



# The Sanctuary of Bull Valley 10-Year Management Plan

## Woodstock, Illinois

September 2015

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## Introduction

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In October 2014, the Sanctuary of Bull Valley Master Operating Association (SBV) retained Davey Resource Group, a division of The Davey Tree Expert Company, to assess the natural areas within the site and develop a 10-year management plan that provides restoration recommendations for the next ten years. An Ecological Assessment and Restoration Plan was completed in October 2002 (Phase 1) and September 2005 (Phases 2 and 3) by Applied Ecological Services to assess the state of the land and to build a plan towards restoring portions in the common properties and Deed-restricted Open Space areas, while preparing other portions for residential development. The 2002 plan was designed to cover the scope through 2010. This management plan will build off of the original plan and all the activities that have been completed from 2002 through 2015. Davey Resource Group recommends that the new plan be implemented starting fall 2015.

## Site Description

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### Site Location

The Sanctuary of Bull Valley subdivision is located on the eastern limits of Woodstock, Illinois. The site is bordered to the north by Country Club Road and to the south by McConnell Road. It covers approximately 300 acres of land that was previously used for agricultural purposes, including livestock, crop production, and horticultural uses. Knickerbocker Properties, LLC was the original developer. It is understood that Knickerbocker Properties was required by the City of Woodstock to maintain at least 47% of the development as open space. The final plat comprises approximately 51% of dedicated open space. These restrictions were applied, in large part, because the kettle-moraine topography of the site boasts 20 kettles which help maintain infiltration of stormwater (Schneider Geoscience). According to the Illinois State Water Survey, these kettles are important sites for groundwater recharge of the Boone Creek Fen Nature Preserves, which are one mile northeast of SBV.



*Photograph 1. This is an example of a kettle (#14) found in the Sanctuary of Bull Valley.*

### General Habitat

Davey Resource Group visited the site on December 22, 2014 and assessed the current vegetation and land cover. In general, the area was found to be comprised predominantly of prairie and savanna, along with some woodland and wetland areas. Within the 300-acre community, four distinct ecotypes have been identified, including woodland, savanna, prairie, and wetland. Each ecotype includes kettles.

Recommendations have been developed for each ecotype and have been mapped within SBV (see Appendix A). A schedule of management activities (see Appendix B) has been compiled for each area; however, budgeted estimates (Appendix C) are based on the SBV natural areas as a whole. Restoration efforts, including brushing, prescribed burning, chemical treatments, mechanical treatments, seeding, and planting of herbaceous and woody materials, should be coordinated and performed at properly timed intervals utilizing best management practices (BMPs).

By following the proactive recommended stewardship activities found in this management plan and monitoring to ensure success over the next ten years, the natural areas within SBV should show both aesthetic and floristic quality improvements.

## Restoration/Maintenance Goals

The primary goal of this restoration plan will be to identify areas in need of continued enhancement of aesthetics and ecosystem health in all designated open space areas consisting of native prairie, savanna, woodland, and wetland vegetation; once these areas are identified, continued restoration will be instrumental to maintaining ecologically suitable native vegetation. Ecological stability is the primary focus of this report since a balanced, stable environment is less costly to maintain due to high levels of native competition naturally reducing the establishment of non-native and/or pioneer species. The original plan's goals included: encouraging native herbaceous ground story vegetation, improving the quality of water infiltration on site for recharge, and preserving large old trees (mostly oaks and hickories). All of these goals continue to be a high priority in this new restoration plan. Davey Resource Group has established a framework that describes the recommended restoration and management objectives, tasks, and performance standards for each restoration unit identified in the Restoration Plan Map (Appendix A).

The maintenance goals for the subdivision's natural areas include:

- Stabilization of natural ecosystem within the property so that restoration practices are:
  - Reduced to a prescribed burn rotation of every 2–3 years,
  - Early Detection and Rapid Response (EDRR) actions by becoming proactive in restoration efforts from having a dedicated on-site weekly team, and
  - Optimized by annual monitoring/evaluation of the site.
- Achieve a Floristic Quality Mean C (Swink & Wilhelm 1994) score of 5 or greater by the end of this ten-year management plan.
- Native vegetative cover exceeds 95%, with no single species comprising greater than 50% cover.
- Maintain an invasive species cover of 5% or less within the property. Table 1 lists the invasive species within the area.
- Reduce aggressive native species such as *Solidago altissima* (tall goldenrod) to less than 50% locally dominant in any given area.

Table 1. Invasive Plant Species

Species	Common Name
<i>Alliaria petiolata</i>	garlic mustard
<i>Artium minus</i>	common burdock
<i>Bromus inermis</i>	Hungarian brome
<i>Carduus nutans</i>	nodding thistle
<i>Celastrus orbiculatus</i>	oriental bittersweet
<i>Cirsium arvense</i>	Canada thistle
<i>Cirsium vulgare</i>	bull thistle
<i>Elaeagnus umbellata</i>	autumn olive
<i>Lonicera maacki</i>	amur honeysuckle
<i>Lonicera morrowii</i>	Morrow's honeysuckle
<i>Lonicera tartarica</i>	Tartarian honeysuckle
<i>Melilotus alba</i>	white sweet clover
<i>Melilotus officinalis</i>	yellow sweet clover
<i>Miscanthus</i> spp.	Chinese/Japanese silvergrass
<i>Phalaris arundinacea</i>	reed canarygrass
<i>Phragmites australis</i>	common reed
<i>Polygonum cuspidatum</i>	Japanese knotweed
<i>Rhamnus cathartica</i>	common buckthorn
<i>Rosa multiflora</i>	multiflora rose

## **Monitoring Methodology**

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### **Floristic Quality Assessment (FQA)**

FQA is a tool designed to assess the quality of natural areas using a checklist of species present on a site. Each plant species displays a different degree of tolerance to natural and human-induced habitat disturbance. Plants also display varying degrees of fidelity to specific habitat integrity. A number termed the coefficient of conservatism (C) has been assigned to each plant in the Chicago region based on its tolerance of disturbance and adherence to specific habitat integrity. C-values range from 0–10 (Swink and Wilhelm 1994).

Native plants that have a high tolerance to disturbance and grow in ubiquitous habitats are assigned C-values on the low end of the spectrum (0, 1, and 2). Native plants with a low disturbance tolerance are typically restricted to high-quality. Unique habitats are assigned C-values on the high end of the spectrum (8, 9, and 10). Non-native species are not assigned C-values, but a default C-value of 0 is used in calculating FQA metrics.

The mean C of a site as well as a second calculation referred to as the Floristic Quality Index (FQI) are two components derived from FQA inventory data that can be used to objectively assess the integrity of a natural area. FQI is a weighted measure of species richness and is determined by multiplying the square root of the number of native species by the mean C.

Due to the vast majority of the Chicago region having FQI values less than 20, indicating no significance in a natural area perspective, a starting goal of 25 or greater is important, with a final goal of the mean C being equal to or greater than 3.5. In addition to being used to determine the integrity of a natural area, FQA can also be used for long-term monitoring of natural area quality and for examining the outcomes of various management strategies, such as prescribed burning and brush removal.

An inventory of plant species observed in each ecotype was analyzed to calculate the mean C and FQI, which helps determine the quality of the plant community and establish baseline data for evaluating future restoration and management activities. Data from each monitoring plot were used to determine an overall mean C and FQI for each ecotype and for the site as a whole.

### **Boundaries**

Initial boundaries for this project were acquired through previously gathered property boundary data from McHenry County. These property boundaries were then uploaded into a GPS unit for the purpose of this project. Using satellite images, ecotypes were mapped and subsequently ground-truthed in the field by meanders through all ecotypes by Nicky Obenauf in spring 2015.

Reviewing aerial maps prior to ground truthing fieldwork, 12 sample monitoring plots were located. Two sample plots were chosen for each ecotype. Six plots were chosen by using original monitoring plots from 2007 to present. Additionally, at least one plot in each ecotype contains an area that has yet to be restored or is in the early stages of restoration. The remaining plots are in various stages of the restoration process; some of these plots are comprised of completely stable environments. Using topographic maps and existing data, the plot corners were mapped.

## Vegetation Inventories

Vegetation inventories were conducted using the meander method at the same time plot data were being recorded by Nicky Obenauf. Meander locations were chosen based on ecotype and covered approximately 25% of each ecotype per unit. All species observed were recorded for each meander. In the event of an unknown species, vouchers were collected where possible to utilize a dichotomous key for identification at a later time. If an unknown plant was sparse or appeared to be rare, voucher photographs were taken to aid in identification. Representational photographs were taken throughout meanders.

## Plots

On December 22, 2014, Tom Daly, Nicky Obenauf, and Michele Warner, professionals with Davey Resource Group, installed six additional monitoring plots and recorded the boundaries of all 12 permanent monitoring plots. These plots were distributed in a way that represents the average vegetative cover in the Sanctuary of Bull Valley. The monitoring plots include two wetland plots, two forested plots, four prairie plots, and four savanna plots. Plot sites within each ecotype were chosen based on representation of the vegetation cover. Some are previously restored sites and are in the maintenance phase of restoration; some are stabilized and starting EDRR techniques and practices. A few areas are almost to the stabilized point but may still be easily tipped back to maintenance, so they have been labeled as “late Maintenance stage.” Other areas are in the beginning stages of restoration or have not had any restoration as of yet. Table 2 illustrates a breakdown of the plot locations and conditions.



*Photograph 2. This is the northeast view facing southwest for Plot 5.*

Table 2. Plot Locations and Conditions

Plot #	Ecotype Location	Environmental Stability
1	woodland	early stage*
2	savanna	stable
3	woodland	maintenance stage*
4	wetland	no restoration+
5	prairie	stable
6	prairie	no restoration
7	savanna	no restoration+
8	prairie	stable
9	savanna	maintenance stage
10	wetland	late maintenance stage
11	savanna	early stage*
12	prairie	late maintenance stage

\* - never has been seeded

+ only invasive vegetation killed

Rebar was installed at each corner of the 10' x 20' plot with flagging to more readily identify corners. Monitoring plot boundaries were surveyed using a GeoXH™ Trimble® GeoExplorer® 6000 series Dual-frequency Global Navigation Satellite System, or GNSS (global positioning system [GPS], GLONASS, SBAS [WAAS]), receiver and antenna with Everest™ multipath rejection technology, and Floodlight technology with 220 channels running professional TerraSync™ software capable of decimeter (10–75 cm) accuracy after differential correction.

Trimble® GPS Pathfinder® Office software was used for post processing the GNSS field-collected data incorporating Trimble® DeltaPhase™ differential correction technology using GPS data collected from an appropriate base station. The corrected GPS latitude-longitude positions were exported into a compatible coordinate system as an AutoCAD® drawing interchange file (DXF). The maps included in this report were prepared using AutoCAD Map® 2014 software (Appendix A).

Nicky Obenauf revisited these plots on various days from late May through early June to determine vegetative cover. All species within each plot were recorded. In the event of an unknown species, vouchers were collected where possible, to utilize a dichotomous key for identification at a later time. If an unknown species was sparse or appeared to be rare, voucher photographs were taken to aid in identification. Vegetation that created a dense monoculture of one species in any growing area within the plot was recorded as a dominant species for future monitoring (but may not be reflected in data sheets).

Two photographs were taken at each monitoring plot in order to take a visual representation of each site; one from the northeast to the southwest, the other from the northwest to the southeast. These photographs can be used for annual comparisons and found in Appendix D Plot Photographs.

### Wildlife Observations

Citizen scientists periodically collected data to aid in wildlife monitoring. Continued data collection is recommended for future years and included in the Restoration Activity Schedule found in Appendix B. Wildlife observations can be utilized as an improvement indicator for a natural area. However, wildlife observation data were not within the scope of this report and therefore not documented.

## Assessment Results

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The objective of the Management Plan is to document the current conditions of the natural areas during restoration/maintenance activities in order to evaluate the progression and success of restoration and adapt restoration techniques if necessary. Davey Resource Group specialists Nicky Obenauf, Tom Daly, and Michele Warner visited the site on December 22, 2014 for the initial identification of specific monitoring plots and mapping of all previous and newly installed monitoring plots. Nicky and Elroy Fossum III returned in May and June 2015 to gather inventory data and further plot data.

### Ecotype Assessment Results

#### Woodland

The northwest portion of Unit 1 is primarily comprised of restored historic oak savanna and is dominated by mature open grown *Quercus alba* (white oak) and *Q. macrocarpa* (bur oak). Unit 1 is also commonly mixed with *Carya ovata* (shagbark hickory) and *Q. rubra* (red oak). At the time Applied Ecological Services (Stoll, Larson, O'Leary, & Tuttle 2003) performed the original Environmental Assessment in 2002. This entire area was dominated by a *Rhamnus cathartica* (common buckthorn)/*Lonicera tatarica* (tartarian honeysuckle) understory crowding out all ground level vegetation and preventing regeneration of young oak and hickory..Additionally, the shrubby understory caused self-pruning in a majority of the currently mature oak and hickory, evident by the lack of branches in the first 20 feet of the trees. The northwestern-most portion of this woodland has



**Photograph 3. This view is an example of the Unit 1 Woodland found in the northwest corner.**

never been restored, which is where Plot 1 can be found. The majority of the acreage that encompasses this woodland is in need of a heavy restoration schedule. Plot 2 can be found in the more stable area of this woodland. Portions of this woodland have become so overgrown that tree canopy cover is greater than 60%. The majority of the mature red oak are found in the southern end of the more densely-wooded area (i.e., woodland) of the western section. Younger undesirable trees are common throughout this area, including: *Acer negundo* (box elder); *Morus alba* (white mulberry); *Prunus serotina* (wild black cherry); and *Ulmus pumila* (Siberian elm). Other native tree species include: *Acer saccharum* (sugar maple); *Carya cordiformis* (bitternut hickory); *Juglans nigra* (black walnut); *Populus deltoides* (cottonwood); *Quercus velutina* (black oak); and *Tilia americana* (basswood).

Trees such as *Acer platanoides* (Norway maple) and *Pinus strobus* (white pine) were historically planted around a house previously located in this area or planted for development of the subdivision. The house and related structures have since been demolished, but the trees remain. Non-native and weedy native shrubs and vines including buckthorn, *Celastrus orbiculatus* (oriental bittersweet), *Rosa multiflora* (multiflora rose), *Rubus allegheniensis* (Allegheny blackberry), *R. occidentalis* (black raspberry), and tartarian honeysuckle have been substantially reduced by aggressive management in the recent past throughout the northwest woodland and savanna. The native herbaceous ground layer is suppressed by shade in the heavily-wooded areas. Where there is abundant vegetation, *Alliaria petiolata* (garlic mustard) dominates. Other herbaceous species in the northern woodland include: *Arctium minus* (common burdock); *Bromus arvensis* (Japanese chess); *Circaea lutetiana canadensis* (enchanter's nightshade); *Daucus carota* (Queen Anne's lace); *Geum canadense* (white avens); *Osmorhiza claytonii* (sweet cicely); *Phalaris arundinacea* (reed canarygrass); *Podophyllum peltatum* (may apple); *Sanicula gregaria* (black snakeroot); *Smilacina racemosa* (false Solomon's seal); and *Urtica dioica* (stinging nettle).



**Photograph 4. Monitoring Plot 9 still contains many cherry trees.**

East of the northwest entrance in Unit 1 is another densely-wooded area. This area has been aggressively treated for common buckthorn, common burdock, garlic mustard, giant ragweed, tartarian honeysuckle, and thistle. The canopy consists of bur oak, shagbark hickory, and white oak. The understory is sparse, consisting of younger saplings of the aforementioned trees, but also contains some *Amelanchier arborea* (serviceberry), *Physocarpus opulifolius* (ninebark), and *Sambucus canadensis* (elderberry).

A third woodland area is located in the northern end of Unit 4 (see Appendix A). This woodlot is an overgrown maple nursery consisting of various nursery specimens of maple and ash species. Canopy cover is between 95%–100%, resulting in a shade suppressed understory. Herbaceous vegetation consists of giant ragweed, Canada thistle, stinging nettle on the periphery, and *Arisaema triphyllum* (Jack-in-the-pulpit) found within the shaded area. Woodland cover at SBV is 12.4 acres, or 8% ground cover.

Since most of the woodlands addressed in this section fall within AES’s classification of “Young Woods” and “Mature Savanna/Woodland” in their 2003 report, it is difficult to determine if the current and future woodland areas as outlined in this report have actually increased or decreased in size. The overall average FQI for Adventives among all woodland ecotype is 46.1, while the overall average FQI for natives is 53.9. The data sheets for woodlands (and all ecotypes) can be found in Appendix E Inventory and Plot Data Sheets.

## Savanna

Those areas designated as savanna, which were not larger savanna areas, were previously classified as young woods by AES. Currently, the savanna ecotype comprises of 47.6 acres, or 32% of total coverage at SBV. This ecotype, combined with the above woodlands, equate to the AES’s report of “Young Woods” and “Mature Savanna/Woodland.” These two ecotypes total 60 combined acres (or 40%) of the SBV natural area, versus the 54.8 acres previously recorded for the combined area in the AES report. This area is not expected to drastically increase, although there may be some areas to focus on for reforestation that may only slightly further increase the savanna/woodland ecotype (if chosen). These sites are essentially tree lines dominated by box elders, buckthorn, tartarian honeysuckle, and wild black cherry. All four of these species have been aggressively controlled with the exception of mature wild black cherry. Young oaks (*Q. alba*, *Q. bicolor*, *Q. coccinea*, *Q. macrocarpa*, and *Q. rubra*) have been introduced to help the progression become a more stable savanna buffer. Other trees located in these fence rows include: *Acer saccharinum* (silver maple); *Carya ovata* (shagbark hickory); *Celtis occidentalis* (hackberry); *Morus* spp. (mulberries); *Pinus strobus* (white pine); *Populus deltoides* (eastern cottonwood); *Quercus macrocarpa* (bur oak); *Q. rubra* (red oak); and *Ulmus americana* (American elm). Shrubs include: *Cornus racemosa* (gray dogwood); *Rosa multiflora* (multiflora rose); *Rubus allegheniensis* (Allegheny blackberry); *R. occidentalis* (black raspberry). Canada goldenrod, garlic mustard, orchard grass, and smooth brome are the most common undesirable herbaceous species in the ground layer and are locally dominant across all fencerows. Other undesirable species include: burdock; *Erigeron annuus* (annual fleabane); *Hackelia virginiana* (stickseed); Kentucky bluegrass; *Leonurus cardiac* (motherwort); oriental bittersweet; *Phleum pratense* (Timothy hay); *Phytolacca americana* (pokeweed); Queen Anne’s lace; stinging nettles; *Rubus* spp. (brambles); and various non-native foxtail species. *Anemone quinquefolia* (wood anemone); *Bromus pubescens* (woodland brome); *Fragaria virginiana* (wild strawberry); *Geum canadense* (wood avens); *Helianthus helianthoides* (false sunflower); *Hystrix patula* (bottlebrush grass); *Oenothera biennis* (common evening primrose); *Verbena urticifolia* (hairy white vervain); and Virginia wildrye are commonly found native species throughout all woodlands and savannas.



**Photograph 5. Some areas of the Unit 1 savanna lack open canopy, which is integral to stability and oak regeneration.**

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**Photograph 6. An open canopy consists of a moderate amount of trees, but their canopies do not touch, which allows a greater amount of light to reach the ground.**



The larger area savannas located throughout the center of Unit 1 are dominated by mature shagbark hickory, along with bur, red, and white oaks. Additional tree species include: bitternut hickory; *Acer saccharum* (sugar maple); *Catalpa speciosa* (catalpa); *Corylus americana* (American hazelnut); hackberry; *Hamamelis virginiana* (American witchhazel); and *Populus tremuloides* (white poplar). Herbaceous species found in the understory include: geranium; *Hypericum perforatum* (Saint John's wort); Jacob's-ladder; *Monarda fistulosa* (bee balm); Queen Anne's lace; river grape; strawberry; various asters; various



**Photograph 7: An open canopy savanna (foreground) contains only a few trees compared to a closed canopy (background).**

goldenrod species; various milkweed species; various non-native turfgrass species; various sunflower species; Virginia bluebells; and white woodland vervain. For a complete list, see the data sheets provided in Appendix E. On an annual basis, this area (central savanna in Unit 1) has been aggressively treated for autumn olive, blackberry species, common buckthorn, oriental bittersweet, Queen Anne's lace, reed canarygrass, sweet clover, tartarian honeysuckle, and thistles. For the most part, the savannas found in SBV consist of fairly closed canopy savannas. This limits the light availability to vegetation. This light limitation can suppress oak regeneration and native vegetation in unstable environments (or in some cases, such as SBV, even stable ecotypes due to human and wildlife pressures). Opening up the savanna canopy will help restoration efforts.

The overall average FQI with Adventives for all savanna ecotype is 34.4, while the average FQI with natives is 39.3 (see Appendix E for more details).

### Prairie

Prairies in various stages of restoration are found throughout the entire site. All 82.8 acres designated as prairie receive regular prescribed burns at an attempted frequency of once every other year. These prairies, covering 56% of SBV, have been previously seeded, constantly monitored, and treated for any non-native or aggressive native species, including blackberry species, common buckthorn, eastern cottonwood, giant ragweed, multiflora rose, oriental bittersweet, reed canarygrass, tartarian honeysuckle, *Salix* spp. (willows), sweet clover, thistles, and white mulberry. These prairies provide ideal habitat for native insects, reptiles, and birds, including declining species such as *Ammodramus henslowii* (Henslow's sparrow), *Dolichonyx oryzivorus* (bobolink), *Spinus tristis* (American goldfinch), and *Sturnella magna* (eastern meadowlark), some of which have been sighted on the property.



**Photograph 8. This large prairie is found along the east border of Unit 1.**

The eastern portion of Unit 1 contains a prairie dominated by *Agrostis alba* (redtop), *Solidago altissima* (tall goldenrod), and *Sorghastrum nutans* (Indian grass). Additional herbaceous species within this area include: *Coreopsis tripteris* (tall coreopsis); *Echinacea purpurea* (broad-leaved purple coneflower); *Lespedeza capitata* (round-headed bush clover); *Monarda fistulosa* (wild bergamot); *Petalostemum candidum* (white prairie clover); purple coneflower; rattlesnake master; *Smilacina racemosum* (feathery false Solomon’s seal); tall coreopsis; and *Tradescantia ohiensis* (common spiderwort). For the benefit of restoration maintenance, this prairie has received regular brushing in order to control *Elaeagnus* sp. (olive), multiflora rose, ragweed, thistles, and other woody vegetation.

The higher quality prairie in Unit 2 contains several kettles located throughout the various prairie length and should be maintained on the same schedule as the surrounding area; however, the species may vary slightly due to the increased amount of moisture that may be found in the kettle area. The western prairie has one trouble spot dominated by redtop. Additionally, where the woodline along the farmfield property has been allowed to continue, undesirable woodies have started establishing further into the prairie.



**Photograph 9. A Unit 2 prairie is facing south from the south end of the tree line on the easternmost property border.**

The centrally located prairie in Unit 3 of SBV is the highest quality within the site at 21.1 Native FQI known as the Main Prairie.

This prairie is very well balanced and not dominated by any specific species as a whole. Notable native vegetation includes: *Aster laevis* (smooth blue aster); *Lupinus perennis occidentalis* (wild lupine); rattlesnake master; and *Silphium terebinthinaceum* (prairie dock). Frequent control measures for sweet clovers have been taken through each growing season. The other two prairies in Unit 3, one north and one south/southeast, have similar species composition. There are several kettles and bioswales located throughout all the natural areas containing other notable species such as *Vernonia gigantea* (ironweed). The eastern prairie is dominated by *Andropogon gerardii* (big bluestem), while the northern prairie contains locally dominant areas of *Bromus inermis* (Hungarian brome), but is otherwise well balanced. However, all the prairies in Units 2 and 3 are seeding influxes of undesirable vegetation from the adjacent/surrounding empty lots. Maintenance of these lots by broadcast herbicide applications is necessary to reduce long-term maintenance issues within the prairies. Additionally, like the woody problem found in Unit 2, the eastern edge along the farmland has established woody vegetation starting to encroach from the farmfield property.



**Photograph 10. This is the Main Prairie Monitoring Plot.**

The prairie located in Unit 4 (formerly phases 2 and 3) is regularly subjected to prescribed burns in order to control blackberry species, black locust, common buckthorn, cherry, mulberry, Norway maples, tartarian honeysuckle, willow species, and other non-native or aggressive herbaceous vegetation. While no single species dominates these natural areas, herbaceous cover is being compromised by a variety of

species, including clovers, Queen Anne's lace, goldenrods, ragweeds, sweet clovers, and thistles. Controlling woody and aggressive species has been an ongoing restoration challenge in this prairie. The prairie in the northwestern portion of this unit is the lowest quality prairie within the site. These natural areas are dominated by the surrounding no-mow fescue and smooth brome. Intensive herbicide and supplemental seeding is specifically recommended for this area. There are four kettles located throughout Unit 4. Like the two units described above, the eastern woody vegetation has been allowed to encroach drastically in this area. It appears that the property boundary is no longer being maintained (due to tens of feet being lost to subtle but consistent buckthorn and honeysuckle invasions). Buckthorn is a known host for the soybean aphid; therefore, it is in the farmer's best interest to also control buckthorn along the property line to enhance his soybean yield in the future.

The overall average FQI with Adventives for all prairie ecotype is 50.5, while the average FQI with natives is 58.7 (see Appendix E for more details).

### Kettles

There are a total of 20 kettles located within the Sanctuary of Bull Valley ( Appendix A). As previously mentioned, these kettles are important recharge sites for groundwater. Additionally, these sites may provide key habitat for wildlife such as butterflies, native frogs, salamanders, solitary bats, and turtles. Three of the 19 kettles are located within areas identified as wetlands. All kettles are located within areas that are monitored and treated for non-native and aggressive species. Any kettle within a prairie, savanna, or woodland is subject to that ecotype's prescribed burn schedule and invasive species control.



*Photograph 11. This is the base of Kettle 4 in Unit 1 facing south.*

Unit 1 contains eight kettles, three of which are located within a savanna. Four kettles are located within a prairie, and the largest in this section is in a wetland. Each of these kettles has been treated for cottonwood seedlings, reed canarygrass, and stinging nettle.

Unit 2 contains four kettles, all of which are located within a prairie, where the dominant vegetation is primarily big bluestem; although *Spartina pectinata* (prairie cord grass) is moving into many kettles throughout SBV. The larger southwestern kettle is dominated by forbs, including *Helianthus giganteus* (giant sunflower), ironweed, and tall coreopsis. These kettles are closely monitored for cottonwood seedlings, giant ragweed, reed canarygrass, and thistle.

Four kettles are located within the central section (Unit 3). These kettles are typically dominated by species that are found in the surrounding natural areas. Each growing season, these kettles are treated for brambles, giant ragweed, sweet clover, and thistle. Three of the four kettles are found within prairies; the fourth kettle (#8) contains monitoring plot 7. This kettle is found with a mix of 60% savanna and 40% woodland located within the old tree nursery area. The canopy for this kettle is comprised of ash (currently dead from emerald ash borer) and maple. There has not been successful restoration on this kettle; only invasive vegetation elimination has been attempted to bring the area under a little control.

The southern section, Unit 4, contains three kettles. Of these kettles, two are located within designated wetlands/stormwater basins. These kettles are not dominated by any one species. The remaining kettle is predominantly within a prairie and contains monitoring plot 12.

For the remainder of this report, all kettle information will be included in the ecotype in which they are found due to their maintenance schedule being identical to their surrounding ecotype. It is important to know and maintain these vital areas; however, the difference in maintenance is negligible. The primary difference would be found in seeding. As kettles require supplemental seed, the seed utilized should be a mesic to wet variety of the surrounding light conditions associated with the surrounding ecotype. In several cases, these kettles were converted to wetlands/stormwater basins to handle the water fluctuations that would be produced by a fully built-out subdivision. The next section addresses the kettles that were converted.

### Wetlands /Stormwater Basins

The Unit 1 wetland is dominated by reed canarygrass that was initially herbicide treated in the spring 2015. The only other species that occurred in this wetland at time of spring monitoring was *Carex stricta* (tussock sedge). The wetland is subject to fluctuating water levels ranging from open standing water to mudflats. In the spring, water levels are high enough that this wetland is able to support breeding wood duck (*Aix sponsa*), but then drains to a mud-flat later in the year allowing the support of other amphibians and vegetation. This wetland is also known as Kettle 2 on the map in Appendix A.



**Photograph 12. Restoration recently started on the original wetland, which is also known as Kettle 2 on the map in Appendix A.**

The second largest wetland is found in the center of Unit 4 (Kettle 18) and comprises approximately 66% wetland and 22% prairie. Mature and failing *Salix babylonica* (weeping willow) line the north end of this kettle. Herbaceous vegetation includes: *Eleocharis* species (spike rushes); giant ragweed; *Helenium autumnale* (sneezeweed); *Polygonum amphibium* (smartweed); and various aster species.

The smallest wetland/stormwater basin is in a man-made basin with overflow protection (Kettle 20). The basin is predominantly vegetated by asters and goldenrods.

The overall average FQI with Adventives among all Wetland/Stormwater Basin ecotype is 36.8, while the overall average FQI for natives is 42.4.

### FQA Results

The total FQA monitoring data for all natural areas within SBV included 250 native species out of nearly 330 total species. The final all-inclusive inventory mean C and FQI was 3.8 and 68, respectively. The native-only inventory mean C and FQI was 4.9 and 78, respectively. However, the individual ecotypes varied in quality (Table 3). Non-native vegetation is listed in all capital letters on the data sheets found in Appendix B. A general goal of Native FQI greater than or equal to 35 by the end of this 10-year report is expected only if stewardship activities are proactive and frequently occurring in the next several years. Proactive application will lead to less management time needed so that the time spent on site is only for Early Detection Rapid Response (EDRR) applications, thereby reducing maintenance costs. Even though EDRR is a much more efficient and less costly management technique, it should always have some monies budgeted; otherwise, a reactive approach settles in and the SBV will not accomplish the goals set forth in this plan.

Table 3. Summary of Restoration/Maintenance FQA Goals

Monitoring Goals		Goals	Previous (2007–2010)	Current (2015)
<b>Overall</b>				
	Native Mean C	5	1	4.9
	Native vegetative cover	95%	70%	80%
	Invasive species cover	< 5%	20%	10%
	Aggressive goldenrod species	<10%	10%	25%

A more detailed breakdown of the results can be found in Table 4 with the data sheets located in Appendix E.

Table 4. Summary of Data Sheets

	Native Species	Total Species	Final Mean C	Native Mean C	Final Mean FQI	Final Native FQI
Woodland	147	201	3.2	4.4	46.1	53.9
Savanna	114	149	2.8	3.7	34.4	39.3
Prairie	147	199	3.6	4.8	50.5	58.7
Wetland/ Stormwater Basins	104	138	3.1	4.2	36.8	42.4

### Overall (Past versus Present)

Overall acreage in 2015 is similar to the original reported acreage from the AES 2003 and 2005 reports. However, ecotypes have changed due to the site undergoing initial restoration in 2004 and 2006; therefore, their current acreages are different than originally planned. Moving forward, these acreages should not fluctuate substantially. Future restoration activities, such as invasive species control and prescribed burning, should continue. Until they are stabilized, priority areas should begin with higher FQI scored areas. Once stabilized, these ecotypes will need continued maintenance work to sustain and improve the areas. In the event of an infestation, supplemental seeding may still be needed on occasion, even in the stabilized areas. It is in the best interest of SBV if supplemental seeding is always part of the budget. Once areas stabilize, the focus can be shifted to the areas with lower FQI in order to reduce the degraded population areas and increase the overall quality of SBV. The achievable goals outlined in this ten-year report should be reached with continued restoration and maintenance. If restoration does not increase to all areas within SBV, the pockets of degradation will increase, and stability and goal achievements may not be reached.

## Discussion and Management Recommendations

The map in Appendix A shows the extent of natural areas identified and the location of 20 kettles. Short-term maintenance of a restoration site is typically considered the first five years of restoration and management. Since this project is currently in its 12th year as of winter 2014/2015, the only areas considered to be in restoration include those which have only recently started the restoration process (nursery area [around plot 7], Unit 1 northeast wetland [around plot 4], Unit 1 northwest woodland [around plot 1], and the slope near the linden tree in Unit 2 [around plot 6]). The rest of SBV is considered to be in maintenance. Throughout the restoration and maintenance process of SBV, a proactive management approach is central to achieving the best, most efficient results. Moving

forward, a regularly scheduled treatment cycle and proactive management approach is highly recommended. Proactive management can be achieved by a dedicated two-person (or more) team on site for three days per week during the growing season, and one day per week in the dormant season (excluding a few weeks for vacation time and burn season). If maintenance becomes reactive, EDRR will not be achieved, nor will the goals and the cost savings from a stable ecosystem. The following recommendations are specific to the listed area and are made based on current observations within those areas.

## Woodland and Oak Savanna

The primary objective of the woodland ecotype is to restore, stabilize, and maintain the densely populated woody area consisting of shagbark hickory, various oaks, and white pines with an understory of herbaceous woodland and savanna species. However, delivering on these goals in the pine areas may be difficult; however, thinning of the dead or declining pines will help open up the canopy. Additionally, replacing any evergreens in or near a natural area is not recommended. Since the oak savanna objectives, tasks, and performance standards are so similar to the woodland objectives, tasks, and performance standards, these two ecotypes have been combined into this section.

In savanna areas, the objective is to maintain historic open oak savanna consisting of scattered oak and shagbark hickory with an understory of herbaceous prairie and savanna species. Within the woodland area, the objective is to restore the areas that have not undergone complete restoration and stabilize the remaining woodland areas. Due to savanna and woodland areas having a substantial amount of large woody debris already on the ground, measures should be taken to prevent further debris from cluttering the areas. A high volume of debris is a roadblock to prescribed burns.

These objectives will be achieved by taking the following steps: introducing woodland and savanna understory species by seed in the fall after any anticipated prescribed burn (especially *Pedicularis canadensis* (wood betony) due to its possible predation on big bluestem, which will naturally start balancing that species density); preparing soil via herbicide treatments and cultipacking the seed where needed; and continuing to remove non-native and weedy native woody species (such as box elder, bramble, cherry, and maple) to reduce future seedbank. Dry woodlands are generally the hardest ecotypes to restore. Increasing light penetration to the ground/herbaceous layers is essential to successful restoration in these ecotypes.

Tasks: The following maintenance tasks are recommended for these two ecotypes.

1. Perform initial seeding with a higher conservative value mix of dry woodland and/or dry savanna native seed mixes in those areas maintained as woodland and designated as open space areas (either Common or D.R.O.S.) and had never been restored/seeded or in early stages of restoration.
  - i. Initial brushing of the western area was completed in winter 2012/2013 with continued maintenance leading up to this report. The woodland to the east of the main entrance was brushed during initial restoration in 2002. However, the area was never seeded. Details of the initial establishment that was anticipated can be found in the Pre-Construction Planting Plan (Sheet 3 of 6) of the previous plan. However, the area had a naturally occurring native seed bank that established; initial seeding by AES was therefore never performed in this area.
  - ii. Supplemental seeding throughout all areas that have invasive, non-native, or aggressive native vegetation is highly recommended to speed the stabilization of this ecotype.
  - iii. Ensure wood betony is included in the seed mix to help stabilize native vegetation.

