana		2	FACU	Wild strawberry	09	09	09	09	09		09					09						09					09		9	
Galanthus nivalis	A		X	Snowdrops													09												1	
Galearis spectabilis		6	UPL	Showy orchis													07												1	
Galinsoga quadriradiata	A		UPL	Galinsoga			09	09	09	09	0	09			09			09	09	09	09	09	09	09	09	09	09	07	14	
Galium aparine		1	FACU	Cleavers	09	09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		22
Galium asprellum		5	OBL	Rough bedstraw																				09		09			2	
Galium circaezans		5	UPL	Wild white licorice	09	09	09	09	09	09	0	09	09	09	09	09	07	09	09	09	09			09	09	09	09	07	18	
Galium mollugo	A*		UPL	Wild madder	09	09		09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		21
Galium pedemontanum	A		n	Piedmont bedstraw					09																				1	
Galium pilosum		5	UPL	Hairy bedstraw			09			0																			2	
Galium tinctorium		4	OBL	Swamp three-petalled bedstra				09				09		09	09	09	09						09	09		09			7	
Galium triflorum		3	FACU	Sweet bedstraw	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		22
Galium verum	A		UPL	Yellow bedstraw											09														1	
Geranium carolinianum		1	UPL	Carolina cranesbill	09		09																	09	09	09			5	
Geranium maculatum		4	FACU	Wild geranium	09	09	09	09	09	09	0	09	09	09	09	07	09			09				09	09	09	07		17	
Geranium sibiricum	A		X	Siberian geranium	09	09			09			09	09	09	09	09	09												9	
Geum canadense		1	FACU	White avens	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		24

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Geum laciniatum		3	FAC+	Rough avens			09	09	09																				3
Geum verum		4	FACU	Spring avens													09	09	07										3
Glechoma hederacea	A*		FACU	Ground ivy	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Goodyera pubescens		6	FACU-	Downy rattlesnake-plantain	09	09					0																	3	
Gratiola neglecta		3	OBL	Clammy hedge-hyssop			09		07								07											3	
Hackelia virginiana		2	FACU	Beggar's-lice	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Hedeoma pulegioides		2	UPL	American pennyroyal	09	09	09	09		09	0	09		09	09			09						09	09			12	
Helianthus annuus	A		FAC-	Common sunflower			09																					1	
Helianthus decapetalus		3	FACU	Thin-leaved sunflower	09				09				09		P0		09	09			09		09					7	
Helianthus grosseserratus	A			Serrate sunflower											09													1	
Heliopsis helianthoides		4	UPL	Ox-eye					09						09								09			09		4	
Hemerocallis fulva	A*		UPL	Orange daylily	09		09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20
Heracleum maximum		3	FACU-	Cow parsnip				09								09	09	07				09	09					6	
Hesperis matronalis	A		FACU-	Dame's rocket	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23
Heteranthera reniformis		4	OBL	Mud plantain	09			09	07								07											4	
Heuchera americana		3	FACU-	Alumroot	09	09	09	09		09	0	09	09	09	09			09	09					09	09			14	
Hibiscus moscheutos	I	7	OBL	Swamp mallow			09																					1	
Hibiscus syriacus	A		X	Rose-of-sharon	09				09															09				3	
Hieracium caespitosum	A		UPL	King devil		09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	21
Hieracium flagellare	A		UPL	Hawkweed	09			09					09	09			09							09	09	09		8	
Hieracium gronovii		5	UPL	Hairy hawkweed								09																1	
Hieracium paniculatum		5	UPL	Panicled hawkweed	09	09		09	09	09	0	09		09										09				9	
Hieracium piloselloides	A		UPL	Small-headed hawkweed	09		09					09																3	
Hieracium scabrum		3	UPL	Rough hawkweed				09	09		0	09																4	
Hieracium venosum		6	UPL	Rattlesnake-weed	09				09	09	0	09																5	
Hosta ventricosa	A		UPL	Plantain-lily					09				09												09	07		4	
Houstonia caerulea		4	FACU	Bluets					09				09					07				09	09					5	
Hydrocotyle americana		7	OBL	Water pennywort		09																						1	
Hydrophyllum virginianum		6	FAC	Virginia waterleaf					09				09			09	09					09						5	
Hypericum gentianoides		4	UPL	Pinweed	09				09		0																	3	
Hypericum mutilum		2	FACW	Dwarf st. john's-wort	09	09		09	09				09		09	09						09	09	09	09	09	09	12	
Hypericum perforatum	A		UPL	Common st. john's-wort		09	09		09	09			09	09		09	09					09		09	09	09	09	13	
Hypericum punctatum		2	FAC-	Spotted st. john's-wort	09	09	09	09	09	09	0	09	09	09	09	09	07	09		09		09	09	09	09	09	09	22	
Hypoxis hirsuta		5	FAC	Yellow star-grass					09																			1	
Impatiens capensis		2	FACW	Orange jewelweed	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Impatiens pallida		3	FACW	Yellow jewelweed	09				09	09	0		09		09	09	09	09	09	09	09	09		09	09			13	
Iris pseudoacorus	A		OBL	Yellow flag	09	09		09	09		0		09		09		07	09		09		09		09				11	
Iris versicolor		7	OBL	Northern blue flag																			09					1	
Isotria verticillata		7	FACU	Whorled pogonia					09																			1	

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT	
Krigia virginica			6 UPL	Dwarf dandelion					09																				1	
Kummerowia striata	A		FACU	Japanese clover	09	09	09	09	09	0																	09		7	
Lactuca biennis			1 FACU	Tall lettuce	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Lactuca canadensis			1 FACU-	Yellow smooth wild lettuce		09	09	09	09	09		09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	18	
Lactuca serriola	A		FAC-	Prickly lettuce		09		09	09	09		09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	19	
Lamium amplexicaule	A		UPL	Henbit								09													09		09		3	
Lamium purpureum	A		UPL	Purple dead-nettle	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Laportea canadensis			4 FACW	Wood nettle	09	09		09	09				09	09	09	09	09				09	09	09		09	09	09	09	14	
Lapsana communis	A		X	Nipplewort		09	09	09	09			09		09	09	09	09								09	09		11		
Lechea pulchella			6 UPL	Pinweed					09		0																		2	
Lechea racemulosa			7 X	Pinweed					09																				1	
Leonurus cardiaca	A		UPL	Motherwort										09	09	09					09		09	09	09				7	
Leonurus marrubiastrum	A		UPL	Lesser motherwort	09			09			09					09										09	09		6	
Lepidium campestre	A		UPL	Cow-cress	09	09	09	09			09	09	09		09					09	09			09	09	09	09	13		
Lepidium densiflorum	A		FAC	Wild pepper-grass											09										09		07		3	
Lepidium virginicum			0 FACU-	Poor man's pepper		09	09	09				09	09	09	09	09	09	09				09			09	09	09	09	16	
Lespedeza capitata			6 FACU-	Big-headed bush-clover					09		0																		2	
Lespedeza cuneata	A		FACU-	Sericea	09	09			09	09																			4	
Lespedeza intermedia			4 UPL	Wand-like bush-clover					09	09	09								09										4	
Lespedeza procumbens			4 UPL	Trailing hairy bush-clover					09																				1	
Lespedeza repens			4 UPL	Trailing bush-clover					09																				1	
Lilium canadense			6 FAC+	Canada lily															07										1	
Linaria vulgaris	A		UPL	Butter-and-eggs	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23	
Lindernia dubia			3 OBL	False pimpernel	09			09	09						09							09							5	
Lobelia cardinalis			6 FACW	Cardinal-flower							09																		1	
Lobelia inflata			0 FACU	Indian tobacco	09	09	09	09	09	09	0	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	19	
Lobelia siphilitica			5 FACW	Great lobelia		09	09	09	09	09	0	09		09	09	09	09	07	09	09	09	09			09	09	09	09	20	
Lobelia spicata			6 FAC-	Spiked lobelia																						09			1	
Lotus corniculatus	A		FACU-	Birdsfoot trefoil		09																			09	09			3	
Ludwigia alternifolia			4 FACW	Seedbox						07					09		09				09							07	4	
Ludwigia palustris			3 OBL	Water purslane	09	09	09	09	09	09		09			09	09	09	07	09	09	09	09	09	09	09	09	09	09	20	
Lycopus americanus			4 OBL	Cut-leaved water-horehound	09	09	09	09				09		09	09				07	09		09	09	09	09	09	09		13	
Lycopus europaeus	A		OBL	European water-horehound		09																				09			2	
Lycopus uniflorus			5 OBL	Bugleweed							0	09		09	09	09	09				09	09	09	09	09	09	09		10	
Lycopus virginicus			3 OBL	Bugleweed	09	09	09	09	09	09		09			09	07	09		09	09	09	09	09	09	09	09	09	09	16	
Lysimachia ciliata			3 FACW	Fringed loosestrife				09	09	09		09	09	09	09	07									09				9	
Lysimachia nummularia	A		OBL	Moneywort	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	21	
Lysimachia quadrifolia			5 FACW	Whorled loosestrife	09	09	09	09	09		0	09	09																8	
Lysimachia terrestris			8 OBL	Swamp candles																						09			1	

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Lythrum salicaria	A*		FACW	Purple loosestrife	09	09	09	09				09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	16
Maianthemum racemosum		5	FACU-	False solomon's-seal	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	21
Malva neglecta	A		UPL	Common mallow									09		09		09		09		09	09	09	09			09	9	
Matricaria discoidea	A		FACU	Pineapple-weed					09						09				09							09	09	5	
Medeola virginiana		5	UPL	Indian cucumber-root	09	09												07			09							4	
Medicago lupulina	A		UPL	Black medick	09	09	09	09	09	09	0	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	22
Melampyrum lineare v. americanum		7	FACU	Cow-wheat	09						0	09																3	
Mellilotus alba	A		FACU	White sweet clover					09																			1	
Mellilotus officinalis	A		FACU	Yellow sweet clover		09																				07		2	
Mentha arvensis v. arvensis	A		FACW	Field mint					09									07	09			09	09	09		09		6	
Mentha piperata	A		FACW	Peppermint			09	09																				2	
Mentha spicata	A		FACW	Spearmint					09			09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	10	
Mertensia virginica		7	FACW	Virginia bluebells	09				09				09	09	09	09	09	09	09	09	09	09	09	09	09	08		10	
Micranthes virginianensis		6	FAC-	Early saxifrage	09	09		09	09	09	0	09	09	09	09			09		09		09		09		08		14	
Mimulus alatus		6	OBL	Wingstem monkey-flower		09		09	09				09				09											5	
Mimulus ringens		5	OBL	Square-stemmed monkeyflow		09	09	09				09	09	09	09	09	07	09		09	09	09	09	09	09	09	07	17	
Mirabilis nyctaginea	A		X	Four o'clock												09												1	
Mitchella repens		5	FACU	Partridgeberry		09		09	09	0	09				09		09		09		09		09		09	07		10	
Mitella diphylla		8	FACU	Bishop's-mitre													07											1	
Mollugo verticillata	A		FAC	Carpetweed											09											09		2	
Monarda fistulosa		4	UPL	Wild bergamot																						p0		1	
Monotropa hypopithys		8	X	Pinesap							0																	1	
Monotropa uniflora		4	FACU-	Indian pipe	09	09		09	09	09	0	09	09											09	09	07		11	
Myosotis laxa		4	OBL	Smaller forget-me-not				09	07								07						09	09				5	
Myosotis scorpioides	A		OBL	Forget-me-not	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20	
Myosoton aquaticum	A		VACW	Giant chickweed	09		09	09	09	0	09	09	09	09	09	09	09					09	09	09	09	09		16	
Narcissus pseudonarcissus	A		X	Daffodil			09	09	09								09								09	09		6	
Nasturtium officinale	A		OBL	Watercress	09	09	09	09	09	09		09	09		09	09	07	09	09				09	09	09	09		18	
Nepeta cataria	A		FACU	Catnip	09			09	09				09	09	09	09		09	09		09	09	09	09	09	09	09	14	
Nuttallanthus canadensis 9w)	SP	7	UPL	Old-field toadflax				09	0																			2	
Obolaria virginica		7	UPL	Pennywort													07											1	
Oenothera biennis		1	FACU-	Evening primrose	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23	
Ornithogalum umbellatum	A		FACU	Star-of-bethlehem	09		09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20	
Osmorhiza claytonii		4	FACU-	Sweet cicely	09	09	09	09									07									07		6	
Osmorhiza longistylis		4	FACU	Anise-root	09	09		09	09	0				09	09	09	09	09	09	09	09	09	09	09		09	09	17	
Oxalis corniculata	A		FACU	Creeping wood-sorrel																				09				1	
Oxalis dillenii		1	UPL	Yellow wood-sorrel	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Oxalis violacea		4	UPL	Violet wood-sorrel		09							09															2	
Pachysandra terminalis	A*		X	Japanese pachysandra	09			09										07										3	

