Wetland Management Plan for Pleasant Valley Conservancy

State Natural Area No. 551

Managed by The Savanna Oak Foundation, Inc.

Vermont Township, Dane County, Wisconsin

Integrated Restorations, LLC

Ecological Restoration & Land Management Services

www.ir-wi.com

Preparer:

Craig A. Annen

Operations Manager & Senior Ecologist

Integrated Restorations, LLC

308 North Nine Mound Road
Verona, WI 53593-1036
(608) 547-1713 (cell)
www.ir-wi.com

Cover Image by Amanda J. Budyak

First Edition: December 2017

Second Edition: February 2024

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Report Documentation Page

PROPERTY OWNERS

_____ _____

Katherine M. Brock, *Owner* date

_____ _____

The Prairie Enthusiasts, *Easement Holder* date

ECOLOGICAL ADVISORY RESOURCES

_____ _____

Amanda Budyak, *Site Manager* date

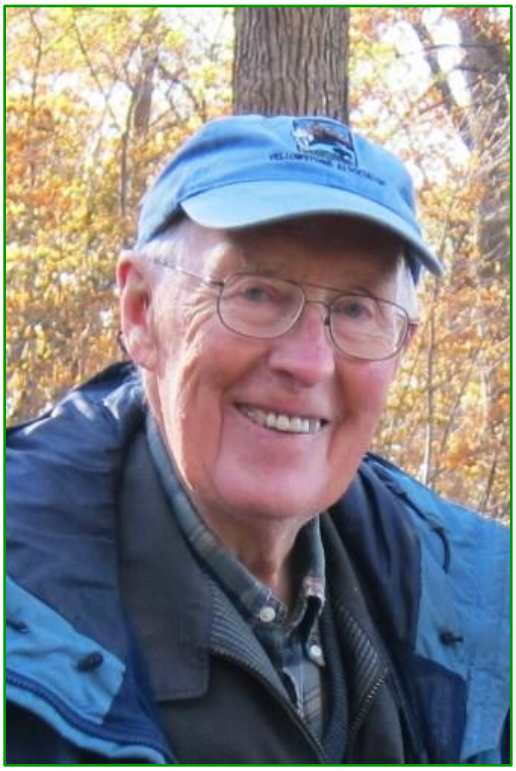
_____ _____

Susan M. Slapnik*, Board of Directors* date

_____ _____

Craig A. Annen*, Integrated Restorations* date

In Commemoration of Dr. Thomas D. Brock
(1926 – 2021)



Contents

Executive Summary

- The Savanna Oak Foundation, Inc. and The Prairie Enthusiasts, Inc. manage the 143-acre Pleasant Valley Conservancy State Natural Area, located at the junction of Pleasant Valley Road and County Road F, Vermont Township, Dane County, Wisconsin.
- Pleasant Valley Conservancy supports a mixture of species-rich upland and wetland habitats, along with associated wetland-upland transition zones.
- The Pleasant Valley Conservancy wetland is 33.74 acres in area. Several wetland types are present at the Pleasant Valley Conservancy, forming a mosaic wetland complex. This complex consists of remnant elements of riparian floodplain, aquatic, emergent aquatic, peaty calcareous sedge meadow, wet prairie, and calcareous fen/spring.
- Hydrologic inputs for the wetland come from surface flow (the wetland is bisected by reaches of both the East Branch of the Blue Mounds Creek and Pleasant Valley Creek), numerous calcium-rich springs that occur throughout the wetland, and runoff from the surrounding drainage basin. The East Branch of the Blue Mounds Creek is part of the Black Earth Creek Priority Watershed drainage system.
- Wet and wet-mesic prairie buffer zones have been established along the northern wetland margins to connect adjacent vegetation communities along a wetland-to-upland continuum, increase habitat diversity, and capture sediment eroding from the uplands before it can enter the wetland system. These buffers also provide refuge habitat to upland species during drought years.
- Offsite impacts and inputs related to agriculture and urban development are minimal in the surrounding landscape (see Appendix C).
- The present ecological condition of this remnant wetland complex is exceptional. As of 2024, native plant species richness of the Pleasant Valley Conservancy Wetland Complex is S = 187. The collective Floristic Quality Index (FQI) value of the wetlands is 67.1 (mean coefficient of conservatism = 4.9), indicative of a natural area of exceptional quality. Twenty-four percent of the

plant species present have a coefficient of conservatism (C) value ≥ 7; Nine percent of species have a C value ≥ 8. One Wisconsin-Threatened species, beaked spike rush (*Eleocharis rostellata*) and three Wisconsin-Special Concern species, low nut rush (*Scleria verticillata*), glade mallow (*Napaea dioica*), and sweet Indian plantain (*Hasteola [Cacalia] suavolens*) have been observed in the complex.

- Potential species richness in the wetland complex is enhanced at multiple trophic levels by the presence of numerous examples of microtopographic and site-scale heterogeneity, including internal drainage channels, riffle areas, shaded areas under woody vegetation, sedge tussocks (numerous rarefraction species occur in the interstitial spaces among tussocks), alluvial pools, open water margins, tree-tip mounds, nurse logs, and differences in substrate (five distinct soil series are present throughout the wetland complex).
- The remnant wetland complex at the Pleasant Valley Conservancy is a gene bank of local plant genetic material representing the historical wetlands of the greater Blue Mounds Creek Watershed and Western Dane County.
- Aquatic invasive species pose a threat to this wetland complex due to its location along the reaches of three creeks, which can act as dispersal corridors.
- Active aquatic invasive species management has been conducted to suppress populations of reed canarygrass (*Phalaris arundinacea*), hybrid cattail (*Typha* x *glauca*), and sandbar willow (*Salix exigua*) occurring in the wetland.
- Independent post-treatment monitoring surveys conducted from 2019 and 2022 demonstrated that aquatic invasive species suppression efforts were accomplishing intended management goals, with areas formerly dominated by *Typha* x *glauca* and *Phalaris* ranking between the 'fair' and 'excellent' provisional floristic quality benchmarks for sedge meadows in the Driftless Area (Appendix B).
- The vegetation community has responded positively to active management and invasive species suppression efforts: Compared to baseline vegetation data, species richness increased 73%, and floristic quality by 37% (Table 1).
- The *Phalaris* and *Typha* x *glauca* invasions have been reversed, but propagule pressure from the surrounding landscape continues to facilitate the need for

follow-up management efforts to mitigate the impacts of these invasive species.

- The Pleasant Valley Conservancy Wetland Complex provides critical wetland habitat in the generally-dry Driftless Area of southwestern Wisconsin.
- Offsite compensatory mitigation of a wetland of this diversity and quality would be exceedingly difficult and expensive.
- As of this writing, the Savanna Oak Foundation, Inc. is preparing a broader site plan and vision for future management goals and desired outcomes for the entire Conservancy (including wetland and upland plant communities).

General Ecological Management Goals

- Oppose aquatic invasive species incursions and maintain remnant wetland communities in their diverse condition to provide ecosystem services (such as carbon storage and water purification) for the Blue Mounds Creek Watershed.
- Prohibit reintroductions of *Phalaris* and *Typha* x *glauca* at Pleasant Valley Conservancy SNA.
- Routinely scout for the presence of pioneer populations of high-impact aquatic invasive species: *Lythrum salicaria*, *Typha angustifolia* and *T*. x *glauca*, *Phragmites*, *Glyceria maxima*, and *Nasturtium officianale*. Attempt to eradicate any populations as soon as they are discovered.
- Continue to manage buffer prairies along the wetland-to-upland transition.
- Continue to selectively remove stands of sandbar willow (*Salix exigua*) from wetland areas to prevent indirect hydrological disturbances correlated with the high evapotranspiration rate of this species.
- Reimpose historical fire patterns and frequency to the wetland communities present, where appropriate.
- Enhance habitat quality for wildlife across all trophic levels to maximize species richness and diversity.
- Conduct annual surveys and continue to document the biological and ecological elements of this exceptionally-diverse wetland complex.
- Increase the distribution and abundance of species of conservation concern to maintain these populations in a favorable conservation status (viable population sizes, metapopulation gene transfer among adjacent natural areas, and positive population regeneration).

Management Accomplishments and Timeline (2018 – 2019)

- Removed stands of *Salix exigua* occurring within the wetland complex. Treated freshly cut stumps with 25% (v/v) OS triclopyr with bark oil diluent. Piled and burned slash over areas where native species were absent (*17 January 2018*).
- Removed beaver dams to maintain water levels in wetland (*16 and 26 April, 11 and 22 October, 5 – 11 November, and 13 December 2019*).
- Conducted prescribed burns in the wetland and wetland buffer zones (*Valley Prairie was burned 16 March 2018 and 21 March 2019, cattail treatment areas were burned 1 June 2018 to reduce cattail litter and facilitate planting, Crane Prairie was burned 21 March 2019, and the entire wetland was burned 9 April 2019*). Savanna Oak Foundation staff installed and maintained firebreaks for these burns.
- Collected seeds from 18 wetland species and sowed them into cattail treatment areas; sowing occurred after controlled burns (*28 March, 1 May, and 17 July 2018; 10 – 12 April and 30 July 2019*).
- Continued with *Phalaris arundinacea* suppression throughout the entire wetland. *Phalaris* was spot-treated with a 0.5% (v/v) mixture of clethodim with 1% (v/v) MSO-NIS (*14 June 2018 and 5 June 2019*).
- Conducted follow-up treatments on clones of *Typha* x *glauca* managed during the 2016-2017 growing seasons. Actively-growing cattail culms were mowed with a STIHL FS110 clearing saw and a 3.85% (v/v) mixture of imazapyr IPA salt in 0.25% (v/v) water conditioning agent with 2% Induce sticking agent was applied to freshly cut stumps (*8-10 August 2018*).
- Thoroughly scouted the PVC wetland complex to determine if any sympatric populations of *Typha angustifolia* were present (*throughout 2018 and 2019 growing seasons*).
- Thoroughly scouted the PVC wetland complex to determine if any undetected clones of *Typha* x *glauca* were present (*throughout 2018 and 2019 growing seasons*).

- Thoroughly scouted the PVC wetland complex for the presence of additional aquatic invasive species: Purple loosestrife (*Lythrum salicaria*), tall manna grass (*Glyceria maxima*), common reed (*Phragmites australis* subsp. *australis*). (*throughout 2018 and 2019 growing seasons; no pioneer populations of any of these species were observed during this survey period*).
- An independent post-treatment wetland survey was conducted by Pat Trochlell and Tom Bernthal to evaluate plant community responses to aquatic invasive species treatments (*8 July 2018*) (Appendix B). Since this survey was conducted shortly after invasive species management, the native species response to management consisted largely of early successional species with low coefficient of conservatism values, and the response was ranked as "fair", according to WDNR provisional benchmarks.
- Ryan O'Connor and Kevin Doyle WDNR conducted a reference wetland survey in the wetland for the Bureau of Natural Heritage Conservation (NHC) (*15 August 2019*) (Appendix C). This survey rated the Pleasant Valley Conservancy wetland as 'minimally disturbed' with minimal changes in the structure and function of the plant community.