2. Continue to remove (brush cut and herbicide stumps) all non-native woody understory species (i.e., shrubs and small trees) and thin selected weedy native woody species from tree row areas. Additionally, continue to remove all non-native tree species and thin selected weedy native trees (especially box elder and cottonwood).
  - i. Removal has been largely completed by Davey Resource Group (previously as Land Keepers) and continues to be a maintenance need as seeds from the seed bank and incoming wildlife germinate.
  - ii. Partial removals and thinning projects have been started by The Davey Tree Expert Company as of 2014. A preliminary list of species to be removed is found in Appendix D, after the seed lists. Many trees were removed during initial thinning in order to achieve a woodland structure.
  - iii. Thinning of desirable trees may be necessary to reach a minimum of 20% ground light in the woodlands or 60% in the savannas. However, removal of any undesired tree should occur first to determine if/where desirable trees need to be thinned.
  - iv. Tree rows contain relatively few trees of appropriate species; therefore, a number of large weedy native trees (e.g., box elder or wild black cherry) will remain for a number of years (e.g., 1–15 years) as “anchor trees” until planted oak and hickory mature. More native tree planting of larger caliper (4 inches or greater) is necessary in tree rows as box elder or wild black cherry are removed. Plant ecologically appropriate tree species (e.g., black oak, bur oak, hackberry, red oak, shagbark hickory, and white oak) and shrubs (e.g., hazelnut) in the savanna restoration areas in a density consistent with an oak savanna structure. As many trees as possible should be transplanted on site. The remainder should be purchased from a local nursery. If this is not desired, then restoring the tree rows to a prairie after anchor trees are removed is an alternative option.
  - v. Continue to remove anchor trees from tree rows when nearby planted oak and hickory become large enough to provide appropriate savanna canopy cover (i.e., 40–60% canopy cover).
3. Herbicide persistent non-native ground layer species (e.g., cool-season grasses and/or garlic mustard and other mustard) and supplementally seed densely treated areas with desirable native species to encourage colonization by existing and seeded native herbaceous vegetation (aka-supplemental seeding). Then maintain the reestablished savanna and/or woodland with appropriate native savanna and woodland species. This will continue to be completed in phases in conjunction with tree and shrub removal (Task 2) and chemical treatments.
4. Reduce aggressive native species (such as *Solidago altissima* [tall goldenrod] and *S. gigantea* [late goldenrod]) by careful chemical application and mowing when in full bloom near monoculture areas found within this ecotype.
5. Monitor all restored areas. A Davey Resource Group ecologist should visit and assess all restored areas three times each growing season.
6. Mow seeded areas once or twice a year as needed for the first two years.
7. Spot herbicide invasive species in brushed woodland areas (e.g., garlic mustard and oriental bittersweet) and seeded barren woodland areas, as needed, until stabilization occurs. Then perform EDRR techniques to minimize risk of infestation.
8. Attempt to conduct a prescribed burn every year to revitalize species composition, burn off non-native seed, and reduce woody species. Once stabilized, prescribed burning every 2–3 years is still highly recommended.

9. A Tree Inventory and Forestry Management Plan is highly recommended. The report produced by such a plan will give an accurate quantity of tree species and their health. Additionally, that information will assist in the identification of which trees should be removed and the timing of their removal.

*Performance Goals:* The following performance goals should be met by the end of the year 2025 assuming implementation of this plan starts winter 2015/2016.

1. Maintain woody plant cover so that at least 20% of the available light can reach ground layer vegetation in the woodland areas and at least 60% can reach ground layer vegetation in the savanna ecotypes.
2. Non-native woody vegetation shall not exceed 5% of the total cover.
3. Vegetation is greater than 90%, with at least 75% of the total ground cover being native species (both herbaceous and shrubby vegetation).

## *Prairie*

The primary objective of the prairie ecotypes is to continue maintenance of native prairie vegetation until the areas are stabilized. In many areas, the prairie is on the verge of stability and only requires prevention of undesirable species establishment. In other areas, undesirable species have consistently encroached, leaving those areas in need of greater focus and maintenance. Namely, these areas tend to be in the wetter kettle depressions, especially the south end of the Unit 1 where vegetative cover was not in existence until recently. Years of lacking vegetation caused the start of erosion at the southern end of southernmost basin in Unit 1 (Kettle #7). Photographs 13–14 shows the worst area where the erosion has caused a deep gully of about 2 feet. Hungarian brome that moved into the area is what has hid the erosion and hampered the native vegetation from thriving in this area. Kettle depressions found within the prairie ecotype generally have very well-drained soils; regardless of the amount of stormwater runoff received, kettle depressions will never be classified as wet (mesic at best). Kettles with these well-drained soils should be planted with dry-mesic prairie species. In kettles that do have poorly draining soils, which is where great establishment of undesirable species have historically occurred, and hold moisture levels for longer periods of time after a storm event, should be seeded in mesic native vegetation. Stability will be achieved by supplemental seeding where needed, regular prescribed burns, and selective herbicide treatments to any non-native or aggressive native vegetation.



*Photograph 13. Erosion has resulted in a deep gully forming.*

*Tasks:* The following tasks are needed to maintain and stabilize the prairies on site:

1. Kettles in prairies should be treated at the same time as the rest of the surrounding prairie. Any non-native or aggressive native vegetation found within kettles should be eliminated to prepare for supplemental seeding along the basin bottom and plugs along slopes. Additionally, there are a few locations where erosion was significant due to previously bare soils (from prior to seeding of Phases 2B/3B).
  - i. Fill in any eroded areas with clean soil.
  - ii. Immediately seed with dry to mesic native prairie seed.



- iii. Install erosion control blanket.
  - iv. Plant enough plugs at nine inch centers to immediately stabilize slopes.
- 2. Herbicide non-native ground layer (e.g., Canada thistle, cool-season grasses, and reed canary grass prairies as found in order to prepare the site for continued reestablishment of native species).
- 3. Reduce aggressive native species (such as *Solidago altissima* [tall goldenrod]) by careful chemical application and mowing when in full bloom near monoculture areas found within this ecotype.
- 4. Install supplemental seed with higher conservative valued native prairie species into areas that are barren of vegetation or had recently had the cool-season, non-native cover chemically treated.
  - i. If seeding occurs in the fall, broadcast the area with a cultipacker to ensure seed/soil contact.
  - ii. If seeding occurs in the spring, the no-till drill seed method should be used.
  - iii. Ensure wood betony is included in the seed mix to help stabilize native vegetation.
- 5. Monitor restored areas. A Davey Resource Group ecologist should visit and assess all restored areas three times over the course of each growing season.
- 6. Conduct a prescribed burn annually while areas are still in the restoration phase. Once the stability phase is reached, a prescribed burn can be conducted every 2–5 years or as fuel allows (no more frequent than every 2 years, but no less than every 5 years; every 3 years is best due to biennial vegetation encroachment).

Performance Goals: The following performance goals shall be met by the end of the year 2025 or earlier.

- 1. Non-native woody vegetation shall not exceed 5% of the total cover.
- 2. Vegetation is greater than 95%, with at least 80% of the total ground cover being native species.

### **Wetland/Stormwater Basins**

In the historic sedge meadow areas (called wetland in earlier documents), the primary objective is to restore the native vegetation for infiltration of stormwater. In the remaining wetlands/stormwater basins, the objective is to restore and maintain native vegetative cover in order to manage the stormwater and runoff associated with the constructed stormwater management roadsides and other conveyance swales, kettles used for retention, and retention basin buffer areas. The basis of SBV's stormwater system is to route and treat on-site surface water in order to maximize the quality and quantity of surface water infiltrating into the ground water while simultaneously reducing runoff pollutants (especially sodiums and chlorides in the winter de-icing practices). Kettles within the wetland ecotypes should be maintained as wetlands. Management practices are detailed in this section.

The wetland goals will be achieved by reducing invasive non-native species cover (i.e., reed canary grass), allowing native species to reestablish by facilitating a seed bank response, and enhancing native species cover and diversity through seeding and planting. Stormwater goals will be achieved by maintaining routes for all stormwater runoff through naturally vegetated swales and into low areas on the site (e.g., kettles). All stormwater management areas will be vegetated by native prairie and wetland species (as appropriate) in order to allow for maximum biofiltration and infiltration.

Tasks: The following tasks are needed to restore the sedge meadow on the site.

1. Conduct prescribed burns in degraded sedge meadow every year to every other year until permanent native vegetative coverage reaches greater than 75% (then burn on the same rotation as surrounding ecotype).
2. Selectively herbicide to eliminate reed canary grass with a grass-specific herbicide in the spring and fall, and as appropriate on two more occasions to control other undesirable vegetation in conjunction with surrounding ecotype.
3. Seed with a higher conservative value of native wetland sedges/grasses/rushes (e.g., *Carex muskingumensis* [swamp oval sedge], *C. stricta* [tussock sedge], *Glyceria septentrionalis* [floating manna grass], *Iris virginica* [blue flag], *Leersia virginica* [white grass], *Muhlenbergia mexicana* [leafy satin grass], and *Scirpus cyperinus* [wool grass]) and forbs (see wetland seed list in Appendix F). Like wood betony in drier areas, make sure to include *Pedicularis lanceolata* (fen betony), which is believed to predate on reed canary grass and help to balance the wetland ecotype, in the seed mixes for this area.

In all wetlands/stormwater basins (once initially restored as described above, as applicable):

1. Spot herbicide invasive species (especially Canada thistle, *Pastinaca sativa* [wild parsnip]-latter species found on slopes, Hungarian brome, and reed canary grass) as needed.
2. Conduct prescribed burns throughout all stormwater systems every 2 to 5 years, no more frequently than every 2 years.
3. Both roadside and other conveyance swales will be maintained as mesic prairie on the slopes and as a salt-tolerant, wet-mesic prairie community in the swale bottoms.



**Photograph 14. Hungarian brome root systems are shallow compared to native vegetation increasing erosion issues.**

- 1) The southeastern most bioswale in Unit 3 (between the houses) has been destroyed and currently requires herbicide treatment and a specialized short stature mix of localized individually-packaged seed mix of 3 grasses/carex species and 3 forbs (found in the wetland seed mix table of Appendix F) in the center, with the border seeded with only one species of the carex found from the center seeding (e.g., do not broadcast seed, drop individual species in groupings). This will produce an organized pattern to the bioswale creating an orderly appearance. The area will also need to have erosion control blanket installed due to potential flowing water. and have focused attention for the next 2–3 growing seasons until natives establish themselves.
4. Ensure elimination of all Hungarian brome dominated areas due to their shallow root systems and restore with native cover by seeding after a growing season of herbicide treatments.
5. All depression and kettle basins receiving a substantial amount of stormwater were originally seeded and planted wetland prairie species; however, due to the moderately well to well-drained soils, wetland species did not thrive in all areas (for example, the Willow Basin in Southwest end). Therefore, reseeding and planting areas with wet-mesic prairie species where wetland vegetation seeding failed should be conducted. The kettles will be maintained as either wet-mesic prairies or as wetlands, depending on successful vegetation found growing within the kettles. Like wood betony in drier areas, make sure to include *Pedicularis lanceolata* (fen betony), which is believed to predate on reed canarygrass and help to balance the area, in the seed mixes for this area.

6. Monitor restored areas. A Davey Resource Group ecologist should visit and assess all restored areas three times each growing season.
7. Annually cut any woody vegetation as found during snow events and treat with chemicals to prevent regrowth and limit the establishment of any woody species along the slopes and basins (excludes kettles found within woodland/savanna ecotypes, in which case only fire tolerant hardwoods should be allowed to thrive).

*Performance Goals:* The following performance goals should be met by the end of year 2025 (assuming implementation of this plan starts winter 2015/2016).

1. Invasive non-native vegetation (e.g., reed canary grass) should not exceed 20% of the total cover in the currently unrestored wetlands, and should not be less than 10% in the rest of the wetlands/kettles/stormwater basins.
2. Herbaceous cover shall exceed 75% of the total ground cover, with the majority of vegetation comprising native species in the currently unrestored wetlands and 95% coverage for all other wetland/kettles/stormwater basins.

### *Overall (Past versus Present)*

Certain areas within the Sanctuary of Bull Valley no longer represent what was originally planned in the 2003/2005 documents. Not all areas were seeded or maintained, per the original plan. Due to these variables, coupled by previous attempts to coerce and restore certain areas into a specified vegetation community type, the decision to restore based on the new map found in Appendix A is a realistic goal based on the current state of Sanctuary of Bull Valley's natural areas.

Continued adherence to the outlined recommendations found in the Schedule of Management Activities (Appendix B) as well as this report is highly recommended to prevent the area from becoming inundated with aggressive, non-native vegetation. Additionally, maintenance of the empty lots within SBV will need to occur for a couple years via broadcast herbicide and supplemental seeding into barren areas to prevent infestation of the lots. This infestation leads to the establishment of undesirable species and their unintentional spread into the natural areas. Thereafter, an occasional broadcast herbicide application may be beneficial once every other to every three years. It is also recommended to require any new landscaping that is to be installed along natural areas to include a native perennial bed that abuts the natural area and contains the homeowner's favorite vegetation from the natural area along with a "ribbon" of their choice of a short native grass for the front of the perennial beds, if needed to give support to possible taller native vegetation found within the bed that they may have chosen. This ribbon and subsequent formally planted bed will create a buffer to the natural area simultaneously fashioning an eye-catching foreground to the natural backdrop of native vegetation.

Finally, to get resident involvement, volunteer days have happened in the past. Continuation of these volunteer days is highly recommended to increase ownership and pride of the natural area, provide interactive education for the residents, increase resident interactions with one another, provide a safe environment for resident children to become more involved in community sponsored events, and first-hand information transference of the status of SBV natural areas management.

## Summary

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Davey Resource Group was retained by The Sanctuary of Bull Valley Master Operating Association to identify, assess, and evaluate the natural areas found within The Sanctuary of Bull Valley subdivision located in Woodstock, Illinois. The site was established as a conservation-orientated, residential development constructed on recharge areas for the Boone Creek Fen located within a mile of the subdivision. A total of 6.5 acres of wetland restoration was, or is, expected to be completed by the end of 2025. Total restoration as of this report (September 2015) consists of 149.3 acres.

The primary herbaceous invasive species found within SBV are reed canary grass, sweet clover, and hungarian brome. The primary woody invasive species are black locust and Siberian elm. A highly damaging invasive vine, oriental bittersweet, is also prevalent and seems to be increasing across the entire site. Control is recommended to further prevent spread and ensure that the invasive species cover is entirely controlled and/or eliminated. Stabilization of SBV is an achievable goal that involves the following measures: conducting prescribed burns; performing aggressive, proactive chemical treatments (which in time should reduce to EDRR techniques); install diverse, high c-valued, native seed into areas in need of supplemental seeding to reach a FQ Mean C of 5 or greater; 95% native vegetative cover with no single species comprising greater than 50% cover; maintaining an invasive species cover of 5% or less within the property (based on Table 1); and reducing aggressive native species such as *Solidago altissima* (tall goldenrod) and/or *S. gigantea* (late goldenrod) to less than 50% locally dominant in any given area.

Desirable, native vegetation is becoming established on the site, with nearly 330 plant species recorded this year. The FQI score is currently 68, with the Mean C just below the goal of 5. The surrounding subdivisions in the area consist of either turfgrass or cattail basins (both with C-values of 0), which contribute to Sanctuary of Bull Valley blossoming into a unique, stable, and attractive area that benefits the local ecosystem. This report addresses data collected in winter 2014 and spring 2015. The site was visited on multiple occasions from December 2014 through September 2015 to collect data for this report.

The Sanctuary of Bull Valley's natural areas are considered higher quality and are in the advanced stages of restoration. With continued proper management of the restored natural areas and monitoring in order to improve the quality of these habitats over time, the goals will be achieved by the end of 2025.

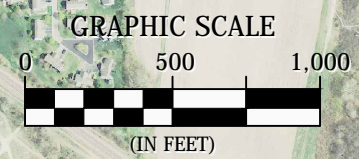
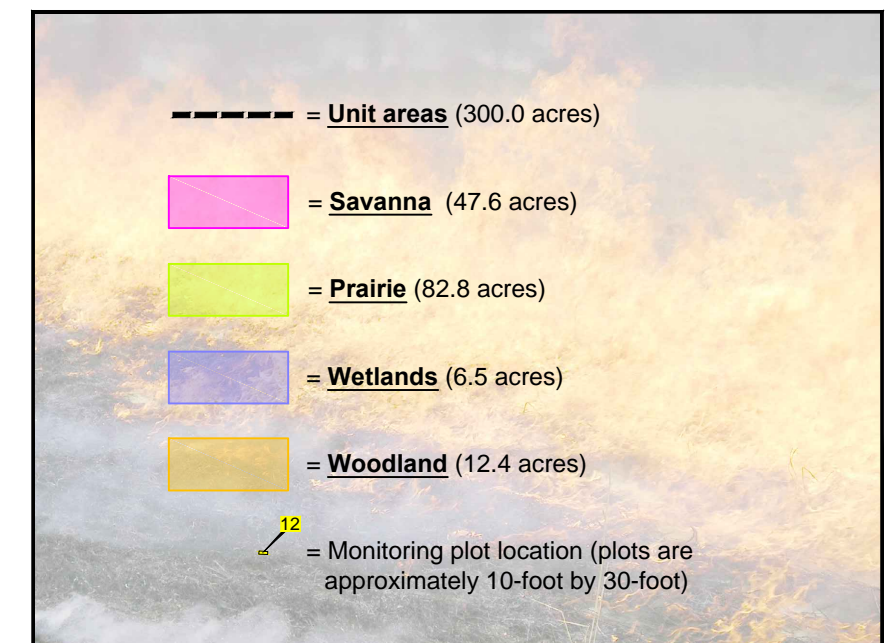
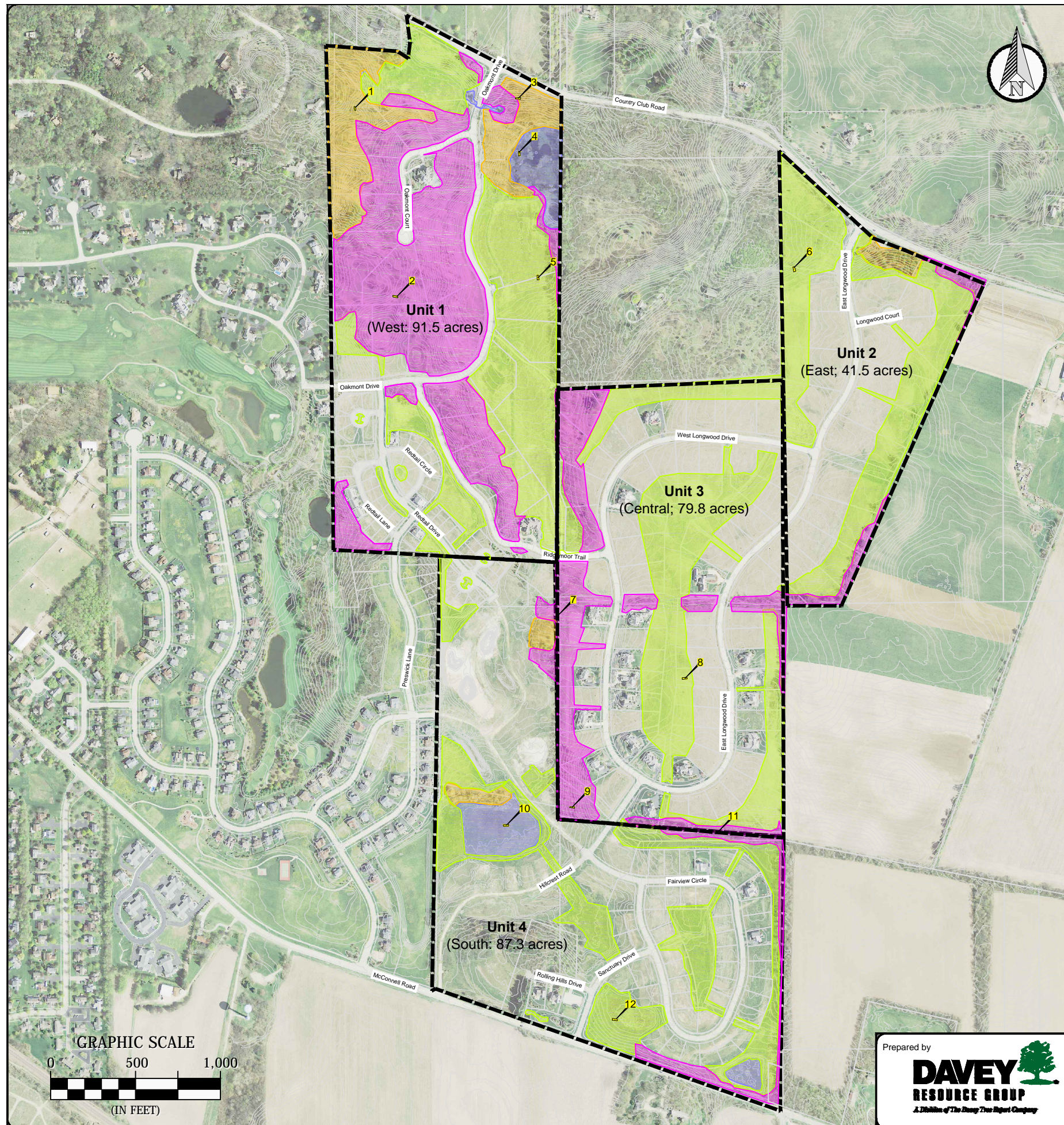
## References and Professional Staff

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Appendix G defines terms used within this report. Appendix H lists references consulted while conducting the field study and preparing this report. Appendix I provides profiles of Davey Resource Group professionals involved in this study.

## ***Appendix A*** ***Maps***

# Appendix A (2015) Restoration Communities Map



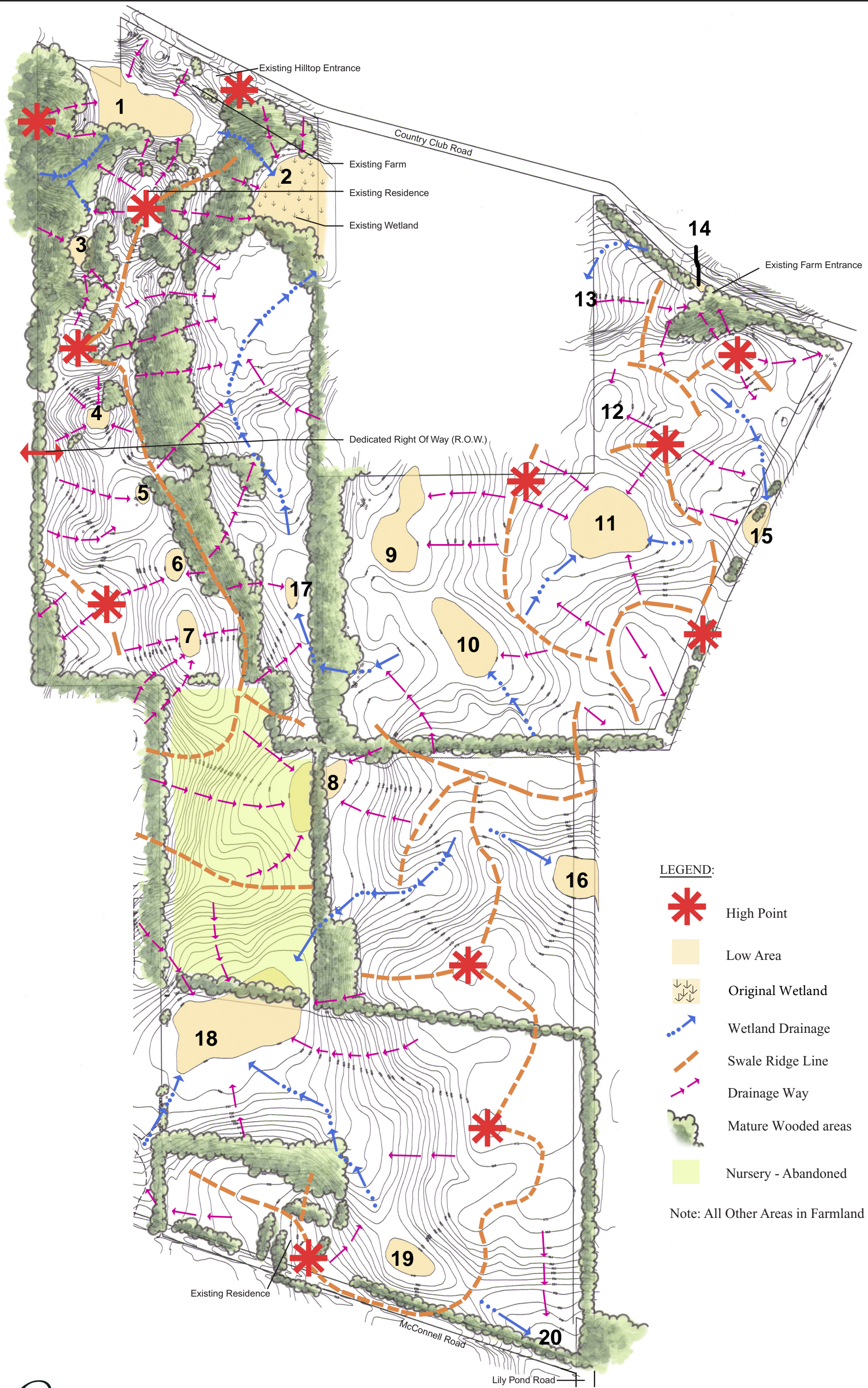
Prepared by  
**DAVEY**  
RESOURCE GROUP  
A Division of The Stimpert Group Company

Prepared for  
The Sanctuary of Bull  
Valley Master Operating  
Association

**The Sanctuary of Bull Valley**  
2015 Ecological Restoration  
and Maintenance  
Woodstock  
McHenry County, Illinois

Data used to produce this  
map were collected  
on December 22, 2014

Map  
View 1  
of 1



0 100 200 400



### Kettles, waterways, and High points

SURVEYOR  
VanderstappenSurveying, Inc.

Based on original document titled "Site Analysis & Existing Conditions"

***Appendix B***  
***Schedule of Activities***



Appendix B: RESTORATION SCHEDULE	2016			2017			2018			2019			2020			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
<b>Stewardship (included in budget)</b>																
Rx Burn				woodlands				woodlands								
Initial/Barren Area Seeding				woodlands				woodlands								
EDRR Applications																
Selective Foliar Herbicide Control																
Selective Mechanical (mow) Control																
Seed Collection/Distribution (for supplemental)																
Planting (herbaceous and woody)																
Woody brush, burn, and treatment																
<b>Monitor &amp; Miscellaneous</b>																
Botanical Monitoring (included in budget)																
Bluebird Box Monitoring*																
Frog Monitoring*																
Dragonfly Monitoring*																
Butterfly Monitoring*																
Volunteer Day for residents																

Appendix B: RESTORATION SCHEDULE	2021			2022			2023			2024			2025			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
<b>Stewardship (included in budget)</b>																
Rx Burn																
Initial/Barren Area Seeding																
EDRR Applications																
Selective Foliar Herbicide Control																
Selective Mechanical (mow) Control																
Seed Collection/Distribution (for supplemental)																
Planting (herbaceous and woody)																
Woody brush, burn, and treatment																
<b>Monitor &amp; Miscellaneous</b>																
Botanical Monitoring (included in budget)																
Bluebird Box Monitoring*																
Frog Monitoring*																
Dragonfly Monitoring*																
Butterfly Monitoring*																
Volunteer Day for residents																

\*done by volunteers/citizen scientists  
 ? Implies this option may not be necessary depending on conditions and how the area responds.  
 Note: This schedule will be needed to be changed and adapted as stability is reached.

## Appendix C

### Restoration Budget

The cost of the recommended forestry management plan has not been included in this budget. However, having one done is highly recommended to be able to better track tree conditions and best determine preferred removal in the case of restoration and habitat improvement.

<b>2016</b>	The focus on the 2016 restoration schedule is to seed the wetland near the “main entrance” (northeast corner of Unit 1) while still maintaining the rest of the natural areas.
Controlled Burn	\$22,700.00
Stewardship/Maintenance	\$49,000.00
Supplemental Native Seeding	\$ 8,500.00
Monitoring	\$ 4,800.00
<b>TOTAL</b>	<b>\$85,000.00</b>

<b>2017</b>	The focus on the 2017 restoration schedule is to kill all undesirable vegetation in the areas near Monitoring Plots 6, 7, and 11, while still maintaining the rest of the natural areas.
Controlled Burn	\$23,400.00
Stewardship/Maintenance	\$49,000.00
Supplemental Native Seeding	\$ 7,800.00
Monitoring	\$ 4,800.00
<b>TOTAL</b>	<b>\$85,000.00</b>

<b>2018</b>	The focus on the 2018 restoration schedule is to kill all undesirable vegetation in the areas and seed the northwest woodland (near Monitoring Plot 1), while still maintaining the rest of the natural areas. If stability seems likely, some reduction of visits during winter months may now be possible.
Controlled Burn	\$22,500.00
Stewardship/Maintenance	\$42,500.00
Supplemental Native Seeding	\$ 9,000.00
Monitoring	\$ 4,800.00
<b>TOTAL</b>	<b>\$78,800.00</b>

<b>2019</b>	The focus on the 2019 restoration schedule is maintaining all areas and supplemental seed any areas that are found to be in need seed or have barren areas. While it is recommended to always have a budget for seed, it may be likely that little to none may be required this year and into the future. Additionally, EDRR techniques are expected to start this year; however, there may still be some areas in need of more focus/maintenance.
Controlled Burn	\$ 0.00
Stewardship/Maintenance	\$53,500.00
Supplemental Native Seeding	\$ 5,000.00
Monitoring	\$ 5,000.00
<b>TOTAL</b>	<b>\$63,500.00</b>

<b>2020</b>	The focus on the 2020 restoration schedule is maintaining all areas and supplemental seed any areas that are found to be in need of seed or have barren areas. Techniques may still be in transition from maintenance to true EDRR.
Controlled Burn	\$26,000.00
Stewardship/Maintenance	\$45,500.00
Supplemental Native Seeding	\$ 5,000.00
Monitoring	\$ 5,000.00
<b>TOTAL</b>	<b>\$81,500.00</b>

<b>2021</b>	The focus on the 2021 restoration schedule is maintaining all areas and supplemental seed any areas that are found to be in need of seed or have barren areas.
Controlled Burn	\$ 0.00
Stewardship/Maintenance	\$46,800.00
Supplemental Native Seeding	\$ 2,000.00
Monitoring	\$ 5,000.00
<b>TOTAL</b>	<b>\$53,800.00</b>

<b>2022</b>	The focus on the 2022 restoration schedule is maintaining all areas and supplemental seed any areas that are found to be in need of seed or have barren areas. While it is recommended to always have a budget for seed, it may be likely that little to none may be required this year and into the future. Additionally, EDRR techniques should become the primary need now.
Controlled Burn	\$27,000.00
Stewardship/Maintenance	\$37,000.00
Supplemental Native Seeding	\$ 2,000.00
Monitoring	\$ 5,000.00
<b>TOTAL</b>	<b>\$71,000.00</b>

<b>2023</b>	The focus on the 2023 restoration schedule is maintaining all areas in proactive EDRR techniques.
Controlled Burn	\$15,000.00
Stewardship/Maintenance	\$27,000.00
Supplemental Native Seeding	\$ 2,000.00
Monitoring	\$ 5,000.00
<b>TOTAL</b>	<b>\$49,000.00</b>

<b>2024</b>	The focus on the 2024 restoration schedule is maintaining all areas in proactive EDRR techniques.
Controlled Burn	\$ 0.00
Stewardship/Maintenance	\$27,500.00
Supplemental Native Seeding	\$ 1,000.00
Monitoring	\$ 5,000.00
<b>TOTAL</b>	<b>\$33,500.00</b>

<b>2025</b>	The focus on the 2025 restoration schedule is maintaining all areas in proactive EDRR techniques.
Controlled Burn	\$17,000.00
Stewardship/Maintenance	\$28,500.00
Supplemental Native Seeding	\$ 1,000.00
Monitoring	\$ 5,000.00
<b>TOTAL</b>	<b>\$51,500.00</b>

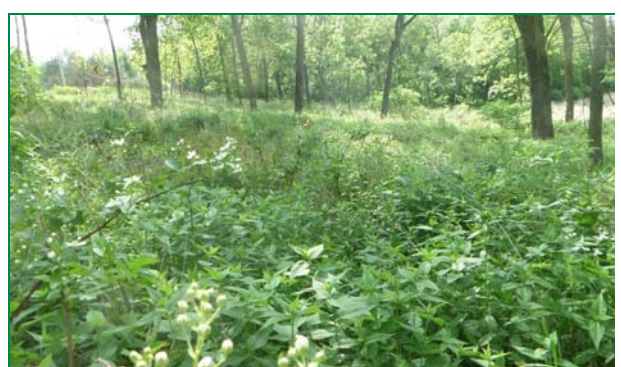
## Appendix D Plot Photographs



*These photographs are of Monitoring Plot 1, a woodland in the early stages of restoration. Attempting to control vegetation was unrealistic since the area was never seeded, nor was there a desirable seedbank, which complicates the possibility of restoration.*



*Monitoring Plot 2 consists of a restored closed canopy savanna.*



*These photographs are of Monitoring Plot 3, a woodland in the maintenance stage of restoration. This area originally had a diverse seed bank so it was never seeded during initial restoration in 2003. Since then restoration consisted of discouraging undesirable vegetation while the native vegetation thrived.*



*Monitoring Plot 4 is a wetland without any restoration and consists of predominantly reed canary grass.*



*Monitoring Plot 5 is a stable prairie with a variety of vegetation.*



*These photographs of Monitoring Plot 6 exemplify the dominance that Hungarian brome has over a natural area and why it is important to kill non-native vegetation prior to seeding.*



*The above two photographs are of Monitoring Plot 7, also known as the former nursery. Plot 7 has not been successfully restored, as invasive vegetation continues to infect the area.*



*The above two photographs are of Monitoring Plot 8, which exemplify a stable, diverse prairie ecotype.*



*The above two photographs are of Monitoring Plot 9, a closed canopy savanna (dominated by cherry tree) and in the maintenance phase of restoration.*



*The above two photographs are of Monitoring Plot 10, a wetland in the late maintenance phase of restoration.*



*The above two photographs are of Monitoring Plot 11, a savanna in the early stage of restoration.*



*The above two photographs are of Monitoring Plot 12, a prairie kettle in the late maintenance phase of restoration.*



***Appendix E***  
***Inventory and Plot Data Sheets***

Site: Sanctuary of Bull Valley  
 Locale: Entire SBV Overall Inventory  
 By: Nicky Obenauf  
 File: c:\FQA\studies\SBV\SBV Complete Inventory.inv