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Packera anonyma	PR	8	UPL	Barrens ragwort																					09			1	
Packera aurea		5	FACW	Golden ragwort	09	09		09	0	09	09	09	09					09	09		09	09	09	09	09	09	07	16	
Papaver dubium	A		UPL	Poppy																09	09			09				3	
Parietaria pensylvanica		2	X	Pellitory											09			09	09		09					09		5	
Paronychia canadensis		6	UPL	Forked chickweed	09	09	09		09									09						09				6	
Paronychia fastigiata (incl. v. paleacea)		7	UPL	Forked chickweed			09	09	0																			3	
Pastinaca sativa	A		UPL	Wild parsnip	09		09			09	09	09	09	07	09			09	09	09								11	
Penstemon digitalis			FAC	White beard-tongue	09	09	09	09	09		09	09		09										09				9	
Penthorum sedoides		3	OBL	Ditch stonecrop	09	09		09	09	09							07											6	
Perilla frutescens	A		FACU	Perilla	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	24
Persicaria arifolia		5	OBL	Halberd-leaved tearthumb	09	09		09	09	09					09	09	07	09	09		09	09	09	09	09	09	09	15	
Persicaria hydropiper	A		OBL	Common smartweed			09	09	0				09						09	09		09	09				8		
Persicaria lapathifolia	A		FACW	Dock-leaved smartweed	09		09	09					09	09							09					09		7	
Persicaria longiseta	A*		FACU-	Long-bristled smartweed	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Persicaria maculosa	A		FACW	Lady's-thumb		09	09		0	09			09	09	09		09	09	09		09	09	09	09	09	09	09	14	
Persicaria pensylvanica		1	FACW	Pennsylvania smartweed	09	09						09	09	09	09			09		09	09	09	09		07		12		
Persicaria punctata		2	OBL	Slender water smartweed	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22
Persicaria sagittata		4	OBL	Arrow-leaved tearthumb	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Persicaria virginica		2	FAC	Virginia knotweed	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Phemeranthus teretifolius	PT	10	UPL	Fame-flower											09										09			2	
Phlox paniculata	A		FACU	Garden phlox					09																			1	
Phlox subulata ssp. subulata		8	X	Moss-pink																					09			1	
Phryma leptostachya		5	FACU-	Lopseed		09	09		0	09	09	09	09		07	09		09		09		09		09	09		13		
Physalis heterophylla		2	UPL	Clammy ground-cherry		09	09	09			09	09	09		09	09		09	09									8	
Physalis subglabrata		2	UPL	Smooth ground-cherry	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Phytolacca americana		0	FACU	Pokeweed	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Pilea fontana		8	FACW	Lesser clearweed					09					09									09			07		4	
Pilea pumila		1	FACW	Clearweed	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Pimpinella saxifraga	A		UPL	Burnet saxifrage																	09	09						2	
Plantago aristata	A		UPL	Bristly plantain	09																							1	
Plantago lanceolata	A		UPL	English plantain	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Plantago major	A		FACU	Common plantain		09	09	09	0	09	09	09	09	09	09				09		09	09	09	09	09	09	09	17	
Plantago rugelii		0	FACU	Pale plantain	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Platanthera lacera		4	FACW	Ragged fringed orchis																					09	09		2	
Podophyllum peltatum		5	FACU	Mayapple	09	09		09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	21	
Polemonium reptans		6	FACU	Jacob's-ladder		09	09	09									09					09						5	
Polygonatum biflorum		5	UPL	Solomon's-seal	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22	
Polygonatum canaliculatum		6	FACU	Great solomon's-seal				09	09					09			09	09		09	09			09	09		9		
Polygonatum pubescens		5	UPL	Hairy solomon's-seal	09								09	09							09	09				07	6		

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Polygonum aviculare	A		FACU	Knotweed	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Polygonum erectum		4	FACU	Erect knotweed									09		09	09	09	09	09	09	09	09		09	09			11	
Polygonum tenue		8	UPL	Slender knotweed											09										09			2	
Portulaca oleracea	A		FAC	Purslane					09			09			09	09							09	09				6	
Potentilla canadensis		2	UPL	Dwarf cinquefoil	09	09	09	09	09	09	0	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	21	
Potentilla norvegica	A		FACU	Rough cinquefoil	09			09				09											09		09	09		6	
Potentilla recta	A		UPL	Rough-fruited cinquefoil		09	09	09				09			09	09				09	09	09			09	09	09	13	
Potentilla reptans	A		UPL	Creeping cinquefoil	09	09	09	09				09	09		09					09	09	09						12	
Potentilla simplex		2	FACU-	Common cinquefoil	09	09		09	09	09	0	09	09		09	07	09					09	09		09	07		16	
Prenanthes altissima		4	FACU-	Tall white wild lettuce	09	09	09	09	09	09	0	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	07	22
Prunella vulgaris		2	FACU	Heal-all	09	09	09	09	09		0	09	09	09	09	09	07	09	09	09	09	09	09	09	09	09	09	21	
Pseudognaphalium obtusifolium		2	UPL	Sweet everlasting	09	09		09	09		0	09	09										09	09	09			10	
Pycnanthemum muticum		5	FACW	Hoary mountain-mint																			09					1	
Pycnanthemum tenuifolium		4	FACW	Narrow-leaved mountain-mint																					09			1	
Pycnanthemum virginianum		4	FAC	Virginia mountain-mint	09	09	09	09				09	09		09	09						09	09		09	09		13	
Pyrola elliptica		6	UPL	Shinleaf	09																							1	
Ranunculus abortivus		2	FACW	Kidneyleaf buttercup	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Ranunculus bulbosus	A		UPL	Bulbous buttercup	09	09		09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22	
Ranunculus caricetorum		7	OBL	Swamp buttercup									09															1	
Ranunculus recurvatus		3	FAC+	Hooked buttercup	09	09	09	09	09	09	0				09	09						09			09	07		12	
Ranunculus sceleratus		1	OBL	Cursed buttercup				09					09	09		09	07					09	09		09			8	
Rorippa palustris		2	OBL	Yellow marsh cress					09														09	09				4	
Rorippa sylvestris	A		FACW	Creeping yellow cress						09																		1	
Rudbeckia hirta	A		FACU-	Brown-eyed susan		09	09					09												09	09			5	
Rudbeckia laciniata		5	FACW	Green-headed coneflower	09		09	09				09	09		09	07		09		09	09	09	09	09	09	07		13	
Rumex acetosella	A		UPL	Sheep sorrel	09	09		09	09		0	09	09		09	09								09	09	09	07	16	
Rumex altissimus		6	FACW	Pale dock																			09					1	
Rumex crispus	A		FACU	Curly dock	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Rumex obtusifolius	A		FACU-	Broad dock	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Sabatia angularis		7	FAC+	Rose-pink											09									09				2	
Sagina japonica	A		X	Pearlwort			09	09			09									09								4	
Sagittaria australis		5	OBL	Southern arrowhead	09	09	09	09	09	09	0	09			09								09			07		11	
Sagittaria latifolia		4	OBL	Broad-leaved arrowhead				09					09	09		07		09		09	09	09						8	
Sagittaria latifolia v. pubescens		5	OBL	Hairy arrowhead											09			09		09						07		4	
Salvia lyrata		4	UPL	Lyre-leaved sage	09			09							09					09								4	
Sanguinaria canadensis		3	UPL	Bloodroot	09	09	09	09	09	09	0		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	21	
Sanicula canadensis		3	UPL	Black snakeroot	09	09	09	09	09	09					09	09	09	09	09	09	09	09	09	09	09	09	07	19	
Sanicula odorata		5	FACU	Black snakeroot				09							09	09	09	09	09			09	09	09	09	07		13	
Sanicula trifoliata		5	UPL	Rough-fruited sanicle																			09	09				2	

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT	
Saponaria officinalis	A		FACU-	Soapwort	09	09			09		0			09	09									09	09				8	
Saururus cernuus		7	OBL	Lizard's-tail				09																					1	
Scleranthus annuus	A		FACU-	Knawel																						09			1	
Scrophularia lanceolata		6	FACU	Lanceleaf figwort		09			09					09															3	
Scrophularia marilandica		1	FACU-	Carpenter's-square	09	09	09		09			09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	15	
Scutellaria elliptica		6	UPL	Hairy skullcap					09					09												09			3	
Scutellaria integrifolia		5	FACW	Hyssop skullcap					09														09						2	
Scutellaria lateriflora		4	FACW	Mad-dog skullcap		09	09	09	09			09						09						09	09				8	
Sedum sarmentosum	A		x	Garden stonecrop					09	09														09					3	
Sedum ternatum		7	UPL	Wild stonecrop										09															1	
Senecio vulgaris	A		FACU	Common groundsel		09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23
Sida spinosa	A		UPL	Prickly mallow					09			09	09	09									09	09	09				7	
Silene antirrhina		1	UPL	Sleepy catchfly			09							09												09			3	
Silene latifolia	A		UPL	White campion	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22
Silene stellata		6	UPL	Starry campion	09	09		09	09			09	09					09					09	09	09	09			9	
Silene vulgaris	A		UPL	Bladder campion								09	09																2	
Sisymbrium officinale	A		UPL	Hedge mustard									09	09		09										09	09		5	
Sisyrinchium angustifolium		3	FACW	Blue-eyed grass	09	09	09	09	09			09	09	09	09	09	07	09					09	09	09	09	09	09	17	
Sisyrinchium mucronatum		6	FAC+	Narrow blue-eyed grass																						09			1	
Solanum carolinense	A		UPL	Horse-nettle	09	09		09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22
Solanum nigrum	A		FACU-	Black nightshade	09			07	0					09	09							09	09	09					8	
Solidago arguta v. arguta		6	UPL	Twice-cut goldenrod	09			09	09	0		09	09																6	
Solidago bicolor		6	UPL	Silverrod	09		09	09				09						09											5	
Solidago caesia		5	FACU	Blue-stemmed goldenrod	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20
Solidago canadensis		1	FACU	Canada goldenrod	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Solidago flexicaulis		6	FACU	Zig-zag goldenrod	09			09					09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		11	
Solidago gigantea		4	FACW	Late goldenrod		09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	21
Solidago juncea		3	UPL	Early goldenrod	09	09	09	09	09	09		09	09	09											09		07		11	
Solidago nemoralis		4	UPL	Gray goldenrod	09	09	09	09	0			09													09	09			8	
Solidago patula		6	OBL	Rough-leaved goldenrod	09	09	09	09	09	0		09		09	09			09	09								09		12	
Solidago rugosa		3	FAC	Rough-stemmed goldenrod	09	09	09	09	09	0		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	23
Solidago ulmifolia		6	UPL	Elm-leaved goldenrod		09	09	09						09												09			5	
Sonchus asper	A		FAC	Spiny-leaved sow thistle	09	09	09	09	09			09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22
Sonchus oleraceus	A		UPL	Sow-thistle	09	09	09	09				09	09	09	09								09					07	10	
Sparganium americanum		7	OBL	Common bur-reed				09	09								09							09	09				5	
Sparganium eurycarpum		8	OBL	Broad-fruited bur-reed				09																	09				2	
Spiranthes cernua		6	FACW	Nodding ladies'-tresses	09												09	09									09		4	
Spiranthes lacera v. gracilis		7	FACU-	Slender ladies'-tresses																						09			1	
Stachys tenuifolia v. hispida			OBL	Hairy hedge nettle																					09				1	