Management Accomplishments and Timeline (2020 – 2023)

- Removed stands of *Salix exigua* occurring within the wetland complex. Treated freshly cut stumps with 25% (v/v) OS triclopyr with bark oil diluent. Piled and burned slash over areas where native species were absent (*August – September 2021, January 2022 and follow up treatments August – September 2022*).
- Removed beaver dams to maintain water levels in wetland (*24 and 28 April, 5 May, 13 June, 11 October, 9 and 23 November 2020, 6 – 14 September, 14 – 25 October, and 8 November 2022*).
- Conducted prescribed burns in the wetland and wetland buffer zones[1] (*Valley Prairie was burned 9 March 2021, 15 March 2022, and 21 March 2023, cattail treatment areas were burned 24 March 2023 (unburned fuels were re-ignited 26 April 2023) to reduce cattail litter and facilitate planting, Crane Prairie was burned 21 March 2021, and the northeastern half of the wetland up to Pleasant Valley Creek was burned 10 April 2021*). Savanna Oak Foundation staff installed and maintained firebreaks for these burns.
- Collected seeds from a total of 36 wetland species and sowed them into cattail treatment areas; sowing occurred after controlled burns (*April 2020, 4 and 29 March 2021 (27 species), 27 April 2022 (28 species), 4 and 13 April 2023 (25 species).*
- Continued with *Phalaris arundinacea* suppression. *Phalaris* was spot-treated with a 0.5% (v/v) mixture of clethodim with 1% (v/v) MSO-NIS (*4 June 2020, 4 June 2021, 1 June 2022, and 7 – 8 June 2023; upstream reach of Pleasant Valley Creek at Richard & Kelle Anderson property was also treated on 10 June 2021 and 3 June 2022 to curtail seed rain into PVC wetland*).
- Conducted treatments on clones of *Typha* x *glauca* detected during previous years' scouting efforts. Actively-growing cattail culms were mowed with a STIHL FS110 clearing saw and a 3.85% (v/v) mixture of imazapyr IPA salt in

[1] Pleasant Valley Conservancy is located within the DNR Intensive Fire Control Zone, and burn permits were suspended during the 2020 covid19 pandemic.

0.25% (v/v) water conditioning agent with 2% Induce sticking agent was applied to freshly cut stumps (*17 – 31 July 2020, 30 July – 10 August 2021, 15 August – 1 September 2022, 1 – 8 August 2023*).

- Thoroughly scouted the PVC wetland complex to determine if any sympatric populations of *Typha angustifolia* were present (*2020 through 2023 growing seasons*).
- Thoroughly scouted the PVC wetland complex to determine if any undetected clones of *Typha* x *glauca* were present (*2020 through 2023 growing seasons*).
- Thoroughly scouted the PVC wetland complex for the presence of additional aquatic invasive species: Purple loosestrife (*Lythrum salicaria*), tall manna grass (*Glyceria maxima*), common reed (*Phragmites australis* subsp. *australis*). (*2020 through 2023 growing seasons; a small pioneer population of purple loosestrife was detected on a neighboring property near the northwest border of the Pleasant Valley Conservancy marsh. This population was treated by Savanna Oak Foundation staff in July 2022, with a follow up treatment in July 2023*).
- An independent post-treatment wetland survey was conducted by Pat Trochlell, Tom Bernthal, and Rob Baller to evaluate plant community responses to aquatic invasive species treatments (*20 September 2022*) (Appendix B). In this survey, six separate *Typha*- and *Phalaris*-treatment areas were evaluated. One treatment area was ranked as "fair", two areas as "good" and the remaining three treatment areas were ranked as being in "excellent" condition, according to WDNR provisional benchmarks.

Ecological and Landscape Context

Biological and Ecological Components

Summary of Wetland Communities

Several wetland types are present at Pleasant Valley Conservancy State Natural Area, forming a **mosaic wetland complex**. This complex consists of elements of **riparian floodplain**, **aquatic**, **emergent**, **shrub-carr**, **peaty calcareous sedge meadow**, **wet prairie**, and **calcareous fen/spring.** These ecotonal communities intergrade continuously (and often imperceptibly) along gradients of hydrology, substrate, and management history. Species-rich **wet** and **wet-mesic prairie buffers** occur along the northern border of the wetland complex. Refer to wetland unit map (Figure 1) for approximate locations of these communities.

The site heterogeneity resulting from the presence of a mosaic of several intergrading wetland types within the same wetland complex promotes and supports species richness and diversity across multiple trophic levels. Each wetland community will support its own habitat specialists, while wetland generalists will occupy multiple communities. Potential species richness in the wetland complex is enhanced by the presence of numerous examples of microtopographic and site-scale heterogeneity, including internal drainage channels, riffle areas, shaded areas under woody vegetation, sedge tussocks and interstitial spaces among tussocks, alluvial pools and mudflats, open water margins, tree-tip mounds, nurse logs, and differences in substrate (five distinct soil series are present throughout the wetland complex).

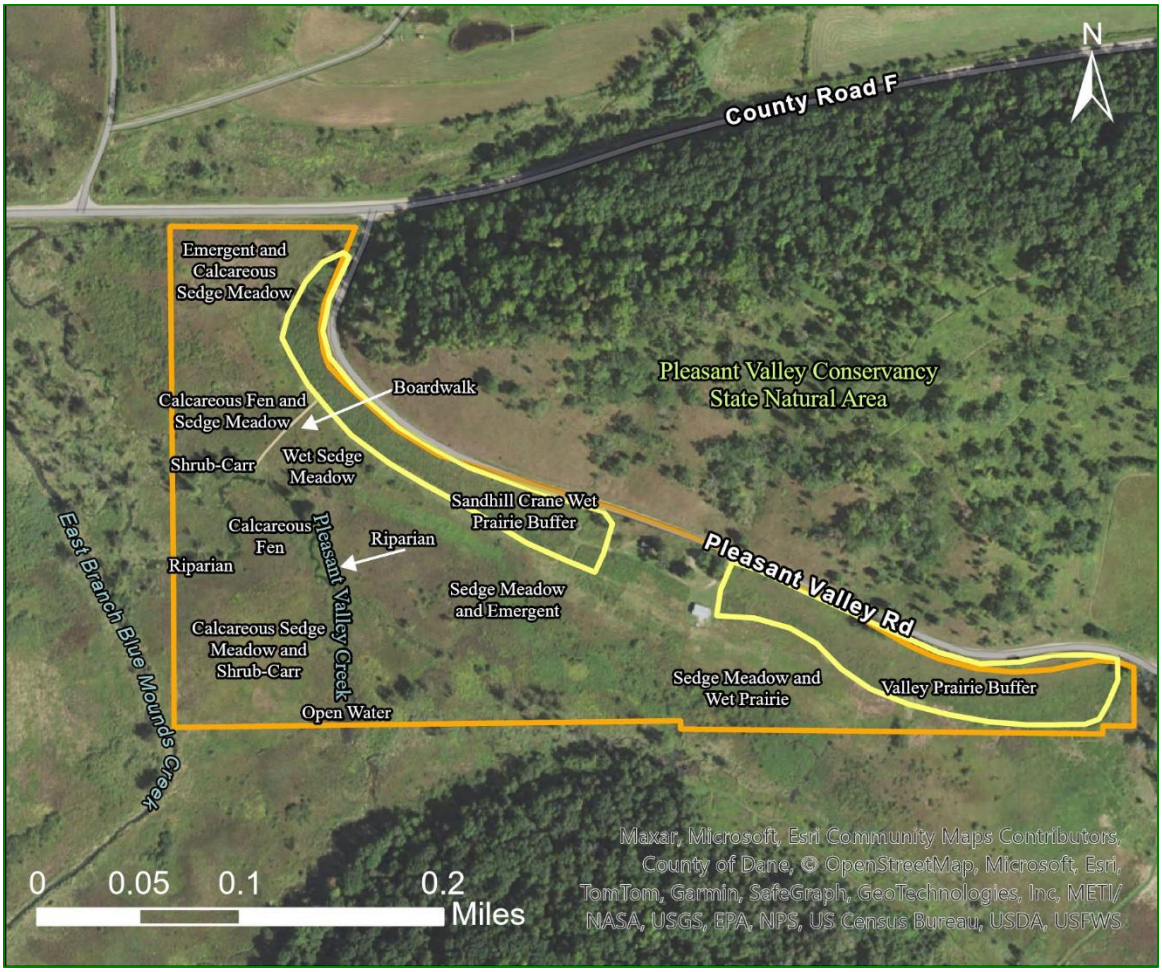


Figure 1. Wetland plant communities at the Pleasant Valley Conservancy Wetland Complex.

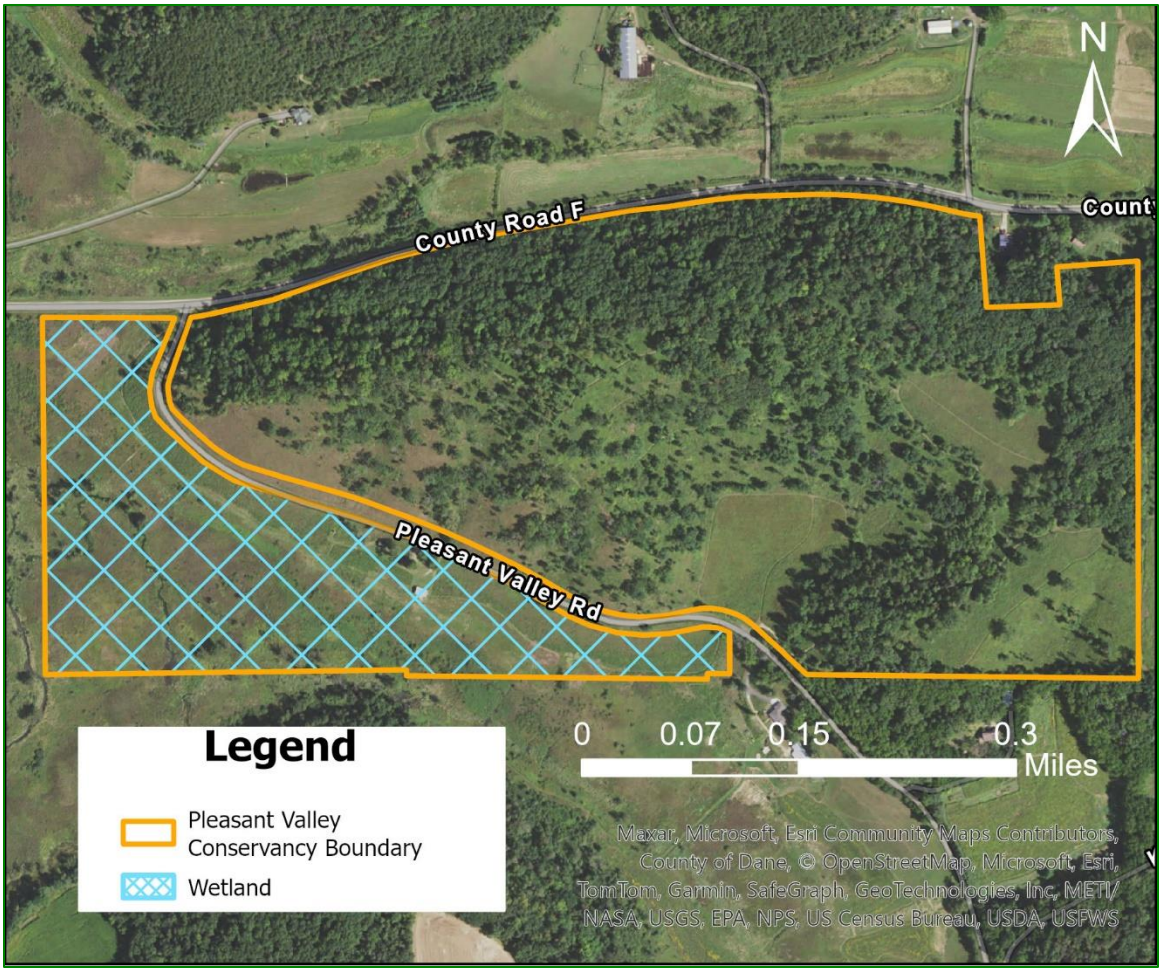


Figure 1b. Pleasant Valley Conservancy Wetland Complex in Relation to Surrounding Uplands.