FLORISTIC QUALITY DATA		Native		Adventive	
250	NATIVE SPECIES	250	76.0%	79	24.0%
250	NATIVE SPECIES	Tree	24 7.3%	Tree	4 1.2%
329	Total Species	Shrub	12 3.6%	Shrub	9 2.7%
4.9	NATIVE MEAN C	W-Vine	4 1.2%	W-Vine	2 0.6%
3.8	W/Adventives	H-Vine	1 0.3%	H-Vine	0 0.0%
78.0	NATIVE FQI	P-Forb	146 44.4%	P-Forb	27 8.2%
68.0	W/Adventives	B-Forb	5 1.5%	B-Forb	14 4.3%
1.1	NATIVE MEAN W	A-Forb	12 3.6%	A-Forb	7 2.1%
1.6	W/Adventives	P-Grass	22 6.7%	P-Grass	10 3.0%
AVG:	Faculative (-)	A-Grass	1 0.3%	A-Grass	6 1.8%
		P-Sedge	19 5.8%	P-Sedge	0 0.0%
		A-Sedge	1 0.3%	A-Sedge	0 0.0%
		Cryptogam	3 0.9%		

ACRONYM	C SCIENTIFIC NAME	W WETNESS	PHYSIOGNOMY	COMMON NAME
ACENEG	0 Acer negundo	-2 FACW-	Nt Tree	BOX ELDER
ACERUB	7 Acer rubrum	0 FAC	Nt Tree	RED MAPLE
ACESAI	0 Acer saccharinum	-3 FACW	Nt Tree	SILVER MAPLE
ACESAU	3 Acer saccharum	3 FACU	Nt Tree	SUGAR MAPLE
ACHMIL	0 ACHILLEA MILLEFOLIUM	3 FACU	Ad P-Forb	YARROW
ACTALT	5 Actinomeris alternifolia	-3 FACW	Nt P-Forb	WINGSTEM
AGANEP	5 Agastache nepetoides	3 FACU	Nt P-Forb	YELLOW GIANT HYSSOP
AGRGRY	2 Agrimonia gryposepala	2 FACU+	Nt P-Forb	TALL AGRIMONY
AGRSMI	0 AGROPYRON SMITHII	4 FACU-	Ad P-Grass	WESTERN WHEAT GRASS
AGRALA	0 AGROSTIS ALBA	-3 FACW	Ad P-Grass	REDTOP
ALISUB PLANTAIN	4 Alisma subcordatum	-5 OBL	Nt P-Forb	COMMON WATER
ALLPET	0 ALLIARIA PETIOLATA	0 FAC	Ad B-Forb	GARLIC MUSTARD
ALLCAN	2 Allium canadense	3 FACU	Nt P-Forb	WILD ONION
AMBARE	0 Ambrosia artemisiifolia elatior	3 FACU	Nt A-Forb	COMMON RAGWEED
AMBTRI	0 Ambrosia trifida	-1 FAC+	Nt A-Forb	GIANT RAGWEED
AMOCAN	9 Amorpha canescens	5 UPL	Nt Shrub	LEAD PLANT
AMPBRB	4 Amphicarpaea bracteata	0 FAC	Nt P-Forb	UPLAND HOG PEANUT
ANDGER	5 Andropogon gerardii	1 FAC-	Nt P-Grass	BIG BLUESTEM GRASS
ANDSCO GRASS	5 Andropogon scoparius	4 FACU-	Nt P-Grass	LITTLE BLUESTEM
ANECAN	4 Anemone canadensis	-3 FACW	Nt P-Forb	MEADOW ANEMONE
ANECYL	6 Anemone cylindrica	5 UPL	Nt P-Forb	THIMBLEWEED
ANEQUI	7 Anemone quinquefolia	5 [UPL]	Nt P-Forb	WOOD ANEMONE
ANEVIR	5 Anemone virginiana	5 UPL	Nt P-Forb	TALL ANEMONE
APOAND	5 Apocynum androsaemifolium	5 UPL	Nt P-Forb	SPREADING DOGBANE
APOCAN	4 Apocynum cannabinum	0 FAC	Nt P-Forb	INDIAN HEMP

AQUCAN	6	<i>Aquilegia canadensis</i>	1	FAC-	Nt P-Forb	WILD COLUMBINE
ARCMIN	0	ARCTIUM MINUS	5	UPL	Ad B-Forb	COMMON BURDOCK
ARITRI	4	<i>Arisaema triphyllum</i>	-2	FACW-	Nt P-Forb	JACK-IN-THE-PULPIT
ASACAN	7	<i>Asarum canadense</i>	5	UPL	Nt P-Forb	WILD GINGER
ASCSUL	8	<i>Asclepias sullivantii</i>	5	UPL	Nt P-Forb	PRAIRIE MILKWEED
ASCSYR	0	<i>Asclepias syriaca</i>	5	UPL	Nt P-Forb	COMMON MILKWEED
ASCTUB	7	<i>Asclepias tuberosa</i>	5	UPL	Nt P-Forb	BUTTERFLY WEED
ASCVER	1	<i>Asclepias verticillata</i>	5	UPL	Nt P-Forb	WHORLED MILKWEED
ASTAZU	8	<i>Aster azureus</i>	5	UPL	Nt P-Forb	SKY-BLUE ASTER
ASTBRA	0	ASTER BRACHYACTIS	3	[FACU]	Ad A-Forb	RAYLESS ASTER
ASTERI	5	<i>Aster ericoides</i>	4	FACU-	Nt P-Forb	HEATH ASTER
ASTLAE	9	<i>Aster laevis</i>	5	UPL	Nt P-Forb	SMOOTH BLUE ASTER
ASTNOV	4	<i>Aster novae-angliae</i>	-3	FACW	Nt P-Forb	NEW ENGLAND ASTER
ASTOBL	10	<i>Aster oblongifolius</i>	5	UPL	Nt P-Forb	AROMATIC ASTER
ASTPIL	0	<i>Aster pilosus</i>	2	FACU+	Nt P-Forb	HAIRY ASTER
ASTPUP	8	<i>Aster puniceus</i>	-5	OBL	Nt P-Forb	BRISTLY ASTER
ASTPUF	7	<i>Aster puniceus firmus</i>	-5	OBL	Nt P-Forb	SHINING ASTER
ASTSAS	5	<i>Aster sagittifolius</i>	5	UPL	Nt P-Forb	ARROW-LEAVED ASTER
ASTSAD	2	<i>Aster sagittifolius drummondii</i>	3	[FACU]	Nt P-Forb	DRUMMOND'S ASTER
ASTSIS	3	<i>Aster simplex</i>	-5	OBL	Nt P-Forb	PANICLED ASTER
ASTUMB	9	<i>Aster umbellatus</i>	-3	FACW	Nt P-Forb	FLAT-TOP ASTER
BAPLEA	8	<i>Baptisia leucantha</i>	2	FACU+	Nt P-Forb	WHITE WILD INDIGO
BAPLEO	10	<i>Baptisia leucophaea</i>	5	UPL	Nt P-Forb	CREAM WILD INDIGO
BARVUL	0	BARBAREA VULGARIS	0	FAC	Ad B-Forb	YELLOW ROCKET
BOUCUR	8	<i>Bouteloua curtipendula</i>	5	UPL	Nt P-Grass	SIDE-OATS GRAMA
BROINE	0	BROMUS INERMIS	5	UPL	Ad P-Grass	HUNGARIAN BROME
BROKAL	10	<i>Bromus kalmii</i>	0	FAC	Nt P-Grass	PRAIRIE BROME
BROPUB	5	<i>Bromus pubescens</i>	2	FACU+	Nt P-Grass	WOODLAND BROME
CACATR PLANTAIN	8	<i>Cacalia atriplicifolia</i>	5	UPL	Nt P-Forb	PALE INDIAN
CALCAN	3	<i>Calamagrostis canadensis</i>	-5	OBL	Nt P-Grass	BLUE JOINT GRASS
CARNUT	0	CARDUUS NUTANS	5	UPL	Ad B-Forb	MUSK THISTLE
CXBEBB	6	<i>Carex bebbii</i>	-5	OBL	Nt P-Sedge	BEBB'S OVAL SEDGE
CXBICK OVAL SEDGE	10	<i>Carex bicknellii</i>	5	[UPL]	Nt P-Sedge	COPPER-SHOULDERED
CXBLAN	1	<i>Carex blanda</i>	0	FAC	Nt P-Sedge	COMMON WOOD SEDGE
CXCRIS	4	<i>Carex cristatella</i>	-4	FACW+	Nt P-Sedge	CRESTED OVAL SEDGE
CXGRAN	4	<i>Carex granularis</i>	-4	FACW+	Nt P-Sedge	PALE SEDGE
CXMOLE	2	<i>Carex molesta</i>	-1	FAC+	Nt P-Sedge	FIELD OVAL SEDGE

CXMUHL	5	Carex muhlenbergii	5 UPL	Nt P-Sedge	SAND BRACTED SEDGE
CXMUSK	8	Carex muskingumensis	-5 OBL	Nt P-Sedge	SWAMP OVAL SEDGE
CXNORM SEDGE	5	Carex normalis	0 [FAC]	Nt P-Sedge	SPREADING OVAL
CXPENS	5	Carex pensylvanica	5 UPL	Nt P-Sedge	COMMON OAK SEDGE
CXROSE SEDGE	4	Carex rosea	5 UPL	Nt P-Sedge	CURLY-STYLED WOOD
CXSTIP	3	Carex stipata	-5 OBL	Nt P-Sedge	COMMON FOX SEDGE
CXSTRI SEDGE	5	Carex stricta	-5 OBL	Nt P-Sedge	COMMON TUSSOCK
CXTRIB SEDGE	3	Carex tribuloides	-4 FACW+	Nt P-Sedge	AWL-FRUITED OVAL
CXVULP	2	Carex vulpinoidea	-5 OBL	Nt P-Sedge	BROWN FOX SEDGE
CARCOR	7	Carya cordiformis	3 [FACU]	Nt Tree	BITTERNUT HICKORY
CAROVT	5	Carya ovata	3 FACU	Nt Tree	SHAGBARK HICKORY
CASFAS	5	Cassia fasciculata	4 FACU-	Nt A-Forb	PARTRIDGE PEA
CATSPE	0	CATALPA SPECIOSA	3 FACU	Ad Tree	HARDY CATALPA
CEAAME	6	Ceanothus americanus	5 UPL	Nt Shrub	NEW JERSEY TEA
CELORB BITTERSWEET	0	CELASTRUS ORBICULATUS	5 UPL	Ad W-Vine	ORIENTAL
CELOCC	3	Celtis occidentalis	1 FAC-	Nt Tree	HACKBERRY
CHEALB	0	CHENOPODIUM ALBUM	1 FAC-	Ad A-Forb	LAMB'S QUARTERS
CHELEP GOOSEFOOT	5	Chenopodium leptophyllum	5 [UPL]	Nt A-Forb	NARROW-LEAVED
CHRLEP	0	CHRYSANTHEMUM LEUCANTHEMUM PINNATIFIDUM	5 UPL	Ad P-Forb	OX-EYE DAISY
CICINT	0	CICHORIUM INTYBUS	5 UPL	Ad P-Forb	CHICORY
CIRLUC NIGHTSHADE	1	Circaea lutetiana canadensis	3 FACU	Nt P-Forb	ENCHANTER'S
CIRARV	0	CIRSIUM ARVENSE	5 UPL	Ad P-Forb	FIELD THISTLE
CIRVUL	0	CIRSIUM VULGARE	4 FACU-	Ad B-Forb	BULL THISTLE
CONMAJ	0	CONVALLARIA MAJALIS	5 UPL	Ad P-Forb	LILY-OF-THE-VALLEY
CONARV	0	CONVOLVULUS ARVENSIS	5 UPL	Ad P-Forb	FIELD BINDWEED
CONSEP	1	Convolvulus sepium	0 FAC	Nt P-Forb	HEDGE BINDWEED
CORLAN	5	Coreopsis lanceolata	3 FACU	Nt P-Forb	SAND COREOPSIS
CORPAL	6	Coreopsis palmata	5 UPL	Nt P-Forb	PRAIRIE COREOPSIS
CORTRP	5	Coreopsis tripteris	0 FAC	Nt P-Forb	TALL COREOPSIS
CORRAC	1	Cornus racemosa	-2 FACW-	Nt Shrub	GRAY DOGWOOD
CORVAR	0	CORONILLA VARIA	5 UPL	Ad P-Forb	CROWN VETCH
DACGLO	0	DACTYLIS GLOMERATA	3 FACU	Ad P-Grass	ORCHARD GRASS
DAUCAR	0	DAUCUS CAROTA	5 UPL	Ad B-Forb	QUEEN ANNE'S LACE
DESCAA	4	Desmodium canadense	1 FAC-	Nt P-Forb	SHOWY TICK TREFOIL
DESILE TREFOIL	6	Desmodium illinoense	5 UPL	Nt P-Forb	ILLINOIS TICK
DIAARM	0	DIANTHUS ARMERIA	5 UPL	Ad A-Forb	DEPTFORD PINK

DIPSYL	0	DIPSACUS SYLVESTRIS	5	UPL	Ad B-Forb	COMMON TEASEL
DODMEA	6	Dodecatheon meadia	3	FACU	Nt P-Forb	SHOOTING STAR
ECHPAL	8	Echinacea pallida	5	UPL	Nt P-Forb	PURPLE CONEFLOWER
ECHPUR CONEFLOWER	3	Echinacea purpurea	5	UPL	Nt P-Forb	BROAD-LEAVED PURPLE
ECHCRU	0	Echinochloa crusgalli	-3	FACW	Nt A-Grass	BARNYARD GRASS
ELAUMB	0	ELAEAGNUS UMBELLATA	5	UPL	Ad Shrub	AUTUMN OLIVE
ELEINT	8	Eleocharis intermedia	-5	[OBL]	Nt A-Sedge	MATTED SPIKE RUSH
ELEPAM	10	Eleocharis palustris major	-5	OBL	Nt P-Sedge	GREAT SPIKE RUSH
ELESMA	5	Eleocharis smallii	-5	OBL	Nt P-Sedge	MARSH SPIKE RUSH
ELYCAN	4	Elymus canadensis	1	FAC-	Nt P-Grass	CANADA WILD RYE
ELYVIL	5	Elymus villosus	3	FACU	Nt P-Grass	SILKY WILD RYE
ELYVIR	4	Elymus virginicus	-2	FACW-	Nt P-Grass	VIRGINIA WILD RYE
EPICOL HERB	3	Epilobium coloratum	-5	OBL	Nt P-Forb	CINNAMON WILLOW
ERASPE	3	Eragrostis spectabilis	5	UPL	Nt P-Grass	PURPLE LOVE GRASS
EREHIE	2	Erechtites hieracifolia	3	FACU	Nt A-Forb	FIREWEED
ERIAN5	0	Erigeron annuus	1	FAC-	Nt B-Forb	ANNUAL FLEABANE
ERISTR	5	Erigeron strigosus	5	[UPL]	Nt B-Forb	DAISY FLEABANE
ERYYUC	9	Eryngium yuccifolium	-1	FAC+	Nt P-Forb	RATTLESNAKE MASTER
ERYALB	5	Erythronium albidum	5	UPL	Nt P-Forb	WHITE TROUT LILY
EUOALA	0	EUONYMUS ALATUS	5	UPL	Ad Shrub	BURNING BUSH
EUPMAM WEED	4	Eupatorium maculatum	-5	OBL	Nt P-Forb	SPOTTED JOE PYE
EUPPUR	7	Eupatorium purpureum	5	UPL	Nt P-Forb	PURPLE JOE PYE WEED
EUPRUG	4	Eupatorium rugosum	5	UPL	Nt P-Forb	WHITE SNAKEROOT
FESELA	0	FESTUCA ELATIOR	2	FACU+	Ad P-Grass	TALL FESCUE
FESRUB	0	FESTUCA RUBRA	1	FAC-	Ad P-Grass	RED FESCUE
FRAVIR	1	Fragaria virginiana	1	FAC-	Nt P-Forb	WILD STRAWBERRY
FRAPES	1	Fraxinus pennsylvanica subintegerrima	0	FAC	Nt Tree	GREEN ASH
GALAPA	1	Galium aparine	3	FACU	Nt A-Forb	ANNUAL BEDSTRAW
GALASP	10	Galium asprellum	-5	OBL	Nt P-Forb	ROUGH BEDSTRAW
GENAND	8	Gentiana andrewsii	-3	FACW	Nt P-Forb	BOTTLE GENTIAN
GERMAC	4	Geranium maculatum	5	[UPL]	Nt P-Forb	WILD GERANIUM
GEUCAN	1	Geum canadense	0	FAC	Nt P-Forb	WOOD AVENS
GEULAT	2	Geum laciniatum trichocarpum	-3	FACW	Nt P-Forb	ROUGH AVENS
GEUTRI	10	Geum triflorum	5	[UPL]	Nt P-Forb	PRAIRIE SMOKE
GLEHED	0	GLECHOMA HEDERACEA	3	FACU	Ad P-Forb	CREEPING CHARLIE
HAMVIR	8	Hamamelis virginiana	3	FACU	Nt Shrub	WITCH HAZEL
HELAUT	5	Helenium autumnale	-4	FACW+	Nt P-Forb	SNEEZEWEED

HELANN	0	HELIANTHUS ANNUUS	1	FAC-	Ad A-Forb	GARDEN SUNFLOWER
HELDIV	5	Helianthus divaricatus	5	UPL	Nt P-Forb	WOODLAND SUNFLOWER
HELGIG	9	Helianthus giganteus	-3	FACW	Nt P-Forb	TALL SUNFLOWER
HELGRO	2	Helianthus grosseserratus	-2	FACW-	Nt P-Forb	SAWTOOTH SUNFLOWER
HELOCC	10	Helianthus occidentalis	4	FACU-	Nt P-Forb	WESTERN SUNFLOWER
HELPET	0	HELIANTHUS PETIOLARIS	5	UPL	Ad A-Forb	PETIOLED SUNFLOWER
HELSTR SUNFLOWER	5	Helianthus strumosus	5	UPL	Nt P-Forb	PALE-LEAVED
HELHEL	5	Heliopsis helianthoides	5	UPL	Nt P-Forb	FALSE SUNFLOWER
HEMFUL	0	HEMEROCALLIS FULVA	5	UPL	Ad P-Forb	ORANGE DAY LILY
HEPACU HEPATICA	6	Hepatica acutiloba	5	UPL	Nt P-Forb	SHARP-LOBED
HESMAT	0	HESPERIS MATRONALIS	5	UPL	Ad P-Forb	DAME'S ROCKET
HEURIC	8	Heuchera richardsonii	1	FAC-	Nt P-Forb	PRAIRIE ALUM ROOT
HIECAE	0	HIERACIUM CAESPITOSUM	5	UPL	Ad P-Forb	FIELD HAWKWEED
HIECAF	6	Hieracium canadense fasciculatum	5	UPL	Nt P-Forb	CANADA HAWKWEED
HIEGRO	6	Hieracium gronovii	5	UPL	Nt P-Forb	HAIRY HAWKWEED
HYDVIR	5	Hydrophyllum virginianum	0	[FAC]	Nt P-Forb	VIRGINIA WATERLEAF
HYPPER WORT	0	HYPERICUM PERFORATUM	5	UPL	Ad P-Forb	COMMON ST. JOHN'S
HYPUN WORT	4	Hypericum punctatum	3	[FACU]	Nt P-Forb	SPOTTED ST. JOHN'S
HYSMAT	5	Hystrix patula	5	UPL	Nt P-Grass	BOTTLEBRUSH GRASS
IMPCAP	3	Impatiens capensis	-3	FACW	Nt A-Forb	ORANGE JEWELWEED
JUGNIG	5	Juglans nigra	3	FACU	Nt Tree	BLACK WALNUT
JUNDUD	4	Juncus dudleyi	0	[FAC]	Nt P-Forb	DUDLEY'S RUSH
JUNEFF	7	Juncus effusus	-5	OBL	Nt P-Forb	COMMON RUSH
JUNTOR	4	Juncus torreyi	-3	FACW	Nt P-Forb	TORREY'S RUSH
KOECRI	7	Koeleria cristata	5	UPL	Nt P-Grass	JUNE GRASS
LACCAN	2	Lactuca canadensis	2	FACU+	Nt B-Forb	WILD LETTUCE
LACHIR	10	Lactuca hirsuta	5	UPL	Nt B-Forb	HAIRY WILD LETTUCE
LACSER	0	LACTUCA SERRIOLA	0	FAC	Ad B-Forb	PRICKLY LETTUCE
LEEORY	4	Leersia oryzoides	-5	OBL	Nt P-Grass	RICE CUT GRASS
LEMMIO	5	Lemna minor	-5	OBL	Nt A-Forb	SMALL DUCKWEED
LEOCAR	0	LEONURUS CARDIACA	5	UPL	Ad P-Forb	MOTHERWORT
LESCAP CLOVER	4	Lespedeza capitata	3	FACU	Nt P-Forb	ROUND-HEADED BUSH
LIAASP	6	Liatris aspera	5	UPL	Nt P-Forb	ROUGH BLAZING STAR
LIACYL STAR	8	Liatris cylindracea	5	UPL	Nt P-Forb	CYLINDRICAL BLAZING
LINVUL	0	LINARIA VULGARIS	5	UPL	Ad P-Forb	BUTTER-AND-EGGS
LOLMUL	0	LOLIUM MULTIFLORUM	5	UPL	Ad A-Grass	ITALIAN RYE GRASS

LONDIO	10	<i>Lonicera dioica</i>	3	FACU	Nt W-Vine	RED HONEYSUCKLE
LONMAA	0	LONICERA MAACKII	5	UPL	Ad Shrub	AMUR HONEYSUCKLE
LONMOR HONEYSUCKLE	0	LONICERA MORROWII	5	UPL	Ad Shrub	MORROW'S
LONTAT HONEYSUCKLE	0	LONICERA TATARICA	5	[UPL]	Ad Shrub	TARTARIAN
LOTCOR	0	LOTUS CORNICULATUS	1	FAC-	Ad P-Forb	BIRD'S FOOT TREFOIL
LUPPEO	7	<i>Lupinus perennis occidentalis</i>	5	UPL	Nt P-Forb	WILD LUPINE
LYCAME HOREHOUND	5	<i>Lycopus americanus</i>	-5	OBL	Nt P-Forb	COMMON WATER
MATSTR	10	<i>Matteuccia struthiopteris</i>	-3	FACW	Cryptogam	OSTRICH FERN
MELALB	0	MELILOTUS ALBA	3	FACU	Ad B-Forb	WHITE SWEET CLOVER
MELLOF	0	MELILOTUS OFFICINALIS	3	FACU	Ad B-Forb	YELLOW SWEET CLOVER
MERVIR	5	<i>Mertensia virginica</i>	-3	FACW	Nt P-Forb	VIRGINIA BLUEBELLS
MONFIS	4	<i>Monarda fistulosa</i>	3	FACU	Nt P-Forb	WILD BERGAMOT
MONPUN	5	<i>Monarda punctata</i>	5	UPL	Nt P-Forb	HORSE MINT
MORRUB	10	<i>Morus rubra</i>	1	FAC-	Nt Tree	RED MULBERRY
MUHMEX	5	<i>Muhlenbergia mexicana</i>	-3	FACW	Nt P-Grass	LEAFY SATIN GRASS
NEPCAT	0	NEPETA CATARIA	1	FAC-	Ad P-Forb	CATNIP
OENBIE PRIMROSE	0	<i>Oenothera biennis</i>	3	FACU	Nt B-Forb	COMMON EVENING
OENNUT PRIMROSE	10	<i>Oenothera nuttallii</i>	5	UPL	Nt P-Forb	WHITE EVENING
OENSPE PRIMROSE	0	OENOTHERA SPECIOSA	5	UPL	Ad P-Forb	SHOWY EVENING
ONOSEN	8	<i>Onoclea sensibilis</i>	-3	FACW	Cryptogam	SENSITIVE FERN
OSMCLO	3	<i>Osmorhiza claytonii</i>	4	FACU-	Nt P-Forb	HAIRY SWEET CICELY
OSMLON	3	<i>Osmorhiza longistylis</i>	4	FACU-	Nt P-Forb	SMOOTH SWEET CICELY
OSMCLI	9	<i>Osmunda claytoniana</i>	-1	FAC+	Cryptogam	INTERRUPTED FERN
OXASTR	0	<i>Oxalis stricta</i>	5	UPL	Nt P-Forb	COMMON WOOD SORREL
PANCOL	7	<i>Panicum columbianum</i>	5	UPL	Nt P-Grass	HEMLOCK PANIC GRASS
PANLEI	10	<i>Panicum leibergii</i>	2	FACU+	Nt P-Grass	PRAIRIE PANIC GRASS
PANVIR	5	<i>Panicum virgatum</i>	-1	FAC+	Nt P-Grass	SWITCH GRASS
PARINT	8	<i>Parthenium integrifolium</i>	5	UPL	Nt P-Forb	WILD QUININE
PARQUI	2	<i>Parthenocissus quinquefolia</i>	1	FAC-	Nt W-Vine	VIRGINIA CREEPER
PASSAT	0	PASTINACA SATIVA	5	UPL	Ad B-Forb	WILD PARSNIP
PENCAL	7	<i>Penstemon calycosus</i>	3	FACU	Nt P-Forb	SMOOTH BEARD TONGUE
PENDIG TONGUE	4	<i>Penstemon digitalis</i>	1	FAC-	Nt P-Forb	FOXGLOVE BEARD
PETCAN CLOVER	9	<i>Petalostemum candidum</i>	5	UPL	Nt P-Forb	WHITE PRAIRIE
PETPUR CLOVER	9	<i>Petalostemum purpureum</i>	5	UPL	Nt P-Forb	PURPLE PRAIRIE
PHAARU	0	PHALARIS ARUNDINACEA	-4	FACW+	Ad P-Grass	REED CANARY GRASS
PHLPRA	0	PHLEUM PRATENSE	3	FACU	Ad P-Grass	TIMOTHY
PHLPIP	7	<i>Phlox pilosa</i>	1	FAC-	Nt P-Forb	SAND PRAIRIE PHLOX

PHLEPIF	7	<i>Phlox pilosa fulgida</i>	-1	FAC+	Nt	P-Forb	PRAIRIE PHLOX
PHRAUS	1	<i>Phragmites australis</i>	-4	FACW+	Nt	P-Grass	COMMON REED
PHYSUB	0	<i>Physalis subglabrata</i>	5	UPL	Nt	P-Forb	TALL GROUND CHERRY
PHYAME	1	<i>Phytolacca americana</i>	1	FAC-	Nt	P-Forb	POKEWEED
PILPUM	5	<i>Pilea pumila</i>	-3	FACW	Nt	A-Forb	CLEARWEED
PINSTR	9	<i>Pinus strobus</i>	3	FACU	Nt	Tree	WHITE PINE
PLALAN	0	PLANTAGO LANCEOLATA	0	FAC	Ad	P-Forb	ENGLISH PLANTAIN
PLAMAJ	0	PLANTAGO MAJOR	-1	FAC+	Ad	P-Forb	COMMON PLANTAIN
POACOM	0	POA COMPRESSA	2	FACU+	Ad	P-Grass	CANADA BLUE GRASS
POAPRA	0	POA PRATENSIS	1	FAC-	Ad	P-Grass	KENTUCKY BLUE GRASS
POASYL	10	<i>Poa sylvestris</i>	0	FAC	Nt	P-Grass	WOODLAND BLUE GRASS
PODPEL	4	<i>Podophyllum peltatum</i>	3	FACU	Nt	P-Forb	MAY APPLE
POLREP	5	<i>Polemonium reptans</i>	0	FAC	Nt	P-Forb	JACOB'S LADDER
POLCAL SEAL	3	<i>Polygonatum canaliculatum</i>	3	FACU	Nt	P-Forb	SMOOTH SOLOMON'S
POLAMS	4	<i>Polygonum amphibium stipulaceum</i>	-5	OBL	Nt	P-Forb	WATER KNOTWEED
POLERE	2	<i>Polygonum erectum</i>	3	FACU	Nt	A-Forb	ERECT KNOTWEED
POLPEN	0	<i>Polygonum pensylvanicum</i>	-4	FACW+	Nt	A-Forb	PINKWEED
POLPER	0	POLYGONUM PERSICARIA	1	[FAC-]	Ad	A-Forb	LADY'S THUMB
POLGVI	2	<i>Polygonum virginianum</i>	0	FAC	Nt	P-Forb	WOODLAND KNOTWEED
PONCOR	10	<i>Pontederia cordata</i>	-5	OBL	Nt	P-Forb	PICKEREL WEED
POPDEL	2	<i>Populus deltoides</i>	-1	FAC+	Nt	Tree	EASTERN COTTONWOOD
POPTRE	4	<i>Populus tremuloides</i>	0	FAC	Nt	Tree	QUAKING ASPEN
POTNAT	7	<i>Potamogeton natans</i>	-5	OBL	Nt	P-Forb	COMMON PONDWEED
POTPAL	10	<i>Potentilla palustris</i>	-5	OBL	Nt	P-Forb	MARSH CINQUEFOIL
POTSIS	4	<i>Potentilla simplex</i>	4	FACU-	Nt	P-Forb	COMMON CINQUEFOIL
PREALB	5	<i>Prenanthes alba</i>	3	FACU	Nt	P-Forb	LION'S FOOT
PRUSER	1	<i>Prunus serotina</i>	3	FACU	Nt	Tree	WILD BLACK CHERRY
PRUVIR	3	<i>Prunus virginiana</i>	3	[FACU]	Nt	Shrub	CHOKE CHERRY
PYCVIR MINT	5	<i>Pycnanthemum virginianum</i>	-4	FACW+	Nt	P-Forb	COMMON MOUNTAIN
QUEALE	5	<i>Quercus alba</i>	0	FAC	Nt	Tree	WHITE OAK
QUEBIC	6	<i>Quercus bicolor</i>	-4	FACW+	Nt	Tree	SWAMP WHITE OAK
QUECOC	4	<i>Quercus coccinea</i>	5	UPL	Nt	Tree	SCARLET OAK
QUEMAC	5	<i>Quercus macrocarpa</i>	1	FAC-	Nt	Tree	BUR OAK
QUEPAU	8	<i>Quercus palustris</i>	-3	FACW	Nt	Tree	PIN OAK
QUERUB	7	<i>Quercus rubra</i>	3	FACU	Nt	Tree	RED OAK
RATPIN	4	<i>Ratibida pinnata</i>	5	UPL	Nt	P-Forb	YELLOW CONEFLOWER



RHACAT	0 RHAMNUS CATHARTICA	3 FACU	Ad Shrub	COMMON BUCKTHORN
RHUGLA	1 Rhus glabra	5 UPL	Nt Shrub	SMOOTH SUMAC
RHURAD	2 Rhus radicans	-1 FAC+	Nt W-Vine	POISON IVY
RHUTYP	1 Rhus typhina	5 UPL	Nt Tree	STAGHORN SUMAC
RIBMIS	5 Ribes missouriense	5 UPL	Nt Shrub	WILD GOOSEBERRY
ROBPSE	0 ROBINIA PSEUDOACACIA	4 FACU-	Ad Tree	BLACK LOCUST
ROSCAR	5 Rosa carolina	4 FACU-	Nt Shrub	PASTURE ROSE
ROSMUL	0 ROSA MULTIFLORA	3 FACU	Ad Shrub	MULTIFLORA ROSE
RUBALL	3 Rubus allegheniensis	2 FACU+	Nt Shrub	COMMON BLACKBERRY
RUBOCC	2 Rubus occidentalis	5 UPL	Nt Shrub	BLACK RASPBERRY
RUDHIR	1 Rudbeckia hirta	3 FACU	Nt P-Forb	BLACK-EYED SUSAN
RUDLAC	5 Rudbeckia laciniata	-4 FACW+	Nt P-Forb	WILD GOLDEN GLOW
RUDTRI	3 Rudbeckia triloba	1 FAC-	Nt A-Forb	BROWN-EYED SUSAN
RUMCRI	0 RUMEX CRISPUS	-1 FAC+	Ad P-Forb	CURLY DOCK
SALBAB	0 SALIX BABYLONICA	-3 FACW	Ad Tree	WEeping WILLOW
SALINT	1 Salix interior	-5 OBL	Nt Shrub	SANDBAR WILLOW
SALNIG	4 Salix nigra	-5 OBL	Nt Tree	BLACK WILLOW
SAMCAN	1 Sambucus canadensis	-2 FACW-	Nt Shrub	ELDERBERRY
SANGRE SNAKEROOT	2 Sanicula gregaria	-1 FAC+	Nt P-Forb	CLUSTERED BLACK
SCIATR	4 Scirpus atrovirens	-5 OBL	Nt P-Sedge	DARK GREEN RUSH
SCIFLU	4 Scirpus fluviatilis	-5 OBL	Nt P-Sedge	RIVER BULRUSH
SCRLAN	5 Scrophularia lanceolata	-1 FAC+	Nt P-Forb	EARLY FIGWORT
SCRMAR	4 Scrophularia marilandica	4 FACU-	Nt P-Forb	LATE FIGWORT
SETFAB	0 SETARIA FABERI	2 FACU+	Ad A-Grass	GIANT FOXTAIL
SETGLA	0 SETARIA GLAUCA	0 FAC	Ad A-Grass	YELLOW FOXTAIL
SETITA	0 SETARIA ITALICA	3 FACU	Ad A-Grass	FOXTAIL MILLET
SETVIV	0 SETARIA VIRIDIS	1 [FAC-]	Ad A-Grass	GREEN FOXTAIL
SETVIM	0 SETARIA VIRIDIS MAJOR	5 UPL	Ad A-Grass	GIANT GREEN FOXTAIL
SILCUC	0 SILENE CUCUBALUS	5 UPL	Ad P-Forb	BLADDER CAMPION
SILNIV	10 Silene nivea	-3 FACW	Nt P-Forb	SNOWY CAMPION
SILSTE	6 Silene stellata	5 UPL	Nt P-Forb	STARRY CAMPION
SILINI	5 Silphium integrifolium	5 UPL	Nt P-Forb	ROSIN WEED
SILLAC	5 Silphium laciniatum	5 UPL	Nt P-Forb	COMPASS PLANT
SILPER	5 Silphium perfoliatum	-2 FACW-	Nt P-Forb	CUP PLANT
SILTER	5 Silphium terebinthinaceum	3 FACU	Nt P-Forb	PRAIRIE DOCK
SISCAM GRASS	10 Sisyrinchium campestre	5 UPL	Nt P-Forb	PRAIRIE BLUE-EYED
SMIRAC	3 Smilacina racemosa	3 FACU	Nt P-Forb	FEATHERY FALSE