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT	
Stellaria alsine		6	OBL	Trailing stitchwort					09										07										2	
Stellaria graminea	A		FACU-	Common stitchwort		09			09						09											09			4	
Stellaria longifolia		4	FACW	Long-leaved stitchwort					09															09			07		3	
Stellaria media	A*		UPL	Common chickweed	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23	
Symphotrichum cordifolium		4	UPL	Heart-leaved aster	09	09	09	09	09	09	0	09	09	09	09	09		09	09		09		09		09				17	
Symphotrichum depauperatum	PT	9	X	Serpentine aster																					09				1	
Symphotrichum lanceolatum		2	FACW	Panicled aster	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Symphotrichum lateriflorum		2	FACW	Calico aster	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09			09	09	09	09	09	09	07		22
Symphotrichum novae-angliae		2	FACW	New england aster		09	09								09								09	09		09			6	
Symphotrichum pilosum v pilosum		2	UPL	Heath aster	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		24
Symphotrichum pilosum v pringlei			UPL	Pringle's aster																						09			1	
Symphotrichum prenanthoides		6	FAC	Zig-zag aster											09		07	09												3
Symphotrichum puniceum		3	OBL	Purple-stemmed aster	09		09	09	09		0	09	09	09	09	09	09		09	09	09	09	09	09	09	09	09	09		21
Symphotrichum undulatum		6	UPL	Wavy-leaved aster								09	09																	2
Symplocarpus foetidus		3	OBL	Skunk cabbage	09	09	09	09	09	09	0	09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09		22
Taraxacum officinale	A		FACU-	Dandelion	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		24
Teucrium canadense		3	FACW	Germander	09	09	09	09	09		09		09	09	09	07	09					09	09	09	09	09	09			15
Thalictrum dioicum		6	FAC	Early meadow rue		09							09	09																3
Thalictrum pubescens		3	FACW	Tall meadow rue	09	09	09	09	09	09	0		09	09	09		07						09		09		09			14
Thalictrum thalictroides		6	FACU-	Rue anemone				09		0		09	09	09											09				6	
Thlaspi alliaceum	A*		UPL	Stinking penny-cress											09	09	09						09			09			5	
Thlaspi arvense	A		UPL	Field pennycress		09	09					09	09	09	09	09	07					09	09				07		11	
Tipularia discolor	PR	6	FACU	Crane-fly orchid																							08		1	
Tradescantia virginiana		4	FACU	Spiderwort					09										09											2
Tragopogon dubius	A		UPL	Larger goat's-beard							0				09						09	09							4	
Tragopogon pratensis	A		UPL	Goat's-beard		09			09						09	09					09	09								6
Trichostema dichotomum		4	UPL	Bluecurls	09			09	0		09																			4
Trifolium aureum	A		UPL	Hop clover		09				0																09				3
Trifolium campestre	A		UPL	Low hop clover		09	09				09			09	09								09			09	09			8
Trifolium hybridum	A		FACU	Alsike clover	09	09	09			09																09				5
Trifolium pratense	A		FACU-	Red clover	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		24
Trifolium repens	A		FACU-	White clover	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		24
Trillium cernuum v. cernuum	PT	6	FACW	Nodding trillium													07													1
Triodanis perfoliata		0	FAC	Venus' looking-glass		09	09	09	09	0	09		09	09	09									09	09		09			12
Tussilago farfara	A		FACU	Colt's-foot		09	09																							2
Typha angustifolia		1	OBL	Narrow-leaved cattail		09	09														09				09					4
Typha latifolia		1	OBL	Cattail		09	09	09	09	09	0	09		09	09	09		09						09	09	09	09	09		16
Urtica dioica	A*		FACU	Stinging nettle	09	09	09	09	09	09	0	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		23
Uvularia perfoliata		6	FACU	Perfoliate bellwort	09	09	09	09		0		09		09			07													8

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Uvularia sessilifolia		6	FACU-	Sessile bellwort	09			09																					2
Veratrum viride		6	FACW	False hellebore														07								07		2	
Verbascum blattaria	A		UPL	Moth-mullein	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	15
Verbascum thapsus	A		UPL	Common mullein	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Verbena hastata		4	FACW	Blue vervain			09	09				09	09	09	09	07			09	09	09							10	
Verbena urticifolia		1	FACU	White vervain	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Verbesina alternifolia		5	FAC	Wingstem				09				09		09		09					09	09						5	
Vernonia noveboracensis		3	FACW	Ironweed	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20
Veronica americana		5	OBL	American brooklime				09	09										09	09		09	09	09				7	
Veronica anagallis-aquatica	A		OBL	Brook-pimpernel				09										09	09				09					4	
Veronica arvensis	A		UPL	Corn speedwell	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23
Veronica hederifolia	A*		UPL	Ivy-leaved speedwell	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20
Veronica officinalis	A		FACU-	Common speedwell	09	09	09	09	09	0	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	19
Veronica peregrina		0	FACU-	Purslane speedwell	09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	19
Veronica persica	A		UPL	Bird's-eye speedwell	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20
Veronica serpyllifolia	A		FAC+	Thyme-leaved speedwell	09	09	09	09	09	0	09	09	09	09	09	07	09	09	09	09	09	09	09	09	09	09	09	09	22
Veronicastrum virginicum		8	FACU	Culver's-root											09									09				2	
Vicia sativa (angustifolia)	A		FACU-	Common vetch	09			09		09	09	09	09	09	09	09					09	09	09	09	09	09	09	12	
Vicia tetrasperma	A		UPL	Four-seeded vetch	09	09									09	09								09	07		6		
Vinca minor	A		UPL	Periwinkle	09		09	09	09	09		09		09		09				09						07		9	
Viola arvensis	A		UPL	Wild pansy																09								1	
Viola blanda		5	FACW	Sweet white violet												07				09								2	
Viola conspersa (labradorica)		5	FACW	Dog violet					09	0			09												07			4	
Viola cucullata		6	FACW	Marsh blue violet	09																							1	
Viola eriocarpa (pub. v. scabriuscula)		6	UPL	Smooth yellow violet	09	09	09	09		09		09	09	09	09	07	09	09	09	09	09	09		09	09	09	07	15	
Viola fimbriatula		7	UPL	Northern downy violet						0	09																	2	
Viola hirsutula		5	UPL	Southern wood violet	09	09	09		0	09	09				09								09					8	
Viola pedata		8	UPL	Birds-foot violet						0																		1	
Viola primulifolia		6	FAC+	Primrose-leaved violet						0	09																	2	
Viola sagittata v. sagittata		6	UPL	Arrow-leaved violet	09	09	09	09	09		09													09	09			8	
Viola sororia		1	FAC-	Common blue violet	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Viola sororia cv. priceana	A		n	Confederate violet				09																				1	
Viola striata		5	FACW	Cream violet	09		09	09						09	09	09	09	09	09	09	09	09						8	
Xanthium strumarium	A		FAC	Cocklebur			09	09				09	09	09	09	07	09	09	09	09	09	09						11	
Zizia aptera		7	FAC	Heart-leaved golden-alexande																				09				1	

**Graminoids**

**189 SPECIES**

**48 ALIENS and INTRODUCED**

Agrostis gigantea	A		FACW	Redtop	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07		16	
Agrostis perennans		2	FACU	Upland bent-grass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07		18
Agrostis stolonifera	A*		FACW	Creeping bentgrass				09				09																2	

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Alopecurus pratensis	A		FACW	Meadow foxtail																					09	09		2	
Andropogon gerardii	I	7	FAC	Big bluestem	09	09											P0												2
Andropogon gyrans	PR	6	UPL	Elliott's broomsedge	09				09			09													09	09		5	
Andropogon virginicus		2	FACU	Broomsedge	09	09	09		09	0	09	09	09	09	09	09	09	09	09	09	09		09	09	09	09	09	09	20
Anthoxanthum odoratum	A		FACU	Sweet vernal grass	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23
Aristida dichotoma v. dichotoma		0	UPL	Poverty grass	09							0													09			3	
Arrhenatherum elatius v. elatius	A		FACU	Tall oatgrass		09						0	09				09										09	5	
Arthraxon hispidus	A*		FACU	A grass	09	09	09	09			0	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	18
Bambusa sp.	A*		x	Tall bamboo		09	09	09																	09	09		08	6
Bouteloua curtipendula	PT	9	X	Side-oats grama grass												09													1
Brachyelytrum erectum		5	UPL	Brachyelytrum grass														09		09	09				09				4
Bromus commutatus	A		UPL	Hairy chess		09	09			09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	18
Bromus inermis	A*		UPL	Awnless brome-grass		09	09	09	09			09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20
Bromus japonicus	A		FACU-	Japanese brome-grass								09	09	09				09										4	
Bromus pubescens		5	UPL	Canada brome				09																		09		2	
Bromus sterilis	A		UPL	Barren brome		09	09	09				09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	17
Bromus tectorum	A		UPL	Hairy chess																							07	1	
Bulbostylis capillaris		4	FACU	Sand rush					09	0					09														3
Carex aggregata		3	FACU	A sedge										09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	13
Carex albicans		3	UPL	A sedge	09	09	09	09	09	09	0	09	09					09	09	09	09	09	09	09	09	09	09	09	14
Carex amphibola		2	FAC	A sedge	09	09		09	09			09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20
Carex annectens		4	FACW	A sedge			09	09	09			09			09	09	09	09								09		8	
Carex blanda		2	FAC	A sedge	09	09	09	09	09		0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22
Carex bromoides		7	FACW	A sedge																						09		1	
Carex caroliniana		5	FACU	Carolina sedge														09						09		09		3	
Carex cephalophora		3	FACU	A sedge		09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	18
Carex communis		5	UPL	A sedge					09																				1
Carex conjuncta	SP	4	FACW	A sedge	09	09	09	09					09	09	07	09						09				09		10	
Carex crinita		5	OBL	A sedge	09			09				09	09	09	09	07													8
Carex davisii	SP	7	FAC-	Davis' sedge																	09	09	09					3	
Carex debilis v. debilis		6	FAC	A sedge				09	09																				2
Carex digitalis		4	UPL	A sedge	09	09	09	09	09	09		09	09	09	09	07	09	09	09	09	09	09	09	09	09	09	07		17
Carex festucacea		4	FAC	A sedge				09																	09			2	
Carex frankii		3	OBL	Frank's sedge				09														09			09			3	
Carex glaucoidea		3	UPL	Glaucous sedge								09													09	09	09	4	
Carex gracilescens		4	UPL	A sedge											09	07												2	
Carex gracillima		5	FACU	A sedge		09																					07	2	
Carex granularis v. granularis		3	FACW	A sedge				09						09	07										09	09	09	6	
Carex grisea		7	FAC	A sedge									09	09	09	09	09					09	09	09				8	