The 33.74-acre Pleasant Valley Conservancy Wetland Complex is part of a larger, 140-plus-acre wetland in five private ownerships that occurs in Pleasant Valley and along the floodplain of the East Branch of the Blue Mounds Creek. The Pleasant Valley Conservancy wetland has been actively managed since 1999 and has permanent protection as a dedicated State Natural Area (number 551).

Independent post-treatment monitoring surveys conducted from 2019 and 2022 demonstrated that aquatic invasive species suppression efforts funded by WDNR grants AIRR-213-17 and ACEI-200-18, and the Savanna Oak Foundation, Inc., were accomplishing intended management goals, with areas formerly

dominated by *Typha* x *glauca* and *Phalaris* ranking between the 'fair' and 'excellent' provisional floristic quality benchmarks for sedge meadows in the Driftless Area (Appendix B).

A WDNR Natural Heritage Conservation (NHC) survey conducted in 2019 determined that the Pleasant Valley Conservancy wetland was rated as minimally disturbed, with minimal changes to the structure and function of the plant community (Appendix C). Field measures of habitat quality measured during this survey determined that the wetland possessed a cover-weighted mean coefficient of conservatism value of W_c = 5.2, placing it in the 'good' quality category (Tier 2) of the WDNR provisional floristic quality benchmarks for sedge meadows in the Driftless Area.

Summary of Vegetation Composition

Botanical nomenclature (including flowering plants, ferns, fern allies, and bryophytes) follows *Flora of North America* (1993 et seq.), except where a volume is still in compilation, in which case nomenclature follows the University of Wisconsin State Herbarium (Wetter et al. 2001).

The vegetational composition of the Pleasant Valley Conservancy Wetland Complex is exceptional. As of 2024, a total of 187 native vascular plant species from 114 genera and 52 different botanical families have been recorded within the Pleasant Valley Conservancy Wetland Complex (Appendix A). Ninety-three species belong to one of five dominant plant families (Asteraceae (37), Cyperaceae (29), Poaceae (11), Lamiaceae (9), or Ranunculaceae (7)). One species, beaked spike rush (*Eleocharis rostellata*) is listed as Threatened in Wisconsin and is highly associated with fen wetland habitats. Three species, low nut rush (*Scleria*

verticillata), glade mallow (*Napaea dioica*), and sweet Indian plantain (*Hasteola [Cacalia] suavolens*) are considered Special Concern in Wisconsin; the latter has been observed by multiple botanists over several growing seasons, indicating that it is a stable population.

A Floristic Quality Index (FQI) was calculated as FQI = mean C $\sqrt{S}$ where S = the native species richness of the site (Swink and Wilhelm 1994). Coefficient of conservatism (C) values were assigned to all vascular plant species from Bernthal (2003). Forty-five plant species (24.1% of sampled species richness) had coefficient of conservatism values ≥ 7, and 17 species (9.1% of sampled species richness) had coefficient of conservatism values ≥ 8; such species typically only occur in the highest-quality, least-disturbed natural areas, and demonstrate the high proportion of habitat specialists inhabiting this wetland. The collective Floristic Quality Assessment Index (FQI) for the entire complex was 67.1, with a mean c value of 4.9 (mode = 4). These estimates indicate that the Pleasant Valley Conservancy Wetland Complex is a natural area with exceptional conservation value (Swink and Wilhelm 1994).

Additional noteworthy plant species include bog aster (*Symphyotrichum* [*Aster*] *boreale*), bog-panicled sedge (*Carex diandra*), fen-panicled sedge (*Carex prairea*), slender sedge (*Carex leptalea*), Tuckerman's sedge (*Carex tuckermanii*), fringed gentian (*Gentianopsis crinita*), and Huron green orchid (*Platanthera huronensis*); these species are rarely observed in the unglaciated portions of southwestern Wisconsin and have high coefficient of conservatism values. The hemi-parasitic swamp betony (*Pedicularis lanceolata*) is also present in abundance, as are two species that have been empirically-determined to be

strong competitors against reed canarygrass, hairy-fruit sedge (*Carex trichocarpa*) and great water dock (*Rumex* [orbiculatus] *britannia*).

Of the total species richness, five species from three botanical families were trees, four species from two families were shrubs, 127 species from 38 botanical families were forbs, 46 species from four families were graminoids (grasses, sedges, or rushes), two species from two families were ferns, and there are two species of fern ally (*Equisetum arvense* and *E. fluviatile*), one species of liverwort, and an unknown number of moss species. Nineteen species of *Carex* sedge are present, along with five species of spike rush (*Eleocharis*) and four species of *Juncus*. Seventeen species listed in Curtis (1959: 579, table XVIII-1) as modal fen species also inhabit the wetland complex, 14 of which were prevalent species in the PEL surveys (Appendix A). This represents 45% of the plant species diversity sampled in fen communities during the UW-Madison Plant Ecology Laboratory (PEL) surveys and provides evidence that portions of the wetland are fen-like in their function and composition. Seven additional species listed in Flora of North America (1993 et seq.) as either fen indicators or indicators of calciphilic conditions were also recorded in the botanical surveys (Appendix A). *Sphagnum* moss and both male and female gametophytes (antheridia and archegonia) of black-lined liverwort (*Marchantia polymorpha*) are abundant in the western portions of the wetland complex (Figures 2 - 4). Although often overlooked, these so-called 'primitive' plants exert an influence on wetland ecosystem services that is disproportionate to their size (cf. Rojas & Zedler 2015).

The plant community has responded positively to active management and invasive species suppression efforts: Compared to baseline vegetation survey

data collected prior to 2016 (Appendix D), species richness has increased 73% and floristic quality by 37% (Table 1).

Figures 2 – 5 (L to R). *Top*: Black-lined liverwort. Archegonia of black-lined liverwort. *Bottom*: Black-lined liverwort on snag log in Pleasant Valley Creek. *Platanthera huronensis*.

Table 1. Summary of Plant Species Composition at Pleasant Valley Conservancy Wetland

	S	FQA	mean C	C ≥ 7	C ≥ 8
Baseline (Pat Trochlell, Josh Sulman, Ted Cochrane)	108	49.0	4.7	19.4%	7.4%
May 2016 (incl. C. Annen, A. Budyak, S. Longabaugh, P. Michler)	135	56.0	4.8	22.0%	9.6%
Dec. 2017 (incl. Budyak, Integrated Restorations staff)	165	63.1	4.9	24.0%	10.4%
Jan. 2024 (incl. Trochlell/Bernthal/Baller and O'Connor/Doyle)	187	67.1	4.9	24.1%	9.1%
Percent Increase (Baseline through 2024)	**73.1%**	**36.9%**	**4.3%**	**24.2%**	**23.0%**

Physical and Abiotic Components

Hydrology

The Pleasant Valley Conservancy wetland occurs within the Blue Mounds Creek Watershed (Hydrologic Unit Code [HUC] = 070700506 (Figures 6a and b). The wetland complex is bisected in a roughly NW-SE direction by the Elvers Creek (WDNR Waterbody Identification Code [WBIC] = 1251600), a first-order tributary of the East Branch of Blue Mounds Creek. The local reach of the East Branch of Blue Mounds Creek flows parallel to Elvers Creek at the western end of the wetland, beyond the property boundary. Pleasant Valley Creek ([WBIC] = 1251300), a first-order tributary of Blue Mounds Creek, merges with the East Branch of Blue Mounds Creek just beyond the southwestern wetland property boundary (Figure 1). A Wisconsin DNR water monitoring station (Elvers Creek 2, SWIMS station ID = 10013393) occurs within the Pleasant Valley Conservancy wetland.

The East Branch of Blue Mounds Creek is rated as a Class II Trout Stream, and its waters are considered navigable (and hence subject to the Clean Water Act). In 2002, Southwest Trout Unlimited applied for and was granted a DNR permit for installation of riprap in the East Branch of Blue Mounds Creek, approximately one mile west of Pleasant Valley Conservancy (docket identification INF-SC-2002-13-4117LW).

The wetland complex occurs between 780 and 800 feet above mean sea level (AMSL); the lowest areas occur in the west, and elevation slightly increases (< 20') traveling from a NW → SE direction (Figure 7). The baseline piezometric ground-

water surface (measured April-May 1960 at the Elvers Creek 2 monitoring station) was 774 feet AMSL (Cline 1965).

Wetland hydrology of the Pleasant Valley Conservancy Wetland Complex is determined by surface-flow, stream activity, and groundwater inputs, with the latter two contributing the majority to hydrologic inputs. Numerous large and small springs occur throughout the complex; some of the larger ones appear to have a high flow rate. The peaty substrates that occur in the western half of the wetland are saturated with groundwater apparently rich in calcium; films composed of insoluble chelates of [Fe---Ca] occur on the surface layers of puddled water (Figure 8). The sediments of the Pleasant Valley Creek channel include readily visible chunks of tufa (marl), which precipitates out of the water column when water super-saturated with $CaCO_3$ encounters air with a lower pCO_2. Interestingly, such material is absent from the bed in the eastern sections of Pleasant Valley Creek and might be an indicator of fine-particle erosional material sedimentation from the upland oak woodlands of the Richard and Kelle Anderson property. The combination of soil composition, calcium-groundwater indicators, and an abundance of fen indicator vegetation parsimoniously support the hypothesis that the western sections of the wetland are either fen or fen-like in function and composition. A detailed quantitative survey of the wetland's stream and spring-fed hydrology would make for a worthwhile and interesting dissertation.