SOLOMON'S SEAL						
SMISTE	5	<i>Smilacina stellata</i>	1	FAC-	Nt P-Forb	STARRY FALSE
SOLOMON'S SEAL						
SMIECI	5	<i>Smilax ecirrhata</i>	5	UPL	Nt P-Forb	UPRIGHT CARRION
FLOWER						
SMIILL	5	<i>Smilax illinoensis</i>	5	UPL	Nt P-Forb	ILLINOIS CARRION
FLOWER						
SMILAS	5	<i>Smilax lasioneura</i>	5	[UPL]	Nt H-Vine	COMMON CARRION
FLOWER						
SOLCAR	0	SOLANUM CAROLINENSE	4	FACU-	Ad P-Forb	HORSE NETTLE
SOLDUL	0	SOLANUM DULCAMARA	0	FAC	Ad W-Vine	BITTERSWEET
NIGHTSHADE						
SOLALT	1	<i>Solidago altissima</i>	3	FACU	Nt P-Forb	TALL GOLDENROD
SOLGIG	4	<i>Solidago gigantea</i>	-3	FACW	Nt P-Forb	LATE GOLDENROD
SOLGRG	4	<i>Solidago graminifolia</i>	-2	FACW-	Nt P-Forb	COMMON GRASS-LEAVED
GOLDENROD						
SOLGRN	3	<i>Solidago graminifolia nuttallii</i>	0	[FAC]	Nt P-Forb	HAIRY GRASS-LEAVED
GOLDENROD						
SOLJUN	5	<i>Solidago juncea</i>	5	UPL	Nt P-Forb	EARLY GOLDENROD
SOLNEM	4	<i>Solidago nemoralis</i>	5	UPL	Nt P-Forb	OLD-FIELD GOLDENROD
SOLRID	7	<i>Solidago riddellii</i>	-5	OBL	Nt P-Forb	RIDDELL'S GOLDENROD
SOLRIG	4	<i>Solidago rigida</i>	4	FACU-	Nt P-Forb	STIFF GOLDENROD
SONARV	0	SONCHUS ARVENSI	1	FAC-	Ad P-Forb	FIELD SOW THISTLE
SORNUT	5	<i>Sorghastrum nutans</i>	2	FACU+	Nt P-Grass	INDIAN GRASS
SPAPEC	4	<i>Spartina pectinata</i>	-4	FACW+	Nt P-Grass	PRAIRIE CORD GRASS
SPOHET	10	<i>Sporobolus heterolepis</i>	4	FACU-	Nt P-Grass	PRAIRIE DROPSEED
TAEINT	9	<i>Taenidia integerrima</i>	5	UPL	Nt P-Forb	YELLOW PIMPERNEL
TAROFF	0	TARAXACUM OFFICINALE	3	FACU	Ad P-Forb	COMMON DANDELION
THADIO	7	<i>Thalictrum dioicum</i>	2	FACU+	Nt P-Forb	EARLY MEADOW RUE
THABAR	8	<i>Thaspium barbinode</i>	5	UPL	Nt P-Forb	HAIRY MEADOW
PARSNIP						
THLARV	0	THLASPI ARVENSE	5	UPL	Ad A-Forb	PENNY CRESS
TILAME	5	<i>Tilia americana</i>	3	FACU	Nt Tree	AMERICAN LINDEN
TRAOHI	2	<i>Tradescantia ohiensis</i>	2	FACU+	Nt P-Forb	COMMON SPIDERWORT
TRADUB	0	TRAGOPOGON DUBIUS	5	UPL	Ad B-Forb	SAND GOAT'S BEARD
TRAPRA	0	TRAGOPOGON PRATENSIS	5	UPL	Ad B-Forb	COMMON GOAT'S BEARD
TRIPRA	0	TRIFOLIUM PRATENSE	5	UPL	Ad P-Forb	RED CLOVER
TRIREP	0	TRIFOLIUM REPENS	2	FACU+	Ad P-Forb	WHITE CLOVER
TRIGRA	8	<i>Trillium grandiflorum</i>	5	UPL	Nt P-Forb	LARGE-FLOWERED
TRILLIUM						
TRIREC	5	<i>Trillium recurvatum</i>	4	FACU-	Nt P-Forb	RED TRILLIUM
TRIPER	5	<i>Triosteum perfoliatum</i>	5	UPL	Nt P-Forb	LATE HORSE GENTIAN
ULMAME	3	<i>Ulmus americana</i>	-2	FACW-	Nt Tree	AMERICAN ELM
ULMPUM	0	ULMUS PUMILA	5	UPL	Ad Tree	SIBERIAN ELM
URTDIO	0	URTICA DIOICA	-1	FAC+	Ad P-Forb	STINGING NETTLE
VERTHA	0	VERBASCUM THAPSUS	5	UPL	Ad B-Forb	COMMON MULLEIN

VERHAS	4	<i>Verbena hastata</i>	-4	FACW+	Nt P-Forb	BLUE VERVAIN
VERSTR	4	<i>Verbena stricta</i>	5	UPL	Nt P-Forb	HOARY VERVAIN
VERURU	5	<i>Verbena urticifolia</i>	5	UPL	Nt P-Forb	HAIRY WHITE VERVAIN
VERALA IRONWEED	3	<i>Vernonia altissima</i>	0	FAC	Nt P-Forb	SMOOTH TALL
VERATA	5	<i>Vernonia altissima taeniotricha</i>	0	[FAC]	Nt P-Forb	HAIRY TALL IRONWEED
VIBDEN	0	VIBURNUM DENTATUM	5	UPL	Ad Shrub	ARROW-WOOD
VIBOPU CRANBERRY	0	VIBURNUM OPULUS	3	[FACU]	Ad Shrub	EUROPEAN HIGHBUSH
VIOPAM	10	<i>Viola palmata</i>	5	UPL	Nt P-Forb	LOBED VIOLET
VIOSOR	3	<i>Viola sororia</i>	1	FAC-	Nt P-Forb	COMMON BLUE VIOLET
VIOSTR	6	<i>Viola striata</i>	-3	FACW	Nt P-Forb	CREAM VIOLET
VITRIP	2	<i>Vitis riparia</i>	-2	FACW-	Nt W-Vine	RIVERBANK GRAPE
ZIZAUR	7	<i>Zizia aurea</i>	-1	FAC+	Nt P-Forb	GOLDEN ALEXANDERS

Site: Sanctuary of Bull Valley  
 Locale: Woodland Overall Inventory  
 By: Nicky Obenauf  
 File: c:\FQA\studies\SEV\Woodland overall inventory.inv

FLORISTIC QUALITY DATA		Native		Adventive	
147	NATIVE SPECIES	147	73.1%	54	26.9%
147	Total Species	19	9.5%	2	1.0%
201	NATIVE MEAN C	7	3.5%	9	4.5%
4.4	W/Adventives	4	2.0%	2	1.0%
3.2	NATIVE FQI	1	0.5%	0	0.0%
53.9	W/Adventives	84	41.8%	18	9.0%
46.1	NATIVE MEAN W	3	1.5%	9	4.5%
1.6	W/Adventives	6	3.0%	2	1.0%
1.9	AVG: Fac. Upland (+)	12	6.0%	10	5.0%
		0	0.0%	2	1.0%
		10	5.0%	0	0.0%
		0	0.0%	0	0.0%
		1	0.5%		

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ACENEG	0	<i>Acer negundo</i>	-2	FACW-	Nt Tree	BOX ELDER
ACERUB	7	<i>Acer rubrum</i>	0	FAC	Nt Tree	RED MAPLE
ACESAI	0	<i>Acer saccharinum</i>	-3	FACW	Nt Tree	SILVER MAPLE
ACHMIL	0	<i>ACHILLEA MILLEFOLIUM</i>	3	FACU	Ad P-Forb	YARROW
AGANEP	5	<i>Agastache nepetoides</i>	3	FACU	Nt P-Forb	YELLOW GIANT HYSSOP
AGRGRY	2	<i>Agrimonia gryposepala</i>	2	FACU+	Nt P-Forb	TALL AGRIMONY
AGRSMI	0	<i>AGROPYRON SMITHII</i>	4	FACU-	Ad P-Grass	WESTERN WHEAT GRASS
AGRALA	0	<i>AGROSTIS ALBA</i>	-3	FACW	Ad P-Grass	REDTOP
ALLPET	0	<i>ALLIARIA PETIOLATA</i>	0	FAC	Ad B-Forb	GARLIC MUSTARD
AMBARE	0	<i>Ambrosia artemisiifolia elatior</i>	3	FACU	Nt A-Forb	COMMON RAGWEED
AMBTRI	0	<i>Ambrosia trifida</i>	-1	FAC+	Nt A-Forb	GIANT RAGWEED
AMPBRE	4	<i>Amphicarpaea bracteata</i>	0	FAC	Nt P-Forb	UPLAND HOG PEANUT
ANDGER	5	<i>Andropogon gerardii</i>	1	FAC-	Nt P-Grass	BIG BLUESTEM GRASS
ANECYL	6	<i>Anemone cylindrica</i>	5	UPL	Nt P-Forb	THIMBLEWEED
ANEQUI	7	<i>Anemone quinquefolia</i>	5	[UPL]	Nt P-Forb	WOOD ANEMONE
ANEVIR	5	<i>Anemone virginiana</i>	5	UPL	Nt P-Forb	TALL ANEMONE
APOAND	5	<i>Apocynum androsaemifolium</i>	5	UPL	Nt P-Forb	SPREADING DOGBANE
APOCAN	4	<i>Apocynum cannabinum</i>	0	FAC	Nt P-Forb	INDIAN HEMP
AQUCAN	6	<i>Aquilegia canadensis</i>	1	FAC-	Nt P-Forb	WILD COLUMBINE
ARCMIN	0	<i>ARCTIUM MINUS</i>	5	UPL	Ad B-Forb	COMMON BURDOCK
ARITRI	4	<i>Arisaema triphyllum</i>	-2	FACW-	Nt P-Forb	JACK-IN-THE-PULPIT
ASCSYR	0	<i>Asclepias syriaca</i>	5	UPL	Nt P-Forb	COMMON MILKWEED
ASCTUB	7	<i>Asclepias tuberosa</i>	5	UPL	Nt P-Forb	BUTTERFLY WEED
ASTAZU	8	<i>Aster azureus</i>	5	UPL	Nt P-Forb	SKY-BLUE ASTER
ASTERI	5	<i>Aster ericoides</i>	4	FACU-	Nt P-Forb	HEATH ASTER

ASTLAE	9 Aster laevis	5 UPL	Nt P-Forb	SMOOTH BLUE ASTER
ASTNOV	4 Aster novae-angliae	-3 FACW	Nt P-Forb	NEW ENGLAND ASTER
ASTPUP	8 Aster puniceus	-5 OBL	Nt P-Forb	BRISTLY ASTER
ASTSAD	2 Aster sagittifolius drummondii	3 {FACU}	Nt P-Forb	DRUMMOND'S ASTER
ASTSIS	3 Aster simplex	-5 OBL	Nt P-Forb	PANICLED ASTER
ASTUMB	9 Aster umbellatus	-3 FACW	Nt P-Forb	FLAT-TOP ASTER
BARVUL	0 BARBAREA VULGARIS	0 FAC	Ad B-Forb	YELLOW ROCKET
BROINE	0 BROMUS INERMIS	5 UPL	Ad P-Grass	HUNGARIAN BROME
BROPUB	5 Bromus pubescens	2 FACU+	Nt P-Grass	WOODLAND BROME
CACATR PLANTAIN	8 Cacalia atriplicifolia	5 UPL	Nt P-Forb	PALE INDIAN
CARNUT	0 CARDUUS NUTANS	5 UPL	Ad B-Forb	MUSK THISTLE
CXBICK OVAL SEDGE	10 Carex bicknellii	5 {UPL}	Nt P-Sedge	COPPER-SHOULDERED
CXBLAN	1 Carex blanda	0 FAC	Nt P-Sedge	COMMON WOOD SEDGE
CXMOLE	2 Carex molesta	-1 FAC+	Nt P-Sedge	FIELD OVAL SEDGE
CXMUSK	8 Carex muskingumensis	-5 OBL	Nt P-Sedge	SWAMP OVAL SEDGE
CXNORM SEdge	5 Carex normalis	0 {FAC}	Nt P-Sedge	SPREADING OVAL
CXPENS	5 Carex pennsylvanica	5 UPL	Nt P-Sedge	COMMON OAK SEDGE
CXROSE SEdge	4 Carex rosea	5 UPL	Nt P-Sedge	CURLY-STYLED WOOD
CXSTRI SEdge	5 Carex stricta	-5 OBL	Nt P-Sedge	COMMON TUSOCK
CXTRIB SEdge	3 Carex tribuloides	-4 FACW+	Nt P-Sedge	AWL-FRUITED OVAL
CXVULP	2 Carex vulpinoidea	-5 OBL	Nt P-Sedge	BROWN FOX SEDGE
CARCOR	7 Carya cordiformis	3 {FACU}	Nt Tree	BITTERNUT HICKORY
CAROV	5 Carya ovata	3 FACU	Nt Tree	SHAGBARK HICKORY
CASFAS	5 Cassia fasciculata	4 FACU-	Nt A-Forb	PARTRIDGE PEA
CATSPE	0 CATALPA SPECIOSA	3 FACU	Ad Tree	HARDY CATALPA
CELOB BITTERSWEET	0 CELASTRUS ORBICULATUS	5 UPL	Ad W-Vine	ORIENTAL
CELOCC	3 Celtis occidentalis	1 FAC-	Nt Tree	HACKBERRY
CHRLEP	0 CHRYSANTHEMUM LEUCANTHEMUM PINNATIFIDUM	5 UPL	Ad P-Forb	OX-EYE DAISY
CICINT	0 CICHORIUM INTYBUS	5 UPL	Ad P-Forb	CHICORY
CIRLUC NIGHTSHADE	1 Circaea lutetiana canadensis	3 FACU	Nt P-Forb	ENCHANTER'S
CIRARV	0 CIRSIUM ARVENSE	5 UPL	Ad P-Forb	FIELD THISTLE
CONMAJ	0 CONVALLARIA MAJALIS	5 UPL	Ad P-Forb	LILY-OF-THE-VALLEY
CONARV	0 CONVULVULUS ARVENSIS	5 UPL	Ad P-Forb	FIELD BINDWEED
CONSEP	1 Convolvulus sepium	0 FAC	Nt P-Forb	HEDGE BINDWEED
CORTRP	5 Coreopsis tripteris	0 FAC	Nt P-Forb	TALL COREOPSIS
CORRAC	1 Cornus racemosa	-2 FACW-	Nt Shrub	GRAY DOGWOOD
DACGLO	0 DACTYLIS GLOMERATA	3 FACU	Ad P-Grass	ORCHARD GRASS

DAUCAR	0 DAUCUS CAROTA	5 UPL	Ad B-Forb	QUEEN ANNE'S LACE
DIAARM	0 DIANTHUS ARMERIA	5 UPL	Ad A-Forb	DEPTFORD PINK
ECHPUR CONEFLOWER	3 Echinacea purpurea	5 UPL	Nt P-Forb	BROAD-LEAVED PURPLE
ELAUMB	0 ELAEAGNUS UMBELLATA	5 UPL	Ad Shrub	AUTUMN OLIVE
ELYCAN	4 Elymus canadensis	1 FAC-	Nt P-Grass	CANADA WILD RYE
ELYVIR	4 Elymus virginicus	-2 FACW-	Nt P-Grass	VIRGINIA WILD RYE
ERISTR	5 Erigeron strigosus	5 [UPL]	Nt B-Forb	DAISY FLEABANE
ERYYUC	9 Eryngium yuccifolium	-1 FAC+	Nt P-Forb	RATTLESNAKE MASTER
EUOALA	0 EUONYMUS ALATUS	5 UPL	Ad Shrub	BURNING BUSH
EUPMAM WEED	4 Eupatorium maculatum	-5 OBL	Nt P-Forb	SPOTTED JOE PYE
EUPPUR	7 Eupatorium purpureum	5 UPL	Nt P-Forb	PURPLE JOE PYE WEED
FESELA	0 FESTUCA ELATIOR	2 FACU+	Ad P-Grass	TALL FESCUE
FESRUB	0 FESTUCA RUBRA	1 FAC-	Ad P-Grass	RED FESCUE
FRAVIR	1 Fragaria virginiana	1 FAC-	Nt P-Forb	WILD STRAWBERRY
GALAPA	1 Galium aparine	3 FACU	Nt A-Forb	ANNUAL BEDSTRAW
GALASP	10 Galium asprellum	-5 OBL	Nt P-Forb	ROUGH BEDSTRAW
GERMAC	4 Geranium maculatum	5 [UPL]	Nt P-Forb	WILD GERANIUM
GEUCAN	1 Geum canadense	0 FAC	Nt P-Forb	WOOD AVENS
GEULAT	2 Geum laciniatum trichocarpum	-3 FACW	Nt P-Forb	ROUGH AVENS
GLEHED	0 GLECHOMA HEDERACEA	3 FACU	Ad P-Forb	CREEPING CHARLIE
HELDIV	5 Helianthus divaricatus	5 UPL	Nt P-Forb	WOODLAND SUNFLOWER
HELGIG	9 Helianthus giganteus	-3 FACW	Nt P-Forb	TALL SUNFLOWER
HELGRO	2 Helianthus grosseserratus	-2 FACW-	Nt P-Forb	SAWTOOTH SUNFLOWER
HELOCC	10 Helianthus occidentalis	4 FACU-	Nt P-Forb	WESTERN SUNFLOWER
HELSTR SUNFLOWER	5 Helianthus strumosus	5 UPL	Nt P-Forb	PALE-LEAVED
HELHEL	5 Heliopsis helianthoides	5 UPL	Nt P-Forb	FALSE SUNFLOWER
HESMAT	0 HESPERIS MATRONALIS	5 UPL	Ad P-Forb	DAME'S ROCKET
HIEGRO	6 Hieracium gronovii	5 UPL	Nt P-Forb	HAIRY HAWKWEED
HYDVIR	5 Hydrophyllum virginianum	0 [FAC]	Nt P-Forb	VIRGINIA WATERLEAF
HYSPAT	5 Hystrix patula	5 UPL	Nt P-Grass	BOTTLEBRUSH GRASS
IMPCAP	3 Impatiens capensis	-3 FACW	Nt A-Forb	ORANGE JEWELWEED
JUGNIG	5 Juglans nigra	3 FACU	Nt Tree	BLACK WALNUT
LACCAN	2 Lactuca canadensis	2 FACU+	Nt B-Forb	WILD LETTUCE
LACSER	0 LACTUCA SERRIOLA	0 FAC	Ad B-Forb	FRICKLY LETTUCE
LEOCAR	0 LEONURUS CARDIACA	5 UPL	Ad P-Forb	MOTHERWORT
LESCAP CLOVER	4 Lespedeza capitata	3 FACU	Nt P-Forb	ROUND-HEADED BUSH

LONDIO	10	Lonicera dioica	3	FACU	Nt W-Vine	RED HONEYSUCKLE
LONMAA	0	LONICERA MAACKII	5	UPL	Ad Shrub	AMUR HONEYSUCKLE
LONMOR	0	LONICERA MORROWII	5	UPL	Ad Shrub	MORROW'S
HONEYSUCKLE						
LONTAT	0	LONICERA TATARICA	5	[UPL]	Ad Shrub	TARTARIAN
HONEYSUCKLE						
MATSTR	10	Matteuccia struthiopteris	-3	FACW	Cryptogam	OSTRICH FERN
MELALB	0	MELILOTUS ALBA	3	FACU	Ad B-Forb	WHITE SWEET CLOVER
MONFIS	4	Monarda fistulosa	3	FACU	Nt P-Forb	WILD BERGAMOT
MORRUB	10	Morus rubra	1	FAC-	Nt Tree	RED MULBERRY
MUHMEX	5	Muhlenbergia mexicana	-3	FACW	Nt P-Grass	LEAFY SATIN GRASS
OENBIE	0	Oenothera biennis	3	FACU	Nt B-Forb	COMMON EVENING
PRIMROSE						
OSMCLO	3	Osmorhiza claytonii	4	FACU-	Nt P-Forb	HAIRY SWEET CICELY
OSMLON	3	Osmorhiza longistylis	4	FACU-	Nt P-Forb	SMOOTH SWEET CICELY
OXASTR	0	Oxalis stricta	5	UPL	Nt P-Forb	COMMON WOOD SORREL
PANCOL	7	Panicum columbianum	5	UPL	Nt P-Grass	HEMLOCK PANIC GRASS
PANVIR	5	Panicum virgatum	-1	FAC+	Nt P-Grass	SWITCH GRASS
PARINT	8	Parthenium integrifolium	5	UPL	Nt P-Forb	WILD QUININE
PARQUI	2	Parthenocissus quinquefolia	1	FAC-	Nt W-Vine	VIRGINIA CREEPER
PASSAT	0	PASTINACA SATIVA	5	UPL	Ad B-Forb	WILD PARSNIP
PENCAL	7	Penstemon calycosus	3	FACU	Nt P-Forb	SMOOTH BEARD TONGUE
PENDIG	4	Penstemon digitalis	1	FAC-	Nt P-Forb	FOXGLOVE BEARD
TONGUE						
PHAARU	0	PHALARIS ARUNDINACEA	-4	FACW+	Ad P-Grass	REED CANARY GRASS
PHLPRA	0	PHLEUM PRATENSE	3	FACU	Ad P-Grass	TIMOTHY
PHRAUS	1	Phragmites australis	-4	FACW+	Nt P-Grass	COMMON REED
PHYSUB	0	Physalis subglabrata	5	UPL	Nt P-Forb	TALL GROUND CHERRY
PHYAME	1	Phytolacca americana	1	FAC-	Nt P-Forb	POKEWEED
PILPUM	5	Pilea pumila	-3	FACW	Nt A-Forb	CLEARWEED
PINSTR	9	Pinus strobus	3	FACU	Nt Tree	WHITE PINE
PLALAN	0	PLANTAGO LANCEOLATA	0	FAC	Ad P-Forb	ENGLISH PLANTAIN
PLAMAJ	0	PLANTAGO MAJOR	-1	FAC+	Ad P-Forb	COMMON PLANTAIN
POACOM	0	POA COMPRESSA	2	FACU+	Ad P-Grass	CANADA BLUE GRASS
POAPRA	0	POA PRATENSIS	1	FAC-	Ad P-Grass	KENTUCKY BLUE GRASS
POASYL	10	Poa sylvestris	0	FAC	Nt P-Grass	WOODLAND BLUE GRASS
PODPEL	4	Podophyllum peltatum	3	FACU	Nt P-Forb	MAY APPLE
POLCAL	3	Polygonatum canaliculatum	3	FACU	Nt P-Forb	SMOOTH SOLOMON'S
SEAL						
POLPER	0	POLYGONUM PERSICARIA	1	[FAC-]	Ad A-Forb	LADY'S THUMB
POLGVI	2	Polygonum virginianum	0	FAC	Nt P-Forb	WOODLAND KNOTWEED
POPDEL	2	Populus deltoides	-1	FAC+	Nt Tree	EASTERN COTTONWOOD

POTSIS	4	Potentilla simplex	4	FACU-	Nt P-Forb	COMMON CINQUEFOIL
PREALB	5	Prenanthes alba	3	FACU	Nt P-Forb	LION'S FOOT
PRUSER	1	Prunus serotina	3	FACU	Nt Tree	WILD BLACK CHERRY
PRUVIR	3	Prunus virginiana	3	[FACU]	Nt Shrub	CHOKO CHERRY
PYCVIR MINT	5	Pycnanthemum virginianum	-4	FACW+	Nt P-Forb	COMMON MOUNTAIN
QUEALB	5	Quercus alba	0	FAC	Nt Tree	WHITE OAK
QUEBIC	6	Quercus bicolor	-4	FACW+	Nt Tree	SWAMP WHITE OAK
QUECOC	4	Quercus coccinea	5	UPL	Nt Tree	SCARLET OAK
QUEMAC	5	Quercus macrocarpa	1	FAC-	Nt Tree	BUR OAK
QUERUB	7	Quercus rubra	3	FACU	Nt Tree	RED OAK
RATPIN	4	Ratibida pinnata	5	UPL	Nt P-Forb	YELLOW CONEFLOWER
RHACAT	0	RHAMNUS CATHARTICA	3	FACU	Ad Shrub	COMMON BUCKTHORN
RHUGLA	1	Rhus glabra	5	UPL	Nt Shrub	SMOOTH SUMAC
RHURAD	2	Rhus radicans	-1	FAC+	Nt W-Vine	POISON IVY
RHUTYP	1	Rhus typhina	5	UPL	Nt Tree	STAGHORN SUMAC
RIEMIS	5	Ribes missouriense	5	UPL	Nt Shrub	WILD GOOSEBERRY
ROBPSE	0	ROBINIA PSEUDOACACIA	4	FACU-	Ad Tree	BLACK LOCUST
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad Shrub	MULTIFLORA ROSE
RUBALL	3	Rubus allegheniensis	2	FACU+	Nt Shrub	COMMON BLACKBERRY
RUBOCC	2	Rubus occidentalis	5	UPL	Nt Shrub	BLACK RASPBERRY
RUDHIR	1	Rudbeckia hirta	3	FACU	Nt P-Forb	BLACK-EYED SUSAN
RUMCRI	0	RUMEX CRISPUS	-1	FAC+	Ad P-Forb	CURLY DOCK
SAMCAN	1	Sambucus canadensis	-2	FACW-	Nt Shrub	ELDERBERRY
SANGRE SNAKEROOT	2	Sanicula gregaria	-1	FAC+	Nt P-Forb	CLUSTERED BLACK
SCRLAN	5	Scrophularia lanceolata	-1	FAC+	Nt P-Forb	EARLY FIGWORT
SCRMAR	4	Scrophularia marilandica	4	FACU-	Nt P-Forb	LATE FIGWORT
SETVIV	0	SETARIA VIRIDIS	1	[FAC-]	Ad A-Grass	GREEN FOXTAIL
SETVIM	0	SETARIA VIRIDIS MAJOR	5	UPL	Ad A-Grass	GIANT GREEN FOXTAIL
SILCUC	0	SILENE CUCUBALUS	5	UPL	Ad P-Forb	BLADDER CAMPION
SILINI	5	Silphium integrifolium	5	UPL	Nt P-Forb	ROSIN WEED
SILPER	5	Silphium perfoliatum	-2	FACW-	Nt P-Forb	CUP PLANT
SILTER	5	Silphium terebinthinaceum	3	FACU	Nt P-Forb	PRAIRIE DOCK
SMIRAC	3	Smilacina racemosa	3	FACU	Nt P-Forb	FEATHERY FALSE
SOLOMON'S SEAL	5	Smilacina stellata	1	FAC-	Nt P-Forb	STARRY FALSE
SMILAS FLOWER	5	Smilax lasioneura	5	[UPL]	Nt H-Vine	COMMON CARRION
SOLCAR	0	SOLANUM CAROLINENSE	4	FACU-	Ad P-Forb	HORSE NETTLE



SOLDUL NIGHTSHADE	0 SOLANUM DULCAMARA	0 FAC	Ad W-Vine	BITTERSWEET
SOLALT	1 Solidago altissima	3 FACU	Nt P-Forb	TALL GOLDENROD
SOLGIG	4 Solidago gigantea	-3 FACW	Nt P-Forb	LATE GOLDENROD
SOLGRG GOLDENROD	4 Solidago graminifolia	-2 FACW-	Nt P-Forb	COMMON GRASS-LEAVED
SOLGRN GOLDENROD	3 Solidago graminifolia nuttallii	0 [FAC]	Nt P-Forb	HAIRY GRASS-LEAVED
SOLJUN	5 Solidago juncea	5 UPL	Nt P-Forb	EARLY GOLDENROD
SOLRIG	4 Solidago rigida	4 FACU-	Nt P-Forb	STIFF GOLDENROD
SORNUT	5 Sorghastrum nutans	2 FACU+	Nt P-Grass	INDIAN GRASS
SPOHET	10 Sporobolus heterolepis	4 FACU-	Nt P-Grass	PRAIRIE DROPSEED
TAEINT	9 Taenidia integerrima	5 UPL	Nt P-Forb	YELLOW PIMPERNEL
TAROFF	0 TARAXACUM OFFICINALE	3 FACU	Ad P-Forb	COMMON DANDELION
THADIO	7 Thalictrum dioicum	2 FACU+	Nt P-Forb	EARLY MEADOW RUE
THABAR PARSNIP	8 Thaspium barbinode	5 UPL	Nt P-Forb	HAIRY MEADOW
TILAME	5 Tilia americana	3 FACU	Nt Tree	AMERICAN LINDEN
TRAOHI	2 Tradescantia ohiensis	2 FACU+	Nt P-Forb	COMMON SPIDERWORT
TRIPRA	0 TRIFOLIUM PRATENSE	5 UPL	Ad P-Forb	RED CLOVER
TRIREP	0 TRIFOLIUM REPENS	2 FACU+	Ad P-Forb	WHITE CLOVER
TRIGRA TRILLIUM	8 Trillium grandiflorum	5 UPL	Nt P-Forb	LARGE-FLOWERED
TRIREC	5 Trillium recurvatum	4 FACU-	Nt P-Forb	RED TRILLIUM
TRIPER	5 Triosteum perfoliatum	5 UPL	Nt P-Forb	LATE HORSE GENTIAN
ULMAME	3 Ulmus americana	-2 FACW-	Nt Tree	AMERICAN ELM
URTDIO	0 URTICA DIOICA	-1 FAC+	Ad P-Forb	STINGING NETTLE
VERTHA	0 VERBASCUM THAPSUS	5 UPL	Ad B-Forb	COMMON MULLLEIN
VERHAS	4 Verbena hastata	-4 FACW+	Nt P-Forb	BLUE VERVAIN
VERURO	5 Verbena urticifolia	5 UPL	Nt P-Forb	HAIRY WHITE VERVAIN
VIBDEN	0 VIBURNUM DENTATUM	5 UPL	Ad Shrub	ARROW-WOOD
VIBOPU CRANBERRY	0 VIBURNUM OPULUS	3 [FACU]	Ad Shrub	EUROPEAN Highbush
VIOPAM	10 Viola palmata	5 UPL	Nt P-Forb	LOBED VIOLET
VIOSOR	3 Viola sororia	1 FAC-	Nt P-Forb	COMMON BLUE VIOLET
VITRIP	2 Vitis riparia	-2 FACW-	Nt W-Vine	RIVERBANK GRAPE

Site: Sanctuary of Bull Valley  
 Locale: Savanna Inventory-overall  
 By: Nicky Obenauf  
 File: c:\FQA\studies\SBV\Savanna overall inventory.inv  
 Notes: Most of this area consists of a closed canopy savanna, several kettles, and some open canopy areas. Poa and "no-mow fescue" has come into the area and taken hold in some areas. It is recommended to eliminate these pockets and seed with high C-valued native seed to prevent infestation of other undesirable vegetation. Some pockets in this area are very stable, other pockets are dominated by oriental bittersweet, various bramble species, reed canary grass, and/or burdock. Overall, the entire area is not dominated by any one particular species, although there are locally dominate pockets of the aforementioned species.