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Carex gynandra			7 OBL	A sedge					09																				1
Carex hirsutella			4 UPL	A sedge	09							09												09	09	09			5
Carex hirta	A		X	Hairy sedge											09	09													2
Carex hirtifolia			3 UPL	A sedge				09	09						09	09	09		09	09		09	09	09	09	09	09		11
Carex hystericina			8 OBL	A sedge				09																					1
Carex jamesii	SP		7 X	James' sedge													07			09									2
Carex laevivaginata			4 OBL	A sedge	09					0	09	09			09	09	09	09	09	09						09	07		10
Carex laxiculmis			5 UPL	A sedge		09	09	09	09	0	09	09	09	09	09	09	09		09	09	09	09	09	09	09	09	09		15
Carex laxiflora			4 FACU	A sedge	09		09	09	09		09											09	09						6
Carex lucorum			6 X	A sedge						0																			1
Carex lupulina			7 OBL	Hop sedge					09				09					07			09	09	09	09		09			7
Carex lurida			1 OBL	Sallow sedge	09	09	09	09	09	0	09	09	09	09	09	09	07	09	09	09	09	09	09	09	09	09	09	07	22
Carex mesochorea			4 FACU	Midland sedge			09					09			09	09					09					09			6
Carex muhlenbergii			5 UPL	Muhlenberg's sedge					07																				1
Carex normalis			3 FACU	A sedge		09	09	09	09		09	09	09	09	09	09					09	09				09			13
Carex pellita			7 OBL	A sedge											09	09						09							3
Carex pensylvanica			5 UPL	A sedge	09	09	09	09	09	0	09	09	09	09	09	09	07	09	09	09	09			09	09	09	07		19
Carex planispicata	SP		9 FAC	A sedge				09														09	09						3
Carex prasina			7 OBL	A sedge		09		09							09	09						09				09	07		7
Carex radiata			2 UPL	A sedge	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	21
Carex rosea			3 UPL	A sedge		09	09				09		09	09	09	09		09	09		09			09	09				9
Carex scoparia			2 FACW	Crowded sedge						0	09			09	09	07	09	09				09	09	09	07				11
Carex sparganioides			3 FACU	A sedge	09			09									07	09						09	09				6
Carex spicata	A		UPL	A sedge										09	09	07			09				09	09	09				7
Carex squarrosa			6 FACW	Squarrose sedge																		09	09						2
Carex stipata			2 OBL	A sedge				09			09			09	09	09	07	09	09	09	09	09	09	09	09	09	09		14
Carex striatula	SP		6 UPL	A sedge		09							09	09			07		09										5
Carex stricta			5 OBL	Tussock sedge	09	09	09	09	0	09		09	09								09	09		09	09				12
Carex stricta v. strictior			5 OBL	Rhizomatous tussock sedge		10									09								09						3
Carex swanii			3 FACU	A sedge	09	09	09	09	0	09						07	09		09				09	09	07				12
Carex tonsa	SP		7 UPL	A sedge				09	0																				2
Carex torta			7 FACW	Sandbar sedge		09							09																2
Carex tribuloides			2 FACW	A sedge	09	09	09	09	09	0	09		09			09	09			09	09	09	09	09	09	09			15
Carex trichocarpa			5 OBL	A sedge				09			09			09	09	09						09	09						7
Carex umbellata			5 UPL	A sedge	09	09	09	0	09																	09			6
Carex virescens			4 UPL	A sedge	09	09	09	0	09																				5
Carex vulpinoidea			2 OBL	A sedge			09	09		09	09	09	09	09	09	07	09	09		09	09	09	09	09	09	09	09		16
Cinna arundinacea			3 FACW	Wood reed-grass	09	09	09	09	0	09	09	09	09	09	09	09	09	09		09	09				09	07			18
Cynodon dactylon	A		FACU	Bermuda grass		09	09																		09				3

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Cyperus erythrorhizos			3	FACW	Redroot flatsedge				09															09				2	
Cyperus esculentus			0	FACW	Yellow nutsedge							09	09		09	09				09							09	6	
Cyperus flavescens			1	OBL	Umbrella-sedge				09	09		09								09	09							5	
Cyperus lupulinus			3	UPL	A flatsedge				09						09													2	
Cyperus odoratus			3	FACW	Rusty flatsedge				09																			1	
Cyperus squarrosus			4	FACW	Umbrella sedge																					09		1	
Cyperus strigosus			2	FACW	A flatsedge	09	09	09	09	09	0	09	09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	22
Dactylis glomerata	A			FACU	Orchard grass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Danthonia compressa			7	FACU-	Northern oat-grass		09		09		0																	3	
Danthonia spicata			2	UPL	Wild oat-grass	09	09	09	09	09	0	09						09						09	09	09		11	
Dichanthelium acuminatum			3	FAC	A panic-grass	09	09		09	09	0	09	09	09					09	09				09	09	09	09	14	
Dichanthelium boschii			5	UPL	A panic-grass	09		09	09	09			09															5	
Dichanthelium clandestinum			2	FAC-	Deer-tongue grass	09	09	09	09	09	0	09	09	09	09	09		07	09		09	09	09	09	09	09	09	21	
Dichanthelium commutatum			4	FACU	A panic-grass				09																			1	
Dichanthelium depauperatum			5	UPL	Poverty panic-grass	09			09		0															09		4	
Dichanthelium dichotomum			2	FAC	A panic-grass	09	09	09	09	09	0	09	09	09				09		09	09	09				09		15	
Dichanthelium latifolium			5	FACU-	Broad-leaved panic-grass				09	09																		2	
Dichanthelium oligosanthes	PT		7	FACU	Heller's witch-grass										09									09				2	
Dichanthelium polyanthes	SP		8	FACU	A panic-grass				09																			1	
Dichanthelium sphaerocarpon			4	FACU	A panic-grass				09						09													2	
Digitaria ischaemum	A			UPL	Crabgrass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22	
Digitaria sanguinalis	A			FACU	Crabgrass	09		09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	19	
Dulichium arundinaceum			7	OBL	Three-way sedge																			09				1	
Echinochloa crus-galli	A			FACU	Barnyard grass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	18	
Echinochloa muricata			3	FACW	Barnyard grass																			09				1	
Eleocharis obtusa			2	OBL	Blunt spike-rush	09		09	09						09										09			5	
Eleocharis tenuis			2	FACW	Slender spike-rush		09					09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	15	
Eleusine indica	A			FACU-	Goose-grass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20	
Elymus hystrix			4	UPL	Bottlebrush grass								09	09	09	09							09				5		
Elymus repens	A*			UPL	Witch grass		09	09				09	09	09	09	09	07	09	09			09	09	09	09	09	09	16	
Elymus riparius			3	FACW	Riverbank wild-rye	09			09						P0	09				09	09	09	09	09	09	09		8	
Elymus villosus			4	FACU-	Hairy wild-rye				09									09				09						3	
Elymus virginicus			3	FACW	Virginia wild-rye				09		0				P0	09						09	09					5	
Eragrostis cilianensis	A			FACU	Stink grass	09	09	09				09		09	09								09	09				8	
Eragrostis hypnoides			7	OBL	Creeping lovegrass				09																			1	
Eragrostis minor	A			UPL	Smaller stink-grass																					09		1	
Eragrostis pectinacea			0	FAC	Carolina lovegrass	09			09			09		09	09					09	09			09	09	07		10	
Eragrostis spectabilis			1	UPL	Tumble grass	09			09	09	0	09	09	09							09			09	09	09	09	11	
Festuca rubra	A			FACU	Red fescue															09						09	07	3	

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Festuca subverticillata		3	FACU	Woodland fescue	09		09	09						09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	16
Festuca trachyphylla	A		n	Hard fescue								09	09	09	09									09	09			6	
Fimbristylis annua	PT	9	FAC	Annual fimbry											09									09				2	
Glyceria septentrionalis		6	OBL	Eastern manna-grass					07																			1	
Glyceria striata		3	OBL	Fowl manna-grass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22
Holcus lanatus	A		FACU	Velvet grass			09	09	0	09			09	09		09				09					09	09	09	10	
Hordeum jubatum	A		FAC	Squirrel-tail										09														1	
Juncus acuminatus		4	OBL	A rush	09		09																09					3	
Juncus effusus		2	FACW	Soft rush	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23
Juncus marginatus		3	FACW	A rush			09											09										2	
Juncus secundus		6	FACU	Secund rush											09									09		07		3	
Juncus tenuis		1	FAC-	Path rush	09	09	09	09	09	0	09	09	09	09	09	09	07	09	09	09	09	09	09	09	09	09	09	23	
Kyllinga gracillima	A		FACW	Small umbrella-sedge			09	09	0	09			09	09				09	09	09	09							10	
Leersia oryzoides		2	OBL	Rice cut-grass	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	22
Leersia virginica		2	FACW	White grass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Lolium perenne	A		FACU-	Perennial rye-grass	09	09	09	09	09	09	09	09	09	09	09	09			09						09			11	
Luzula echinata		3	FACU	Wood rush	09	09	09	09	09	0	09	09	09			09	09	09	09	09	09	09	09	09	09	09	07	17	
Luzula multiflora		3	FACU	Wood rush	09																							1	
Microstegium vimineum	A*		FAC	Japanese stilt-grass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Miscanthus sinensis	A*		FACU	Japanese plumegrass																			09					1	
Muhlenbergia frondosa		1	FAC	Leafy muhly	09	09	09	09	09	09	09	09	09	09	09	09			09		09	09	09	09	09	09	09	13	
Muhlenbergia schreberi		0	FAC	Nimblewill	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23	
Muhlenbergia sobolifera		5	UPL	Creeping muhly			09																	09			2		
Panicum anceps		4	FAC	A panic-grass	09	09	09	09	0	09		09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	15	
Panicum dichotomiflorum		0	FACW	A panic-grass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22	
Panicum philadelphicum		1	FAC-	A panic-grass	09	09	09	09							09	09					09	09	09	09	09	07		10	
Panicum rigidulum		6	FACW	A panic-grass																			09				1		
Panicum virgatum	I		FAC	Switch-grass	09	09		09						09												p0	5		
Paspalum laeve		3	FAC+	Bead-grass			09	09		09				09	09						09	09	09	09	09	09	09	9	
Paspalum setaceum		3	FACU	Bead-grass	09		09	0	09					09		09						09	09	09	09	09	09	9	
Pennisetum alopecuroides	A		X	Fountain-grass		09	09							09														3	
Phalaris arundinacea	A*		FACW	Reed-canary grass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Phleum pratense	A		FACU	Timothy	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09					09	09	09	17		
Phragmites australis	A*		FACW	Giant reed	09	09	09	09	0	09			09	09	09	09	09	09				09	09	09	09	09	16		
Poa alsodes		5	FACW	Woodland bluegrass																						07	1		
Poa annua	A		FACU	Annual bluegrass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Poa autumnalis	PE	7	FAC	Late bluegrass													07										1		
Poa compressa	A		FACU	Canada bluegrass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	19		
Poa cuspidata		6	UPL	Woodland bluegrass													07	09						09			3		