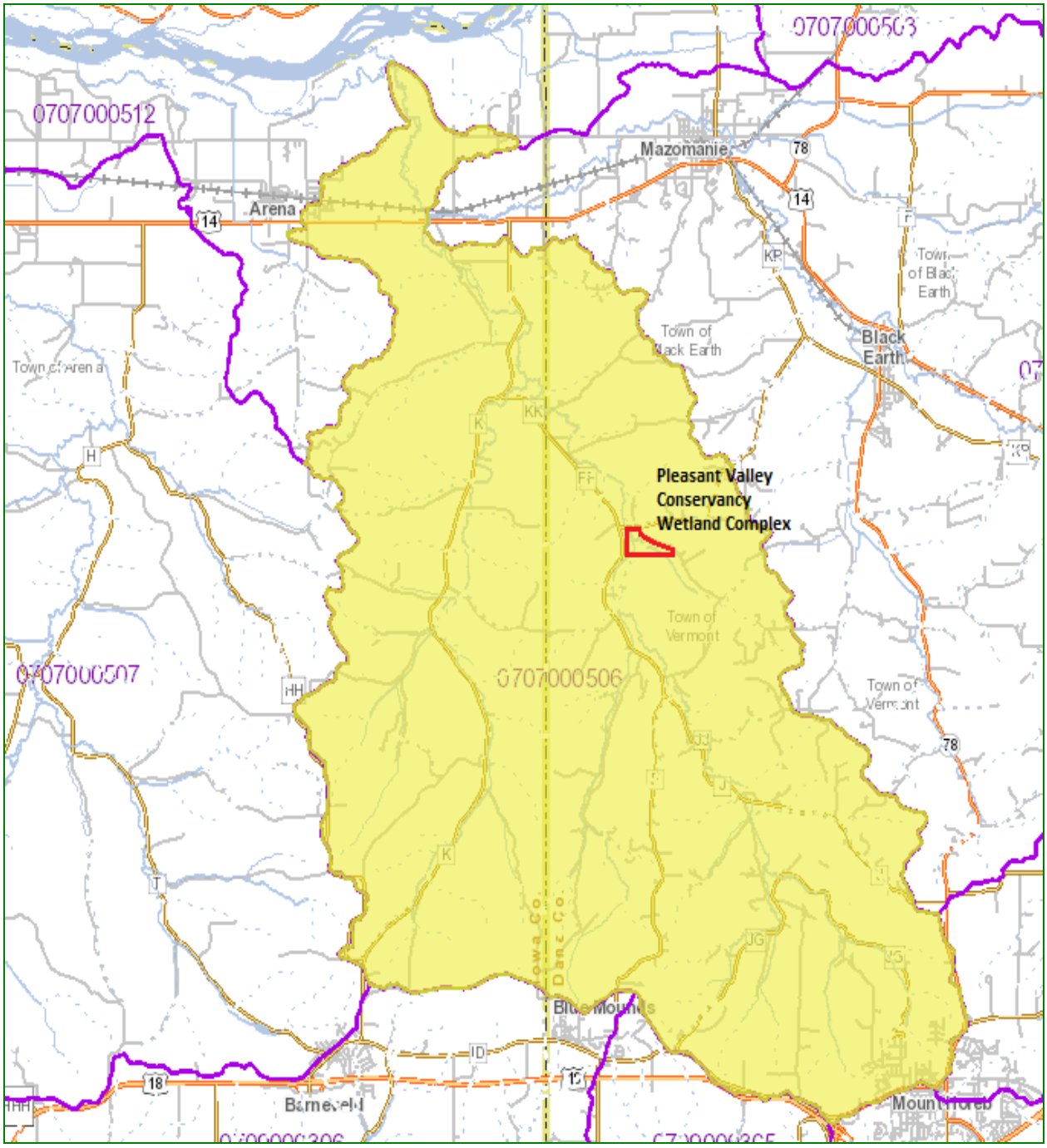


Figure 6a. Location of Pleasant Valley Conservancy Wetland Complex and Blue Mounds Creek Watershed (from the Wisconsin Department of Natural Resources Water Surface Viewer, accessed 8 January 2024).

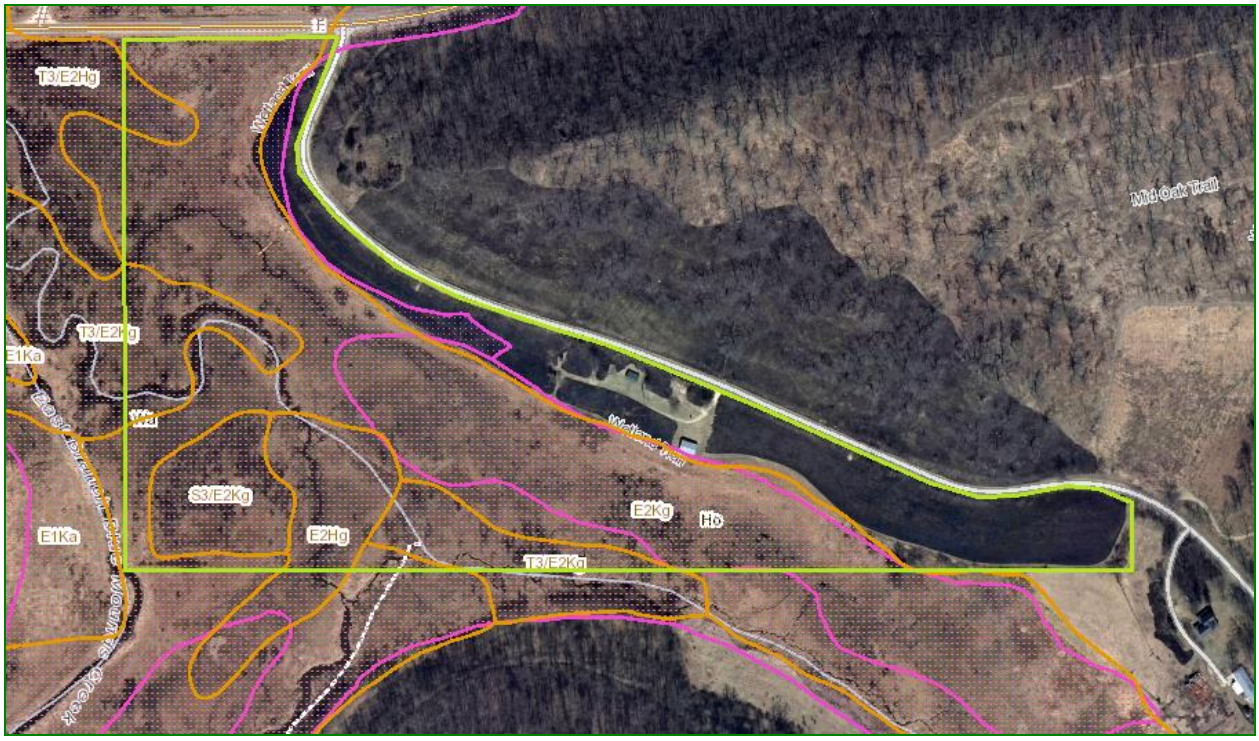


Figure 6b. Pleasant Valley Conservancy Wetland Complex in relation to OHWM (Ordinary High-Water Mark, delineated in orange) and hydric soils, delineated in pink (from the Wisconsin Department of Natural Resources Water Surface Viewer, accessed 30 November 2017).

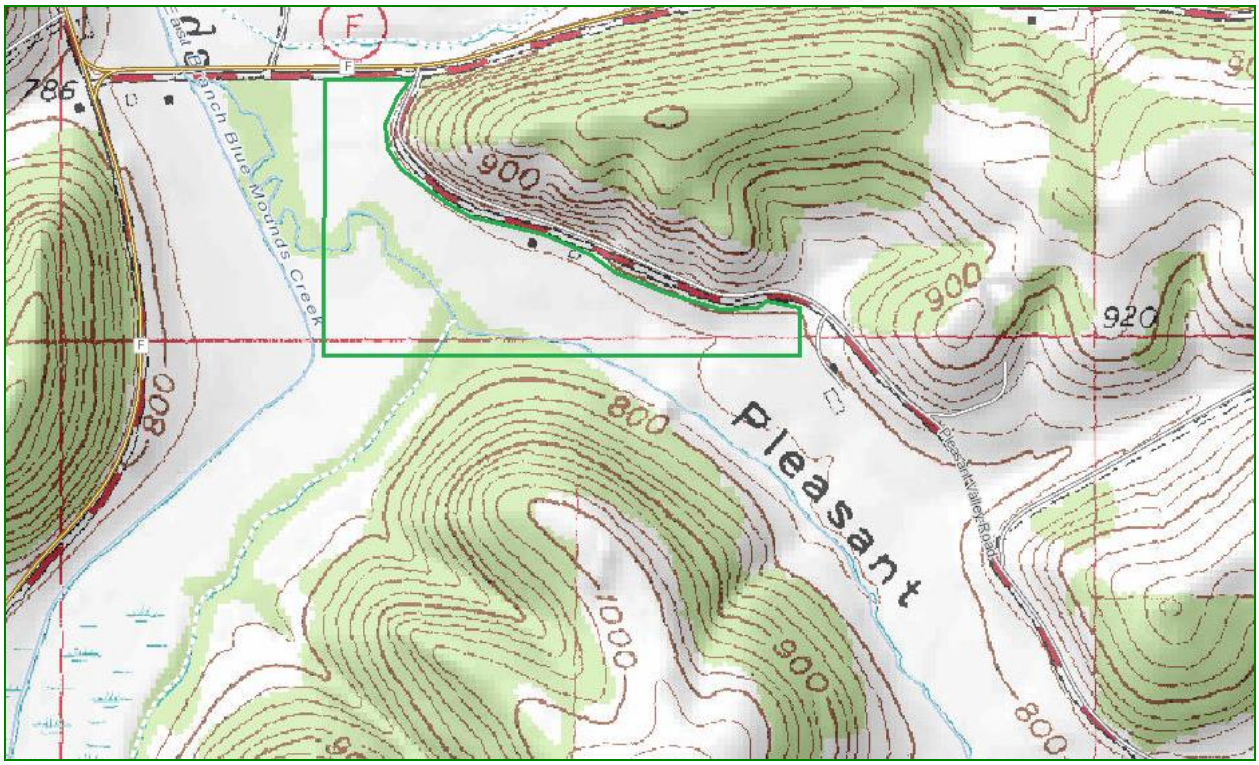


Figure 7. Topographic map of Pleasant Valley Conservancy Wetland Complex (contour interval = 20').

Figure 8. Iron-calcium chelates are insoluble in water and visible as a film on pooled surface water of wetland systems fed by calcium-rich groundwater.

The other principal contributor to the site's hydrology are the presence of Pleasant Valley Creek (a segment of which traverses the wetland) and Blue Mounds Creek immediately to the southwest. In spring, these creeks fill with rainwater runoff and snowmelt, which often spills over their banks, flooding the wetland and depositing silt and other allochthonous material onto their littoral zones and terraces. Several rivulets and deep drainage channels dissect the west-central section of the wetland; here, *Carex aquatilis* is a matrix clonal dominant, with numerous interstitial species growing along gradients of redox potential on the sides of its tall tussocks. Along the western banks of Pleasant Valley Creek, one can find a rich variety of plant species richness (particularly, five species of spike rush, *Eleocharis*) inhabiting the channel bars, meander scars, point bars, side pools, and other geomorphological features shaped by moving water (more so since the distribution and abundance of *Phalaris* have diminished in response to active management). The high degree of site-scale and microtopographic heterogeneity is a principal factor sustaining the remarkably-high species richness of the remnant vegetation inhabiting this wetland complex.

Geology

The lowlands of Pleasant Valley are underlain by upper-Cambrian bedrock material of the Dresbach Group, Franconia Sandstone, and Trempealeau Formation (Figure 9). Ordovician Prairie du Chein Dolomite and St. Peter Sandstone occur on the toe-slopes, mid-slopes, and ridges of Pleasant Valley (Figure 8). Weathering and erosion of these Ordovician formations influences soil development and soil chemistry in the valley bottoms where the Pleasant Valley Conservancy Wetland Complex occurs. More recent Quaternary deposits at the bottom of Pleasant Valley consist of glacial outwash and alluvial material deposited during the closing years of the Pleistocene by glacial meltwater rivers (Figure 9, inset) (Cline 1965).