FLORISTIC QUALITY DATA		Native		Adventive	
114	NATIVE SPECIES	Tree	15 10.1%	Tree	0 0.0%
149	Total Species	Shrub	5 3.4%	Shrub	4 2.7%
3.7	NATIVE MEAN C	W-Vine	2 1.3%	W-Vine	2 1.3%
2.8	W/Adventives	H-Vine	2 1.3%	H-Vine	0 0.0%
39.3	NATIVE FQI	P-Forb	61 40.9%	P-Forb	11 7.4%
34.4	W/Adventives	B-Forb	4 2.7%	B-Forb	8 5.4%
1.6	NATIVE MEAN W	A-Forb	4 2.7%	A-Forb	3 2.0%
1.8	W/Adventives	P-Grass	9 6.0%	P-Grass	6 4.0%
AVG:	Fac. Upland (+)	A-Grass	0 0.0%	A-Grass	1 0.7%
		P-Sedge	9 6.0%	P-Sedge	0 0.0%
		A-Sedge	0 0.0%	A-Sedge	0 0.0%
		Fern	3 2.0%		

ACRONYM	C SCIENTIFIC NAME	W WETNESS	PHYSIOGNOMY	COMMON NAME
ACENEG	1 Acer negundo	-2 FACW-	Nt Tree	BOXELDER
ACESAU	4 Acer saccharum	3 FACU	Nt Tree	SUGAR MAPLE
AGRGRY	3 Agrimonia gryposepala	2 FACU+	Nt P-Forb	TALL AGRIMONY
AGRALA	0 Agrostis alba	-3 FACW	Nt P-Grass	RED TOP
ALLPET	0 ALLIARIA PETIOLATA	0 FAC	Ad B-Forb	GARLIC MUSTARD
ALLCAC	2 Allium canadense	3 FACU	Nt P-Forb	WILD GARLIC
AMBART	0 Ambrosia artemisiifolia	3 FACU	Nt A-Forb	COMMON RAGWEED
AMBTRI	0 Ambrosia trifida	-1 FAC+	Nt A-Forb	GIANT RAGWEED
AMPBRB	4 Amphicarpa bracteata	0 FAC	Nt H-Vine	HOG PEANUT
ANDGER	5 Andropogon gerardii	1 FAC-	Nt P-Grass	BIG BLUESTEM
ANECAN	4 Anemone canadensis	-3 FACW	Nt P-Forb	MEADOW ANEMONE
ANECYL	8 Anemone cylindrica	5 UPL	Nt P-Forb	CANDLE ANEMONE
APOCAN	2 Apocynum cannabinum	0 FAC	Nt P-Forb	DOGBANE
ARCMIN	0 ARCTIUM MINUS	5 UPL	Ad B-Forb	COMMON BURDOCK
ARITRI	4 Arisaema triphyllum	-2 FACW-	Nt P-Forb	INDIAN TURNIP
ASACAN	5 Asarum canadense	5 UPL	Nt P-Forb	CANADA WILD GINGER
ASCSYR	0 Asclepias syriaca	5 UPL	Nt P-Forb	COMMON MILKWEED
ASCTUB	5 Asclepias tuberosa v. interior	5 UPL	Nt P-Forb	BUTTERFLYWEED
ASCVER	1 Asclepias verticillata	5 UPL	Nt P-Forb	HORSETAIL MILKWEED
ASTDRU	3 Aster drummondii	3 FACU	Nt P-Forb	DRUMMOND'S ASTER
ASTERI	4 Aster ericoides	4 FACU-	Nt P-Forb	HEATH ASTER
ASTLAE	8 Aster laevis	5 UPL	Nt P-Forb	SMOOTH BLUE ASTER

ASTSAG	4	<i>Aster sagittifolius</i>	5	UPL	Nt P-Forb	ARROW-LEAVED ASTER
BARVUL	0	<i>BARBARBA VULGARIS</i>	0	FAC	Ad B-Forb	WINTER CRESS
BROINE	0	<i>BROMUS INERMIS</i>	5	UPL	Ad P-Grass	HUNGARIAN BROME
BROPUB	5	<i>Bromus pubescens</i>	2	FACU+	Nt P-Grass	WOODLAND BROME
CALCAN	3	<i>Calamagrostis canadensis</i>	-5	OBL	Nt P-Grass	BLUE JOINT GRASS
CXBEBB	8	<i>Carex bebbii</i>	-5	OBL	Nt P-Sedge	BEBB'S OVAL SEDGE
CXBLAN	2	<i>Carex blanda</i>	0	FAC	Nt P-Sedge	COMMON WOOD SEDGE
CXMOLE	2	<i>Carex molesta</i>	0	FAC	Nt P-Sedge	FIELD OVAL SEDGE
CXMUSK	6	<i>Carex muskingumensis</i>	-5	OBL	Nt P-Sedge	SWAMP OVAL SEDGE
CXNORM SEdge	4	<i>Carex normalis</i>	-3	FACW	Nt P-Sedge	SPREADING OVAL
CXPENP SEdge	5	<i>Carex pensylvanica</i>	5	UPL	Nt P-Sedge	PENNSYLVANIA OAK
CXROSE SEdge	5	<i>Carex rosea</i>	5	UPL	Nt P-Sedge	CURLY-STYLED WOOD
CXTRIB SEdge	3	<i>Carex tribuloides</i>	-4	FACW+	Nt P-Sedge	AWL-FRUITED OVAL
CXVULP	3	<i>Carex vulpinoidea</i>	-5	OBL	Nt P-Sedge	BROWN FOX SEDGE
CARCOR	4	<i>Carya cordiformis</i>	0	FAC	Nt Tree	BITTERNUT HICKORY
CAROVT	4	<i>Carya ovata</i>	3	FACU	Nt Tree	SHAGBARK HICKORY
CATSPE	0	<i>Catalpa speciosa</i>	3	FACU	Nt Tree	CIGAR TREE
CELORB BITTERSWEET	0	<i>CELASTRUS ORBICULATUS</i>	5	UPL	Ad W-Vine	ORIENTAL
CHEALB	0	<i>CHENOPODIUM ALBUM</i>	1	FAC-	Ad A-Forb	LAMB'S QUARTERS
CIRLUT NIGHTSHADE	2	<i>Circaea lutetiana v. canadensis</i>	3	FACU	Nt P-Forb	ENCHANTER'S
CIRARV	0	<i>CIRSIIUM ARVENSE</i>	3	FACU	Ad P-Forb	FIELD THISTLE
CIRVUL	0	<i>CIRSIIUM VULGARE</i>	4	FACU-	Ad B-Forb	BULL THISTLE
CONARV	0	<i>CONVOLVULUS ARVENSIS</i>	5	UPL	Ad P-Forb	FIELD BINDWEED
CORTRP	4	<i>Coreopsis tripteris</i>	0	FAC	Nt P-Forb	TALL COREOPSIS
CORVAR	0	<i>CORONILLA VARIA</i>	5	UPL	Ad P-Forb	CROWN VETCH
CRYTE	10	<i>Cryptogramma stelleri</i>	3	FACU	Nt Fern	SLENDER CLIFFBRAKE
DACGLO	0	<i>DACTYLIS GLOMERATA</i>	3	FACU	Ad P-Grass	ORCHARD GRASS
DAUCAR	0	<i>DAUCUS CAROTA</i>	4	FACU-	Ad B-Forb	QUEEN ANNE'S LACE
DODMEA	6	<i>Dodecatheon meadia</i>	3	FACU	Nt P-Forb	SHOOTING STAR
ECHPAL CONEFLOWER	7	<i>Echinacea pallida</i>	5	UPL	Nt P-Forb	PALE PURPLE
ELYCAN	4	<i>Elymus canadensis</i>	1	FAC-	Nt P-Grass	CANADA WILD RYE
ELYVIL	4	<i>Elymus villosus</i>	3	FACU	Nt P-Grass	SILKY WILD RYE
ELYVIR	4	<i>Elymus virginicus</i>	-2	FACW-	Nt P-Grass	VIRGINIA WILD RYE
ERIANN	1	<i>Erigeron annuus</i>	1	FAC-	Nt B-Forb	ANNUAL FLEABANE
ERISTR	2	<i>Erigeron strigosus</i>	1	FAC-	Nt P-Forb	DAISY FLEABANE
ERYALB TONGUE	4	<i>Erythronium albidum</i>	5	UPL	Nt P-Forb	WHITE ADDER'S
EUOALA	0	<i>EUONYMUS ALATUS</i>	5	UPL	Ad Shrub	WINGED EUONYMUS

EUPRUG	2	<i>Eupatorium rugosum</i>	3	FACU	Nt P-Forb	WHITE SNAKEROOT
EUTGRA GOLDENROD	3	<i>Euthamia graminifolia</i>	-2	FACW-	Nt P-Forb	GRASS-LEAVED
FESARU	0	FESTUCA ARUNDINACEA	2	FACU+	Ad P-Grass	TALL FESCUE
FRAVIR	2	<i>Fragaria virginiana</i>	1	FAC-	Nt P-Forb	WILD STRAWBERRY
GALAPA	0	<i>Galium aparine</i>	3	FACU	Nt A-Forb	ANNUAL BEDSTRAW
GALASP	7	<i>Galium asprellum</i>	-5	OBL	Nt P-Forb	ROUGH BEDSTRAW
GERMAC	4	<i>Geranium maculatum</i>	3	FACU	Nt P-Forb	WILD GERANIUM
GEUCAN	2	<i>Geum canadense</i>	0	FAC	Nt P-Forb	WHITE AVENS
HAMVIR	8	<i>Hamamelis virginiana</i>	3	FACU	Nt Shrub	WITCH HAZEL
HELANN	0	HELIANTHUS ANNUUS	1	FAC-	Ad A-Forb	COMMON SUNFLOWER
HELDIV	5	<i>Helianthus divaricatus</i>	5	UPL	Nt P-Forb	WOODLAND SUNFLOWER
HELGRO	2	<i>Helianthus grosseserratus</i>	-2	FACW-	Nt P-Forb	SAWTOOTH SUNFLOWER
HELHEL	4	<i>Heliopsis helianthoides</i>	5	UPL	Nt P-Forb	FALSE SUNFLOWER
HEPNOA HEPATICAE	7	<i>Hepatica nobilis v. acuta</i>	5	UPL	Nt P-Forb	SHARP-LOBED
HIECAE	0	HIERACIUM CAESPITOSUM	5	UPL	Ad P-Forb	FIELD HAWKWEED
HYPPUN WORT	3	<i>Hypericum punctatum</i>	-1	FAC+	Nt P-Forb	SPOTTED ST. JOHN'S
JUGNIG	4	<i>Juglans nigra</i>	3	FACU	Nt Tree	BLACK WALNUT
LACCAN	1	<i>Lactuca canadensis</i>	2	FACU+	Nt B-Forb	WILD LETTUCE
LACHIR	7	<i>Lactuca hirsuta v. sanguinea</i>	5	UPL	Nt B-Forb	HAIRY WILD LETTUCE
LEOCAR	0	LEONURUS CARDIACA	5	UPL	Ad P-Forb	MOTHERWORT
LONMOR HONEYSUCKLE	0	LONICERA MORROWI	5	UPL	Ad Shrub	MORROW'S
LUPPER	8	<i>Lupinus perennis</i>	5	UPL	Nt P-Forb	WILD LUPINE
MATSTR	9	<i>Matteuccia struthiopteris</i>	-3	FACW	Nt Fern	OSTRICH FERN
MELOFC	0	MBELILOTUS OFFICINALIS	3	FACU	Ad B-Forb	YELLOW SWEET CLOVER
MERVIR	5	<i>Mertensia virginica</i>	-3	FACW	Nt P-Forb	VIRGINIA BLUEBELLS
MONFIS	4	<i>Monarda fistulosa</i>	3	FACU	Nt P-Forb	WILD BERGAMOT
MORRUB	4	<i>Morus rubra</i>	1	FAC-	Nt Tree	RED MULBERRY
OENBIB PRIMROSE	1	<i>Oenothera biennis</i>	3	FACU	Nt B-Forb	COMMON EVENING
ONOSEN	5	<i>Onoclea sensibilis</i>	-3	FACW	Nt Fern	SENSITIVE FERN
OSMCLI	3	<i>Osmorhiza claytonii</i>	4	FACU-	Nt P-Forb	HAIRY SWEET CICELY
OSMLON	3	<i>Osmorhiza longistylis</i>	4	FACU-	Nt P-Forb	ANISE ROOT
OXASTR	0	<i>Oxalis stricta</i>	3	FACU	Nt P-Forb	TALL WOOD SORREL
PARINT	8	<i>Parthenium integrifolium</i>	5	UPL	Nt P-Forb	WILD QUININE
PARQUI	2	<i>Parthenocissus quinquefolia</i>	1	FAC-	Nt W-Vine	VIRGINIA CREEPER
PHAARU	0	PHALARIS ARUNDINACEA	-4	FACW+	Ad P-Grass	REED CANARY GRASS
PHYSUB CHERRY	0	<i>Physalis subglabrata</i>	5	UPL	Nt P-Forb	SMOOTH GROUND

PHYAME	1	<i>Phytolacca americana</i>	1	FAC-	Nt P-Forb	POKEWEED
PLAMAJ	0	PLANTAGO MAJOR	-1	FAC+	Ad P-Forb	COMMON PLANTAIN
POACOM	0	POA COMPRESSA	2	FACU+	Ad P-Grass	CANADIAN BLUE GRASS
POAPRA	0	POA PRATENSIS	1	FAC-	Ad P-Grass	KENTUCKY BLUE GRASS
PODPPEL	4	<i>Podophyllum peltatum</i>	3	FACU	Nt P-Forb	MAY APPLE
POLREP	5	<i>Polemonium reptans</i>	0	FAC	Nt P-Forb	JACOB'S LADDER
POLCOM	4	<i>Polygonatum commutatum</i>	3	FACU	Nt P-Forb	GREAT SOLOMON SEAL
POLERE	0	<i>Polygonum erectum</i>	3	FACU	Nt A-Forb	ERECT KNOTWEED
POLVIG	3	<i>Polygonum virginianum</i>	0	FAC	Nt P-Forb	VIRGINIA KNOTWEED
POPTRE	3	<i>Populus tremuloides</i>	0	FAC	Nt Tree	QUAKING ASPEN
POTSIM	3	<i>Potentilla simplex</i>	4	FACU-	Nt P-Forb	COMMON CINQUEFOIL
PRUSER	1	<i>Prunus serotina</i>	3	FACU	Nt Tree	WILD BLACK CHERRY
QUEALB	5	<i>Quercus alba</i>	3	FACU	Nt Tree	WHITE OAK
QUEBIC	7	<i>Quercus bicolor</i>	-4	FACW+	Nt Tree	SWAMP WHITE OAK
QUEMAC	5	<i>Quercus macrocarpa</i>	1	FAC-	Nt Tree	BURR OAK
QUEPAL	4	<i>Quercus palustris</i>	-3	FACW	Nt Tree	PIN OAK
QUERUB	5	<i>Quercus rubra</i>	3	FACU	Nt Tree	NORTHERN RED OAK
RHACAT	0	RHAMNUS CATHARTICA	3	FACU	Ad Shrub	COMMON BUCKTHORN
RHUTYP	2	<i>Rhus typhina</i>	5	UPL	Nt Shrub	STAGHORN SUMAC
ROBPSE	1	<i>Robinia pseudo-acacia</i>	4	FACU-	Nt Tree	BLACK LOCUST
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad Shrub	JAPANESE ROSE
RUBALL	2	<i>Rubus allegheniensis</i>	2	FACU+	Nt Shrub	COMMON BLACKBERRY
RUEOCC	2	<i>Rubus occidentalis</i>	3	FACU	Nt Shrub	BLACK RASPBERRY
RUDHIR	2	<i>Rudbeckia hirta</i>	3	FACU	Nt P-Forb	BLACK-EYED SUSAN
RUMCRP	0	RUMEX CRISPUS	-1	FAC+	Ad P-Forb	CURLY DOCK
SAMCAN	2	<i>Sambucus canadensis</i>	4	FACU-	Nt Shrub	COMMON ELDER
SCHSCO	5	<i>Schizachyrium scoparium</i>	4	FACU-	Nt P-Grass	LITTLE BLUESTEM
SETGLA	0	SETARIA GLAUCA	0	FAC	Ad A-Grass	PIGEON GRASS
SILCUC	0	SILENE CUCUBALUS	5	UPL	Ad P-Forb	BLADDER CAMPION
SILPER	4	<i>Silphium perfoliatum</i>	-2	FACW-	Nt P-Forb	CUP PLANT
SMIRAC	4	<i>Smilacina racemosa</i>	3	FACU	Nt P-Forb	FEATHERY FALSE
SOLOMON SEAL						
SMISTE	5	<i>Smilacina stellata</i>	1	FAC-	Nt P-Forb	STARRY FALSE
SOLOMON SEAL						
SMIECI	5	<i>Smilax ecirrhata</i>	5	UPL	Nt P-Forb	UPRIGHT CARRION
FLOWER						
SMILAS	4	<i>Smilax lasioneuron</i>	5	UPL	Nt H-Vine	COMMON CARRION
FLOWER						
SOLDUL	0	SOLANUM DULCAMARA	0	FAC	Ad W-Vine	BITTERSWEET
NIGHTSHADE						
SOLCAN	1	<i>Solidago canadensis</i>	3	FACU	Nt P-Forb	CANADA GOLDENROD
SOLRID	7	<i>Solidago riddellii</i>	-5	OBL	Nt P-Forb	RIDDELL'S GOLDENROD

SOLRIG	4	<i>Solidago rigida</i>	4	FACU-	Nt P-Forb	RIGID GOLDENROD
SORNUT	4	<i>Sorghastrum nutans</i>	2	FACU+	Nt P-Grass	INDIAN GRASS
TAEINT	7	<i>Taenidia integerrima</i>	5	UPL	Nt P-Forb	YELLOW PIMPERNEL
TAROFF	0	TARAXACUM OFFICINALE	3	FACU	Ad P-Forb	COMMON DANDELION
THATHA	5	<i>Thalictrum thalictroides</i>	5	UPL	Nt P-Forb	RUE ANEMONE
THLARV	0	THLASPI ARVENSE	5	UPL	Ad A-Forb	FIELD PENNY CRESS
TRAOHI	3	<i>Tradescantia ohiensis</i>	2	FACU+	Nt P-Forb	COMMON SPIDERWORT
TRADUB	0	TRAGOPOGON DUBIUS	5	UPL	Ad B-Forb	SAND GOAT'S BEARD
TRIPRA	0	TRIFOLIUM PRATENSE	2	FACU+	Ad P-Forb	RED CLOVER
TRIREF	0	TRIFOLIUM REPENS	2	FACU+	Ad P-Forb	WHITE CLOVER
TRIPRF	5	<i>Triosteum perfoliatum</i>	5	UPL	Nt P-Forb	LATE HORSE GENTIAN
URTDIO	2	<i>Urtica dioica</i>	-1	FAC+	Nt P-Forb	TALL NETTLE
VERTHA	0	VERBASCUM THAPSUS	5	UPL	Ad B-Forb	WOOLLY MULLEIN
VERURT	3	<i>Verbena urticifolia</i>	-1	FAC+	Nt P-Forb	WHITE VERVIAN
VIOSOR	3	<i>Viola sororia</i>	1	FAC-	Nt P-Forb	WOOLLY BLUE VIOLET
VIOSTR	4	<i>Viola striata</i>	-3	FACW	Nt P-Forb	COMMON WHITE VIOLET
VITRIP	2	<i>Vitis riparia</i>	-2	FACW-	Nt W-Vine	RIVERVBANK GRAPE

Site: Sanctuary of Bull Valley  
 Locale: Prairie Overall Inventory  
 By: Nicky Obenaus  
 File: c:\FQA\studies\SBV\Prairie overall inventory.inv

FLORISTIC QUALITY DATA		Native	147	73.9%	Adventive	52	26.1%
147	NATIVE SPECIES	Tree	12	6.0%	Tree	2	1.0%
199	Total Species	Shrub	9	4.5%	Shrub	6	3.0%
4.8	NATIVE MEAN C	W-Vine	2	1.0%	W-Vine	1	0.5%
3.6	W/Adventives	H-Vine	1	0.5%	H-Vine	0	0.0%
58.7	NATIVE FQI	P-Forb	90	45.2%	P-Forb	21	10.6%
50.5	W/Adventives	B-Forb	4	2.0%	B-Forb	8	4.0%
1.7	NATIVE MEAN W	A-Forb	5	2.5%	A-Forb	4	2.0%
2.0	W/Adventives	P-Grass	14	7.0%	P-Grass	8	4.0%
AVG:	Fac. Upland (+)	A-Grass	0	0.0%	A-Grass	2	1.0%
		P-Sedge	10	5.0%	P-Sedge	0	0.0%
		A-Sedge	0	0.0%	A-Sedge	0	0.0%
		Cryptogam	0	0.0%			

ACRONYM	C SCIENTIFIC NAME	W WETNESS	PHYSIOGNOMY	COMMON NAME
ACENEG	0 Acer negundo	-2 FACW-	Nt Tree	BOX ELDER
ACHMIL	0 ACHILLEA MILLEFOLIUM	3 FACU	Ad P-Forb	YARROW
AGRSMI	0 AGROPYRON SMITHII	4 FACU-	Ad P-Grass	WESTERN WHEAT GRASS
AGRALA	0 AGROSTIS ALBA	-3 FACW	Ad P-Grass	REDTOP
AMBARE	0 Ambrosia artemisiifolia elatior	3 FACU	Nt A-Forb	COMMON RAGWEED
AMBTRI	0 Ambrosia trifida	-1 FAC+	Nt A-Forb	GIANT RAGWEED
AMOCAN	9 Amorpha canescens	5 UPL	Nt Shrub	LEAD PLANT
ANDGER	5 Andropogon gerardii	1 FAC-	Nt P-Grass	BIG BLUESTEM GRASS
ANDSCO GRASS	5 Andropogon scoparius	4 FACU-	Nt P-Grass	LITTLE BLUESTEM
ANECYL	6 Anemone cylindrica	5 UPL	Nt P-Forb	THIMBLEWEED
APOAND	5 Apocynum androsaemifolium	5 UPL	Nt P-Forb	SPREADING DOGBANE
APOCAN	4 Apocynum cannabinum	0 FAC	Nt P-Forb	INDIAN HEMP
ARCMIN	0 ARCTIUM MINUS	5 UPL	Ad B-Forb	COMMON BURDOCK
ARITRI	4 Arisaema triphyllum	-2 FACW-	Nt P-Forb	JACK-IN-THE-PULPIT
ARUDIP	10 Aruncus dioicus pubescens	3 FACU	Nt P-Forb	GOAT'S BEARD
ASCSUL	8 Asclepias sullivantii	5 UPL	Nt P-Forb	PRAIRIE MILKWEED
ASCSYR	0 Asclepias syriaca	5 UPL	Nt P-Forb	COMMON MILKWEED
ASCVER	1 Asclepias verticillata	5 UPL	Nt P-Forb	WHORLED MILKWEED
ASTAZU	8 Aster azureus	5 UPL	Nt P-Forb	SKY-BLUE ASTER
ASTBRA	0 ASTER BRACHYACTIS	3 [FACU]	Ad A-Forb	RAYLESS ASTER
ASTERI	5 Aster ericoides	4 FACU-	Nt P-Forb	HEATH ASTER
ASTLAE	9 Aster laevis	5 UPL	Nt P-Forb	SMOOTH BLUE ASTER
ASTNOV	4 Aster novae-angliae	-3 FACW	Nt P-Forb	NEW ENGLAND ASTER
ASTOBL	10 Aster oblongifolius	5 UPL	Nt P-Forb	AROMATIC ASTER
ASTFIL	0 Aster pilosus	2 FACU+	Nt P-Forb	HAIRY ASTER

ASTPUP	8	<i>Aster puniceus</i>	-5	OBL	Nt P-Forb	BRISTLY ASTER
ASTPUF	7	<i>Aster puniceus firmus</i>	-5	OBL	Nt P-Forb	SHINING ASTER
ASTSIS	3	<i>Aster simplex</i>	-5	OBL	Nt P-Forb	PANICLED ASTER
ASTUMB	9	<i>Aster umbellatus</i>	-3	FACW	Nt P-Forb	FLAT-TOP ASTER
BAPLEA	8	<i>Baptisia leucantha</i>	2	FACU+	Nt P-Forb	WHITE WILD INDIGO
BAPLEO	10	<i>Baptisia leucophaea</i>	5	UPL	Nt P-Forb	CREAM WILD INDIGO
BROINE	0	<i>BROMUS INERMIS</i>	5	UPL	Ad P-Grass	HUNGARIAN BROME
BROKAL	10	<i>Bromus kalmii</i>	0	FAC	Nt P-Grass	PRAIRIE BROME
BROPUB	5	<i>Bromus pubescens</i>	2	FACU+	Nt P-Grass	WOODLAND BROME
CALCAN	3	<i>Calamagrostis canadensis</i>	-5	OBL	Nt P-Grass	BLUE JOINT GRASS
CXBICK	10	<i>Carex bicknellii</i>	5	[UPL]	Nt P-Sedge	COPPER-SHOULDERED
OVAL SEDGE						
CXCRIS	4	<i>Carex cristatella</i>	-4	FACW-	Nt P-Sedge	CRESTED OVAL SEDGE
CXGRAN	4	<i>Carex granularis</i>	-4	FACW+	Nt P-Sedge	PALE SEDGE
CXMOLE	2	<i>Carex molesta</i>	-1	FAC+	Nt P-Sedge	FIELD OVAL SEDGE
CXMUHL	5	<i>Carex muhlenbergii</i>	5	UPL	Nt P-Sedge	SAND BRACTED SEDGE
CXMUSK	8	<i>Carex muskingumensis</i>	-5	OBL	Nt P-Sedge	SWAMP OVAL SEDGE
CXSTIP	3	<i>Carex stipata</i>	-5	OBL	Nt P-Sedge	COMMON FOX SEDGE
CXSTRI	5	<i>Carex stricta</i>	-5	OBL	Nt P-Sedge	COMMON TUSSOCK
SEDGE						
CXTRIB	3	<i>Carex tribuloides</i>	-4	FACW+	Nt P-Sedge	AWL-FRUITED OVAL
SEDGE						
CXVULP	2	<i>Carex vulpinoidea</i>	-5	OBL	Nt P-Sedge	BROWN FOX SEDGE
CAROVT	5	<i>Carya ovata</i>	3	FACU	Nt Tree	SHAGBARK HICKORY
CASFAS	5	<i>Cassia fasciculata</i>	4	FACU-	Nt A-Forb	PARTRIDGE PEA
CATSPE	0	<i>CATALPA SPECIOSA</i>	3	FACU	Ad Tree	HARDY CATALPA
CEAAME	6	<i>Ceanothus americanus</i>	5	UPL	Nt Shrub	NEW JERSEY TEA
CELOBR	0	<i>CELASTRUS ORBICULATUS</i>	5	UPL	Ad W-Vine	ORIENTAL
BITERSWBET						
CELOCC	3	<i>Celtis occidentalis</i>	1	FAC-	Nt Tree	HACKBERRY
CHEALB	0	<i>CHENOPODIUM ALBUM</i>	1	FAC-	Ad A-Forb	LAMB'S QUARTERS
CHRLEP	0	<i>CHRYSANTHEMUM LEUCANTHEMUM PINNATIFIDUM</i>	5	UPL	Ad P-Forb	OX-EYE DAISY
CIRARV	0	<i>CIRSIUM ARVENSE</i>	5	UPL	Ad P-Forb	FIELD THISTLE
CIRVUL	0	<i>CIRSIUM VULGARE</i>	4	FACU-	Ad B-Forb	BULL THISTLE
CONARV	0	<i>CONVOLVULUS ARVENSIS</i>	5	UPL	Ad P-Forb	FIELD BINDWEED
CONSEP	1	<i>Convolvulus sepium</i>	0	FAC	Nt P-Forb	HEDGE BINDWEED
CORLAN	5	<i>Coreopsis lanceolata</i>	3	FACU	Nt P-Forb	SAND COREOPSIS
CORPAL	6	<i>Coreopsis palmata</i>	5	UPL	Nt P-Forb	PRAIRIE COREOPSIS
CORTRP	5	<i>Coreopsis tripteris</i>	0	FAC	Nt P-Forb	TALL COREOPSIS
CORRAC	1	<i>Cornus racemosa</i>	-2	FACW-	Nt Shrub	GRAY DOGWOOD
DACGLO	0	<i>DACTYLIS GLOMERATA</i>	3	FACU	Ad P-Grass	ORCHARD GRASS



DAUCAR	0 DAUCUS CAROTA	5 UPL	Ad B-Forb	QUEEN ANNE'S LACE
DESCAA	4 Desmodium canadense	1 FAC-	Nt P-Forb	SHOWY TICK TREFOIL
DESILE TREFOIL	6 Desmodium illinoense	5 UPL	Nt P-Forb	ILLINOIS TICK
DIAARM	0 DIANTHUS ARMERIA	5 UPL	Ad A-Forb	DEPTFORD PINK
DODMEA	6 Dodecatheon meadia	3 FACU	Nt P-Forb	SHOOTING STAR
ECHPAL	8 Echinacea pallida	5 UPL	Nt P-Forb	PURPLE CONEFLOWER
ECHPUR CONEFLOWER	3 Echinacea purpurea	5 UPL	Nt P-Forb	BROAD-LEAVED PURPLE
ELAUMB	0 ELAEAGNUS UMBELLATA	5 UPL	Ad Shrub	AUTUMN OLIVE
ELYCAN	4 Elymus canadensis	1 FAC-	Nt P-Grass	CANADA WILD RYE
ELYVIR	4 Elymus virginicus	-2 FACW-	Nt P-Grass	VIRGINIA WILD RYE
EPICOL HERB	3 Epilobium coloratum	-5 OBL	Nt P-Forb	CINNAMON WILLOW
ERASPE	3 Eragrostis spectabilis	5 UPL	Nt P-Grass	PURPLE LOVE GRASS
EREHIE	2 Erechites hieracifolia	3 FACU	Nt A-Forb	FIREWEED
ERIAN5	0 Erigeron annuus	1 FAC-	Nt B-Forb	ANNUAL FLEABANE
ERISTR	5 Erigeron strigosus	5 [UPL]	Nt B-Forb	DAISY FLEABANE
ERYYUC	9 Eryngium yuccifolium	-1 FAC+	Nt P-Forb	RATTLESNAKE MASTER
EUPPUR	7 Eupatorium purpureum	5 UPL	Nt P-Forb	PURPLE JOE PYE WEED
FESELA	0 FESTUCA ELATIOR	2 FACU+	Ad P-Grass	TALL FESCUE
FESRUB	0 FESTUCA RUBRA	1 FAC-	Ad P-Grass	RED FESCUE
FRAVIR	1 Fragaria virginiana	1 FAC-	Nt P-Forb	WILD STRAWBERRY
GALAPA	1 Galium aparine	3 FACU	Nt A-Forb	ANNUAL BEDSTRAW
GENAND	8 Gentiana andrewsii	-3 FACW	Nt P-Forb	BOTTLE GENTIAN
GEUCAN	1 Geum canadense	0 FAC	Nt P-Forb	WOOD AVENS
GEUTRI	10 Geum triflorum	5 [UPL]	Nt P-Forb	PRAIRIE SMOKE
HELGRO	2 Helianthus grosseserratus	-2 FACW-	Nt P-Forb	SAWTOOTH SUNFLOWER
HELOCC	10 Helianthus occidentalis	4 FACU-	Nt P-Forb	WESTERN SUNFLOWER
HELPET	0 HELIANTHUS PETIOLARIS	5 UPL	Ad A-Forb	PETIOLED SUNFLOWER
HELSTR SUNFLOWER	5 Helianthus strumosus	5 UPL	Nt P-Forb	PALE-LEAVED
HELHEL	5 Heliopsis helianthoides	5 UPL	Nt P-Forb	FALSE SUNFLOWER
HESMAT	0 HESPERIS MATRONALIS	5 UPL	Ad P-Forb	DAME'S ROCKET
HEURIC	8 Heuchera richardsonii	1 FAC-	Nt P-Forb	PRAIRIE ALUM ROOT
HIECAE	0 HIERACIUM CAESPITOSUM	5 UPL	Ad P-Forb	FIELD HAWKWEED
HIECAF	6 Hieracium canadense fasciculatum	5 UPL	Nt P-Forb	CANADA HAWKWEED
HYPPER WORT	0 HYPERICUM PERFORATUM	5 UPL	Ad P-Forb	COMMON ST. JOHN'S
HYPPUN WORT	4 Hypericum punctatum	3 [FACU]	Nt P-Forb	SPOTTED ST. JOHN'S
JUGNIG	5 Juglans nigra	3 FACU	Nt Tree	BLACK WALNUT

KOECRI	7	<i>Koeleria cristata</i>	5 UPL	Nt P-Grass	JUNE GRASS
LACCAN	2	<i>Lactuca canadensis</i>	2 FACU+	Nt B-Forb	WILD LETTUCE
LACSER	0	LACTUCA SERRIOLA	0 FAC	Ad B-Forb	PRICKLY LETTUCE
LEOCAR	0	LEONURUS CARDIACA	5 UPL	Ad P-Forb	MOTHERWORT
LESCAP CLOVER	4	<i>Lespedeza capitata</i>	3 FACU	Nt P-Forb	ROUND-HEADED BUSH
LIAASP	6	<i>Liatris aspera</i>	5 UPL	Nt P-Forb	ROUGH BLAZING STAR
LIACYL STAR	8	<i>Liatris cylindracea</i>	5 UPL	Nt P-Forb	CYLINDRICAL BLAZING
LINVUL	0	LINARIA VULGARIS	5 UPL	Ad P-Forb	BUTTER-AND-EGGS
LOLMUL	0	LOLIUM MULTIFLORUM	5 UPL	Ad A-Grass	ITALIAN RYE GRASS
LONMOR HONEYSUCKLE	0	LONICERA MORROWII	5 UPL	Ad Shrub	MORROW'S
LONTAT HONEYSUCKLE	0	LONICERA TATARICA	5 [UPL]	Ad Shrub	TARTARIAN
LOTCOR	0	LOTUS CORNICULATUS	1 FAC-	Ad P-Forb	BIRD'S FOOT TREFOIL
LUPPEO	7	<i>Lupinus perennis occidentalis</i>	5 UPL	Nt P-Forb	WILD LUPINE
MELALB	0	MELILOTUS ALBA	3 FACU	Ad B-Forb	WHITE SWEET CLOVER
MELLOF	0	MELILOTUS OFFICINALIS	3 FACU	Ad B-Forb	YELLOW SWEET CLOVER
MONFIS	4	<i>Monarda fistulosa</i>	3 FACU	Nt P-Forb	WILD BERGAMOT
MONPUN	5	<i>Monarda punctata</i>	5 UPL	Nt P-Forb	HORSE MINT
MORRUB	10	<i>Morus rubra</i>	1 FAC-	Nt Tree	RED MULBERRY
NEPCAT	0	NEPETA CATARIA	1 FAC-	Ad P-Forb	CATNIP
OENBIE PRIMROSE	0	<i>Oenothera biennis</i>	3 FACU	Nt B-Forb	COMMON EVENING
OENNUT PRIMROSE	10	<i>Oenothera nuttallii</i>	5 UPL	Nt P-Forb	WHITE EVENING
OENSPE PRIMROSE	0	OENOTHERA SPECIOSA	5 UPL	Ad P-Forb	SHOWY EVENING
OXASTR	0	<i>Oxalis stricta</i>	5 UPL	Nt P-Forb	COMMON WOOD SORREL
PANLEI	10	<i>Panicum leibergii</i>	2 FACU+	Nt P-Grass	PRAIRIE PANIC GRASS
PANVIR	5	<i>Panicum virgatum</i>	-1 FAC+	Nt P-Grass	SWITCH GRASS
PARINT	8	<i>Parthenium integrifolium</i>	5 UPL	Nt P-Forb	WILD QUININE
PARQUI	2	<i>Parthenocissus quinquefolia</i>	1 FAC-	Nt W-Vine	VIRGINIA CREEPER
PASSAT	0	PASTINACA SATIVA	5 UPL	Ad B-Forb	WILD PARSNIP
PENCAL	7	<i>Penstemon calycosus</i>	3 FACU	Nt P-Forb	SMOOTH BEARD TONGUE
PENDIG TONGUE	4	<i>Penstemon digitalis</i>	1 FAC-	Nt P-Forb	FOXGLOVE BEARD
PETCAN CLOVER	9	<i>Petalostemum candidum</i>	5 UPL	Nt P-Forb	WHITE PRAIRIE
PETPUR CLOVER	9	<i>Petalostemum purpureum</i>	5 UPL	Nt P-Forb	PURPLE PRAIRIE
PHAARU	0	PHALARIS ARUNDINACEA	-4 FACW+	Ad P-Grass	REED CANARY GRASS
PHLPIP	7	<i>Phlox pilosa</i>	1 FAC-	Nt P-Forb	SAND PRAIRIE PHLOX
PHLPIF	7	<i>Phlox pilosa fulgida</i>	-1 FAC+	Nt P-Forb	PRAIRIE PHLOX
PHYSUB	0	<i>Physalis subglabrata</i>	5 UPL	Nt P-Forb	TALL GROUND CHERRY
PINSTR	9	<i>Pinus strobus</i>	3 FACU	Nt Tree	WHITE PINE

PLAMAJ	0	PLANTAGO MAJOR	-1	FAC+	Ad P-Forb	COMMON PLANTAIN
POAPRA	0	POA PRATENSIS	1	FAC-	Ad P-Grass	KENTUCKY BLUE GRASS
POLCAL SEAL	3	Polygonatum canaliculatum	3	FACU	Nt P-Forb	SMOOTH SOLOMON'S
POPDEL	2	Populus deltoides	-1	FAC+	Nt Tree	EASTERN COTTONWOOD
POTSIS	4	Potentilla simplex	4	FACU-	Nt P-Forb	COMMON CINQUEFOIL
PRUSER	1	Prunus serotina	3	FACU	Nt Tree	WILD BLACK CHERRY
PRUVIR	3	Prunus virginiana	3	[FACU]	Nt Shrub	CHOKO CHERRY
PYCVIR MINT	5	Pycnanthemum virginianum	-4	FACW+	Nt P-Forb	COMMON MOUNTAIN
QUEBIC	6	Quercus bicolor	-4	FACW+	Nt Tree	SWAMP WHITE OAK
QUEMAC	5	Quercus macrocarpa	1	FAC-	Nt Tree	BUR OAK
RATPIN	4	Ratibida pinnata	5	UPL	Nt P-Forb	YELLOW CONEFLOWER
RHACAT	0	RHAMNUS CATHARTICA	3	FACU	Ad Shrub	COMMON BUCKTHORN
RHUGLA	1	Rhus glabra	5	UPL	Nt Shrub	SMOOTH SUMAC
RHUTYP	1	Rhus typhina	5	UPL	Nt Tree	STAGHORN SUMAC
ROSCAR	5	Rosa carolina	4	FACU-	Nt Shrub	PASTURE ROSE
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad Shrub	MULTIFLORA ROSE
RUBALL	3	Rubus allegheniensis	2	FACU+	Nt Shrub	COMMON BLACKBERRY
RUBOCC	2	Rubus occidentalis	5	UPL	Nt Shrub	BLACK RASPBERRY
RUDHIR	1	Rudbeckia hirta	3	FACU	Nt P-Forb	BLACK-EYED SUSAN
RUDLAC	5	Rudbeckia laciniata	-4	FACW+	Nt P-Forb	WILD GOLDEN GLOW
RUMCRI	0	RUMEX CRISPUS	-1	FAC+	Ad P-Forb	CURLY DOCK
SALNIG	4	Salix nigra	-5	OBL	Nt Tree	BLACK WILLOW
SAMCAN	1	Sambucus canadensis	-2	FACW-	Nt Shrub	ELDERBERRY
SETGLA	0	SETARIA GLAUCA	0	FAC	Ad A-Grass	YELLOW FOXTAIL
SILCUC	0	SILENE CUCUBALUS	5	UPL	Ad P-Forb	BLADDER CAMPION
SILNIV	10	Silene nivea	-3	FACW	Nt P-Forb	SNOWY CAMPION
SILSTE	6	Silene stellata	5	UPL	Nt P-Forb	STARRY CAMPION
SILINI	5	Silphium integrifolium	5	UPL	Nt P-Forb	ROSWIN WEED
SILLAC	5	Silphium laciniatum	5	UPL	Nt P-Forb	COMPASS PLANT
SILPER	5	Silphium perfoliatum	-2	FACW-	Nt P-Forb	CUP PLANT
SILTER	5	Silphium terebinthinaceum	3	FACU	Nt P-Forb	PRAIRIE DOCK
SISCAM GRASS	10	Sisyrinchium campestre	5	UPL	Nt P-Forb	PRAIRIE BLUE-EYED
SMIRAC SOLOMON'S SEAL	3	Smilacina racemosa	3	FACU	Nt P-Forb	FEATHERY FALSE
SMISTE SOLOMON'S SEAL	5	Smilacina stellata	1	FAC-	Nt P-Forb	STARRY FALSE
SMILL FLOWER	5	Smilax illinoensis	5	UPL	Nt P-Forb	ILLINOIS CARRION
SMILAS FLOWER	5	Smilax lasioneura	5	[UPL]	Nt H-Vine	COMMON CARRION