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Poa pratensis	A		FACU	Kentucky bluegrass	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Poa sylvestris		4	FACW	Woodland bluegrass	09			09										07		09				09	09			6	
Poa trivialis	A		FACW	Rough-stemmed bluegrass	09	09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22
Puccinellia distans	A		OBL	Alkali-grass																			09					1	
Rhynchospora capitellata		8	OBL	Small-headed beak-rush								09																1	
Saccharum ravennae	A		n	Ravenna-grass			09																					1	
Schedonorus arundinaceus	A*		FACU-	Meadow fescue	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Schizachyrium scoparium		4	FACU	Little bluestem grass	09	09	09	09	0	09	09											09		09	09	09		12	
Schoenoplectus tabernaemontanae		5	OBL	Great bulrush			09					09	09	09	09	09	09	09	09	09	09	09	09	09	09	09		11	
Scirpus atrovirens		4	OBL	Black bulrush	09		09														09			09				4	
Scirpus cyperinus		4	FACW	Woolgrass	09	09	09	09	09	0	09	09	09	09	09				09		09	09	09	09	09	09	09	18	
Scirpus expansus		6	OBL	Red-stem bulrush														07	09									2	
Scirpus georgianus		3	OBL	Bulrush			09				09	09	09					07	09	09				09	09	07		9	
Scirpus hattorianus		4	OBL	Bulrush			09																	09				2	
Scirpus pendulus		6	OBL	Slender bulrush																						07		1	
Scirpus polyphyllus		4	OBL	Leafy bulrush				09										07	09	09					09			5	
Scleria pauciflora	PT	8	FACU	Few-flowered nut-rush										09										09				2	
Setaria faberi	A		UPO	Giant foxtail grass	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23	
Setaria parviflora		3	FAC	Slender foxtail grass			09	09	09									09	09	09				09	09			8	
Setaria pumila	A		FAC	Yellow foxtail	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Setaria viridis	A		UPL	Green foxtail	09	09	09	09				09														09		6	
Sorghastrum nutans		5	UPL	Indian grass	09	09	09	09		0	09				09										09			8	
Sorghum halepense	A		FACU	Johnson grass									09									09						2	
Sphenopholis intermedia		4	FAC-	Wedgegrass	09	09	09	09	09			09	09	09	09	07	09	09	09	09		09	09			07		16	
Sporobolus vaginiflorus		1	UPL	Poverty-grass	09							09	09	09	09									09	09			7	
Trichophorum planifolium		6	UPL	Woodland club-rush			09	09	0	09	09																	5	
Tridens flavus		1	FACU	Purpletop	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Tripsacum dactyloides	PE	4	FACW	Gamma grass													09											1	
Vulpia octoflora		0	UPL	Six-weeks fescue	09			09																				2	
Zizania aquatica	PR	8	OBL	Wild rice																				09				1	
<b>Shrubs</b>					<b>53 SPECIES</b>					<b>21 ALIENS and INTRODUCED</b>																			
Alnus serrulata		4	OBL	Common alder	09	09		09	09	09													09				08	7	
Amorpha fruticosa	A		FACW	Indigo bush											09	09	09	09		09	09	09						7	
Berberis thunbergii	A*		FACU	Japanese barberry	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Buddleja davidi	A*		X	Butterfly-bush					09																	09		2	
Cephalanthus occidentalis		7	OBL	Buttonbush				09														09	09					3	
Cercis canadensis	I	7	FACU-	Redbud				09				09						09	09						09		5		
Comptonia peregrina		7	UPL	Sweet-fern				09																				1	
Cornus amomum		3	FACW	Swamp dogwood	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	21	

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Cornus racemosa		3	FAC	Panicled dogwood						09	0	09	09							09									5
Corylus americana		5	FACU-	American hazelnut			09	09	09	09	0	09	09	09	09				09		09								10
Elaeagnus umbellata	A*		UPL	Autumn olive	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Euonymus alatus	A*		UPL	Winged burning-bush	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	08	23
Forsythia sp.	A		n	Forsythia								09																	1
Gaylussacia baccata		6	FACU	Black huckleberry	09	09	09	09	09	0	09																		7
Hamamelis virginiana		6	FAC-	Witch-hazel	09	09	09	09	09	0	09	09	09	09	09			09		09		09		09	09				16
Ilex crenata	A		UPL	Japanese holly																							07	1	
Ilex verticillata		4	FACW	Winterberry	09	09		09	09	0		09	09							09	09				09	09			11
Kalmia latifolia		6	FACU	Mountain laurel	09	09		09	09	0	09	09																	8
Ligustrum obtusifolium	A*		FACU	Broad-leaved privet	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23
Lindera benzoin		2	FACW	Spicebush	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Lonicera maackii	A*		UPL	Amur bush-honeysuckle	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Lonicera morrowii	A*		UPL	Morrow's bush-honeysuckle		09	09	09	0	09	09	09	09	09	09							09	09						12
Mahonia bealei	A		X	Hollygrape										09															1
Philadelphus sp.	A		n	Mock orange		09	09		09	09																			4
Quercus ilicifolia		8	UPL	Scrub oak	09	09				0																			3
Rhododendron periclymenioides		5	FAC	Pinxter flower	09	09		09	09	0	09	09	09		09	07										09			12
Rhodotypos scandens	A*		UPL	Jetbead		09	09		09												09					09			5
Rhus copallina		4	FACU-	Shining sumac						09	0																		2
Rhus glabra		3	UPL	Smooth sumac			09	09	09		09	09	09	09						09				09		09			10
Rosa carolina		5	UPL	Pasture rose			09						09												09				3
Rosa multiflora	A*		FACU	Multiflora rose	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Rosa palustris		7	OBL	Swamp rose				09	09		09													09					4
Rubus allegheniensis		1	FACU	Blackberry	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Rubus flagellaris		1	UPL	Dewberry	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23
Rubus hispidus		6	FACW	Swamp dewberry					09	0																			2
Rubus occidentalis		1	UPL	Thimbleberry	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Rubus pascuus (?)				A blackberry		09	09	09																					3
Rubus pensylvanicus		2	X	Pennsylvania blackberry			09																						1
Rubus phoenicolasius	A*		UPL	Wineberry	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Sambucus canadensis		3	FACW	Elderberry	09	09		09	09	0	09	09		09	09				09		09	09	09	09	09	09	07		17
Staphylea trifolia		5	FAC	Bladdernut		09		09					09	09	09				09		09		09	09		09			10
Symphoricarpos orbiculatus	A		FACU-	Coralberry		09		09					09						09		09		09		09				6
Vaccinium corymbosum		5	FACW	Highbush blueberry	09			09	09	0																			4
Vaccinium pallidum		6	UPL	Lowbush blueberry	09	09	09	09	09	0	09	09	09			09									09				12
Vaccinium stamineum		7	FACU-	Deerberry	09	09	09	09	09	0	09	09																	9
Viburnum acerifolium		5	UPL	Maple-leaved viburnum	09	09	09	09	09	0	09	09	09	09	09			09	09	09	09	09	09	09	09				18
Viburnum dentatum		3	FAC	Southern arrowwood viburnu	09	09	09	09	09	0	09	09	09		09	07				09	09	09	09	09	09	09	07		17

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Viburnum dilatatum	A*		UPL	Linden viburnum	09					09	0	09		09												09		6	
Viburnum lentago		5	FAC	Nannyberry					09																				1
Viburnum opulus	A*		X	Guelder-rose									09								09					09		3	
Viburnum plicatum	A*		UPL	Doublefile viburnum														07								07		2	
Viburnum prunifolium		2	FACU	Black-haw	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23
Viburnum sieboldii	A*		UPL	Siebold's viburnum																						07		1	
<b>Trees</b>					<b>81 SPECIES</b>					<b>29 ALIENS and INTRODUCED</b>																			
Acer negundo		2	FAC+	Box elder	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Acer palmatum	A*		UPL	Japanese maple					09				09													09		3	
Acer platanoides	A*		UPL	Norway maple	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Acer pseudoplatanus	A		UPL	Sycamore maple																						09		1	
Acer rubrum		1	FAC	Red maple	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Acer saccharinum		3	FACW	Silver maple	09	09	09					09	09	09	09	09	09	09			09	09	09	09	09	09	09	17	
Acer saccharum		5	FACU	Sugar maple	09	09		09	09	0			09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	19	
Aesculus flava (octandra)	A		X	Yellow buckeye														07										1	
Ailanthus altissima	A*		FACU-	Tree-of-heaven	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09		09	09	09	09	09	09	23	
Albizia julibrissin	A		UPL	Mimosa					09			09	09	09											09	09		6	
Alnus glutinosa	A*		FACW	Black alder			09	09	09															09				4	
Amelanchier arborea		5	FAC-	Tree shadbush	09	09	09	09	09	09	0	09	09	09														10	
Aralia elata	A*		n	Asian hercules-club			09	09		0																		3	
Betula lenta		4	FACU	Cherry birch			09								09													2	
Betula populifolia		2	FAC	Gray birch	09					0																		2	
Carpinus caroliniana ssp. virginiana		5	FAC	Ironwood	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	21
Carya cordiformis		3	FACU	Bitternut hickory	09	09		09				09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	19	
Carya glabra		4	FACU-	Pignut hickory	09	09		09	09	0			09	09							09	09	09	09	09	09	09	11	
Carya ovata		5	FACU-	Shagbark hickory	09	09		09	09	09		09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	18	
Carya tomentosa		5	UPL	Mockemut hickory	09	09	09	09	09	0	09		09		07	09		09					09	09	09	07		15	
Castanea dentata		5	UPL	American chestnut					09																			1	
Castanea mollissima	A		n	Chinese chestnut													07											1	
Catalpa bignonioides	A		UPL	Catalpa							09		09							09	09	09		09				6	
Celtis occidentalis		2	FACU	Hackberry		09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20	
Comus alternifolia		5	UPL	Pagoda dogwood	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20	
Comus florida		5	FACU-	Flowering dogwood	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22	
Crataegus crus-galli		4	FACU	Cockspur hawthorn	09	09		09						09	09	09						09						7	
Crataegus phaenopyrum		4	FAC	Washington thorn																	09		09	09	08			4	
Crataegus pruinosa		4	UPL	Frosted hawthorn		09						09											09					3	
Crataegus species		n		Hawthorn	09	09		09	09	0		09	09	09		07		09					09	09				12	
Diospyros virginiana		5	FAC-	Persimmon					09																09			2	
Fagus grandifolia		6	FACU	American beech	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23	