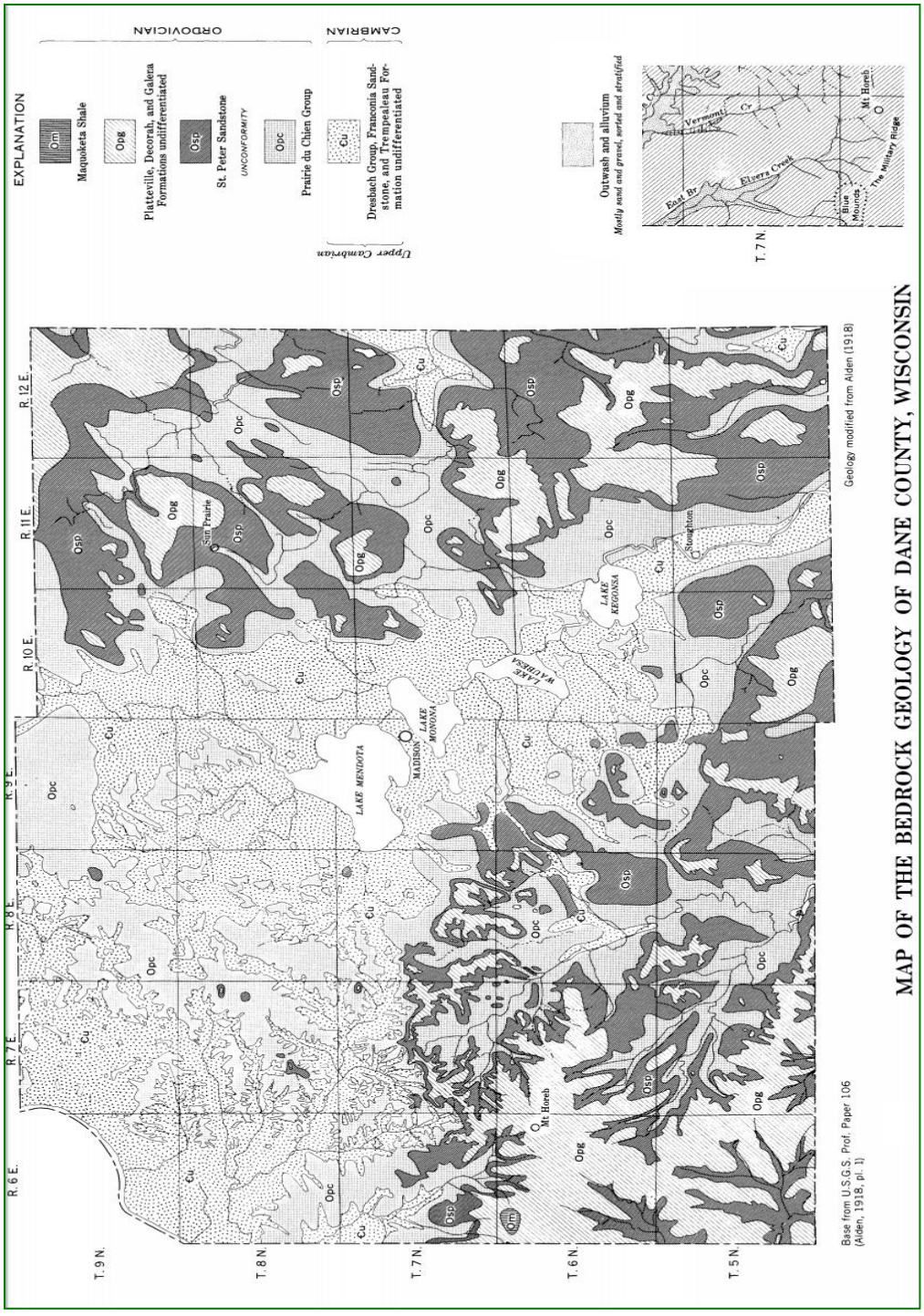


Figure 9. Cambrian, Ordovician, and Quaternary Geology of Pleasant Valley Conservancy.

Soils and Geomorphology

Soil development (pedogenesis) is a function of bedrock composition, climate history (including glacial influences), vegetation history, and time. Five soil series (two hydric and three mineral) are present within the Pleasant Valley Conservancy wetlands and adjacent buffer prairies: Houghton Muck (hydric), Wacousta Silty Clay Loam (hydric), Troxel Silt Loam (aeric), Seaton Silt Loam (aeric), and the Gaphill-Rockbluff complex (aeric). The distribution and abundance of plant species and wetland community types sort out along gradients in the underlying soil series; for example, the presence of several calciphilic species in abundance in the western reaches of the wetland reflect higher calcium carbonate content in areas underlain by Wacousta Silty Clay Loam. Ferns, mosses, and bryophytes tend to occur in higher abundance here as well. The dominance of a southern sedge meadow matrix interspersed with emergent species in the eastern reaches of the wetland complex reflect their occurrence on organic Houghton Muck soils. Refer to soil map on page 33 for specific locations of each soil series.

Hydric Soils

Houghton Muck (Ho), a euic-Typic Haplosaprist

Very poorly-drained hydric histosol (organic soil) occurring in depressions on stream terraces (0 – 2% slopes). The water table is typically at or near the soil surface, with occasional ponding, and available water storage in the soil profile is very high (23.9 inches). At Pleasant Valley Conservancy, this series occurs in the

floodplain of Pleasant Valley Creek, and in the central shallow depressions east of Elvers Creek.

Parent material: Herbaceous organic material overlying dolomite.

Expected soil profile:

Oa1	(0 – 15 inches)	muck
Oa2	(15 – 60 inches)	muck
R	(> 80 inches)	buried herbaceous organic material; dolomitic bedrock

Soil Color Hydric Indicators:
Hue: Between 5YR and 10YR
Value: 2, 2.5, or 3
Chroma: 0 to 3

Wacousta Silty Clay Loam (Wa), a mesic-Typic Endoaquoll

Very poorly-drained hydric mollisol (possessing a mollic epipedon) formed in lacustrine sediments and occurring in shallow depressions on stream terraces (0 – 2% slopes). The water table is typically at or near the soil surface, with frequent ponding, and available water storage in the soil profile is very high (12.6 inches). The maximum concentration $CaCO_3$ in profile is 30%. At Pleasant Valley Conservancy, this series occurs in the floodplain between the Elvers Creek and East Branch of Blue Mounds Creek, and in the shallow depressions west to County Road F.

Parent material: Stratified silty lacustrine material; dolomitic bedrock.

Expected soil profile:

Ap	(0 – 13 inches)	silty clay loam
Bg	(13 – 19 inches)	silty clay loam
Cg	(19 – 79 inches)	silt loam
R	(> 80 inches)	stratified silty lacustrine deposits; dolomitic bedrock

Soil Color Hydric Indicators:
Hue: 10YR or 2.5Y
Value: 2
Chroma: 1

Mineral Soils

Troxel Silt Loam (TrB), a mesic-Pachic Argiudoll

A moderately well-drained alfisol formed in silty colluvium (material weathered and transported to the bases of slopes) and loamy drift, occurring at base slopes and foot slopes of valleys and interfluves (0 – 3% slopes). Depth to water table is 36 – 72 inches, and available water storage in the soil profile is very high (12.4 inches). At Pleasant Valley Conservancy, this series occurs in the lower elevations of the Valley Prairie buffer.

Parent material: Silty colluvium and loess deposits; dolomitic bedrock.

Expected soil profile:

Ap	(0 – 31 inches)	silt loam
Bt	(31 – 54 inches)	silty clay loam
BC	(54 – 79 inches)	silt loam
R	(> 80 inches)	silty colluvium and loess; dolomite

Seaton Silt Loam (TSvD2), a typic-mesic-Hapuldalf

A well-drained alfisol formed in coarse loess, occurring on side slopes of valleys and interfluves (0 – 3% slopes). Depth to water table is 36 – 72 inches, and available water storage in the soil profile is very high (12.7 inches). At Pleasant Valley Conservancy, this series occurs in the higher elevations of the Valley Prairie buffer. The characteristics of this soil series have likely been influenced by construction and maintenance of Pleasant Valley Road.

Parent material: Loess deposits over dolomitic bedrock.

Expected soil profile:

Ap	(0 – 9 inches)	silt loam
BE	(9 – 15 inches)	silt loam
Bt1 – Bt4	(15 – 44 inches)	silt loam
BC	(44 – 70 inches)	silt loam
C	(70 – 79 inches)	silt loam
R	(> 79 inches)	loess overlying dolomite

Gaphill-Rockbluff complex (1145F), a typic-mesic-Hapuldalf

A well-drained alfisol formed in sandy colluvium, occurring at base slopes, toe slopes, and shoulders of valleys and interfluves (30 – 60% slopes). Depth to water table exceeds 80 inches, and available water storage in the soil profile is low (between 3.6 – 5.7 inches). At Pleasant Valley Conservancy, this series occurs in the Sandhill Crane Wet Prairie buffer. The characteristics of this soil series have likely been influenced by construction and maintenance of Pleasant Valley Road.

Parent material: Sandy colluvium over sandy residuum originating from the weathering of sandstone.

Expected soil profile:

Oe, A	(0 – 4 inches)	loamy sand
E	(4 – 9 inches)	loamy sand
Bw	(9 – 35 inches)	sand
C	(35 – 52 inches)	sand
R	(> 52 inches)	sandy colluvium over sandy residuum; sandstone

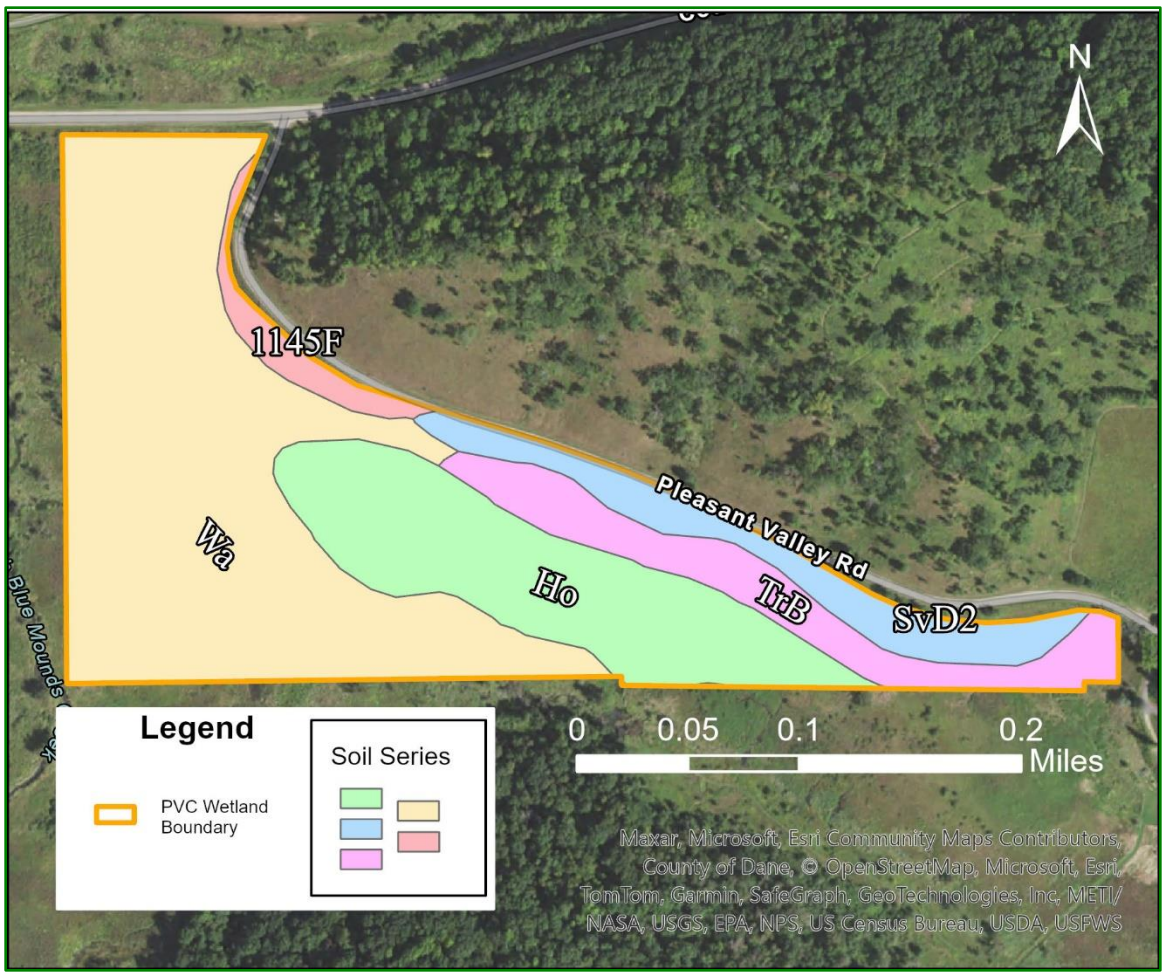


Figure 10. Soils of the Pleasant Valley Conservancy Wetland Complex.