SOLCAR	0 SOLANUM CAROLINENSE	4 FACU-	Ad P-Forb	HORSE NETTLE
SOLALT	1 Solidago altissima	3 FACU	Nt P-Forb	TALL GOLDENROD
SOLGIG	4 Solidago gigantea	-3 FACW	Nt P-Forb	LATE GOLDENROD
SOLGRG GOLDENROD	4 Solidago graminifolia	-2 FACW-	Nt P-Forb	COMMON GRASS-LEAVED
SOLJUN	5 Solidago juncea	5 UPL	Nt P-Forb	EARLY GOLDENROD
SOLNEM	4 Solidago nemoralis	5 UPL	Nt P-Forb	OLD-FIELD GOLDENROD
SOLRID	7 Solidago riddellii	-5 OBL	Nt P-Forb	RIDDELL'S GOLDENROD
SOLRIG	4 Solidago rigida	4 FACU-	Nt P-Forb	STIFF GOLDENROD
SONARV	0 SONCHUS ARVENSIS	1 FAC-	Ad P-Forb	FIELD SOW THISTLE
SORNUT	5 Sorghastrum nutans	2 FACU+	Nt P-Grass	INDIAN GRASS
SPAPEC	4 Spartina pectinata	-4 FACW+	Nt P-Grass	PRAIRIE CORD GRASS
SPOHET	10 Sporobolus heterolepis	4 FACU-	Nt P-Grass	PRAIRIE DROPSEED
TAROFF	0 TARAXACUM OFFICINALE	3 FACU	Ad P-Forb	COMMON DANDELION
TRAOHI	2 Tradescantia ohiensis	2 FACU+	Nt P-Forb	COMMON SPIDERWORT
TRADUB	0 TRAGOPOGON DUBIUS	5 UPL	Ad B-Forb	SAND GOAT'S BEARD
TRIPRA	0 TRIFOLIUM PRATENSE	5 UPL	Ad P-Forb	RED CLOVER
TRIREP	0 TRIFOLIUM REPENS	2 FACU+	Ad P-Forb	WHITE CLOVER
ULMPUM	0 ULMUS PUMILA	5 UPL	Ad Tree	SIBERIAN ELM
URTDIO	0 URTICA DIOICA	-1 FAC+	Ad P-Forb	STINGING NETTLE
VERHAS	4 Verbena hastata	-4 FACW+	Nt P-Forb	BLUE VERVAIN
VERSTR	4 Verbena stricta	5 UPL	Nt P-Forb	HOARY VERVAIN
VERURU	5 Verbena urticifolia	5 UPL	Nt P-Forb	HAIRY WHITE VERVAIN
VERALA IRONWEED	3 Vernonia altissima	0 FAC	Nt P-Forb	SMOOTH TALL
VERATA	5 Vernonia altissima taeniotricha	0 [FAC]	Nt P-Forb	HAIRY TALL IRONWEED
VIBOPU CRANBERRY	0 VIBURNUM OPULUS	3 [FACU]	Ad Shrub	EUROPEAN Highbush
VIOSOR	3 Viola sororia	1 FAC-	Nt P-Forb	COMMON BLUE VIOLET
VITRIP	2 Vitis riparia	-2 FACW-	Nt W-Vine	RIVERBANK GRAPE
ZIZAUR	7 Zizia aurea	-1 FAC+	Nt P-Forb	GOLDEN ALEXANDERS

Site: Sanctuary of Bull Valley  
 Locale: Wetland overall inventory  
 By: Nicky Obenauf  
 File: c:\FQA\studies\SBV\Wetland overall inventory.inv  
 Notes: While the slopes and culvert inlet isn't within the wetland boundaries, it does affect the basin if undesirable species exists. Therefore, slopes and inlets are included in this inventory.

FLORISTIC QUALITY DATA		Native	104	75.4%	Adventive	34	24.6%
104	NATIVE SPECIES	Tree	9	6.5%	Tree	2	1.4%
138	Total Species	Shrub	3	2.2%	Shrub	4	2.9%
4.2	NATIVE MEAN C	W-Vine	2	1.4%	W-Vine	1	0.7%
3.1	W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
42.4	NATIVE FQI	P-Forb	56	40.6%	P-Forb	8	5.8%
36.8	W/Adventives	B-Forb	1	0.7%	B-Forb	5	3.6%
-0.5	NATIVE MEAN W	A-Forb	7	5.1%	A-Forb	2	1.4%
0.2	W/Adventives	P-Grass	12	8.7%	P-Grass	8	5.8%
AVG: Faculative		A-Grass	1	0.7%	A-Grass	4	2.9%
		P-Sedge	12	8.7%	P-Sedge	0	0.0%
		A-Sedge	1	0.7%	A-Sedge	0	0.0%
		Cryptogam	0	0.0%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ACENEG	0	<i>Acer negundo</i>	-2	FACW-	Nt Tree	BOX ELDER
ACERUB	7	<i>Acer rubrum</i>	0	FAC	Nt Tree	RED MAPLE
ACESAI	0	<i>Acer saccharinum</i>	-3	FACW	Nt Tree	SILVER MAPLE
ACTALT	5	<i>Actinomeris alternifolia</i>	-3	FACW	Nt P-Forb	WINGSTEM
AGRSMI	0	<i>AGROPYRON SMITHII</i>	4	FACU-	Ad P-Grass	WESTERN WHEAT GRASS
AGRALA	0	<i>AGROSTIS ALBA</i>	-3	FACW	Ad P-Grass	REDBTOP
ALISUB PLANTAIN	4	<i>Alisma subcordatum</i>	-5	OBL	Nt P-Forb	COMMON WATER
ALLPET	0	<i>ALLIARIA PETIOLATA</i>	0	FAC	Ad B-Forb	GARLIC MUSTARD
AMBTRI	0	<i>Ambrosia trifida</i>	-1	FAC+	Nt A-Forb	GIANT RAGWEED
ANDGER	5	<i>Andropogon gerardii</i>	1	FAC-	Nt P-Grass	BIG BLUESTEM GRASS
ANDSCO GRASS	5	<i>Andropogon scoparius</i>	4	FACU-	Nt P-Grass	LITTLE BLUESTEM
ARCMIN	0	<i>ARCTIUM MINUS</i>	5	UPL	Ad B-Forb	COMMON BURDOCK
ARITRI	4	<i>Arisaema triphyllum</i>	-2	FACW-	Nt P-Forb	JACK-IN-THE-PULPIT
ASCINC	4	<i>Asclepias incarnata</i>	-5	OBL	Nt P-Forb	SWAMP MILKWEED
ASCSYR	0	<i>Asclepias syriaca</i>	5	UPL	Nt P-Forb	COMMON MILKWEED
ASTERI	5	<i>Aster ericoides</i>	4	FACU-	Nt P-Forb	HEATH ASTER
ASTLAE	9	<i>Aster laevis</i>	5	UPL	Nt P-Forb	SMOOTH BLUE ASTER
ASTNOV	4	<i>Aster novae-angliae</i>	-3	FACW	Nt P-Forb	NEW ENGLAND ASTER
ASTOBL	10	<i>Aster oblongifolius</i>	5	UPL	Nt P-Forb	AROMATIC ASTER
ASTPIL	0	<i>Aster pilosus</i>	2	FACU+	Nt P-Forb	HAIRY ASTER
ASTPUP	8	<i>Aster puniceus</i>	-5	OBL	Nt P-Forb	BRISTLY ASTER
ASTPUF	7	<i>Aster puniceus firmus</i>	-5	OBL	Nt P-Forb	SHINING ASTER
BOUCUR	8	<i>Bouteloua curtipendula</i>	5	UPL	Nt P-Grass	SIDE-OATS GRAMA
BROINE	0	<i>BROMUS INERMIS</i>	5	UPL	Ad P-Grass	HUNGARIAN BROME
BROPUE	5	<i>Bromus pubescens</i>	2	FACU+	Nt P-Grass	WOODLAND BROME

CALCAN	3	<i>Calamagrostis canadensis</i>	-5	OBL	Nt P-Grass	BLUE JOINT GRASS
CXBLAN	1	<i>Carex blanda</i>	0	FAC	Nt P-Sedge	COMMON WOOD SEDGE
CXMOLE	2	<i>Carex molesta</i>	-1	FAC+	Nt P-Sedge	FIELD OVAL SEDGE
CXMUSK	8	<i>Carex muskingumensis</i>	-5	OBL	Nt P-Sedge	SWAMP OVAL SEDGE
CXNORM SEdge	5	<i>Carex normalis</i>	0	[FAC!]	Nt P-Sedge	SPREADING OVAL
CXSTIP	3	<i>Carex stipata</i>	-5	OBL	Nt P-Sedge	COMMON FOX SEDGE
CXSTRI SEdge	5	<i>Carex stricta</i>	-5	OBL	Nt P-Sedge	COMMON TUSSOCK
CXTRIB SEdge	3	<i>Carex tribuloides</i>	-4	FACW+	Nt P-Sedge	AWL-FRUITED OVAL
CXVULP	2	<i>Carex vulpinoidea</i>	-5	OBL	Nt P-Sedge	BROWN FOX SEDGE
CASFAS	5	<i>Cassia fasciculata</i>	4	FACU-	Nt A-Forb	PARTRIDGE PEA
CHEALB	0	<i>CHENOPODIUM ALBUM</i>	1	FAC-	Ad A-Forb	LAMB'S QUARTERS
CICINT	0	<i>CICHORIUM INTYBUS</i>	5	UPL	Ad P-Forb	CHICORY
CIRLUC NIGHTSHADE	1	<i>Circaea lutetiana canadensis</i>	3	FACU	Nt P-Forb	ENCHANTER'S
CIRARV	0	<i>CIRSIIUM ARVENSE</i>	5	UPL	Ad P-Forb	FIELD THISTLE
CORTRP	5	<i>Coreopsis tripteris</i>	0	FAC	Nt P-Forb	TALL COREOPSIS
DACGLO	0	<i>DACTYLIS GLOMERATA</i>	3	FACU	Ad P-Grass	ORCHARD GRASS
DAUCAR	0	<i>DAUCUS CAROTA</i>	5	UPL	Ad B-Forb	QUEEN ANNE'S LACE
DIPSYL	0	<i>DIPSACUS SYLVESTRIS</i>	5	UPL	Ad B-Forb	COMMON TEASEL
ECHCRU	0	<i>Echinochloa crusgalli</i>	-3	FACW	Nt A-Grass	BARNYARD GRASS
ELEINT	8	<i>Eleocharis intermedia</i>	-5	[OBL]	Nt A-Sedge	MATTED SPIKE RUSH
ELEPAM	10	<i>Eleocharis palustris major</i>	-5	OBL	Nt P-Sedge	GREAT SPIKE RUSH
ELESMA	5	<i>Eleocharis smallii</i>	-5	OBL	Nt P-Sedge	MARSH SPIKE RUSH
ELYSAN	4	<i>Elymus canadensis</i>	1	FAC-	Nt P-Grass	CANADA WILD RYE
ELYVIL	5	<i>Elymus villosus</i>	3	FACU	Nt P-Grass	SILKY WILD RYE
ELYVIR	4	<i>Elymus virginicus</i>	-2	FACW-	Nt P-Grass	VIRGINIA WILD RYE
EPICOL HERB	3	<i>Epilobium coloratum</i>	-5	OBL	Nt P-Forb	CINNAMON WILLOW
EREHIE	2	<i>Erechtites hieracifolia</i>	3	FACU	Nt A-Forb	FIREWEED
ERYYUC	9	<i>Eryngium yuccifolium</i>	-1	FAC+	Nt P-Forb	RATTLESNAKE MASTER
EUPPUR	7	<i>Eupatorium purpureum</i>	5	UPL	Nt P-Forb	PURPLE JOE PYE WEED
FESRUB	0	<i>FESTUCA RUBRA</i>	1	FAC-	Ad P-Grass	RED FESCUE
FRAVIR	1	<i>Fragaria virginiana</i>	1	FAC-	Nt P-Forb	WILD STRAWBERRY
FRAPES	1	<i>Fraxinus pennsylvanica subintegerrima</i>	0	FAC	Nt Tree	GREEN ASH
GALAPA	1	<i>Galium aparine</i>	3	FACU	Nt A-Forb	ANNUAL BEDSTRAW
GALASP	10	<i>Galium asprellum</i>	-5	OBL	Nt P-Forb	ROUGH BEDSTRAW
GEUCAN	1	<i>Geum canadense</i>	0	FAC	Nt P-Forb	WOOD AVENS
HELAUT	5	<i>Helenium autumnale</i>	-4	FACW+	Nt P-Forb	SNEEZEWEED

HELIGIG	9 Helianthus giganteus	-3 FACW	Nt P-Forb	TALL SUNFLOWER
HELGRO	2 Helianthus grosseserratus	-2 FACW-	Nt P-Forb	SAWTOOTH SUNFLOWER
HELHEL	5 Heliopsis helianthoides	5 UPL	Nt P-Forb	FALSE SUNFLOWER
HEMFUL	0 HEMEROCALLIS FULVA	5 UPL	Ad P-Forb	ORANGE DAY LILY
JUGNIG	5 Juglans nigra	3 FACU	Nt Tree	BLACK WALNUT
JUNDUD	4 Juncus dudleyi	0 [FAC]	Nt P-Forb	DUDLEY'S RUSH
JUNEFF	7 Juncus effusus	-5 OBL	Nt P-Forb	COMMON RUSH
JUNFOR	4 Juncus torreyi	-3 FACW	Nt P-Forb	TORREY'S RUSH
LEEORY	4 Leersia oryzoides	-5 OBL	Nt P-Grass	RICE CUT GRASS
LEMMIO	5 Lemna minor	-5 OBL	Nt A-Forb	SMALL DUCKWEED
LOLMUL	0 LOLIUM MULTIFLORUM	5 UPL	Ad A-Grass	ITALIAN RYE GRASS
LONMOR	0 LONICERA MORROWII	5 UPL	Ad Shrub	MORROW'S
HONEYSUCKLE				
LYCAME	5 Lycopodium americanus	-5 OBL	Nt P-Forb	COMMON WATER
HOREHOUND				
MONFIS	4 Monarda fistulosa	3 FACU	Nt P-Forb	WILD BERGAMOT
OENBIE	0 Oenothera biennis	3 FACU	Nt B-Forb	COMMON EVENING
PRIMROSE				
OXASTR	0 Oxalis stricta	5 UPL	Nt P-Forb	COMMON WOOD SORREL
PANVIR	5 Panicum virgatum	-1 FAC+	Nt P-Grass	SWITCH GRASS
PARQUI	2 Parthenocissus quinquefolia	1 FAC-	Nt W-Vine	VIRGINIA CREEPER
PASSAT	0 PASTINACA SATIVA	5 UPL	Ad B-Forb	WILD PARSNIP
PENDIG	4 Penstemon digitalis	1 FAC-	Nt P-Forb	FOXGLOVE BEARD
TONGUE				
PETCAN	9 Petalostemum candidum	5 UPL	Nt P-Forb	WHITE PRAIRIE
CLOVER				
PETPUR	9 Petalostemum purpureum	5 UPL	Nt P-Forb	PURPLE PRAIRIE
CLOVER				
PHAARU	0 PHALARIS ARUNDINACEA	-4 FACW+	Ad P-Grass	REED CANARY GRASS
PHYSUB	0 Physalis subglabrata	5 UPL	Nt P-Forb	TALL GROUND CHERRY
PHYAME	1 Phytolacca americana	1 FAC-	Nt P-Forb	POKEWEED
PLAMAJ	0 PLANTAGO MAJOR	-1 FAC+	Ad P-Forb	COMMON PLANTAIN
POACOM	0 POA COMPRESSA	2 FACU+	Ad P-Grass	CANADA BLUE GRASS
POAPRA	0 POA FRATENSIS	1 FAC-	Ad P-Grass	KENTUCKY BLUE GRASS
POLAMS	4 Polygonum amphibium stipulaceum	-5 OBL	Nt P-Forb	WATER KNOTWEED
POLPEN	0 Polygonum pensylvanicum	-4 FACW+	Nt A-Forb	PINKWEED
POLPER	0 POLYGONUM PERSICARIA	1 [FAC-]	Ad A-Forb	LADY'S THUMB
PONCOR	10 Pontederia cordata	-5 OBL	Nt P-Forb	PICKEREL WEED
POPDEL	2 Populus deltoides	-1 FAC+	Nt Tree	EASTERN COTTONWOOD
POTNAT	7 Potamogeton natans	-5 OBL	Nt P-Forb	COMMON PONDWEED
POTPAL	10 Potentilla palustris	-5 OBL	Nt P-Forb	MARSH CINQUEFOIL
PRUSER	1 Prunus serotina	3 FACU	Nt Tree	WILD BLACK CHERRY
PYCVIR	5 Pycnanthemum virginianum	-4 FACW+	Nt P-Forb	COMMON MOUNTAIN

MINT QUEMAC	5 Quercus macrocarpa	1 FAC-	Nt Tree	BUR OAK
RATPIN	4 Ratibida pinnata	5 UPL	Nt P-Forb	YELLOW CONEFLOWER
RHACAT	0 RHAMNUS CATHARTICA	3 FACU	Ad Shrub	COMMON BUCKTHORN
ROBPSE	0 ROBINIA PSEUDOACACIA	4 FACU-	Ad Tree	BLACK LOCUST
ROSMUL	0 ROSA MULTIFLORA	3 FACU	Ad Shrub	MULTIFLORA ROSE
RUBOCC	2 Rubus occidentalis	5 UPL	Nt Shrub	BLACK RASPBERRY
RUDHIR	1 Rudbeckia hirta	3 FACU	Nt P-Forb	BLACK-EYED SUSAN
RUDTRI	3 Rudbeckia triloba	1 FAC-	Nt A-Forb	BROWN-EYED SUSAN
RUMCRI	0 RUMEX CRISPUS	-1 FAC+	Ad P-Forb	CURLY DOCK
SALBAB	0 SALIX BABYLONICA	-3 FACW	Ad Tree	WEeping WILLOW
SALINT	1 Salix interior	-5 OBL	Nt Shrub	SANDBEAR WILLOW
SALNIG	4 Salix nigra	-5 OBL	Nt Tree	BLACK WILLOW
SAMCAN	1 Sambucus canadensis	-2 FACW-	Nt Shrub	ELDERBERRY
SCIATR	4 Scirpus atrovirens	-5 OBL	Nt P-Sedge	DARK GREEN RUSH
SCIFLU	4 Scirpus fluviatilis	-5 OBL	Nt P-Sedge	RIVER BULRUSH
SETFAB	0 SETARIA FABERI	2 FACU+	Ad A-Grass	GIANT FOXTAIL
SETITA	0 SETARIA ITALICA	3 FACU	Ad A-Grass	FOXTAIL MILLET
SETVIV	0 SETARIA VIRIDIS	1 [FAC-]	Ad A-Grass	GREEN FOXTAIL
SILLAC	5 Silphium laciniatum	5 UPL	Nt P-Forb	COMPASS PLANT
SILTER	5 Silphium terebinthinaceum	3 FACU	Nt P-Forb	PRAIRIE DOCK
SOLDUL NIGHTSHADE	0 SOLANUM DULCAMARA	0 FAC	Ad W-Vine	BITTERSWEET
SOLALT	1 Solidago altissima	3 FACU	Nt P-Forb	TALL GOLDENROD
SOLGIG	4 Solidago gigantea	-3 FACW	Nt P-Forb	LATE GOLDENROD
SOLGRG GOLDENROD	4 Solidago graminifolia	-2 FACW-	Nt P-Forb	COMMON GRASS-LEAVED
SOLGRN GOLDENROD	3 Solidago graminifolia nuttallii	0 [FAC]	Nt P-Forb	HAIRY GRASS-LEAVED
SOLJUN	5 Solidago juncea	5 UPL	Nt P-Forb	EARLY GOLDENROD
SOLRID	7 Solidago riddellii	-5 OBL	Nt P-Forb	RIDDELL'S GOLDENROD
SOLRIG	4 Solidago rigida	4 FACU-	Nt P-Forb	STIFF GOLDENROD
SORNUT	5 Sorghastrum nutans	2 FACU+	Nt P-Grass	INDIAN GRASS
SPAPEC	4 Spartina pectinata	-4 FACW+	Nt P-Grass	PRAIRIE CORD GRASS
TAROFF	0 TARAXACUM OFFICINALE	3 FACU	Ad P-Forb	COMMON DANDELION
TRIPRA	0 TRIFOLIUM PRATENSE	5 UPL	Ad P-Forb	RED CLOVER
URTDIO	0 URTICA DIOICA	-1 FAC+	Ad P-Forb	STINGING NETTLE
VERSTR	4 Verbena stricta	5 UPL	Nt P-Forb	HOARY VERVAIN
VERURU	5 Verbena urticifolia	5 UPL	Nt P-Forb	HAIRY WHITE VERVAIN
VERALA IRONWEED	3 Vernonia altissima	0 FAC	Nt P-Forb	SMOOTH TALL



VIBOPU	0	VIBURNUM OPULUS	3	[FACU]	Ad Shrub	EUROPEAN HIGHBUSH
CRANBERRY						
VIOSOR	3	Viola sororia	1	FAC-	Nt P-Forb	COMMON BLUE VIOLET
VITRIP	2	Vitis riparia	-2	FACW-	Nt W-Vine	RIVERBANK GRAPE
ZIZAUR	7	Zizia aurea	-1	FAC+	Nt P-Forb	GOLDEN ALEXANDERS

Site: #1 Woodland  
 Locale: SBV  
 Date: May 29, 2015 x hours  
 By: Nicky Obenauf Michelle Warner Tom Daly  
 File: s:\nrc\_chicago\FQA Software\studies\SBV\SBV#1Woodland12222014.inv  
 Notes: Local dominantes are Jewelweed 40%, Sanicula gregaria 20%, and Lonicera maackii 20%.  
 100% shade-little dappling.  
 Not as bad as anticipated/previously existed (due to invasive control).

FLORISTIC QUALITY DATA						
21 NATIVE SPECIES	Native	21	67.7%	Adventive	10	32.3%
31 Total Species	Tree	2	6.5%	Tree	0	0.0%
2.8 NATIVE MEAN C	Shrub	2	6.5%	Shrub	3	9.7%
1.9 W/Adventives	W-Vine	2	6.5%	W-Vine	1	3.2%
12.9 NATIVE FQI	H-Vine	0	0.0%	H-Vine	0	0.0%
10.6 W/Adventives	P-Forb	11	35.5%	P-Forb	1	3.2%
0.5 NATIVE MEAN W	B-Forb	0	0.0%	B-Forb	2	6.5%
1.2 W/Adventives	A-Forb	1	3.2%	A-Forb	0	0.0%
AVG: Faculative (-)	P-Grass	3	9.7%	P-Grass	3	9.7%
	A-Grass	0	0.0%	A-Grass	0	0.0%
	P-Sedge	0	0.0%	P-Sedge	0	0.0%
	A-Sedge	0	0.0%	A-Sedge	0	0.0%
	Cryptogam	0	0.0%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ACENEG	0	Acer negundo	-2	FACW-	Nt Tree	BOX ELDER
AGRGRY	2	Agrimonia gryposepala	2	FACU+	Nt P-Forb	TALL AGRIMONY
ALLPET	0	ALLIARIA PETIOLATA	0	FAC	Ad B-Forb	GARLIC MUSTARD
ARCMIN	0	ARCTIUM MINUS	5	UPL	Ad B-Forb	COMMON BURDOCK
ARITRI	4	Arisaema triphyllum	-2	FACW-	Nt P-Forb	JACK-IN-THE-PULPIT
ASTERI	5	Aster ericoides	4	FACU-	Nt P-Forb	HEATH ASTER
ASTSIS	3	Aster simplex	-5	OBL	Nt P-Forb	PANICLED ASTER
BROPUB	5	Bromus pubescens	2	FACU+	Nt P-Grass	WOODLAND BROME
CELOBR	0	CELASTRUS ORBICULATUS	5	UPL	Ad W-Vine	ORIENTAL BITTERSWEET
DACGLO	0	DACTYLIS GLOMERATA	3	FACU	Ad P-Grass	ORCHARD GRASS
ELYVIR	4	Elymus virginicus	-2	FACW-	Nt P-Grass	VIRGINIA WILD RYE
FESRUB	0	FESTUCA RUBRA	1	FAC-	Ad P-Grass	RED FESCUE
GEUCAN	1	Geum canadense	0	FAC	Nt P-Forb	WOOD AVENS
IMPCAP	3	Impatiens capensis	-3	FACW	Nt A-Forb	ORANGE JEWELWEED
LONMAA	0	LONICERA MAACKII	5	UPL	Ad Shrub	AMUR HONEYSUCKLE
LONTAT	0	LONICERA TATARICA	5	[UPL]	Ad Shrub	TARTARIAN HONEYSUCKLE
PARQUI	2	Parthenocissus quinquefolia	1	FAC-	Nt W-Vine	VIRGINIA CREEPER
PHAARU	0	PHALARIS ARUNDINACEA	-4	FACW+	Ad P-Grass	REED CANARY GRASS
PHYAME	1	Phytolacca americana	1	FAC-	Nt P-Forb	POKEWEED
POASYL	10	Poa sylvestris	0	FAC	Nt P-Grass	WOODLAND BLUE GRASS
POLGVI	2	Polygonum virginianum	0	FAC	Nt P-Forb	WOODLAND KNOTWEED
PRUSER	1	Prunus serotina	3	FACU	Nt Tree	WILD BLACK CHERRY
RHURAD	2	Rhus radicans	-1	FAC+	Nt W-Vine	POISON IVY
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad Shrub	MULTIFLORA ROSE
RUBALL	3	Rubus allegheniensis	2	FACU+	Nt Shrub	COMMON BLACKBERRY

RUBOCC	2	<i>Rubus occidentalis</i>	5	UPL	Nt Shrub	BLACK RASPBERRY
SANGRE SNAKEROOT	2	<i>Sanicula gregaria</i>	-1	FAC+	Nt P-Forb	CLUSTERED BLACK
SMIRAC SEAL	3	<i>Smilacina racemosa</i>	3	FACU	Nt P-Forb	FEATHERY FALSE SOLOMON'S
SOLALT	1	<i>Solidago altissima</i>	3	FACU	Nt P-Forb	TALL GOLDENROD
TAROFF	0	TARAXACUM OFFICINALE	3	FACU	Ad P-Forb	COMMON DANDELION
VIOSOR	3	<i>Viola sororia</i>	1	FAC-	Nt P-Forb	COMMON BLUE VIOLET

Site: Sanctuary of Bull Valley  
 Locale: #2 Woodland Restored  
 Date: May 28-29, 2015 x hours  
 By: Nicky Obenauf  
 File: s:\nrc\_chicago\FQA Software\studies\SBV\SBV #2 Woodland 05282015.inv  
 Notes: 100% Dappled shade that was burned approximately 4 weeks ago.  
 Locally dominate species: sorghastrum nutans 30%, rest were evenly balanced.

FLORISTIC QUALITY DATA		Native		Adventive	
28	NATIVE SPECIES	4	11.4%	7	20.0%
35	Total Species	0	0.0%	0	0.0%
3.7	NATIVE MEAN C	1	2.9%	3	8.6%
2.9	W/Adventives	0	0.0%	0	0.0%
19.5	NATIVE FQI	14	40.0%	1	2.9%
17.4	W/Adventives	2	5.7%	1	2.9%
1.4	NATIVE MEAN W	0	0.0%	0	0.0%
1.7	W/Adventives	2	5.7%	2	5.7%
AVG: Faculative (-)		0	0.0%	0	0.0%
		5	14.3%	0	0.0%
		0	0.0%	0	0.0%
		0	0.0%	0	0.0%

ACRONYM	C SCIENTIFIC NAME	W WETNESS	PHYSIOGNOMY	COMMON NAME
ACHMIL	0 ACHILLEA MILLEFOLIUM	3 FACU	Ad P-Forb	YARROW
ALLCAN	2 Allium canadense	3 FACU	Nt P-Forb	WILD ONION
CXBLAN	1 Carex blanda	0 FAC	Nt P-Sedge	COMMON WOOD SEDGE
CXMOLE	2 Carex molesta	-1 FAC+	Nt P-Sedge	FIELD OVAL SEDGE
CXPENS	5 Carex pensylvanica	5 UPL	Nt P-Sedge	COMMON OAK SEDGE
CXSTIP	3 Carex stipata	-5 OBL	Nt P-Sedge	COMMON FOX SEDGE
CXVULP	2 Carex vulpinoidea	-5 OBL	Nt P-Sedge	BROWN FOX SEDGE
CAROVT	5 Carya ovata	3 FACU	Nt Tree	SHAGBARK HICKORY
CORTRP	5 Coreopsis tripteris	0 FAC	Nt P-Forb	TALL COREOPSIS
DAUCAR	0 DAUCUS CAROTA	5 UPL	Ad B-Forb	QUEEN ANNE'S LACE
ERISTR	5 Erigeron strigosus	5 [UPL]	Nt B-Forb	DAISY FLEABANE
PESELA	0 FESTUCA ELATIOR	2 FACU+	Ad P-Grass	TALL FESCUE
HELGRO	2 Helianthus grosseserratus	-2 FACW-	Nt P-Forb	SAWTOOTH SUNFLOWER
HIEGRO	6 Hieracium gronovii	5 UPL	Nt P-Forb	HAIRY HAWKWEED
LACCAN	2 Lactuca canadensis	2 FACU+	Nt B-Forb	WILD LETTUCE
LESCAP	4 Lespedeza capitata	3 FACU	Nt P-Forb	ROUND-HEADED BUSH
CLOVER	0 LONICERA MAACKII	5 UPL	Ad Shrub	AMUR HONEYSUCKLE
LONMAA	7 Panicum columbianum	5 UPL	Nt P-Grass	HEMLOCK PANIC GRASS
PANCOL	0 POA PRATENSIS	1 FAC-	Ad P-Grass	KENTUCKY BLUE GRASS
POAPRA	1 Prunus serotina	3 FACU	Nt Tree	WILD BLACK CHERRY
PRUSER	5 Quercus macrocarpa	1 FAC-	Nt Tree	BUR OAK
QUEMAC	7 Quercus rubra	3 FACU	Nt Tree	RED OAK
QUERUB	4 Ratibida pinnata	5 UPL	Nt P-Forb	YELLOW CONEFLOWER
RATPIN	0 RHAMNUS CATHARTICA	3 FACU	Ad Shrub	COMMON BUCKTHORN
RHACAT				

ROSMUL	0 ROSA MULTIFLORA	3 FACU	Ad Shrub	MULTIFLORA ROSE
RUDHIR	1 Rudbeckia hirta	3 FACU	Nt P-Forb	BLACK-EYED SUSAN
SOLALT	1 Solidago altissima	3 FACU	Nt P-Forb	TALL GOLDENROD
SOLGIG	4 Solidago gigantea	-3 FACW	Nt P-Forb	LATE GOLDENROD
SOLGRG	4 Solidago graminifolia	-2 FACW-	Nt P-Forb	COMMON GRASS-LEAVED
GOLDENROD				
SOLGRN	3 Solidago graminifolia nuttallii	0 [FAC]	Nt P-Forb	HAIRY GRASS-LEAVED
GOLDENROD				
SORNUT	5 Sorghastrum nutans	2 FACU+	Nt P-Grass	INDIAN GRASS
TRAOHI	2 Tradescantia ohiensis	2 FACU+	Nt P-Forb	COMMON SPIDERWORT
VIOPAM	10 Viola palmata	5 UPL	Nt P-Forb	LOBED VIOLET
VIOSOR	3 Viola sororia	1 FAC-	Nt P-Forb	COMMON BLUE VIOLET
VITRIP	2 Vitis riparia	-2 FACW-	Nt W-Vine	RIVERBANK GRAPE

Site: #3 Woodland  
 Locale: SBV  
 Date: May 29, 2015 x hours  
 By: Nicky Obenauf Michele Warner Tom Daly  
 File: s:\nrc\_chicago\FQA Software\studies\SBV\SBV#3Woodland12222014.inv  
 Notes: Chemical treatment evident from early May.  
 100% shade.

Locally dominate=Alliaria petiolata 20% (but most damaged from chemical treatment),  
 Helianthus strumosus 20%, rest evenly mixed.