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Fraxinus americana		1	FACU	White ash	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Fraxinus nigra		7	FACW	Black ash																						09		1	
Fraxinus pennsylvanica		3	FACW	Green ash			09	09	09				09			09	09	09			09	09	09	09	09			12	
Gingko biloba	A		X	Gingko																						09		1	
Gleditsia triacanthos	A		FAC-	Honey locust	09			09			0		09	09	09	09	07	09	09		09	09	09	09	09	09	09	16	
Gymnocladus dioica	A		X	Kentucky coffee-tree		09					09	0		09														4	
Ilex opaca		5	FACU	American holly	09	09		09			0							09			09			09	09	08		9	
Juglans cinerea	SP	3	FACU	Butternut	09	09				09							07											4	
Juglans nigra		2	FACU	Black walnut	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Juniperus virginiana		2	FACU	Red cedar	09	09	09	09	09	0		09	09	09		07					09			09	09	09	09	15	
Liquidambar styraciflua	I	5	FAC	Sweet-gum																		09						1	
Liriodendron tulipifera		2	FACU	Tulip-tree	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	24	
Maclura pomifera	A		UPL	Osage orange		09	09		09	0		09	09	09	09			09		09	09	09	09	09	09	09	09	16	
Malus pumila	A		UPL	Apple	09	09		09			09			09	09			09							09	09	07	10	
Malus species	A*		UPL	Crabapple	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23	
Morus alba	A		UPL	White mulberry	09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22	
Nyssa sylvatica		4	FAC	Black gum	09	09	09	09	09	0	09	09	09	09	09		09		09	09	09	09	09	09	09	09	09	21	
Ostrya virginiana		6	FACU-	Hop hornbeam	09			09																	09		3		
Paulownia tomentosa	A*		UPL	Princess-tree	09	09		09	0	09											09	09	09	09	09	09	09	12	
Phellodendron japonicum	A*		UPL	Japanese cork-tree		09	09								09	07			09								6		
Pinus strobus	A		FACU	White pine		09		09				09					07										4		
Platanus occidentalis		3	FACW	Sycamore	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Populus deltoides		4	FACU-	Cottonwood				09						09													2		
Populus grandidentata		3	FACU-	Bigtooth aspen	09	09	09	09	09		09		09	09										09	09		11		
Populus tremuloides		4	UPL	Quaking aspen			09																				1		
Prunus avium	A		UPL	Sweet cherry	09	09	09	09	09	09		09	09	09		09	09	09	09	09	09	09		09	09	09	17		
Prunus serotina		1	FACU	Black cherry	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Prunus subhirtella	A*		ni	Higan cherry		09	09			0							09	09							09	07	7		
Pyrus calleryana	A*		n	Callery pear		09	09		0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	18		
Pyrus communis	A		UPL	Pear		09																					1		
Quercus alba		4	FACU	White oak	09	09	09	09	09	0	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	07	22	
Quercus bicolor		7	FACW	Swamp white oak					09													09		09	09		4		
Quercus coccinea		4	UPL	Scarlet oak	09	09	09	09	09	0	09	09															8		
Quercus montana		6	UPL	Chestnut oak	09	09	09	09	09	0	09	09															8		
Quercus palustris		3	FACW	Pin oak	09	09	09			09	09		09	09		09	09	09	09	09	09	09	09	09	09	09	07	16	
Quercus rubra		4	FACU-	Red oak	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22	
Quercus stellata		7	UPL	Post oak				09																	09		2		
Quercus velutina		4	UPL	Black oak	09	09	09	09	09	0	09	09	09	09	09	09	09			09	09	09	09	09	09	07	18		
Rhus hirta		1	UPL	Staghorn sumac	09	09	09	09	09		09		09	09	09										09		10		

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT
Robinia pseudo-acacia	A*		FACU-	Black locust	09	09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20
Salix babylonica	A		FACW	Weeping willow																					09	09		2	
Salix nigra		2	FACW	Black willow	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Salix x rubens	A		X	Crack willow												09							09					2	
Sassafras albidum		1	FACU-	Sassafras	09	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09		09		21	
Tilia americana		5	FACU	Basswood		09	09					09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	14	
Tsuga canadensis		6	FACU	Eastern hemlock	09			09													09							3	
Ulmus americana		4	FACW	American elm	09																				09			2	
Ulmus parviflora	A*		n	Chinese elm											09											09		2	
Ulmus rubra		4	FAC	Slippery elm	09	09	09	09	09	09			09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	20	
<b>Vines, herbaceous</b>					<b>26 SPECIES</b>					<b>9 ALIENS and INTRODUCED</b>																			
Amphicarpa bracteata		4	FAC	Hog peanut	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23
Calystegia sepium		0	FAC-	Hedge bindweed	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Calystegia spithamea ssp. spithamae		4	UPL	Upright bindweed			09																					1	
Clematis terniflora	A		FACU-	Sweet autumn clematis	09																							1	
Clematis virginiana		4	FAC	Virgin's-bower	09		09	09				09	09				09	09	09	09								9	
Convolvulus arvensis	A		UPL	Field bindweed													09											1	
Coronilla varia	A		UPL	Crown vetch	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Cuscuta campestris	PT	6	X	Dodder										09							09	09						3	
Cuscuta gronovii		3	WETL	Dodder	09			09				09	09	09	09				09		09	09						8	
Dioscorea villosa		4	FAC+	Wild yam			09	09					09	09	09	07	09		09		09		09	09	09	07		11	
Echinocystis lobata		2	FAC	Wild cucumber	09										09	09	09	09	09	09	09	09	09	09	09	09	09	10	
Fallopia convolvulus	A		FACU	Black bindweed		09		09	09									09						09				5	
Fallopia scandens		1	FAC	Climbing false buckwheat	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24	
Humulus japonicus	A*		FACU	Japanese hops	09		09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22	
Humulus lupulus		2	FACU	Common hops																				09				1	
Ipomoea hederacea	A		FACU	Ivy-leaved morning-glory	09			09						09				09	09	09								6	
Ipomoea lacunosa	SP	1	FACW	Small white morning-glory										09							09							2	
Ipomoea pandurata		4	FACU	Wild potato-vine				09	09																			2	
Ipomoea purpurea	A		UPL	Common morning-glory				09																				1	
Menispermum canadense		4	FACU	Canada moonseed			09	09						09	09	09	09	09	09	09	09	09	09	09	09	09	09	13	
Persicaria perfoliata	A*		FAC	Mile-a-minute	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	23	
Sicyos angulatus		2	FACU	Bur-cucumber	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	22	
Smilax herbacea		5	FAC	Carrion-flower	09	09								09														3	
Smilax pulverulenta		5	FACW	Hairy carrion-flower		09						09	09	09	09	07			09				09					8	
Solanum dulcamara	A		FAC-	Deadly nightshade			09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	07	20	
Strophostyles helvola		4	FACU	Trailing wild bean	09																							1	

SCIENTIFIC NAME	STATUS	CC	WIC	COMMON NAME	1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	COUNT	
<b>Vines, woody</b>					<b>16 SPECIES</b>																<b>7 ALIENS and INTRODUCED</b>									
Akebia quinata	A*		UPL	Five-leaf vine																										1
Ampelopsis brevipedunculata	A*		UPL	Porcelain-berry	09	09						09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	17
Campsis radicans		2	FAC	Trumpet-creeper			09	09	09									09	09	09						09	09		8	
Celastrus orbiculatus	A*		UPL	Oriental bittersweet	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Euonymus fortunei	A*		UPL	Wintercreeper	09		09				09		09					09	09					09	09	09	09		10	
Hedera helix	A*		UPL	English ivy	09		09	09	09		09		09					09	09			09		09		09	08		11	
Lonicera japonica	A*		FAC-	Japanese honeysuckle	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Lonicera sempervirens		5	FACU	Trumpet honeysuckle	09			09																					2	
Parthenocissus quinquefolia		1	FACU	Virginia creeper	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Smilax glauca		3	FACU	Glaucous greenbrier	09	09		09	09	0	09		09										09	09				07	11	
Smilax rotundifolia		3	FAC	Round-leaved greenbrier	09	09	09	09	09		09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	08	13
Toxicodendron radicans		1	FAC	Poison ivy	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Vitis aestivalis		4	FACW	Summer grape	09	09		09	09	0	09									09									07	8
Vitis labrusca		4	FACU	Fox grape	09	09	09	09	09	0	09	09		09															07	10
Vitis vulpina		1	FAC	Frost grape	09	09	09	09	09	0	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	09	24
Wisteria floribunda	A*		ni	Japanese wisteria	09		09				09		09																4	

APPENDIX 2  
INVASIVE ALIENS IN EAST BRADFORD TOWNSHIP

SCIENTIFIC NAME	COMMON NAME	WIS	COUNT	COMMENT
<b>FORBS</b>				
Alliaria petiolata	Garlic mustard	FACU-	24	Common throughout
Cardamine impatiens	Cut-leaved bittercress	UPL	24	Moist areas
Cirsium arvense	Canada thistle	FACU	24	Fields, disturbed ground
Duchesnea indica	Indian strawberry	FACU-	24	Moist areas
Fallopia japonica	Japanese knotweed	FACU-	10	Roadsides, stream banks
Ficaria verna (w)	Lesser celandine	FAC	23	Abundant floodplains
Galium mollugo	Wild madder	UPL	21	Fields
Glechoma hederacea	Ground ivy	FACU	24	Moist ground
Hemerocallis fulva	Orange daylily	UPL	20	Floodplains, banks
Lythrum salicaria	Purple loosestrife	FACW+	16	Locally abundant in wetlands
Pachysandra terminalis	Japanese pachysandra	X	3	
Persicaria longiseta	Long-bristled smartweed	FACU-	24	Common throughout
Thlaspi alliaceum	Stinking penny-cress	UPL	5	Disturbed ground, stream banks
Urtica dioica	Stinging nettle	FACU	23	Moist ground, floodplains
Veronica hederaefolia	Ivy-leaved speedwell	UPL	20	Moist ground, floodplains
<b>GRAMINOIDS</b>				
Agrostis stolonifera	Creeping bentgrass	FACW	2	
Arthraxon hispidus	A grass	FACU+	18	Dangerous, increasing
Bambusa sp.	Tall bamboo	x	5	
Bromus inermis	Awnless brome-grass	UPL	20	
Elymus repens	Witch grass	UPL	15	
Microstegium vimineum	Japanese stilt-grass	FAC	24	Common throughout
Miscanthus sinensis	Japanese plumegrass	FACU	1	
Phalaris arundinacea	Reed-canary grass	FACW+	24	Wet ground
Phragmites australis	Giant reed	FACW	16	
Schedonorus arundinaceus	Meadow fescue	FACU-	24	
<b>SHRUBS</b>				
Berberis thunbergii	Japanese barberry	FACU	24	
Buddleja davidi	Butterfly-bush	X	2	
Elaeagnus umbellata	Autumn olive	UPL	24	Common, usually drier areas
Euonymus alatus	Winged burning-bush	UPL	22	
Ligustrum obtusifolium	Broad-leaved privet	FACU	23	
Lonicera maackii	Amur bush-honeysuckle	UPL	24	Common throughout
Lonicera morrowii	Morrow's bush-honeysuckle	UPL	12	
Rhodotypos scandens	Jetbead	UPL	5	
Rosa multiflora	Multiflora rose	FACU	24	Common throughout
Rubus phoenicolasius	Wineberry	UPL	24	Common throughout
Viburnum dilitatum	Linden viburnum	UPL	6	Increasing
Viburnum opulus	Guelder-rose	X	3	
Viburnum plicatum	Doublefile viburnum	UPL	2	
Viburnum sieboldii	Siebold's viburnum	UPL	1	
<b>TREES</b>				
Acer palmatum	Japanese maple	UPL	3	
Acer platanoides	Norway maple	UPL	24	
Ailanthus altissima	Tree-of-heaven	FACU-	23	
Alnus glutinosa	Black alder	FACW-	4	Planted in mitigation wetlands
Aralia elata	Asian hercules-club	n	3	Increasing
Malus species	Crabapple	UPL	23	
Paulownia tomentosa	Princess-tree	UPL	12	
Phellodendron japonicum	Japanese cork-tree	UPL	6	Increasing
Prunus subhirtella	Higan cherry	ni	7	Increasing
Pyrus calleryana	Callery pear	n	18	Increasing
Robinia pseudo-acacia	Black locust	FACU-	20	
Ulmus parviflora	Chinese elm	n	2	