Wetland Management History

The Pleasant Valley Conservancy wetland has been actively managed since 1999 and has permanent protection as a dedicated State Natural Area. Management activities have consisted of selective removal of invasive shrubs (*Lonicera* spp. and *Salix* spp.), control of aquatic invasive species (*Lythrum salicaria*, *Phalaris*, *Typha*, and *Torilis japonica*), and prescribed burns. The majority of routine upkeep and management have been carried out by Savanna Oak Foundation staff throughout this time period (SOF staff logged 774.75 hours during the ACEI-200-18 grant funding period). Contractors have been periodically brought in to work on specific, larger-scale management projects and prescribed burns.

In the early days of wetland management, a dense stand of wild parsnip (*Pastinaca sativa*) occupied the Crane buffer prairie, the wetland boundary, and on the corner of County Road F and Pleasant Valley Road. Savanna Oak Foundation staff eradicated this stand through pulling, seed head removal, and limited herbicide spot treatments to first-year plants. The first shrub removal management occurred at the east-central part of the wetland, along Pleasant Valley Creek (south of the shed), and was conducted by Michler & Brown, LLC in 2005. Species removed included sandbar and black willow, box elder, buckthorn, and honeysuckle. Additional management was performed to daylight several young bur oaks in the NW area, and to put a stop to aggressive shrub growth that was encroaching on the sedge meadow. That same year, a large stand of sandbar willow occurring immediately southwest of the cabin was also removed, as were several large box elder trees directly south of the old well house. In the winter of 2007-08, Integrated Restorations, LLC cleared mature honeysuckle and a large

black willow from the central section of the wetland, near the confluence of Pleasant Valley and Elvers Creeks. From 2013 – 2015, Savanna Oak Foundation staff cleared an extensive stand of sandbar willow from the fen area at the western end of the wetland complex.

In 2002, Paul Michler (of Michler & Brown, LLC) located a single flowering purple loosestrife plant near the fence that delineates the southwest property boundary. That same year he treated an extensive patch of *Phalaris arundinacea* along the mowed margin of County Road F with glyphosate. Beginning in 2004, Michler & Brown began scouting and spot-treating clones of *Phalaris* inhabiting the wetland complex. That same year, Craig Annen initiated field research on *Phalaris* suppression in the central wetland area[2], summarized in Annen (2008). Integrated Restorations took over *Phalaris* management beginning in 2008. During the initial years of suppression, only the eastern half of the wetland complex was readily accessible to foot travel for spot spraying. In 2007, beavers moved into the riparian areas near the western portion of the wetland and dammed the area, leading to extensive and prolonged flooding. To reduce their effect on the wetland's hydrology, the beavers were trapped out beginning in 2011, and their dams were dismantled by Savanna Oak Foundation staff. In the wake of flooding, *Phalaris* quickly established in the open drawdown margins, while sandbar willow began to increase in abundance in a large point bar with fen characteristics. A boardwalk was installed to gain easier access to the sandbar willow stand and western wetland area in 2013, and in 2014 contractors from Integrated Restorations and Savanna Oak Foundation staff were finally able to

[2] The Savanna Oak Foundation, Inc. funded this research, but no grant funds were used for any part of the research project.

tackle the extensive willow and *Phalaris* stands in the western wetland. The grass-selective herbicide sethoxydim was employed for *Phalaris* suppression from 2004 through 2008; between 2009 and 2012, the grass-selective formulation fluazifop-p-butyl was adopted due to its higher activity (see Annen 2010), reduced susceptibility to degradation from exposure to ultraviolet light (see Annen 2006), and in the interest of herbicide resistance management (see Annen 2007). From 2013 up until this writing, the grass-selective formulation clethodim has been utilized for reed canarygrass suppression. This formulation has higher activity than sethoxydim, but lower environmental persistence than fluazifop-p-butyl.

Phalaris suppression efforts have reversed the invasion and reduced its total cover to no more than 1% of its pre-management area in the northwest portions of the wetland (see Appendix C, *page 2*), and less than 10% of its pre-management area in the southeastern portions of the wetland. Furthermore, its importance value has also been reduced throughout the wetland complex from dominant in several areas to patchy and scattered, along with passive replacement by conservative native wetland grasses, sedges, and forbs, presumably from the wetland's native propagule banks. Nevertheless, *Phalaris* is extensively distributed along upstream reaches of the Pleasant Valley Creek and East Branch of Blue Mounds Creek and is a dominant species in the wetland areas to the east, west, and southern boundaries of the Pleasant Valley wetland. Intense propagule pressure from these areas, along with spring flooding and continued beaver activity, continually interact to facilitate reestablishment of *Phalaris*, requiring annual follow-up management to maintain this wetland in its remarkable condition.

In 2008, Integrated Restorations detected a small population of erect hedge parsley (*Torilis japonica*) in the east-central portion of the wetland, along a cut-bank terrace of the Pleasant Valley Creek. From 2008 through 2010, hedge parsley plants were pulled, bagged, and removed from the wetland. Wild parsnip and garlic mustard have also been treated (mowing and herbicide applications) at various locations near the wetland-to-upland transition zones.

In 2015, Savanna Oak Foundation staff discovered a large stand of *Typha* x *glauca* in the northwest corner of the wetland, near a culvert under County Road F (which could have been the disturbance that facilitated the invasion). With funding from WDNR Aquatic Invasive Species Rapid Response grant **AIRR-213-17**, Integrated Restorations mowed and treated this clone with imazapyr (see Annen et al. (2018) for details on treatment protocols), and attempted to eradicate four additional clones, one occurring near the confluence of Pleasant Valley Creek and Blue Mounds Creek, and the other three on adjacent land under private ownership. A limited amount of follow-up treatments were carried out on these clones in 2017. In 2019, Savanna Oak Foundation staff observed a large and expanding stand of *Typha* x *glauca* near the intersection of Pleasant Valley Road and County Road F. This stand was well-established, dense, covered 8.11 acres of the wetland, and appeared to be rapidly increasing in area. Funding from WDNR Surface Water Grant **ACEI-200-18** was utilized to manage this large stand before it could spread into more of the wetland (Figure 11).

The Pleasant Valley Conservancy wetland (along with three additional adjacent wetland properties) were burned by the USFWS in 2005 and again in 2010. In 2013, the PVC wetland (this time with two adjacent wetland properties) was burned by a combined crew consisting of Integrated Restorations, Michler &

Brown, Quercus Land Stewardship, and an array of volunteers. The northern and western portions of the wetland were burned by Michler & Brown in 2010 and by Integrated Restorations in 2016. A two-acre section of the wetland bordering Pleasant Valley Road and County Road F was burned in 2018. The entire wetland (including a portion of two adjacent properties) was burned in 2019; an escape occurred during this burn but was contained by using the East Branch of the Blue Mounds Creek as a secondary control line. *Typha* suppression areas were spot-burned in 2021 to facilitate removal of accumulated litter and expose the native species seed bank to light for germination. The northeastern half of the wetland (up to Pleasant Valley Creek) including a portion of the Anderson wetland were burned in 2022. *Typha* suppression areas near the intersection of Pleasant Valley Road and County Road F were burned in 2023 to remove accumulated litter and facilitate interseeding. The initial attempt resulted in an incomplete burn, so portions of this area were re-ignited approximately one month later.

Figure 11. Focus areas of *Typha* and *Salix* sp. suppression for WDNR grant ACEI-200-18 (2018-2022).

Wetland Threat Summary and Management Guidelines

Aquatic invasive species will continue to pose a threat to this wetland complex due to its location along the reaches of two creeks, which can act as effective dispersal corridors. The Pleasant Valley Conservancy wetlands are near the headwaters of Pleasant Valley Creek, but positioned along the mid-stream reaches of the East Branch of Blue Mounds Creek. Seeds of high-impact aquatic invasive species (*Typha angustifolia*, *T.* x *glauca*, *Phalaris*, *Lythrum salicaria*, *Phragmites*) float on water. Coops and van der Velde (1995) estimated the FT_{90} (90% seed float time) of *Phalaris*, *Phragmites*, and *Typha* at 38.3, 65.0, and 27.6 hours, respectively. Considering a proxy creek velocity of 0.224 m/s (measured in Pheasant Branch Creek and similar in discharge to Elvers Creek), 90% of floating reed canarygrass seed could be dispersed 30.9 km, *Typha* seeds 22¼ km, and *Phragmites* seed 52.4 km from upstream populations before settling out in exposed mudflats within or near the wetlands. It is clear from these estimates that propagules of all three of these aquatic invasive species have the potential to be dispersed from long distances into the Pleasant Valley Conservancy wetlands; annual scouting should be a routine component for managing these wetlands, and pioneer stands should be eradicated upon discovery.

Shrub encroachment also poses a continuing threat to the integrity and plant species composition of this wetland complex. Willows exhibit high evapotranspiration rates (Nagel & Dart 1980; Sparks & Ehleringer 1997), and when present in abundance they can lower water tables, predisposing sites to invasions by perennial monocots (particularly *Phalaris*). The mechanism behind this is that when water table levels drop, a fraction of the more hydrophytic plant species become locally extirpated, leaving empty niche space for colonization.

Phalaris also exhibits high evapotranspiration rates (Schilling & Kiniry 2007; Zhang & Schilling 2006)) and exacerbates this hydrological disturbance in proportion to its abundance, facilitating and enabling its own establishment. Once established, perennial monocots produce prolific amounts of aboveground biomass, along with litter displaying high C:N ratios and a high concentration of lignin derivatives resistant to microbial and physical degradation (Eppinga et al. 2011). Over time, this litter accumulates and facilitates perennial monocot dominance through mulching effects. Selective thinning should be carried out regularly to prevent willows and other aggressive shrubs from indirectly influencing aquatic invasive species colonization and abundance.

The Pleasant Valley Conservancy Wetland Complex should be burned at a random interval of 2 – 4 years (mimicking historical fire frequency in sedge meadows). Burning removes litter, facilitating the expression of a site's potential native species richness by exposing the soil surface to light for seed germination. Burning also has a coppicing effect on shrub-carr species, keeping them in check. Curtis (1959: 641) documented reed canarygrass in 11 different community types, with maximum presence in shrub-carr, where reed canarygrass achieved the abundance of a modal species present in 60% of stands. These figures highlight the connection between shrub-carr development and reed canarygrass abundance, and the importance of burning in reed canarygrass management; shrub-carr is a community that develops over southern sedge meadow when it no longer experiences the effects of periodic fire. Burning also prevents native clonal perennial monocots (e.g. *Carex trichocarpa*, *Carex lacustris*) from becoming overly dominant and reducing expressed species richness. Auclair et al. (1976) determined that diversity in *Carex*-dominated meadows was positively correlated

with fire incidence and negatively correlated with litter mass. Prescribed fire should be a prominent component in future management of the Pleasant Valley wetland.

Lastly, recent research (Pieper et al. 2017, Gedde et al. 2021) determined that field populations of *Typha latifolia*, *T. angustifolia*, and *T.* x *glauca* are in a state of near-complete genetic panmixia, resulting in series of introgressive hybrids that are exceedingly difficult to identify by field characteristics. These reports further suggest that *T. latifolia* populations are being rapidly displaced by stands of introgressive hybrids. The implication of these studies is that what we perceive as native cattail populations are probably (or most likely will become) invasive hybrids that displace native wetland herbaceous vegetation. Based on this information, future management should consider eradicating all cattail culms in the Pleasant Valley Conservancy wetland to protect the ecological integrity of this wetland complex.