FLORISTIC QUALITY DATA		Native	18	62.1%	Adventive	11	37.9%
18	NATIVE SPECIES	Tree	0	0.0%	Tree	0	0.0%
29	Total Species	Shrub	2	6.9%	Shrub	1	3.4%
2.9	NATIVE MEAN C	W-Vine	1	3.4%	W-Vine	0	0.0%
1.8	W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
12.5	NATIVE FQI	P-Forb	9	31.0%	P-Forb	2	6.9%
9.8	W/Adventives	B-Forb	3	10.3%	B-Forb	6	20.7%
2.2	NATIVE MEAN W	A-Forb	0	0.0%	A-Forb	0	0.0%
2.4	W/Adventives	P-Grass	2	6.9%	P-Grass	2	6.9%
AVG: Fac. Upland (+)		A-Grass	0	0.0%	A-Grass	0	0.0%
		P-Sedge	1	3.4%	P-Sedge	0	0.0%
		A-Sedge	0	0.0%	A-Sedge	0	0.0%
		Cryptogam	0	0.0%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ALLPET	0	ALLIARIA PETIOLATA	0	FAC	Ad B-Forb	GARLIC MUSTARD
ARCMIN	0	ARCTIUM MINUS	5	UPL	Ad B-Forb	COMMON BURDOCK
ARITRI	4	Arisaema triphyllum	-2	FACW-	Nt P-Forb	
JACK-IN-THE-PULPIT						
ASTERI	5	Aster ericoides	4	FACU-	Nt P-Forb	HEATH ASTER
BARVUL	0	BARBAREA VULGARIS	0	FAC	Ad B-Forb	YELLOW ROCKET
BROPUB	5	Bromus pubescens	2	FACU+	Nt P-Grass	WOODLAND BROME
CXBLAN	1	Carex blanda	0	FAC	Nt P-Sedge	COMMON WOOD SEDGE
DACGLO	0	DACTYLIS GLOMERATA	3	FACU	Ad P-Grass	ORCHARD GRASS
DAUCAR	0	DAUCUS CAROTA	5	UPL	Ad B-Forb	QUEEN ANNE'S LACE
ELYVIR	4	Elymus virginicus	-2	FACW-	Nt P-Grass	VIRGINIA WILD RYE
ERISTR	5	Erigeron strigosus	5	[UPL]	Nt B-Forb	DAISY FLEABANE
FESELA	0	FESTUCA ELATIOR	2	FACU+	Ad P-Grass	TALL FESCUE
FRAVIR	1	Fragaria virginiana	1	FAC-	Nt P-Forb	WILD STRAWBERRY
HELSTR	5	Helianthus strumosus	5	UPL	Nt P-Forb	PALE-LEAVED
SUNFLOWER						
LACCAN	2	Lactuca canadensis	2	FACU+	Nt B-Forb	WILD LETTUCE
LACSER	0	LACTUCA SERRIOLA	0	FAC	Ad B-Forb	PRICKLY LETTUCE
LEOCAR	0	LEONURUS CARDIACA	5	UPL	Ad P-Forb	MOTHERWORT
OENBIE	0	Oenothera biennis	3	FACU	Nt B-Forb	COMMON EVENING
PRIMROSE						
PARQUI	2	Parthenocissus quinquefolia	1	FAC-	Nt W-Vine	VIRGINIA CREEPER
POLCAL	3	Polygonatum canaliculatum	3	FACU	Nt P-Forb	SMOOTH SOLOMON'S
SEAL						
POLGVI	2	Polygonum virginianum	0	FAC	Nt P-Forb	WOODLAND KNOTWEED
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad Shrub	MULTIFLORA ROSE
RUBALL	3	Rubus allegheniensis	2	FACU+	Nt Shrub	COMMON BLACKBERRY

RUBOCC	2	<i>Rubus occidentalis</i>	5 UPL	Nt Shrub	BLACK RASPBERRY
SMIRAC	3	<i>Smilacina racemosa</i>	3 FACU	Nt P-Forb	FEATHERY FALSE
SOLOMON'S SEAL					
SOLALT	1	<i>Solidago altissima</i>	3 FACU	Nt P-Forb	TALL GOLDENROD
TAROFF	0	TARAXACUM OFFICINALE	3 FACU	Ad P-Forb	COMMON DANDELION
VERTHA	0	VERBASCUM THAPSUS	5 UPL	Ad B-Forb	COMMON MULLEIN
VERURU	5	<i>Verbena urticifolia</i>	5 UPL	Nt P-Forb	HAIRY WHITE
VERVAIN					

Site: Sanctuary of Bull Valley  
 Locale: #4 Wetland  
 Date: May 29, 2015 .5 hours  
 December 22, 2014 .5 hours  
 By: Nicky Obenauf, Michele Warner, Tom Daly  
 File: s:\nrc\_chicago\FQA Software\studies\SBV\SBV #4 Wetland 12222014.inv  
 Notes: Unrestored area, first monitoring = 12/2014  
 Shade=50% (morning=NO sun due to maples, afternoon=4 hours of direct sun [10am-2pm],  
 evening=dappled shade from oaks)  
 Locally dominate=total vegetation <2% coverage. RCG was chemically treated in early may.

FLORISTIC QUALITY DATA		Native		Adventive	
1 NATIVE SPECIES	Tree	1	50.0%	1	50.0%
2 Total Species	Shrub	0	0.0%	0	0.0%
5.0 NATIVE MEAN C	W-Vine	0	0.0%	0	0.0%
2.5 W/Adventives	H-Vine	0	0.0%	0	0.0%
5.0 NATIVE FQI	P-Forb	0	0.0%	0	0.0%
3.5 W/Adventives	B-Forb	0	0.0%	0	0.0%
-5.0 NATIVE MEAN W	A-Forb	0	0.0%	0	0.0%
-4.5 W/Adventives	P-Grass	0	0.0%	1	50.0%
AVG: Obl. Wetland	A-Grass	0	0.0%	0	0.0%
	P-Sedge	1	50.0%	0	0.0%
	A-Sedge	0	0.0%	0	0.0%
	Cryptogam	0	0.0%		

ACRONYM	C SCIENTIFIC NAME	W WETNESS	PHYSIOGNOMY	COMMON NAME
CXSTRI	5 Carex stricta	-5 OBL	Nt P-Sedge	COMMON TUSSOCK
SEDGE				
PHAARU	0 PHALARIS ARUNDINACEA	-4 FACW+	Ad P-Grass	REED CANARY GRASS



Site: Sanctuary of Bull Valley  
 Locale: #5 Prairie Restored  
 Date: May 28-29 x hours  
 By: Nicky Obenauf  
 File: s:\nrc\_chicago\FQA Software\studies\SEV\SEV #5 Prairie 05282015.inv  
 Notes: 100% sun after morning shade (approximately 2 hours after sunrise).  
 Locally dominate species: Sorghastrum nutans 25%, Solidago altissima 20%, Poa pratense 20%.

FLORISTIC QUALITY DATA		Native		Adventive	
14	NATIVE SPECIES	Tree	1	Tree	0
19	Total Species	Shrub	0	Shrub	0
3.9	NATIVE MEAN C	W-Vine	0	W-Vine	0
2.8	W/Adventives	H-Vine	0	H-Vine	0
14.4	NATIVE FQI	P-Forb	10	P-Forb	3
12.4	W/Adventives	B-Forb	1	B-Forb	1
2.5	NATIVE MEAN W	A-Forb	0	A-Forb	0
2.6	W/Adventives	P-Grass	2	P-Grass	1
AVG: Fac. Upland		A-Grass	0	A-Grass	0
		P-Sedge	0	P-Sedge	0
		A-Sedge	0	A-Sedge	0
		Cryptogam	0		

ACRONYM	C SCIENTIFIC NAME	W WETNESS	PHYSIOGNOMY	COMMON NAME
CIRARV	0 CIRSIIUM ARVENSE	5 UPL	Ad P-Forb	FIELD THISTLE
CORTRP	5 Coreopsis tripteris	0 FAC	Nt P-Forb	TALL COREOPSIS
DAUCAR	0 DAUCUS CAROTA	5 UPL	Ad B-Forb	QUEEN ANNE'S LACE
ECHPUR	3 Echinacea purpurea	5 UPL	Nt P-Forb	BROAD-LEAVED PURPLE
CONEFLOWER				
ELYVIR	4 Elymus virginicus	-2 FACW-	Nt P-Grass	VIRGINIA WILD RYE
ERISTR	5 Erigeron strigosus	5 [UPL]	Nt B-Forb	DAISY FLEABANE
LESCAP	4 Lespedeza capitata	3 FACU	Nt P-Forb	ROUND-HEADED BUSH
CLOVER				
MONFIS	4 Monarda fistulosa	3 FACU	Nt P-Forb	WILD BERGAMOT
PETCAN	9 Petalostemum candidum	5 UPL	Nt P-Forb	WHITE PRAIRIE
CLOVER				
POAPRA	0 POA PRATENSIS	1 FAC-	Ad P-Grass	KENTUCKY BLUE GRASS
PRUSER	1 Prunus serotina	3 FACU	Nt Tree	WILD BLACK CHERRY
RATPIN	4 Ratibida pinnata	5 UPL	Nt P-Forb	YELLOW CONEFLOWER
SMIRAC	3 Smilacina racemosa	3 FACU	Nt P-Forb	FEATHERY FALSE
SOLOMON'S SEAL				
SOLALT	1 Solidago altissima	3 FACU	Nt P-Forb	TALL GOLDENROD
SOLGRG	4 Solidago graminifolia	-2 FACW-	Nt P-Forb	COMMON GRASS-LEAVED
GOLDENROD				
SONARV	0 SONCHUS ARVENENSIS	1 FAC-	Ad P-Forb	FIELD SOW THISTLE
SORNUT	5 Sorghastrum nutans	2 FACU+	Nt P-Grass	INDIAN GRASS
TAROFF	0 TARAXACUM OFFICINALE	3 FACU	Ad P-Forb	COMMON DANDELION
TRAOHI	2 Tradescantia ohiensis	2 FACU+	Nt P-Forb	COMMON SPIDERWORT

Site: Sanctuary of Bull Valley  
 Locale: #6 Prairie Not Restored  
 By: Nicky Obenauf  
 File: s:\nrc\_chicago\FQA Software\studies\SBV\SBV #6 Prairie 05282015.inv  
 Notes: 100% sun, area not restored though.  
 Locally dominate species: Bromus inermis 40%, Melilotus officinalis 20%, Poa pratense 20%.

FLORISTIC QUALITY DATA		Native		Adventive			
9	NATIVE SPECIES	Tree	2	13.3%	Tree	0	0.0%
15	Total Species	Shrub	0	0.0%	Shrub	1	6.7%
4.4	NATIVE MEAN C	W-Vine	0	0.0%	W-Vine	0	0.0%
2.7	W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
13.3	NATIVE FQI	P-Forb	6	40.0%	P-Forb	1	6.7%
10.3	W/Adventives	B-Forb	0	0.0%	B-Forb	2	13.3%
0.9	NATIVE MEAN W	A-Forb	0	0.0%	A-Forb	0	0.0%
1.8	W/Adventives	P-Grass	1	6.7%	P-Grass	2	13.3%
AVG:	Faculative (-)	A-Grass	0	0.0%	A-Grass	0	0.0%
		P-Sedge	0	0.0%	P-Sedge	0	0.0%
		A-Sedge	0	0.0%	A-Sedge	0	0.0%
		Cryptogam	0	0.0%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
BROINE	0	BROMUS INERMIS	5	UPL	Ad P-Grass	HUNGARIAN BROME
DAUCAR	0	DAUCUS CAROTA	5	UPL	Ad B-Forb	QUEEN ANNE'S LACE
GENAND	8	Gentiana andrewsii	-3	FACW	Nt P-Forb	BOTTLE GENTIAN
HELSTR	5	Helianthus strumosus	5	UPL	Nt P-Forb	PALE-LEAVED
SUNFLOWER						
HYPPUN	4	Hypericum punctatum	3	[FACU]	Nt P-Forb	SPOTTED ST. JOHN'S
WORT						
MELLOF	0	MELILOTUS OFFICINALIS	3	FACU	Ad B-Forb	YELLOW SWEET CLOVER
POAPRA	0	POA PRATENSIS	1	FAC-	Ad P-Grass	KENTUCKY BLUE GRASS
POLCAL	3	Polygonatum canaliculatum	3	FACU	Nt P-Forb	SMOOTH SOLOMON'S
SEAL						
POPDEL	2	Populus deltoides	-1	FAC+	Nt Tree	EASTERN COTTONWOOD
QUEMAC	5	Quercus macrocarpa	1	FAC-	Nt Tree	BUR OAK
RHACAT	0	RHAMNUS CATHARTICA	3	FACU	Ad Shrub	COMMON BUCKTHORN
RUDHIR	1	Rudbeckia hirta	3	FACU	Nt P-Forb	BLACK-EYED SUSAN
SOLRID	7	Solidago riddellii	-5	OBL	Nt P-Forb	RIDDELL'S GOLDENROD
SORNUT	5	Sorghastrum nutans	2	FACU+	Nt P-Grass	INDIAN GRASS
TRIREP	0	TRIFOLIUM REPENS	2	FACU-	Ad P-Forb	WHITE CLOVER

Site: Sanctuary of Bull Valley  
 Locale: #7 Savanna Not Restored  
 By: Nicky Obenauf  
 File: s:\nrc\_chicago\FQA Software\studies\SBV\SBV #7 Prairie 05282015.inv  
 Notes: 50% sun/shade depending on time of day, dappling sun in morning, complete shade in afternoon/evening.

Locally dominate species: *Cirsium arvense* 80%.

FLORISTIC QUALITY DATA		Native		Adventive	
13	NATIVE SPECIES	Tree	0	Tree	0
25	Total Species	Shrub	2	Shrub	0
2.6	NATIVE MEAN C	W-Vine	1	W-Vine	0
1.4	W/Adventives	H-Vine	0	H-Vine	0
9.4	NATIVE FQI	P-Forb	7	P-Forb	5
6.8	W/Adventives	B-Forb	1	B-Forb	3
0.8	NATIVE MEAN W	A-Forb	1	A-Forb	1
1.5	W/Adventives	P-Grass	1	P-Grass	3
AVG:	Faculative (-)	A-Grass	0	A-Grass	0
		P-Sedge	0	P-Sedge	0
		A-Sedge	0	A-Sedge	0
		Cryptogam	0		

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ALLPET	0	ALLIARIA PETIOLATA	0	FAC	Ad B-Forb	GARLIC MUSTARD
AMBTRI	0	Ambrosia trifida	-1	FAC+	Nt A-Forb	GIANT RAGWEED
ARCMIN	0	ARCTIUM MINUS	5	UPL	Ad B-Forb	COMMON BURDOCK
ASCSYR	0	Asclepias syriaca	5	UPL	Nt P-Forb	COMMON MILKWEED
BARVUL	0	BARBAREA VULGARIS	0	FAC	Ad B-Forb	YELLOW ROCKET
BROINE	0	BROMUS INERMIS	5	UPL	Ad P-Grass	HUNGARIAN BROME
BROPUB	5	Bromus pubescens	2	FACU+	Nt P-Grass	WOODLAND BROME
CIRARV	0	CIRSIUM ARVENSE	5	UPL	Ad P-Forb	FIELD THISTLE
CONARV	0	CONVOLVULUS ARVENSIS	5	UPL	Ad P-Forb	FIELD BINDWEED
GALASP	10	Galium asprellum	-5	OBL	Nt P-Forb	ROUGH BEDSTRAW
GEUCAN	1	Geum canadense	0	FAC	Nt P-Forb	WOOD AVENS
LACCAN	2	Lactuca canadensis	2	FACU+	Nt B-Forb	WILD LETTUCE
OXASTR	0	Oxalis stricta	5	UPL	Nt P-Forb	COMMON WOOD SORREL
PHAARU	0	PHALARIS ARUNDINACEA	-4	FACW+	Ad P-Grass	REED CANARY GRASS
POAPRA	0	POA PRATENSIS	1	FAC-	Ad P-Grass	KENTUCKY BLUE GRASS
RUBALL	3	Rubus allegheniensis	2	FACU+	Nt Shrub	COMMON BLACKBERRY
RUBOCC	2	Rubus occidentalis	5	UPL	Nt Shrub	BLACK RASPBERRY
SOLALT	1	Solidago altissima	3	FACU	Nt P-Forb	TALL GOLDENROD
SOLGIG	4	Solidago gigantea	-3	FACW	Nt P-Forb	LATE GOLDENROD
SOLGRG	4	Solidago graminifolia	-2	FACW-	Nt P-Forb	COMMON GRASS-LEAVED
GOLDENROD TAROFF	0	TARAXACUM OFFICINALE	3	FACU	Ad P-Forb	COMMON DANDELION
THLARV	0	THLASPI ARVENSE	5	UPL	Ad A-Forb	PENNY CRESS
TRIREP	0	TRIFOLIUM REPENS	2	FACU+	Ad P-Forb	WHITE CLOVER
URTDIO	0	URTICA DIOICA	-1	FAC+	Ad P-Forb	STINGING NETTLE

VITRIP 2 *Vitis riparia*

-2 FACW- Nt W-Vine RIVERBANK GRAPE

Site: Sanctuary of Bull Valley  
 Locale: #8 Prairie  
 Date: May 29, 2015 x hours  
 By: Michele Warner, Nicky Obenauf, Tom Daly  
 File: s:\nrc\_chicago\FQA Software\studies\SBV\SBV #8 Prairie 12222014.inv  
 Notes: No clear locally dominate species-all balanced  
 100% sun.

FLORISTIC QUALITY DATA		Native		Adventive			
19	NATIVE SPECIES	Tree	0	0.0%	Tree	0	0.0%
22	Total Species	Shrub	0	0.0%	Shrub	0	0.0%
4.8	NATIVE MEAN C	W-Vine	0	0.0%	W-Vine	0	0.0%
4.2	W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
21.1	NATIVE FQI	P-Forb	13	59.1%	P-Forb	2	9.1%
19.6	W/Adventives	B-Forb	1	4.5%	B-Forb	1	4.5%
2.7	NATIVE MEAN W	A-Forb	1	4.5%	A-Forb	0	0.0%
2.9	W/Adventives	P-Grass	4	18.2%	P-Grass	0	0.0%
AVG: Fac. Upland		A-Grass	0	0.0%	A-Grass	0	0.0%
		P-Sedge	0	0.0%	P-Sedge	0	0.0%
		A-Sedge	0	0.0%	A-Sedge	0	0.0%
		Cryptogam	0	0.0%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ANDGER GRASS	5	Andropogon gerardii	1	FAC-	Nt P-Grass	BIG BLUESTEM
ANDSCO GRASS	5	Andropogon scoparius	4	FACU-	Nt P-Grass	LITTLE BLUESTEM
ASTLAE	9	Aster laevis	5	UPL	Nt P-Forb	SMOOTH BLUE ASTER
CASFAS	5	Cassia fasciculata	4	FACU-	Nt A-Forb	PARTRIDGE PEA
DAUCAR	0	DAUCUS CAROTA	5	UPL	Ad B-Forb	QUEEN ANNE'S LACE
ECHPUR PURPLE CONEFLOWER	3	Echinacea purpurea	5	UPL	Nt P-Forb	BROAD-LEAVED
HYPPER WORT	0	HYPERICUM PERFORATUM	5	UPL	Ad P-Forb	COMMON ST. JOHN'S
LESCAP CLOVER	4	Lespedeza capitata	3	FACU	Nt P-Forb	ROUND-HEADED BUSH
LUPPEO	7	Lupinus perennis occidentalis	5	UPL	Nt P-Forb	WILD LUPINE
MONFIS	4	Monarda fistulosa	3	FACU	Nt P-Forb	WILD BERGAMOT
OENBIE PRIMROSE	0	Oenothera biennis	3	FACU	Nt B-Forb	COMMON EVENING
PANVIR	5	Panicum virgatum	-1	FAC+	Nt P-Grass	SWITCH GRASS
PENDIG TONGUE	4	Penstemon digitalis	1	FAC-	Nt P-Forb	FOXGLOVE BEARD
PETCAN CLOVER	9	Petalostemum candidum	5	UPL	Nt P-Forb	WHITE PRAIRIE
PHLPIP PHLOX	7	Phlox pilosa	1	FAC-	Nt P-Forb	SAND PRAIRIE
RATPIN	4	Ratibida pinnata	5	UPL	Nt P-Forb	YELLOW CONEFLOWER
SILTER	5	Silphium terebinthinaceum	3	FACU	Nt P-Forb	PRAIRIE DOCK
SOLGIG	4	Solidago gigantea	-3	FACW	Nt P-Forb	LATE GOLDENROD
SOLRIG	4	Solidago rigida	4	FACU-	Nt P-Forb	STIFF GOLDENROD
SORNUT	5	Sorghastrum nutans	2	FACU+	Nt P-Grass	INDIAN GRASS
TAROFF	0	TARAXACUM OFFICINALE	3	FACU	Ad P-Forb	COMMON DANDELION
VIOSOR VIOLET	3	Viola sororia	1	FAC-	Nt P-Forb	COMMON BLUE

Site: Sanctuary of Bull Valley  
 Locale: #9 Savannah  
 Date: May 29, 2015 x hours  
 By: Michele Warner, Tom Daly, Nicky Obenauf  
 File: s:\nrc\_chicago\FQA Software\studies\SBV\SBV #9 Savannah 12222014.inv  
 Notes: Dappled sun (100% canopy cover though).  
 Locally dominate species: Lonicera tatarica 40%, Bromus inermis 20%.

FLORISTIC QUALITY DATA		Native		Adventive	
20	NATIVE SPECIES	Tree	0	Tree	0
31	Total Species	Shrub	2	Shrub	3
3.0	NATIVE MEAN C	W-Vine	1	W-Vine	1
1.9	W/Adventives	H-Vine	1	H-Vine	0
13.2	NATIVE FQI	P-Forb	11	P-Forb	1
10.6	W/Adventives	B-Forb	2	B-Forb	2
1.7	NATIVE MEAN W	A-Forb	0	A-Forb	0
2.3	W/Adventives	P-Grass	2	P-Grass	4
AVG:	Fac. Upland (+)	A-Grass	0	A-Grass	0
		P-Sedge	1	P-Sedge	0
		A-Sedge	0	A-Sedge	0
		Cryptogam	0		

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
AGRALA	0	AGROSTIS ALBA	-3	FACW	Ad P-Grass	REDTOP
ARCMIN	0	ARCTIUM MINUS	5	UPL	Ad B-Forb	COMMON BURDOCK
ARITRI	4	Arisaema triphyllum	-2	FACW-	Nt P-Forb	
JACK-IN-THE-PULPIT						
ASTERI	5	Aster ericoides	4	FACU-	Nt P-Forb	HEATH ASTER
BROINE	0	BROMUS INERMIS	5	UPL	Ad P-Grass	HUNGARIAN BROME
BROPUB	5	Bromus pubescens	2	FACU+	Nt P-Grass	WOODLAND BROHE
CXBLAN	1	Carex blanda	0	FAC	Nt P-Sedge	COMMON WOOD SEDGE
CELORB	0	CELASTRUS ORBICULATUS	5	UPL	Ad W-Vine	ORIENTAL
BITTERSWEET						
DACGLO	0	DACTYLIS GLCMERATA	3	FACU	Ad P-Grass	ORCHARD GRASS
DAUCAR	0	DAUCUS CAROTA	5	UPL	Ad B-Forb	QUEEN ANNE'S LACE
ELYVIR	4	Elymus virginicus	-2	FACW-	Nt P-Grass	VIRGINIA WILD RYE
ERYALB	5	Erythronium albidum	5	UPL	Nt P-Forb	WHITE TROUT LILY
FESELA	0	FESTUCA ELATIOR	2	FACU+	Ad P-Grass	TALL FESCUE
GEUCAN	1	Geum canadense	0	FAC	Nt P-Forb	WOOD AVENS
LACCAN	2	Lactuca canadensis	2	FACU+	Nt B-Forb	WILD LETTUCE
LONTAT	0	LONICERA TATARICA	5	[UPL]	Ad Shrub	TARTARIAN
HONEYSUCKLE						
OENBIE	0	Oenothera biennis	3	FACU	Nt B-Forb	COMMON EVENING
PRIMROSE						
OXASTR	0	Oxalis stricta	5	UPL	Nt P-Forb	COMMON WOOD
SORREL						
PARQUI	2	Parthenocissus quinquefolia	1	FAC-	Nt W-Vine	VIRGINIA CREEPER
POLCAL	3	Polygonatum canaliculatum	3	FACU	Nt P-Forb	SMOOTH SOLOMON'S
SEAL						
RHACAT	0	RHAMNUS CATHARTICA	3	FACU	Ad Shrub	COMMON BUCKTHORN
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad Shrub	MULTIFLORA ROSE
RUBOCC	2	Rubus occidentalis	5	UPL	Nt Shrub	BLACK RASPBERRY
SAMCAN	1	Sambucus canadensis	-2	FACW-	Nt Shrub	ELDERBERRY

SMIRAC	3	<i>Smilacina racemosa</i>	3	FACU	Nt P-Forb	FEATHERY FALSE
SOLOMON'S SEAL						
SMILAS FLOWER	5	<i>Smilax lasioneura</i>	5	{UPL}	Nt H-Vine	COMMON CARRION
SOLALT	1	<i>Solidago altissima</i>	3	FACU	Nt P-Forb	TALL GOLDENROD
SOLGIG	4	<i>Solidago gigantea</i>	-3	FACW	Nt P-Forb	LATE GOLDENROD
TAROFF	0	TARAXACUM OFFICINALE	3	FACU	Ad P-Forb	COMMON DANDELION
VERURU	5	<i>Verbena urticifolia</i>	5	UPL	Nt P-Forb	HAIRY WHITE
VERVAIN						
VIOSTR	6	<i>Viola striata</i>	-3	FACW	Nt P-Forb	CREAM VIOLET

Site: Sanctuary of Bull Valley  
 Locale: #10 Wetland  
 By: Michele Warner, Tom Daly, Nicky Obenauf  
 File: s:\nrc\_chicago\FQA Software\studies\SBV\SBV #10 Wetland 12222014.inv  
 Notes: New within wet area of willow basin kettle.  
 100% sun.  
 Locally dominate: Aster ericoides 20%.

FLORISTIC QUALITY DATA		Native		Adventive			
14	NATIVE SPECIES	Tree	0	0.0%	Tree	0	0.0%
23	Total Species	Shrub	0	0.0%	Shrub	0	0.0%
4.1	NATIVE MEAN C	W-Vine	0	0.0%	W-Vine	1	4.3%
2.5	W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
15.5	NATIVE FOI	P-Forb	8	34.8%	P-Forb	1	4.3%
12.1	W/Adventives	B-Forb	0	0.0%	B-Forb	0	0.0%
-2.0	NATIVE MEAN W	A-Forb	0	0.0%	A-Forb	1	4.3%
-1.2	W/Adventives	P-Grass	3	13.0%	P-Grass	5	21.7%
AVG: Fac. Wetland (-)		A-Grass	0	0.0%	A-Grass	1	4.3%
		P-Sedge	3	13.0%	P-Sedge	0	0.0%
		A-Sedge	0	0.0%	A-Sedge	0	0.0%
		Cryptogam	0	0.0%			

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ACTALT	5	Actinomeris alternifolia	-3	FACW	Nt P-Forb	WINGSTEM
AGRALA	0	AGROSTIS ALBA	-3	FACW	Ad P-Grass	REDTOP
ASCINC	4	Asclepias incarnata	-5	OBL	Nt P-Forb	SWAMP MILKWEED
ASCSYR	0	Asclepias syriaca	5	UPL	Nt P-Forb	COMMON MILKWEED
ASTERI	5	Aster ericoides	4	FACU-	Nt P-Forb	HEATH ASTER
CALCAN	3	Calamagrostis canadensis	-5	OBL	Nt P-Grass	BLUE JOINT GRASS
CXMOLE	2	Carex molesta	-1	FAC+	Nt P-Sedge	FIELD OVAL SEDGE
CXMUSK	6	Carex muskingumensis	-5	OBL	Nt P-Sedge	SWAMP OVAL SEDGE
CXTRIB	3	Carex tribuloides	-4	FACW+	Nt P-Sedge	AWL-FRUITED OVAL
SEDGE						
DACGLO	0	DACTYLIS GLOMERATA	3	FACU	Ad P-Grass	ORCHARD GRASS
ELYCAN	4	Elymus canadensis	1	FAC-	Nt P-Grass	CANADA WILD RYE
ELYVIR	4	Elymus virginicus	-2	FACW-	Nt P-Grass	VIRGINIA WILD RYE
FESRUB	0	FESTUCA RUBRA	1	FAC-	Ad P-Grass	RED FESCUE
FRAVIR	1	Fragaria virginiana	1	FAC-	Nt P-Forb	WILD STRAWBERRY
HELAUT	5	Helenium autumnale	-4	FACW+	Nt P-Forb	SNEEZEWEED
PHAARU	0	PHALARIS ARUNDINACEA	-4	FACW+	Ad P-Grass	REED CANARY GRASS
POAPRA	0	POA PRATENSIS	1	FAC-	Ad P-Grass	KENTUCKY BLUE
GRASS						
POLAMS	4	Polygonum amphibium stipulaceum	-5	OBL	Nt P-Forb	WATER KNOTWEED
POLPER	0	POLYGONUM PERSICARIA	1	[FAC-]	Ad A-Forb	LADY'S THUMB
POTPAL	10	Potentilla palustris	-5	OBL	Nt P-Forb	MARSH CINQUEFOIL
RUMCRI	0	RUMEX CRISPUS	-1	FAC+	Ad P-Forb	CURLY DOCK
SETFAB	0	SETARIA FABERI	2	FACU+	Ad A-Grass	GIANT FOXTAIL
SOLDUL	0	SOLANUM DULCAMARA	0	FAC	Ad W-Vine	BITTERSWEET
NIGHTSHADE						



Site: Sanctuary of Bull Valley  
 Locale: #11 Savannah  
 By: Michele Warner, Tom Daly, Nicky Obenauf  
 File: s:\nrc\_chicago\FQA Software\studies\SBV\SBV #11 Savannah 12222014.in  
 Notes: Existing plot, but was destroyed by mower/tractor equipment years ago.  
 100% sun with only some dappling on occasion throughout the day.  
 Locally Dominate=Bromus inermis 80%.

FLORISTIC QUALITY DATA		Native		Adventive	
17	NATIVE SPECIES	Tree	1 3.4%	Tree	1 3.4%
29	Total Species	Shrub	2 6.9%	Shrub	2 6.9%
3.4	NATIVE MEAN C	W-Vine	0 0.0%	W-Vine	0 0.0%
2.0	W/Adventives	H-Vine	1 3.4%	H-Vine	0 0.0%
14.1	NATIVE FQI	P-Forb	11 37.9%	P-Forb	3 10.3%
10.8	W/Adventives	B-Forb	1 3.4%	B-Forb	3 10.3%
2.5	NATIVE MEAN W	A-Forb	1 3.4%	A-Forb	0 0.0%
2.8	W/Adventives	P-Grass	0 0.0%	P-Grass	3 10.3%
AVG:	Fac. Upland	A-Grass	0 0.0%	A-Grass	0 0.0%
		P-Sedge	0 0.0%	P-Sedge	0 0.0%
		A-Sedge	0 0.0%	A-Sedge	0 0.0%
		Cryptogam	0 0.0%		

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
ALLPET	0	ALLIARIA PETIOLATA	0	FAC	Ad B-Forb	GARLIC MUSTARD
ARCMIN	0	ARCTIUM MINUS	5	UPL	Ad B-Forb	COMMON BURDOCK
ASTLAE	9	Aster laevis	5	UPL	Nt P-Forb	SMOOTH BLUE ASTER
ASTSAS	5	Aster sagittifolius	5	UPL	Nt P-Forb	ARROW-LEAVED
ASTER						
ASTSAD	2	Aster sagittifolius drummondii	3	[FACU]	Nt P-Forb	DRUMMOND'S ASTER
BROINE	0	BROMUS INERMIS	5	UPL	Ad P-Grass	HUNGARIAN BROME
CIRARV	0	CIRSIUM ARVENSE	5	UPL	Ad P-Forb	FIELD THISTLE
CIRVUL	0	CIRSIUM VULGARE	4	FACU-	Ad B-Forb	BULL THISTLE
DACGLO	0	DACTYLIS GLOMERATA	3	FACU	Ad P-Grass	ORCHARD GRASS
ERISTR	5	Erigeron strigosus	5	[UPL]	Nt B-Forb	DAISY FLEABANE
GALAPA	1	Galium aparine	3	FACU	Nt A-Forb	ANNUAL BEDSTRAW
GEUCAN	1	Geum canadense	0	FAC	Nt P-Forb	WOOD AVENS
HELGRO	2	Helianthus grosseserratus	-2	FACW-	Nt P-Forb	SAWTOOTH
SUNFLOWER						
HELHEL	5	Heliopsis helianthoides	5	UPL	Nt P-Forb	FALSE SUNFLOWER
LEOCAR	0	LEONURUS CARDIACA	5	UPL	Ad P-Forb	MOTHERWORT
LONTAT	0	LONICERA TATARICA	5	[UPL]	Ad Shrub	TARTARIAN
HONEYSUCKLE						
PHAARU	0	PHALARIS ARUNDINACEA	-4	FACW+	Ad P-Grass	REED CANARY GRASS
PHYAME	1	Phytolacca americana	1	FAC-	Nt P-Forb	POKEWEED
POLGVI	2	Polygonum virginianum	0	FAC	Nt P-Forb	WOODLAND KNOTWEED
PRUSER	1	Prunus serotina	3	FACU	Nt Tree	WILD BLACK CHERRY
ROBPSE	0	ROBINIA PSEUDOACACIA	4	FACU-	Ad Tree	BLACK LOCUST
ROSMUL	0	ROSA MULTIFLORA	3	FACU	Ad Shrub	MULTIFLORA ROSE
RUBALL	3	Rubus allegheniensis	2	FACU+	Nt Shrub	COMMON BLACKBERRY
RUBOCC	2	Rubus occidentalis	5	UPL	Nt Shrub	BLACK RASPBERRY

SMISTE	5	<i>Smilacina stellata</i>	1	FAC-	Nt P-Forb	STARRY FALSE
SOLOMON'S SEAL						
SMILAS FLOWER	5	<i>Smilax lasioneura</i>	5	[UPL]	Nt H-Vine	COMMON CARRION
SOLGIG	4	<i>Solidago gigantea</i>	-3	FACW	Nt P-Forb	LATE GOLDENROD
TAROFF	0	TARAXACUM OFFICINALE	3	FACU	Ad P-Forb	COMMON DANDELION
VERURU	5	<i>Verbena urticifolia</i>	5	UPL	Nt P-Forb	HAIRY WHITE
VERVAIN						

Site: Sanctuary of Bull Valley  
 Locale: #12 Prairie  
 By: Michele Warner, Tom Daly, Nicky Obenauf  
 File: s:\nrc\_chicago\FQA Software\studies\SBV\SBV #12 Prairie 12222014.inv  
 Notes: New Prairie: Restored McConnell Road Basin.  
 100% Sun.  
 No locally dominate mix, all species appear to be balanced.