APPENDIX 2  
 INVASIVE ALIENS IN EAST BRADFORD TOWNSHIP

SCIENTIFIC NAME	COMMON NAME	WIS	COUNT	COMMENT
<b>VINES, HERBACEOUS</b>				
<i>Humulus japonicus</i>	Japanese hops	FACU	22	
<i>Persicaria perfoliata</i>	Mile-a-minute	FAC	23	Locally abundant
<b>VINES, WOODY</b>				
<i>Akebia quinata</i>	Five-leaf vine	UPL	1	
<i>Ampelopsis brevipedunculata</i>	Porcelain-berry	UPL	17	Increasing
<i>Celastrus orbiculatus</i>	Oriental bittersweet	UPL	24	
<i>Euonymus fortunei</i>	Wintercreeper	UPL	10	
<i>Hedera helix</i>	English ivy	UPL	10	
<i>Lonicera japonica</i>	Japanese honeysuckle	FAC-	24	
<i>Wisteria floribunda</i>	Japanese wisteria	ni	4	

APPENDIX 3  
SPECIES WITH COEFFICIENT OF CONSERVATISM OF 7 OR GREATER

CC	SCIENTIFIC NAME	COMMON NAME	HABIT	WET	HABITAT	RANK	COUNT
7 - Poor range of ecological tolerance, advanced stage of succession							
7	<i>Andropogon gerardii</i>	Big bluestem	Graminoids	FAC			2
7	<i>Aquilegia canadensis</i>	American columbine	Forbs	UPL			1
7	<i>Arisaema dracontium</i>	Green dragon	Forbs	FACW	Floodplain woods		2
7	<i>Baptisia tinctoria</i>	Wild indigo	Forbs	UPL			2
7	<i>Boechera laevigata</i> (w)	Smooth rock-cre	Forbs	UPL			3
7	<i>Carex bromoides</i>	A sedge	Graminoids	FACW	Wet woods		1
7	<i>Carex davisii</i>	Davis' sedge	Graminoids	FAC-		SP	3
7	<i>Carex grisea</i>	A sedge	Graminoids	FAC			8
7	<i>Carex gynandra</i>	A sedge	Graminoids	OBL	Wetlands		1
7	<i>Carex jamesii</i>	James' sedge	Graminoids	X		SP	2
7	<i>Carex lupulina</i>	Hop sedge	Graminoids	OBL	Swamps		7
7	<i>Carex pellita</i>	A sedge	Graminoids	OBL	Wet meadows		3
7	<i>Carex prasina</i>	A sedge	Graminoids	OBL	Wooded seeps		7
7	<i>Carex tonsa</i>	A sedge	Graminoids	UPL		SP	1
7	<i>Carex torta</i>	Sandbar sedge	Graminoids	FACW	Gravel bars		2
7	<i>Cephalanthus occidentalis</i>	Buttonbush	Shrubs	OBL	Wetlands		3
7	<i>Chrysosplenium americanum</i>	Golden saxifrage	Forbs	OBL	Wooded seeps		3
7	<i>Comandra umbellata</i>	Bastard toad-flax	Forbs	UPL			2
7	<i>Comptonia peregrina</i>	Sweet-fern	Shrubs	UPL			1
7	<i>Danthonia compressa</i>	Northern oat-grass	Graminoids	FACU-			3
7	<i>Dicentra cucullaria</i>	Dutchman's breeches	Forbs	UPL	Rich woods, banks		5
7	<i>Dichanthelium oligosanthes</i>	Heller's witch-grass	Graminoids	FACU	Serpentine	PT	2
7	<i>Dulichium arundinaceum</i>	Three-way sedge	Graminoids	OBL	Wetlands		1
7	<i>Epigaea repens</i>	Trailing arbutus	Forbs	UPL			3
7	<i>Eragrostis hypnoides</i>	Creeping lovegrass	Graminoids	OBL			1
7	<i>Fraxinus nigra</i>	Black ash	Trees	FACW			1
7	<i>Hydrocotyle americana</i>	Water pennywort	Forbs	OBL	Wetlands		1
7	<i>Iris versicolor</i>	Northern blue flag	Forbs	OBL	Open wetlands		1
7	<i>Isotria verticillata</i>	Whorled pogonia	Forbs	FACU			1
7	<i>Lechea racemulosa</i>	Pinweed	Forbs	X			1
7	<i>Lycopodium clavatum</i>	Runing-pine clubmoss	Ferns	FAC			1
7	<i>Lycopodium hickeyi</i>	Hickey's tree clubmoss	Ferns	FACU			3
7	<i>Melampyrum lineare</i>	Cow-wheat	Forbs	FACU			3
7	<i>Mertensia virginica</i>	Virginia bluebells	Forbs	FACW	Floodplain woods		10
7	<i>Nuphar lutea</i>	Spatterdock	Aquatics	OBL	Ponds, sloughs		3
7	<i>Nuttallanthus canadensis</i>	Old-field toadflax	Forbs	UPL		SP	2
7	<i>Obolaria virginica</i>	Pennywort	Forbs	UPL	Rich woods		1
7	<i>Osmunda regalis</i>	Royal fern	Ferns	OBL	Wet woods		2
7	<i>Paronychia fastigiata</i>	Forked chickweed	Forbs	UPL			3
7	<i>Poa autumnalis</i>	Late bluegrass	Graminoids	FAC	Low woods	PE	1
7	<i>Quercus bicolor</i>	Swamp white oak	Trees	FACW+			4
7	<i>Quercus stellata</i>	Post oak	Trees	UPL			2
7	<i>Ranunculus caricetorum</i>	Swamp buttercup	Forbs	OBL	Wetlands		1
7	<i>Rosa palustris</i>	Swamp rose	Shrubs	OBL	Wetlands		4
7	<i>Sabatia angularis</i>	Rose-pink	Forbs	FAC+	Serpentine		2
7	<i>Saururus cernuus</i>	Lizard's-tail	Forbs	OBL	Wetlands		1
7	<i>Sedum ternatum</i>	Wild stonecrop	Forbs	UPL			1
7	<i>Sparganium americanum</i>	Common bur-reed	Forbs	OBL	Wetlands		5
7	<i>Spiranthes lacera</i> v. <i>gracilis</i>	Slender ladies'-tresses	Forbs	FACU-			1
7	<i>Vaccinium stamineum</i>	Deerberry	Shrubs	FACU-			9
7	<i>Viola fimbriatula</i>	Northern downy violet	Forbs	UPL			2
7	<i>Zizia aptera</i>	alexanders	Forbs	FAC			1

**APPENDIX 3**  
**SPECIES WITH COEFFICIENT OF CONSERVATISM OF 7 OR GREATER**

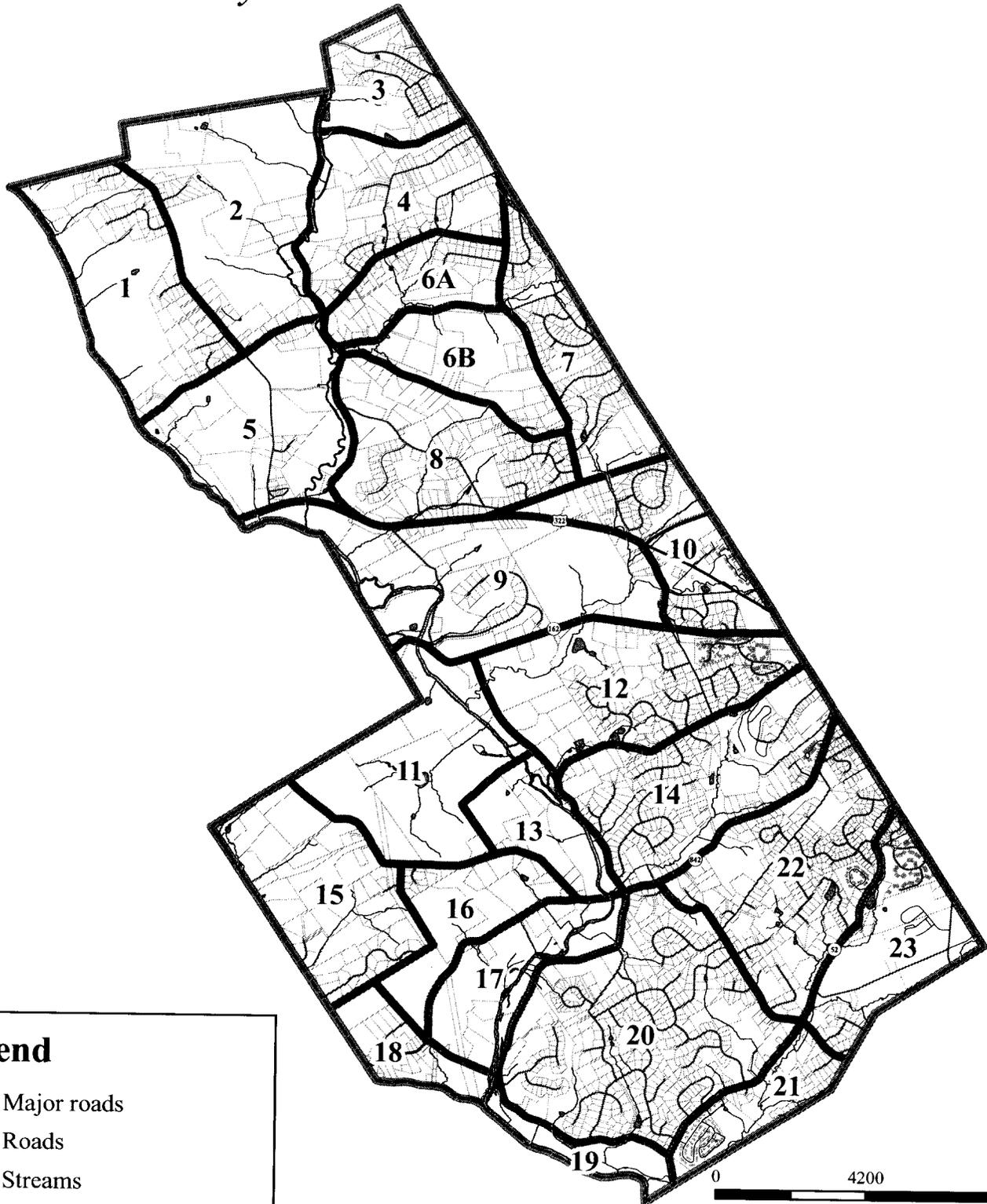
<b>8 - Poor range of ecological tolerance, advanced stage of succession</b>							
8	<i>Arabidopsis lyrata</i> (w)	Lyre-leaved rock cress	Forbs	FACU	Serpentinite		3
8	<i>Asplenium trichomanes</i>	D93	Ferns	UPL	Rocks		1
8	<i>Carex hystericina</i>	A sedge	Graminoids	OBL			1
8	<i>Chamaelirium luteum</i>	Fairy-wand	Forbs	FAC	Rich woods		2
8	<i>Dichanthelium polyanthos</i>	A panic-grass	Graminoids	FACU		SP	1
8	<i>Lysimachia terrestris</i>	Swamp candles	Forbs	OBL			1
8	<i>Mitella diphylla</i>	Bishop's-mitre	Forbs	FACU			1
8	<i>Monotropa hypopithys</i>	Pinesap	Forbs	X			1
8	<i>Packera anonyma</i>	Barrens ragwort	Forbs	UPL		PR	1
8	<i>Phlox subulata</i> ssp. <i>subulata</i>	Moss-pink	Forbs	X			1
8	<i>Pilea fontana</i>	Lesser clearweed	Forbs	FACW+	Wooded seeps		4
8	<i>Polygonum tenue</i>	Slender knotweed	Forbs	UPL	Serpentinite		2
8	<i>Polypodium virginianum</i>	Polypody	Ferns	UPL			10
8	<i>Quercus ilicifolia</i>	Scrub oak	Shrubs	UPL			2
8	<i>Rhynchospora capitellata</i>	Small-headed beak-rush	Graminoids	OBL	Wet meadows		1
8	<i>Scleria pauciflora</i>	Few-flowered nut-rush	Graminoids	FACU+	Serpentinite	PT	2
8	<i>Sparganium eurycarpum</i>	Broad-fruited bur-reed	Forbs	OBL	Wetlands		2
8	<i>Veronicastrum virginicum</i>	Culver's-root	Forbs	FACU			2
8	<i>Viola pedata</i>	Birds-foot violet	Forbs	UPL			1
8	<i>Woodwardia areolata</i>	Netted chain fern	Ferns	OBL	Wet woods	PT	1
8	<i>Zizania aquatica</i>	Wild rice	Graminoids	OBL	Open wetlands	PR	1
<b>9 - High degree of fidelity to narrow range of habitats</b>							
9	<i>Asclepias verticillata</i>	Whorled milkweed	Forbs	UPL	Serpentinite		1
9	<i>Bouteloua curtipendula</i>	Side-oats grama grass	Graminoids	X	Serpentinite	PT	1
9	<i>Carex planispicata</i>	A sedge	Graminoids	FAC	Rich woods	SP	3
9	<i>Cerastium velutinum</i>	Barrens chickweed	Forbs	UPL	Serpentinite	SP	2
9	<i>Fimbristylis annua</i>	Annual fimbry	Graminoids	FAC	Serpentinite	PT	2
9	<i>Pellaea atropurpurea</i>	Purple cliffbrake fern	Ferns	UPL			1
9	<i>Pellaea glabella</i>	Blue cliffbrake fern	Ferns	UPL		SP	1
9	<i>Symphotrichum depauperatum</i>	Serpentine aster	Forbs	X	Serpentinite	PT	1
<b>10 - High degree of fidelity to narrow range of habitats</b>							
10	<i>Phemeranthus teretifolius</i>	Fame-flower	Forbs	UPL	Serpentinite	PT	2