Conservation Value of the Pleasant Valley Conservancy Wetland Complex

The Pleasant Valley Conservancy Wetland Complex provides critical wetland habitat in the generally-dry Driftless Area of southwestern Wisconsin to at-risk and uncommon species across multiple tropic levels. The Conservancy's wetlands also function as a waterfowl production area for several species of waterfowl that are frequently observed (wood ducks, hooded mergansers, geese, Sandhill cranes, and the WI-Threatened white egret) and as a stopover during spring and autumn migrations. Pickerel frogs (WI-Special Concern) are also regularly observed inhabiting these wetlands. Bird species that breed here include the willow flycatcher, great blue heron, green heron, mallard, wood duck, Sandhill crane, Wilson's snipe, belted kingfisher, sedge wren, and marsh wren. Calcareous fen wetlands (wetlands possessing obligate and facultative calciphilic plants growing in groundwater seepage areas rich in calcium and magnesium base cations) are the rarest wetland type in North America, particularly in non-glaciated regions. The Wisconsin DNR estimated that only a few hundred acres of fen wetlands existed in the entire state prior to European settlement (WDNR 1995). The pristine quality and functional integrity of this wetland system are due in part to minimal agricultural production land-use patterns in the surrounding landscape. The wetland has been actively managed since 1999, and Pleasant Valley Conservancy has permanent protection as a designated State Natural Area (number 551). Offsite compensatory mitigation of a wetland of this diversity and quality would be exceedingly difficult and expensive to achieve.

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Appendix A:

Vegetation Composition of Pleasant Valley Conservancy Wetland Complex

Botanical Nomenclature:

Botanical nomenclature (including flowering plants, ferns, fern allies, and bryophytes) follows *Flora of North America* (1993 et seq.), except where a volume is still in compilation, in which case nomenclature follows the University of Wisconsin State Herbarium (Wetter et al. 2001).

Floristic Quality Assessment (FQA):

A Floristic Quality Index (FQI) was calculated as FQI = mean C $\sqrt{S}$ where S = the native species richness of the site (Swink and Wilhelm 1994). Coefficient of conservatism (C) values were assigned to all vascular plant species from Bernthal (2003).

Botanical Name	Common Name	C value	Botanist	Guild
Acer saccarinum	Sugar Maple	2	Craig Annen	Tree
Alisma subcordatum	Water Plantain	3	Craig Annen	Emergent Forb
Allium canadense	Wild Onion	4	Patricia Trochlell	Forb
Amphicarpaea bracteata	Hog Peanut	5	Trochlell/Bernthal/Baller	Forb
Anemone canadensis	Meadow Anemone	4	Patricia Trochlell	Forb
Anaphalis margaritacea	Pearly Everlasting	3	Patricia Trochlell	Forb
Angelica atropurpurea	Great Angelica	6	Patricia Trochlell	Calciphilic Forb
Apois americana	Common Groundnut	5	Trochlell/Bernthal/Baller	Forb
Arnoglossum atriplicifolia	Pale Indian Plantain	4	Patricia Trochlell	Forb
Asclepias exaltata	Poke Milkweed	7	Patricia Trochlell	Forb
Asclepias incarnata	Swamp Milkweed (Modal Fen)	5	Patricia Trochlell	Forb
Asclepias syriaca	Common Milkweed	1	Patricia Trochlell	Forb
Bidens cernuus	Nodding Beggar's Ticks	4	Patricia Trochlell	Drawdown Forb
Bidens connata	Purple-Stemmed Beggar's Ticks	6	Trochlell/Bernthal/Baller	Forb
Bidens trichosperma	Northern Tickseed	7	O'Connor/Doyle	Forb
Bromus ciliatus	Fringed Brome	7	Patricia Trochlell	Grass
Calamagrostis canadensis	Blue-Joint Grass (Modal Fen)	5	Patricia Trochlell	Matrix Grass
Caltha palustris	Marsh Marigold (Modal Fen)	6	Patricia Trochlell	Calciphilic Forb
Campanula aparinoides	Marsh Bellflower (Modal Fen)	7	Patricia Trochlell	Forb
Cardimine bulbosa	Spring Cress	6	Sean Longabaugh	Forb
Carex aquatilis	Water Sedge	7	Craig Annen	Matrix Sedge (Very Wet)
Carex bebbii	Bebb's Oval Sedge	4	Josh Sulman	Sedge
Carex comosa	Bristly Lake Sedge	5	Craig Annen	Sedge
Carex crawfordii	Crawford's Oval Sedge	5	Craig Annen	Sedge
Carex diandra	Bog Panicled Sedge (FNA Fen)	9	Ted Cochrane	Bog Sedge
Carex hystericina	Porcupine Sedge	3	Josh Sulman	Sedge
Carex granularis	Limestone Meadow Sedge (FNA Calc.)	3	Josh Sulman	Calciphilic Sedge
Carex interior	Oak Sedge	7	Josh Sulman	Sedge
Carex lacustris	Lake Sedge	6	Josh Sulman	Matrix Sedge (Very Wet)
Carex leptalea	Slender Sedge (FNA Fen)	9	Josh Sulman	Sedge
Carex pellita	Broad-Leaved Wooly Sedge (FNA Fen)	4	Josh Sulman	Calciphillic Sedge
Carex prairea	Fen Panicled Sedge (FNA Fen)	10	Josh Sulman	Sedge
Carex scoparia	Lance-Fruited Oval Sedge	4	Craig Annen	Bog Sedge
Carex stipata	Fox Sedge	2	Josh Sulman	Bog Sedge
Carex stricta	Tussock Sedge	7	Josh Sulman	Matrix Sedge (Moist)
Carex trichocarpa	Hairy-Fruit Sedge	7	Josh Sulman	Matrix Sedge (Wet)
Carex tuckermanii	Tuckerman's Sedge	8	Craig Annen	Riparian Sedge
Carex utricularia	Yellow Lake Sedge	7	Josh Sulman	Bog Sedge
Carex vulpinoidea	Brown Fox Sedge	2	Josh Sulman	Sedge
Ceratophyllum demersum	Coontail (FNA Calcareous)	3	Craig Annen	Aquatic (Calciphile)
Chelone glabra	Turtlehead	7	Patricia Trochlell	Forb
Cicuta bulbifera	Bulblet Water-Hemlock	7	Trochlell/Bernthal/Baller	Forb
Cicuta maculata	Water-Hemlock	6	Patricia Trochlell	Forb
Circaea lutetiana canadensis	Enchanter's Nightshade	2	Patricia Trochlell	Forb
Cirsium discolor	Field Thistle	4	Trochlell/Bernthal/Baller	Forb
Cirsium muticum	Swamp Thistle	8	Patricia Trochlell	Forb
Conzya canadensis	Horseweed	0	Trochlell/Bernthal/Baller	Forb
Cusguta gronovii	Swamp Dodder	4	Sean Longabaugh	Parasitic Forb
Desmodium canadense	Canada Tick-Trefoil	4	Trochlell/Bernthal/Baller	Forb
Doellingera [Aster] umbellatum	Flat-Topped Aster	6	Patricia Trochlell	Forb
Eleocharis acicularis	Needle Spike Rush	5	Craig Annen	Sedge
Eleocharis erythropoda	Bald Spike Rush	3	O'Connor/Doyle	Sedge
Eleocharis obtusa	Blunt Spike Rush	3	Craig Annen	Sedge
Eleocharis palustris	Marsh Spike Rush	6	Craig Annen	Sedge
Eleocharis rostellata	**Beaked Spike Rush (THREATENED)**	10	**Craig Annen**	**Sedge**
Elodea canadensis	Elodea	3	Craig Annen	Aquatic
Elymus riparius	Riverbank Wild Rye	6	Patricia Trochlell	Riparian Grass
Epilobium coloratum	Willow Herb	3	Patricia Trochlell	Forb
Epilobium leptophyllum	Marsh Willow Herb	3	Craig Annen	Forb
Equisetum arvense	Common Horsetail	1	Craig Annen	Fern Ally
Equisetum fluviatile	River Horsetail	7	Craig Annen	Fern Ally
Erechtites hieraciifolius	American Burn Weed	2	Trochlell/Bernthal/Baller	Forb
Erigeron pulchellus	Robin's Plantain	4	Patricia Trochlell	Forb
Erigeron strigosus	Daisy Fleabane	2	Patricia Trochlell	Forb
Eutrochium [Eupatorium] maculatum	Spotted Joe-Pye Weed	4	Patricia Trochlell	Forb
Eupatorium perfoliatum	Boneset (Modal Fen)	6	Patricia Trochlell	Forb
Galearis spectabilis	Showy Orchis	6	Patricia Trochlell	Bog Forb
Galium aparine	Catchweed	2	Patricia Trochlell	Forb