FLORISTIC QUALITY DATA		Native		Adventive	
17	NATIVE SPECIES	Tree	0 0.0%	Tree	8 32.0%
25	Total Species	Shrub	0 0.0%	Shrub	0 0.0%
3.2	NATIVE MEAN C	W-Vine	0 0.0%	W-Vine	0 0.0%
2.2	W/Adventives	H-Vine	0 0.0%	H-Vine	0 0.0%
13.1	NATIVE FQI	P-Forb	10 40.0%	P-Forb	3 12.0%
10.8	W/Adventives	B-Forb	2 8.0%	B-Forb	2 8.0%
0.1	NATIVE MEAN W	A-Forb	1 4.0%	A-Forb	0 0.0%
1.1	W/Adventives	P-Grass	3 12.0%	P-Grass	3 12.0%
AVG:	Faculative	A-Grass	0 0.0%	A-Grass	0 0.0%
		P-Sedge	1 4.0%	P-Sedge	0 0.0%
		A-Sedge	0 0.0%	A-Sedge	0 0.0%
		Cryptogam	0 0.0%		

ACRONYM	C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
AMBTRI	0	Ambrosia trifida	-1	FAC+	Nt A-Forb	GIANT RAGWEED
ASTNOV	4	Aster novae-angliae	-3	FACW	Nt P-Forb	NEW ENGLAND ASTER
CXSTRI SEDGE	5	Carex stricta	-5	OBL	Nt P-Sedge	COMMON TUSSOCK
CIRARV	0	CIRSIUM ARVENSE	5	UPL	Ad P-Forb	FIELD THISTLE
CIRVUL	0	CIRSIUM VULGARE	4	FACU-	Ad B-Forb	BULL THISTLE
CORTRP	5	Coreopsis tripteris	0	FAC	Nt P-Forb	TALL COREOPSIS
DACGLO	0	DACTYLIS GLOMERATA	3	FACU	Ad P-Grass	ORCHARD GRASS
DAUCAR	0	DAUCUS CAROTA	5	UPL	Ad B-Forb	QUEEN ANNE'S LACE
ELYCAN	4	Elymus canadensis	1	FAC-	Nt P-Grass	CANADA WILD RYE
ELYVIR	4	Elymus virginicus	-2	FACW-	Nt P-Grass	VIRGINIA WILD RYE
FESRUB	0	FESTUCA RUBRA	1	FAC-	Ad P-Grass	RED FESCUE
HELGRO SUNFLOWER	2	Helianthus grosseserratus	-2	FACW-	Nt P-Forb	SAWTOOTH
LACCAN	2	Lactuca canadensis	2	FACU+	Nt B-Forb	WILD LETTUCE
MONFIS	4	Monarda fistulosa	3	FACU	Nt P-Forb	WILD BERGAMOT
OENBIE PRIMROSE	0	Oenothera biennis	3	FACU	Nt B-Forb	COMMON EVENING
OXASTR SORREL	0	Oxalis stricta	5	UPL	Nt P-Forb	COMMON WOOD
PENDIG TONGUE	4	Penstemon digitalis	1	FAC-	Nt P-Forb	FOXGLOVE BEARD
POAPRA GRASS	0	POA PRATENSIS	1	FAC-	Ad P-Grass	KENTUCKY BLUE
SILCUC	0	SILENE CUCUBALUS	5	UPL	Ad P-Forb	BLADDER CAMPION
SOLALT	1	Solidago altissima	3	FACU	Nt P-Forb	TALL GOLDENROD
SOLGIG	4	Solidago gigantea	-3	FACW	Nt P-Forb	LATE GOLDENROD
SOLRIG	4	Solidago rigida	4	FACU-	Nt P-Forb	STIFF GOLDENROD
SPAPEC GRASS	4	Spartina pectinata	-4	FACW+	Nt P-Grass	PRAIRIE CORD
TAROFF	0	TARAXACUM OFFICINALE	3	FACU	Ad P-Forb	COMMON DANDELION

ZIZAUR 7 Zizia aurea

-1 FAC+ Nt P-Forb GOLDEN ALEXANDERS

## Appendix F Plantings and Seed Mix Recommendations

The following table should be planted in oak savanna areas at a seeding rate of at least 20 pounds per acre:

Savanna Mix			Grasses and forbs at an approximate 60/40 ratio
<b>Grasses, Sedges, etc.</b>			
<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value</u>	<u>Notes</u>
<i>Bouteloua curtipendula</i>	side-oats grama	8	
<i>Bromus purgans</i>	hairy wood chess	5	
<i>Carex bicknellii</i>	bicknell's sedge	10	
<i>Carex davisii</i>	awned graceful sedge	7	
<i>Carex frankii</i>	bristly cattail sedge	8	
<i>Carex pensylvanica</i>	common oak sedge	5	use plugs for this species
<i>Carex sprengeii</i>	long-beaked sedge	9	
<i>Dichanthelium</i> sp.	panic grasses	5+	only use the higher quality species (ie-not implicatum)
<i>Elymus hystrix</i>	bottlebrush grass	5	
<i>Elymus villosus</i>	silky wild rye	5	
<i>Eragrostis spectabilis</i>	purples love grass	3	
<i>Koeleria cristata</i>	June grass	7	
<i>Luzula multiflora</i>	wood rush	7	
<i>Muhlenbergia mexicana</i>	leafy satin grass	5	
<i>Sporobolus cryptandrus</i>	sand dropseed	7	use plugs for this species
<i>Sporobolus heterolepis</i>	prairie dropseed	10	
<i>Stipa spartea</i>	porcupine grass	7	
<b>Forbs</b>			
<i>Agastache scrophulariaefolia</i>	purple giant hyssop	5	
<i>Allium cernuum</i>	nodding wild onion	7	
<i>Allium trioccum</i>	wild leek	7	use plugs for this species
<i>Amorpha canescens</i>	lead plant	9	
<i>Anemone cylindrica</i>	thimbleweed	6	
<i>Anemone virginiana</i>	tall anemone	5	use plugs for this species
<i>Aquilegia canadensis</i>	wild columbine	6	
<i>Asarum canadense</i>	wild ginger	7	use plugs for this species
<i>Asclepias amplexicaulis</i>	sand milkweed	7	due to Monarch's plight, trying to increase <i>Asclepias</i> is important!
<i>Asclepias exaltata</i>	poke milkweed	9	due to Monarch's plight, trying to increase <i>Asclepias</i> is important!
<i>Asclepias hirtella</i>	tall green milkweed	10	due to Monarch's plight, trying to increase <i>Asclepias</i> is important!
<i>Asclepias lanuginosa</i>	woolly milkweed	10	due to Monarch's plight, trying to increase <i>Asclepias</i> is important!
<i>Asclepias tuberosa</i>	butterfly milkweed	9	due to Monarch's plight, trying to increase <i>Asclepias</i> is important!
<i>Baptisia leucantha</i>	white wild indigo	8	
<i>Blephilia hirsuta</i>	wood mint	8	
<i>Brickellia eupatorioides</i>	false boneset	6	
<i>Cacalia atriplicifolia</i>	pale Indian plantain	8	
<i>Coreopsis lanceolata</i>	sand coreopsis	5	
<i>Coreopsis palmata</i>	prairie coreopsis	6	

<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value</u>	<u>Notes</u>
<i>Dalea purpurea</i>	purple prairie clover	7	
<i>Desmanthus illinoensis</i>	Illinois sensitive plant	3	
<i>Dicentra cucullaria</i>	Dutchman's breeches	6	
<i>Dodecatheon meadia</i>	shooting star	6	
<i>Echinacea pallida</i>	pale purple coneflower	8	
<i>Erythronium albidum</i>	white trout lily	5	use plugs for this species
<i>Gentiana andrewsii</i>	bottle gentian	8	use plugs for this species
<i>Gentiana puberulenta</i>	prairie gentian	10	use plugs for this species
<i>Heuchera richardsonii</i>	prairie alum root	8	use plugs for this species
<i>Isopyrum biternatum</i>	false rue anemone	8	use plugs for this species
<i>Liatris aspera</i>	rough blazing star	6	
<i>Lithospermum canescens</i>	hoary puccoon	8	use plugs for this species
<i>Lupinus perennis</i>	wild lupine	7	
<i>Mertensia virginica</i>	Virginia bluebells	5	
<i>Mitella diphylla</i>	bishop's cap	10	use plugs for this species
<i>Napaea dioica</i>	glade mallow	10	
<i>Osmunda claytoniana</i>	interrupted fern	9	use plugs for this species
<i>Pedicularis canadensis</i>	wood betony	9	
<i>Penstemon digitalis</i>	foxglove beard tongue	4	
<i>Penstemon pallidus</i>	pale beard tongue	6	
<i>Phlox divaricata</i>	woodland phlox	5	use plugs for this species
<i>Phlox pilosa</i>	sand prairie phlox	7	
<i>Polemonium reptans</i>	Jacob's-ladder	5	
<i>Potentilla arguta</i>	prairie cinquefoil	5	
<i>Rudbeckia subtomentosa</i>	sweet black-eyed Susan	9	
<i>Sanguinaria canadensis</i>	bloodroot	6	use plugs for this species
<i>Silene stellata</i>	starry campion	6	use plugs for this species
<i>Sisyrinchium albidum</i>	common blue-eyed grass	7	
<i>Solidago caesia</i>	blue-stemmed goldenrod	7	
<i>Solidago flexicaulis</i>	broad-leaved goldenrod	7	
<i>Solidago speciosa</i>	showy goldenrod	7	
<i>Solidago ulmifolia</i>	elm-leaved goldenrod	5	
<i>Symphotrichum oblongifolius</i>	aromatic aster	10	use plugs for this species
<i>Symphotrichum azureus</i>	sky-blue aster	8	
<i>Symphotrichum cordifolium</i>	heart leaved blue wood aster	7	
<i>Symphotrichum laeve</i>	smooth blue aster	9	
<i>Symphotrichum linariifolius</i>	flax-leaved aster	10	use plugs for this species
<i>Symphotrichum macrophyllum</i>	big-leaved aster	8	use plugs for this species
<i>Symphotrichum sagittifolius</i>	arrow-leaved aster	5	
<i>Symphotrichum shortii</i>	short's aster	8	
<i>Thalictrum dasycarpum</i>	purple meadow rue	5	
<i>Thalictrum dioicum</i>	early meadow rue	7	
<i>Trillium grandiflorum</i>	large flowered trillium	8	use plugs for this species
<i>Trillium recurvatum</i>	red trillium	5	use plugs for this species
<i>Uvularia grandiflora</i>	bellwort	7	use plugs for this species
<i>Viola pedata lineariloba</i>	bird's foot violet	9	use plugs for this species
<i>Viola pubescens</i>	yellow violet	5	use plugs for this species
<i>Zizia aptera</i>	heart-leaved meadow parsnip	10	

The following table should be planted in dry prairie areas at a seeding rate of at least 15 pounds per acre:

<b>Short Grass Dry Prairie Mix</b>			Grasses and forbs at an approximate 60/40 ratio
<b><u>Grasses and Grass-like</u></b>			
<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value</u>	<u>Notes</u>
<i>Bouteloua curtipendula</i>	side-oats grama	8	
<i>Carex bicknellii</i>	bicknell's/prairie sedge	10	
<i>Dichanthelium</i> sp.	panic grasses	5+	only use the higher quality species (ie-not implicatum)
<i>Eragrostis spectabilis</i>	purples love grass	3	
<i>Koeleria cristata</i>	June grass	7	
<i>Sporobolus cryptandrus</i>	sand dropseed	7	use plugs for this species
<i>Sporobolus heterolepis</i>	prairie dropseed	10	use plugs for this species
<i>Stipa spartea</i>	porcupine grass	7	
<b><u>Forbs</u></b>			
<i>Allium cernuum</i>	nodding wild onion	7	
<i>Amorpha canescens</i>	lead plant	9	
<i>Anemone cylindrica</i>	thimbleweed	6	
<i>Asclepias amplexicaulis</i>	sand milkweed	7	
<i>Asclepias hirtella</i>	tall green milkweed	10	
<i>Asclepias lanuginosa</i>	woolly milkweed	10	due to Monarch plight, trying to increase Asclepias is important!
<i>Asclepias tuberosa</i>	butterfly milkweed	9	
<i>Baptisia leucantha</i>	white wild indigo	8	
<i>Brickellia eupatorioides</i>	false boneset	6	
<i>Coreopsis lanceolata</i>	sand/lance-leaved coreopsis	5	
<i>Coreopsis palmata</i>	prairie coreopsis	6	
<i>Dalea purpurea</i>	purple prairie clover	7	
<i>Desmanthus illinoensis</i>	Illinois sensitive plant	3	
<i>Echinacea pallida</i>	pale purple coneflower	8	
<i>Gentiana puberulenta</i>	prairie gentian	10	use plugs for this species
<i>Liatris aspera</i>	rough blazing star	6	
<i>Lithospermum canescens</i>	hoary puccoon	8	use plugs for this species
<i>Lupinus perennis</i>	wild lupine	7	
<i>Pedicularis canadensis</i>	wood betony	9	
<i>Penstemon digitalis</i>	foxglove beard tongue	4	
<i>Phlox pilosa</i>	sand prairie phlox	7	
<i>Potentilla arguta</i>	prairie cinquefoil	5	
<i>Sisyrinchium albidum</i>	common blue-eyed grass	7	
<i>Solidago speciosa</i>	showy goldenrod	7	
<i>Symphyotrichum azureus</i>	sky-blue aster	8	
<i>Symphyotrichum oblongifolius</i>	aromatic aster	10	use plugs for this species
<i>Symphyotrichum laeve</i>	smooth blue aster	9	
<i>Viola pedata lineariloba</i>	bird's foot violet	9	use plugs for this species
<i>Zizia aptera</i>	heart-leaved meadow parsnip	10	

The following table should be planted in wetland areas at a seeding rate of at least 15 pounds per acre:

<b>Wet Prairie</b>			Grasses and forbs at an approximate 60/40 ratio
<b><u>Grasses, sedges, etc.</u></b>			
<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value</u>	<u>Notes</u>
<i>Calamagrostis canadensis</i>	blue joint grass	3	
<i>Carex annectens</i>	small yellow fox sedge	5	
<i>Carex bebbii</i>	bebb's sedge	6	
<i>Carex comosa</i>	bristly sedge	5	
<i>Carex frankii</i>	bristly cattail sedge	8	
<i>Carex hystricina</i>	porcupine sedge	5	
<i>Carex lupulina</i>	common hop sedge	7	use plugs for this species
<i>Carex lurida</i>	bottlebrush sedge	8	
<i>Carex muskingumensis</i>	palm sedge	8	
<i>Carex scoparia</i>	pointed broom sedge	7	
<i>Carex stricta</i>	common tussock sedge	5	
<i>Eleocharis elliptica</i>	golden-seeded spike rush	8	
<i>Eleocharis intermedia</i>	matted spike rush	8	
<i>Eleocharis obtusa</i>	blunt spike rush	3	Or other native Eleocharis species
<i>Juncus dudleyi</i>	Dudley's rush	4	
<i>Juncus effusus</i>	common/soft rush	7	
<i>Leersia virginica</i>	white grass	7	
<i>Scirpus atrovirens</i>	dark green bulrush	4	
<i>Scirpus cyperinus</i>	wool grass	6	
<i>Scirpus validus</i>	great/soft stem bulrush	5	
<i>Sparganium eurycarpum</i>	common bur reed	6	use plugs for this species
<i>Vallisneria americana</i>	eel grass	7	
<b><u>Forbs</u></b>			
<i>Acorus calamus</i>	sweet flag	7	
<i>Alisma subcordatum</i>	mud/water plantain	7	
<i>Angelica atropurpurea</i>	great angelica	7	
<i>Asclepias incarnata</i>	swamp milkweed	4	due to Monarch's plight, trying to increase Asclepias is important!
<i>Astragalus canadensis</i>	Canadian milkvetch	10	
<i>Bidens cernua</i>	nodding bur marigold	5	
<i>Bidens coronata</i>	tall swamp marigold	9	
<i>Cacalia suaveolens</i>	sweet Indian plantain	10	
<i>Cassia hebecarpa</i>	wild senna	9	
<i>Chelone glabra</i>	turtlehead	8	
<i>Elodea nuttallii</i>	slender waterweed	7	
<i>Filipendula rubra</i>	queen of the prairie	10	use plugs for this species
<i>Gentiana andrewsii</i>	bottle/closed gentian	8	
<i>Hibiscus laevis</i>	Halberd-leaved rose mallow	6	
<i>Hypericum pyramidatum</i>	great st. John's wort	10	
<i>Iris virginica shrevei</i>	wild blue iris	5	
<i>Liatris spicata</i>	marsh blazing star	6	use plugs for this species
<i>Lobelia cardinalis</i>	cardinal flower	7	use plugs for this species
<i>Lobelia siphilitica</i>	great blue lobelia	6	
<i>Ludwigia alternifolia</i>	seedbox	6	
<i>Ludwigia polycarpa</i>	false loosestrife	6	
<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value</u>	<u>Notes</u>
<i>Lycopus americanus</i>	common water horehound	5	



<i>Lythrum alatum</i>	winged loosestrife	7	
<i>Melanthium virginicum</i>	bunch flower	10	
<i>Mimulus ringens</i>	monkey flower	6	
<i>Napaea dioica</i>	glade mallow	10	
<i>Pedicularis lanceolata</i>	swamp betony	9	
<i>Peltandra virginica</i>	arrow arum	10	use plugs for this species
<i>Penthorum sedoides</i>	ditch stone crop	5	
<i>Physostegia virginiana</i>	obedient plant	6	
<i>Pontederia cordata</i>	pickerelweed	10	
<i>Potamogeton</i> sp.	pondweed	5+	Ensure native variety used.
<i>Ranunculus</i> sp.	buttercups	6+	Only choose from higher C-valued
<i>Rorippa islandica</i>	tough marsh cress	4	
<i>Rudbeckia subtomentosa</i>	sweet black-eyed Susan	9	
<i>Rumex orbiculatus</i>	great water/Marsh dock	10	
<i>Sagittaria graminea</i>	grass-leaved arrowhead	9	
<i>Symphyotrichum puniceum</i>	swamp aster	8	
<i>Symphyotrichum umbellatus</i>	flat top aster	9	
<i>Thalictrum dasycarpum</i>	purple meadow rue	5	
<i>Zizia aurea</i>	golden Alexanders	7	use plugs for this species

The following table should be planted in mesic (moderately moist) prairies at a seeding rate of at least 15 pounds per acre:

<b>Mesic Prairie</b>			Grasses and forbs at an approximate 60/40 ratio
<b><u>Grasses, sedges, etc.</u></b>			
<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value</u>	<u>Notes</u>
<i>Carex annectens</i>	small yellow fox sedge	5	
<i>Carex bicknellii</i>	bicknell's/prairie sedge	10	
<i>Dichanthelium</i> sp.	panic grasses	5+	only use the higher quality species (ie-not implicatum)
<b><u>Forbs</u></b>			
<i>Asclepias purpurascens</i>	purple milkweed	8	
<i>Asclepias incarnata</i>	swamp milkweed	4	due to Monarch's plight, trying to increase Asclepias is important!
<i>Asclepias tuberosa</i>	butterfly milkweed	7	due to Monarch's plight, trying to increase Asclepias is important!
<i>Cassia hebecarpa</i>	wild senna	9	use plugs for this species
<i>Coreopsis tripteris</i>	tall coreopsis	5	
<i>Dalea purpurea</i>	purple prairie clover	9	
<i>Desmodium canadense</i>	showy tick trefoil	4	
<i>Desmodium illinoense</i>	Illinois tick trefoil	9	
<i>Eryngium yuccifolium</i>	rattlesnake master	9	
<i>Filipendula rubra</i>	queen of the prairie	10	use plugs for this species
<i>Gentiana andrewsii</i>	bottle gentian	8	use plugs for this species
<i>Heuchera richardsonii</i>	prairie alum root	8	use plugs for this species
<i>Kuhnia eupatorioides</i>	false boneset	6	
<i>Liatris pycnostachya</i>	prairie blazing star	6	
<i>Liatris pycnostachya</i>	prairie blazing star	8	use plugs for this species
<i>Liatris spicata</i>	marsh blazing star	6	use plugs for this species
<i>Lupinus perennis</i>	wild lupine	7	
<i>Napaea dioica</i>	glade mallow	10	use plugs for this species
<i>Parthenium integrifolium</i>	wild quinine	10	
<i>Pedicularis lanceolata</i>	swamp betony	9	
<i>Physostegia virginiana</i>	obedient plant	6	
<i>Silphium laciniatum</i>	compass plant	5	
<i>Solidago speciosa</i>	showy goldenrod	7	
<i>Symphyotrichum laevis</i>	smooth blue aster	9	
<i>Symphyotrichum novae-angliae</i>	New England aster	4	
<i>Thalictrum dasycarpum</i>	purple meadow rue	5	
<i>Verbena stricta</i>	hoary vervain	4	
<i>Veronicastrum virginicum</i>	Culver's root	7	

The following table should be planted in woodlands at a seeding rate of at least 20 pounds per acre:

<b>Woodland Mix</b>			Grasses and forbs at an approximate 60/40 ratio
<b><u>Grasses, sedges, etc.</u></b>			
<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value</u>	<u>Notes</u>
<i>Bromus purgans</i>	hairy wood chess	5	
<i>Carex davisii</i>	awned graceful sedge	7	
<i>Carex frankii</i>	bristly cattail sedge	8	
<i>Carex pensylvanica</i>	common oak sedge	5	use plugs for this species
<i>Carex sprengeii</i>	long-beaked sedge	9	
<i>Elymus hystrix</i>	bottlebrush grass	5	
<i>Elymus villosus</i>	silky wild rye	5	
<i>Luzula multiflora</i>	wood rush	7	
<i>Muhlenbergia mexicana</i>	leafy satin grass	5	
<b><u>Forbs</u></b>			
<i>Agastache scrophulariaefolia</i>	purple giant hyssop	5	
<i>Allium cernuum</i>	nodding wild onion	7	
<i>Allium trioccum</i>	wild leek	7	use plugs for this species
<i>Anemone virginiana</i>	tall/Virginia anemone	5	use plugs for this species
<i>Aquilegia canadensis</i>	wild columbine	6	
<i>Asarum canadense</i>	wild ginger	7	use plugs for this species
<i>Asclepias exaltata</i>	poke milkweed	9	due to Monarch's plight, trying to increase Asclepias is important!
<i>Blephilia hirsuta</i>	wood mint	8	
<i>Dicentra cucullaria</i>	Dutchman's breeches	6	
<i>Dodecatheon meadia</i>	shooting star	6	
<i>Erythronium albidum</i>	white trout lily	5	use plugs for this species
<i>Isopyrum biternatum</i>	false rue anemone	8	use plugs for this species
<i>Mertensia virginica</i>	Virginia bluebells	5	
<i>Mitella diphylla</i>	bishop's cap	10	use plugs for this species
<i>Napaea dioica</i>	glade mallow	10	
<i>Osmunda claytoniana</i>	interrupted fern	9	use plugs for this species
<i>Pedicularis canadensis</i>	wood betony	9	
<i>Penstemon pallidus</i>	pale beard tongue	6	
<i>Phlox divaricata</i>	woodland phlox	5	use plugs for this species
<i>Polemonium reptans</i>	Jacob's ladder	5	
<i>Rudbeckia subtomentosa</i>	sweet black-eyed Susan	9	
<i>Sanguinaria canadensis</i>	bloodroot	6	use plugs for this species
<i>Silene stellata</i>	starry campion	6	use plugs for this species
<i>Solidago caesia</i>	blue-stemmed goldenrod	7	
<i>Solidago flexicaulis</i>	broad-leaved goldenrod	7	
<i>Solidago ulmifolia</i>	elm-leaved goldenrod	5	
<i>Symphyotrichum cordifolium</i>	heart leaved blue wood aster	7	
<i>Symphyotrichum laevis</i>	smooth blue aster	9	
<i>Symphyotrichum macrophyllum</i>	big-leaved aster	8	use plugs for this species
<i>Symphyotrichum sagittifolius</i>	arrow-leaved aster	5	
<i>Symphyotrichum shortii</i>	short's aster	8	
<i>Thalictrum dasycarpum</i>	purple meadow rue	5	
<i>Thalictrum dioicum</i>	early meadow rue	7	
<i>Trillium grandiflorum</i>	large flowered trillium	8	use plugs for this species
<i>Trillium recurvatum</i>	red trillium	5	use plugs for this species
<i>Uvularia grandiflora</i>	bellwort	7	use plugs for this species
<i>Viola pubescens</i>	yellow violet	5	use plugs for this species

The following list can be used for supplemental seeding at a rate of 10 pounds per acre (assumes only for supplemental purposes, otherwise increase rate to 20 pounds per acre):

<b>High Diversity Mix</b>			Grasses and forbs at an approximate 60/40 ratio
<b><u>Grasses and Grass-like</u></b>			
<b><u>Botanical Name</u></b>	<b><u>Common Name</u></b>	<b><u>C-value</u></b>	<b><u>Notes</u></b>
<i>Bouteloua curtipendula</i>	side-oats grama	8	
<i>Carex bicknellii</i>	bicknell's/prairie sedge	10	
<i>Carex brevior</i>	plains oval sedge	4	
<i>Hierochloa odorata</i>	vanilla/sweet grass	9	
<i>Koeleria cristata</i>	June grass	7	
<i>Muhlenbergia mexicana</i>	leafy satin grass	5	
<i>Sporobolus cryptandrus</i>	sand dropseed	7	use plugs for this species
<i>Sporobolus heterolepis</i>	prairie dropseed	10	use plugs for this species
<b><u>Forbs</u></b>			
<i>Allium cernuum</i>	nodding wild onion	7	
<i>Anemone virginiana</i>	tall anemone	5	
<i>Asclepias tuberosa</i>	butterfly milkweed	7	due to Monarch's plight, trying to increase Asclepias is important!
<i>Asclepias verticillata</i>	whorled milkweed	4	due to Monarch's plight, trying to increase Asclepias is important!
<i>Aster umbellatus</i>	flat-top aster	9	
<i>Brickellia eupatorioides</i>	false boneset	6	
<i>Cassia hebecarpa</i>	wild senna	9	
<i>Coreopsis lanceolata</i>	sand coreopsis	5	
<i>Coreopsis palmata</i>	prairie coreopsis	6	
<i>Dalea candidum</i>	white prairie clover	5	
<i>Dalea purpurea</i>	purple prairie clover	9	
<i>Desmodium illinoense</i>	Illinois tick trefoil	9	
<i>Dodecatheon meadia</i>	shooting star	6	
<i>Echinacea pallida</i>	pale purple coneflower	8	
<i>Eryngium yuccifolium</i>	rattlesnake master	9	
<i>Geum triflorum</i>	prairie smoke/avens	10	
<i>Helianthus occidentalis</i>	western sunflower	10	
<i>Heuchera richardsonii</i>	alum root	8	
<i>Liatris aspera</i>	rough blazing star	6	
<i>Liatris pycnostachya</i>	prairie blazing star	6	
<i>Lupinus perennis</i>	wild lupine	7	
<i>Monarda punctata</i>	horse mint	5	
<i>Parthenium integrifolium</i>	wild quinine	10	
<i>Pedicularis canadensis</i>	wood betony	9	
<i>Rudbeckia subtomentosa</i>	sweet black-eyed Susan	9	
<i>Sisyrinchium campestre</i>	blue-eyed grass	10	
<i>Solidago ptarmicoides</i>	stiff aster	10	
<i>Solidago speciosa</i>	showy goldenrod	7	
<i>Symphotrichum laeve</i>	sky-blue aster	9	
<i>Veronicastrum virginicum</i>	culver's root	7	
<i>Zizia aurea</i>	golden Alexanders	7	

The following table consists of the trees that should start to be eliminated from SBV:

<u>Scientific Name</u>	<u>Common Name</u>
<i>Acer negundo</i>	box elder
<i>Acer</i> spp.	maple
<i>Morus</i> spp.	mulberry
<i>Picea</i> spp.	spruce
<i>Pinus</i> spp.	pine
<i>Prunus serotina</i>	black cherry
<i>Prunus virginiana</i>	chokeberry
<i>Robinia pseudoacacia</i>	black locust
<i>Ulmus pumila</i>	Siberian elm

## Appendix G

### Definitions

Davey Resource Group defines the following terms found within this report as follows:

**Dominant vegetation.** A species that occurs in a monoculture comprising greater than 50% areal cover in any given area.

**Locally dominant vegetation.** A species that occurs in monoculture patches comprising 20–50% areal cover in any given area.

**Plots.** Permanent monitoring location that is 10 feet by 20 square feet, indicated by rebar.

**Prairie.** An ecotype with less than 5% overhead canopy.

**Savannah.** An ecotype with overhead canopy coverage of 5–60%.

**Wetland.** An ecotype where soils are saturated at or near the surface at a frequency and duration long enough to support a dominance of wetlands plants and the development of hydric soils.

**Woodland.** An ecotype with overhead canopy coverage of greater than 60%.

## Appendix H

### References

- Applied Ecological Services. 2003. *Sanctuary of Bull Valley Ecological Assessment and Restoration Plan*. Completed for Knickerbocker Properties, LLC.
- Applied Ecological Services. 2005. *Sanctuary of Bull Valley Ecological Assessment and Restoration Plan*. Completed for The Roslin Group.
- Freyman, W.A. and L.A. Masters. 2013. *The Universal Floristic Quality Assessment (FQA) Calculator* [Computer program]. <http://universalFQA.org>. Accessed 2015.
- Swink, F. and G. Wilhelm. 1994. *Plants of the Chicagoland Region*. 4<sup>th</sup> ed. Indianapolis: Indiana Academy of Science.

## **Appendix I**

### **Resumes of Professional Staff**

**Ken Christensen** is a senior biologist with more than 30 years of experience in the natural resource field. Mr. Christensen is involved in all aspects of wetlands and stream restoration projects, including design, planting, and implementation. He is also involved with monitoring of mitigation and restoration projects to ensure that such endeavors reach a successful conclusion. Mr. Christensen assists in plant surveys and wetlands delineations and in the field identification of vertebrate populations, especially amphibians, reptiles, and mammals. Proficient with AutoCAD® software, Mr. Christensen is responsible for managing the Global Navigation Satellite System (GNSS) data collection and AutoCAD® mapping operations for all natural resource studies. As an International Society of Arboriculture Certified Arborist (OH-0690A), he performs tree appraisals and inventories and also develops tree preservation plans. Mr. Christensen is a LEED® Accredited Professional and has received the following training: American Ecological Engineering Society Wetland Mitigation Design from Virginia Polytechnic Institute and State University; AutoCAD® for Stream Restoration and Monitoring from North Carolina Cooperative Extension; North Carolina Stream Restoration Institute's Stream Classification and Assessment Program and Stream Restoration Design Principles. Mr. Christensen is prequalified by Ohio Department of Transportation for wetland mitigation. He has also completed training through Ohio Environmental Protection Agency for conducting the following: Headwater Habitat Evaluation Index (HHEI); Qualitative Habitat Evaluation Index (QHEI); Ohio Rapid Assessment Method (ORAM) v.5; and Vegetation Index of Biotic Integrity (VIBI). He is a member of the International Society of Arboriculture, Ecological Landscaping Association, and Northern Ohio Association of Herpetologists. Mr. Christensen holds a Bachelor of Science degree in conservation from Kent State University.

**Thomas Daly** is a field technician/biologist with Davey Resource Group's Natural Resources Consulting team in Chicago. Mr. Daly assists with ecological and restoration services, including woody and herbaceous invasive species control, prescribed burning, native plantings, and slope stabilization. He is a licensed commercial applicator in Illinois (CA11160946) for pesticide applications, including applications in aquatic habitats and rights-of-way. He is trained in first aid, CPR, Department of Transportation hazardous material use and transport, and chainsaw and brush saw safety and use. Prior to joining Davey Resource Group, Mr. Daly gained valuable experience as an intern for the McHenry County Conservation District developing his knowledge of Midwest woody plant identifications and ecological restoration practices. Mr. Daly worked on fish, mussel, and bird surveys, wetland delineations, and database management. In 2014, he worked on the Enbridge pipeline project performing tree assessment and inventories. He has also shown strong interest in wetland delineations and just completed basic and advanced wetland delineation training from the University of Wisconsin-La Crosse University. He is also currently working towards his International Society of Arboriculture certification. Mr. Daly earned a Bachelor of Science in environmental studies and sustainability from Northern Michigan University.

**Nicky Obenauf** is an ecologist and project manager for Davey's Natural Resource Consulting office in Chicago. She has over seven years of experience in the environmental conservation field and is responsible for supervising field crews, communicating with clients, Homeowners Association (HOA) members, landowners, and government officials regarding project scope of work, status, and schedule. When appropriate, she performs fieldwork, including planting, seeding, implementing erosion control, brush cutting, prescribed burning, applying herbicides, ecological restoration plans and implementation, landscape development, herbaceous vegetation assessments (including Floristic Quality Assessments), water quality monitoring, botanical monitoring, and wildlife monitoring. She also prepares and delivers public educational materials and outreach presentations to disseminate technical scientific data in a format that can be easily understood by the general public of all ages. Locally, Ms. Obenauf has been a trained Advanced OakKeeper and Plants of Concern monitor in the Chicago Wilderness area. She is



certified through the Illinois Department of Natural Resources as a Certified Prescribed Burn Manager (#10-104). She is also certified through the Illinois Department of Agriculture with her Commercial Applicator's pesticide license in Illinois (#CA11136309). Ms. Obenauf has completed OSHA 30-hour General Industry and IWEER Wetland Delineation training. Before joining Davey Resource Group, she acted as the steward for Wright Woods Forest Preserve within the Lake County Forest Preserve District of Illinois, as a Certified Interpretive Guide through the National Association for Interpretation, and as a wildlife coordinator and monitor for the Chicago Wilderness Habitat Project. Ms. Obenauf volunteers for the Wildlife Biologist for the Illinois Department of Natural Resources in a variety of roles (for example, monitoring wildlife-including butterflies, dragonflies, amphibians, bats, and songbirds; and banding waterfowl). Ms. Obenauf is a board member for the Environmental Defenders of McHenry County and a member of the Stewardship Network of Michigan, the Society for Ecological Restoration, and The Land Conservancy of McHenry County. Ms. Obenauf graduated from Northern Michigan University with a Bachelor of Science degree in environmental conservation with a biology minor (emphasis in wildlife ecology).

**Michele Warner** is a botanist with Davey Resource Group's Natural Resource Consulting office in Chicago, Illinois. Ms. Warner assists with a wide variety of ecological projects including invasive species management, ecological restoration, floristic quality assessments (FQA), prescribed fire, and other ecological surveys. Prior to joining Davey Resource Group, Ms. Warner gained valuable experience during her four years with the National Park Service at Mesa Verde National Park, Colorado and Indiana Dunes National Lakeshore, Indiana (which serviced Lincoln Boyhood National Memorial, Indiana, Sleeping Bear National Lakeshore, Michigan, and Cuyahoga Valley National Park, Ohio) where she implemented integrated and adaptive resource management techniques. Her experience includes native and non-native flora identification, vegetation and fuel load sampling to determine the effects of prescribed fire regimes in a variety of plant communities, mechanical, biological, and chemical control of invasive species, and prescribed burning. She provided technical and motion sensor photography, botanical training, and coordination of large groups of volunteers. She wrote grant applications and performed boundary surveys and repairs. Ms. Warner completed Karner blue butterfly population counts, habitat restorations, and determined the effects of deer browse on Karner blue butterfly habitats. She performed stream health assessments including macroinvertebrate sampling and vertebrate habitat evaluations including bat surveys and peregrine falcon and other breeding bird surveys. Ms. Warner holds an Illinois Commercial Pesticide Applicator license (CA 11158763), and completed S-190 Intro to Wildland Fire Behavior, S-130 Firefighter Type II, IWEER Wetland Delineation training. She graduated from Grand Valley State University with a Bachelor of Science in natural resources management and a minor in biology.