COUNT= Number of sections seen in East Bradford Township out of total of 24 sections

# Map 1

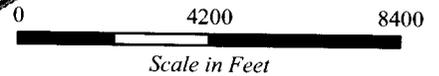
## East Bradford Township

### Botanical Survey Sections



#### Legend

-  Major roads
-  Roads
-  Streams
-  Bodies of water
-  Botanical survey sections
-  Tax parcels
-  Township boundary



**Brandywine Conservancy**

**Environmental Management Center**

*Data Source: Base data from Chester County GIS Department, 2010. Botanical survey sections created by Janet Ebert and Brandywine Conservancy, 3/2010.*

*Map created: June 7, 2010*



Symbol	Geology Type
ck	Cockeysville Marble
Ybfa	felsic and intermediate gneiss, amphibolite facies
Ybfg	felsic gneiss, granulite facies
oct	Octoraro Phyllite
pc	Peters Creek Schist
um	ultramafite
wb	Wissahickon Schist

**Legend**

- Roads
- Streams
- Bodies of water
- Geology
- Watershed boundaries
- Township boundary

## MAP 2 Watersheds & Geology

*East Bradford Township  
Chester County*

0    1,350    2,700    5,400

Scale in Feet



**Brandywine Conservancy**  
Environmental Management Center  
P.O. Box 141    Chadds Ford, Pennsylvania 19317    (610) 388-2700

Data Source: Base data from Chester County GIS Department, 2010. Watershed boundaries from PASDA, 1996. Geology from USGS, 2001.

Date created: June 7, 2010



**Legend**

-  Rare plant species
-  Exceptional natural areas
-  Major roads
-  Roads
-  Streams
-  Bodies of water
-  Tax parcels
-  Township boundary

**Map 3**  
**2005 Aerial Photograph,**  
**Exceptional Natural Areas**  
**& Rare Plant Species**

*East Bradford Township*  
*Chester County*

0 1,350 2,700 5,400

Scale in Feet



**Brandywine Conservancy**  
 Environmental Management Center  
 P.O. Box 141 Chadds Ford, Pennsylvania 19317 (610) 338-2706

*Data Source: Base data from Chester County GIS Department, 2007. Exceptional natural areas and rare plant species from Janet Ebert survey, 4/2010. Aerial photograph from PASDA, 2005.*

*Date created: June 7, 2010*



**Legend**

-  Rare plant species
-  Exceptional natural areas
-  Major roads
-  Roads
-  Streams
-  Bodies of water
-  Tax parcels
-  Township boundary

## Map 4 1937 Aerial Photograph

*East Bradford Township  
Chester County*

0 1,350 2,700 5,400

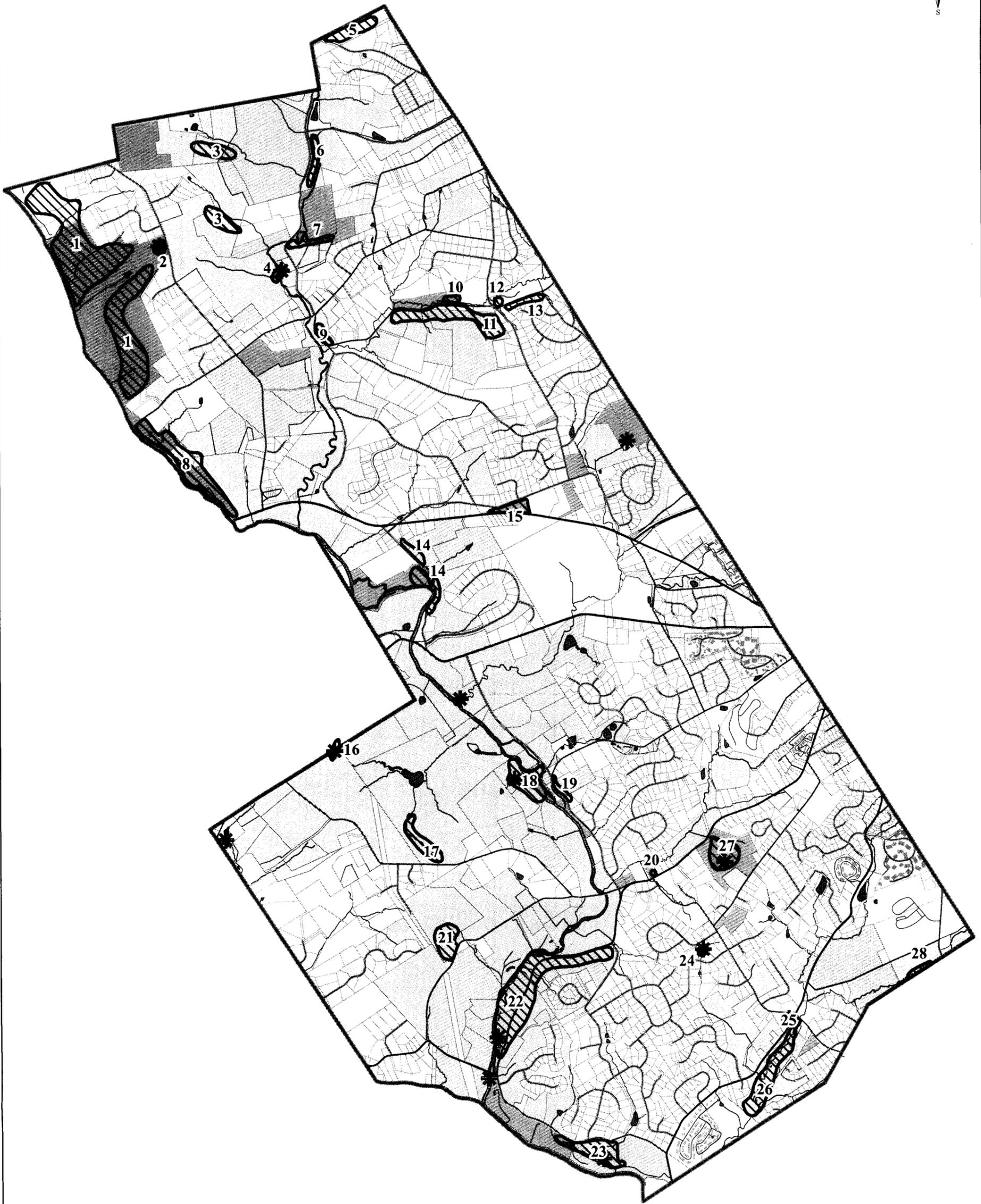
Scale in Feet



**Brandywine Conservancy**  
Environmental Management Center  
P.O. Box 141 Chadds Ford, Pennsylvania 19317 (610) 388-2708

*Data Source: Base data from Chester County GIS Department, 2007. Exceptional natural areas and rare plant species from Janet Ebert survey, 4/2010. Aerial Photograph from PASDA, 1937.*

*Date created: June 7, 2010*

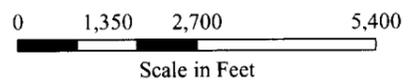


**Legend**

-  Rare plant species
-  Exceptional natural areas
-  Major roads
-  Roads
-  Streams
-  Bodies of water
-  Tax parcels
-  Township owned open space
-  Future conservation acquisition per Official Map
-  Other open space priorities per Open Space Plan
-  Protected lands and restricted open space

# Map 5 Land Status, Exceptional Natural Areas & Rare Plant Species

*East Bradford Township  
Chester County*



**Brandywine Conservancy**  
Environmental Management Center  
P.O. Box 141 Chadds Ford, Pennsylvania 19317 (610) 388-2700

*Data source: Base data from Chester County GIS Department, 2007. Protected lands from Chester County Planning Commission, 2005 (revised by Brandywine Conservancy, 04/2010). Exceptional natural areas and rare plant species from Janet Ebert survey, 4/2010.*

*Date created: June 7, 2010*