Botanical Name	Common Name	C value	Botanist	Guild
Galium boreale	Northern Bedstraw (Modal Fen)	**5**	Patricia Trochlell	Forb
Galium concinnum	Pretty Bedstraw	**6**	Craig Annen	Forb
Galium labradoricum	Marsh Bedstraw	**10**	Craig Annen	Forb
Galium tinctorium	Three-Lobed Bedstraw	**5**	O'Connor/Doyle	Forb
Galium trifidum	Northern Three-Lobed Bedstraw	**6**	Trochlell/Bernthal/Baller	Forb
Gentianella quinquefolia	Stiff Gentian	**7**	Trochlell/Bernthal/Baller	Forb
Gentianopsis crinita	Fringed Gentian	**6**	Trochlell/Bernthal/Baller	Forb
Geum aleppicum strictum	Yellow Avens	**3**	Patricia Trochlell	Forb
Geum canadense	White Avens	**2**	Patricia Trochlell	Forb
Glyceria canadensis	Rattlesnake Manna Grass	**7**	Craig Annen	Grass
Glyceria grandis	American Manna Grass	**6**	Patricia Trochlell	Grass
Glyceria striata	Fowl Manna Grass (Modal Fen)	**4**	Patricia Trochlell	Grass
Hasteola suavolens	**Sweet Indian Plantain (SPECIAL CONCERN)**	**8**	Patricia Trochlell	Forb
Helenium autumnale	Sneezeweed	**4**	Patricia Trochlell	Forb
Helianthus grosseserratus	Saw-Toothed Sunflower	**2**	Patricia Trochlell	Forb
Helianthus tuberosus	Jerusalem Artichoke	**2**	Patricia Trochlell	Forb
Heracleum lanatum	Cow Parsnip	**3**	Patricia Trochlell	Forb
Impatiens capensis	Jewel Weed	**2**	Patricia Trochlell	Forb
Iris virginica shrevei	Blue Flag Iris (Modal Fen as *I. shrevei*)	**5**	Patricia Trochlell	Forb
Juncus canadensis	Canada Rush	**7**	Craig Annen	Rush
Juncus dudleyi	Dudley's Rush (Modal Fen)	**4**	Patricia Trochlell	Rush
Juncus nodosus	Jointed Rush	**7**	Craig Annen	Rush
Juncus tenuis	Path Rush	**1**	Craig Annen	Rush
Lathyrus palustris	Marsh Pea	**5**	Patricia Trochlell	Forb
Leersia oryzoides	Rice Cut Grass	**3**	Patricia Trochlell	Grass
Lemna minor	Duckweed	**4**	Craig Annen	Aquatic
Lemna turionifera	Lesser Forked Duckweed	**2**	Craig Annen	Aquatic
Liatris ligustylis	Meadow Blazing Star	**7**	Amanda Budyak	Forb
Lilium michiganense	Turk's Cap Lily	**6**	Patricia Trochlell	Forb
Lobelia cardnalis	Cardnal Flower	**7**	Patricia Trochlell	Forb
Lobelia kalmii	Kalm's Lobelia (Modal Fen)	**9**	Craig Annen	Calciphillic Forb
Lobelia siphilitica	Great Blue Lobelia (Modal Fen)	**5**	Patricia Trochlell	Forb
Lysimachia ciliata	Fringed Loosestrife	**5**	Patricia Trochlell	Forb
Lycopus americanus	Water Horehound (Modal Fen)	**4**	Patricia Trochlell	Forb
Lycopus uniflorus	Bugleweed	**4**	Craig Annen	Forb
Marchantia polymorpha	Black-Lined Liverwort	**NR**	Craig Annen	Liverwort
Mentha [arvensis] canadensis	Wild Mint	**3**	Patricia Trochlell	Forb
Monarda fistulosa	Wild Bergamont	**3**	Patricia Trochlell	Forb
Muhlenbergia glomerata	Marsh Wild Timothy	**9**	Craig Annen	Grass
Muhlenbergia mexicana	Leafy Satin Grass	**4**	Trochlell/Bernthal/Baller	Grass
Napaea dioica	**Glade Mallow (SPECIAL CONCERN)**	**6**	**Patricia Trochlell**	**Forb**
Onoclea sensiblis	Sensitive Fern	**5**	Amanda Budyak	Fern
Oxalis stricta	Yellow Wood Sorrel	**0**	Patricia Trochlell	Forb
Oxypolis rigidor	Cowbane	**6**	Patricia Trochlell	Forb
Pedicularis lanceolata	Swamp Betony (Modal Fen)	**8**	Patricia Trochlell	Hemiparasitic
Persicaria [Polygonum] amphibia	Pink Smartweed	**5**	Craig Annen	Forb
Persicaria [Polygonum] hydropiperoides	Water Pepper	**6**	Patricia Trochlell	Drawdown Forb
Persicaria [Polygonum] punctata	Smartweed	**5**	Patricia Trochlell	Drawdown Forb
Persicaria [Polygonum] sagittata	Arrow-Leaved Tearthumb	**6**	Trochlell/Bernthal/Baller	Forb
Pilea fontana	Bog Clearweed	**7**	O'Connor/Doyle	Forb
Pilea pumila	Canadian Clearweed	**3**	Trochlell/Bernthal/Baller	Forb
Platanthera huronensis	Huron Green Orchid	**7**	Craig Annen	Bog
Poa palustris	Marsh Bluegrass	**5**	Patricia Trochlell	Grass
Polemonium reptans	Jacob's Ladder	**6**	Patricia Trochlell	Forb
Potamogeton nodosus	Long-Leaved Pondweed	**7**	Craig Annen	Aquatic
Potamogeton pusillus	Slender-Leaved Pondweed	**7**	Craig Annen	Aquatic
Proserpinaca palustris	Mermaid Weed	**8**	Craig Annen	Aquatic
Quercus macrocarpa	Bur Oak	**5**	Amanda Budyak	Tree
Pycnanthemum virginianum	Virginia Mountain Mint	**6**	Patricia Trochlell	Forb
Ranunculus abortivus	Kidney-Leaf Buttercup	**1**	Craig Annen	Forb
Ranunculus hispidus var. *nitidus*	Swamp Buttercup	**6**	Patricia Trochlell	Forb
Ranunculus recurvatus	Hooked Buttercup	**5**	Patricia Trochlell	Forb
Ranunculus sceleratus	Cursed Crow's Foot	**3**	Craig Annen	Forb
Ribes americanum	Black Currant	**4**	Patricia Trochlell	Shrub
Rosa sp.	Rose	**NR**	Craig Annen	Shrub
Rudbeckia hirta	Black-Eyed Susan	**4**	Patricia Trochlell	Forb
Rudbeckia laciniata	Cut-Leaved Coneflower	**6**	Patricia Trochlell	Forb
Rudbeckia triloba	Brown-Eyed Susan	**4**	Trochlell/Bernthal/Baller	Forb

Botanical Name	Common Name	C value	Botanist	Guild
Rumex [orbiculatus] britannica	Water Dock	8	Patricia Trochlell	Forb
Sagittaria latifolia	Arrowhead	3	Craig Annen	Emergent Forb
Salix bebbiana	Bebb's Willow	7	Patricia Trochlell	Tree
Salix discolor	Sage Willow	2	Patricia Trochlell	Tree
Salix nigra	Black Willow	4	Patricia Trochlell	Tree
Sambucus canadesis	Elderberry	3	Patricia Trochlell	Shrub
Saxifraga pensylvanica	Swamp Saxifrage	7	Patricia Trochlell	Forb
Schoenoplectus tabernaemontani	Soft-Stem Bulrush	4	Patricia Trochlell	Sedge
Scirpus atrovirens	Green-Headed Bulrush	3	Craig Annen	Sedge
Scirpus cyperinus	Woolgrass	4	Patricia Trochlell	Sedge
Scirpus hattorianus	Early Green Bulrush	3	Craig Annen	Sedge
Scleria verticillata	**Low Nutrush (SPECIAL CONCERN)**	**10**	**Craig Annen/Ted Cochrane**	**Sedge**
Scutellaria galericulata	Marsh Skullcap	5	Patricia Trochlell	Forb
Scutellaria lateriflora	Blue Skullcap	5	O'Connor/Doyle	Forb
Silphium perfoliatum	Cup Plant	4	Patricia Trochlell	Forb
Silphium terebinthinaceum	Prairie Dock	7	Trochlell/Bernthal/Baller	Forb
Sium suave	Water Parsnip	5	Patricia Trochlell	Forb
Solidago canadensis	Canada Goldenrod	1	Patricia Trochlell	Forb
Solidago flexicaulis	Zig-Zag Goldenrod	6	Craig Annen	Forb
Solidago gigantea	Late Goldenrod	3	Patricia Trochlell	Forb
Solidago riddellii	Riddell's Goldenrod (Modal Fen)	7	Craig Annen	Calciphillic Forb
Solidago speciosa	Showy Goldenrod	5	Craig Annen	Forb
Solidago ulmifolia	Elm-Leaved Goldenrod	5	Craig Annen	Forb
Sphagnum sp.	Sphagnum Moss	NR	Craig Annen	Moss
Stachys palustris	Hedge Nettle	5	Patricia Trochlell	Forb
Stellaria longifolia	Stitchwort (Modal Fen)	5	Patricia Trochlell	Forb
Symplocarpus foetidus	Skunk Cabbage (FNA Fen)	8	Patricia Trochlell	Calciphillic Forb
Sparganium eurycarpum	Bur-Reed	5	Craig Annen	Sedge
Spartina pectinata	Prairie Cordgrass	5	Craig Annen	Grass
Symphyotrichum [Aster] boreale	Bog Aster	10	Craig Annen	Bog Forb
Symphyotrichum [Aster] firmum	Shining Aster	6	Patricia Trochlell	Forb
Symphyotrichum [Aster] lanceolatum	Panicled Aster (Modal Fen as *A. simplex*)	4	Patricia Trochlell	Forb
Symphyotrichum [Aster] novae-angliae	New England Aster	3	Patricia Trochlell	Forb
Symphyotrichum [Aster] pilosum	Frost Aster	1	Patricia Trochlell	Forb
Symphyotrichum [Aster] prenanthoides	Crooked Aster	9	Patricia Trochlell	Forb
Symphyotrichum [Aster] puniceum	Red-Stemmed Aster	6	Patricia Trochlell	Forb
Teucrium canadense	American Germander	4	Craig Annen	Forb
Thalictrum dasycarpum	Purple Meadow-Rue (Modal Fen)	4	Patricia Trochlell	Forb
Thelypteris palustris	Eastern Marsh Fern	7	Sean Longabaugh	Fern
Typha latifolia	Broad-Leaved Cattail	1	Patricia Trochlell	Emergent Forb
Urtica dioica	Stinging Nettle	1	Patricia Trochlell	Forb
Valisneria americana	Water Celery	6	Craig Annen	Aquatic
Verbena hastata	Blue Vervain	3	Patricia Trochlell	Forb
Verbena stricta	Hoary Vervain	3	Patricia Trochlell	Forb
Verbena urticifolia	Nettle-Leaved Vervain	2	Craig Annen	Forb
Veronia faciculata	Ironweed	5	Patricia Trochlell	Forb
Viburnum sp.	Highbush Cranberry	NR	Patricia Trochlell	Shrub
Vicia americana	American Vetch	4	Patricia Trochlell	Forb
Viola affinis	Le Conte's Violet	4	Trochlell/Bernthal/Baller	Forb
Viola sororia	Dooryard Violet	3	Patricia Trochlell	Forb
Zizia aurea	Golden Alexander	7	Patricia Trochlell	Forb

Mean C	**4.91**	**Asteraceae**	**37**
Modal C	**4.00**	**Cyperaceae**	**29**
Species Richness	**187**	**Poaceae**	**11**
FQA	**67.1**	**Lamiaceae**	**9**
		Ranunculaceae	**7**
Proportion of species C ≥ 7 (S = 45)	**24.1%**	**Total**	**93**
Proportion of species C ≥ 8 (S = 17)	**9.1%**		**49.7% S in 5 families**

Pleasant Valley Post-Treatment Wetland Survey

Introduction

Pleasant Valley Conservancy is located in the Driftless Area. A long, narrow and steep ridge runs roughly east and west through the site. A broad wetland valley extends to the south from the base of the ridge. Calcareous groundwater discharge and seepage feed the wetlands and support Pleasant Valley Creek, a tributary to East Blue Mounds Creek. Although the wetlands have been impacted by past ditching and drainage, they are largely intact.

This report describes two plant surveys conducted in parts of the wetlands. The purpose of the surveys was to evaluate the plant communities' response after invasive species treatments. Based on prior observations of invasive species and remnant treated cut stems, it was clear that invasive species represented a significant portion of the plant community. Cutting and herbicide treatments were done from 2018 to 2022.

On 8 July 2018, Pat Trochlell and Tom Bernthal surveyed a small area that had been treated to remove invasive cattails. Pat Trochlell, Tom Bernthal and Rob Baller, together with Amanda Budyak and Kathie Brock, surveyed 6 treatment areas on 20 September 2022. These wetland areas were treated for both invasive cattails and willows in 2020, 2021 and 2022.

Timed-meander surveys were conducted and plant species data was recorded on plant data sheets. Data was then entered and analyzed using the Wisconsin Department of Natural Resources (WDNR) Floristic Quality Assessment Calculator. Plant metrics for each assessment area were classified using WDNR's Wetland Benchmark Study ranking criteria.

General observations and animal species seen during surveys were also noted in the data sheets. Birds are documented using 4-letter alpha codes.

Methods

Timed-Meander Survey Method

Vegetation sampling was conducted using the Timed-Meander Sampling Protocol for Wetland Floristic Quality Assessment (Trochlell, 2017). This is the Wisconsin Department of Natural Resources (WDNR) standard wetlands monitoring protocol used in conjunction with the Floristic Quality Assessment (FQA) Methodology for Wisconsin to determine wetland plant community condition (Bernthal 2003, Hlina et al 2013, and Marti and Bernthal 2019). The method has been used for conducting Natural Heritage Inventory surveys of State Natural Area wetland plant communities, FQA Benchmark Project surveys, water quality standards compliance surveys, wetland restoration site monitoring and wetland assessments for regulatory purposes.

In this method, wetland types are first identified using aerial photographs and/or site investigations of the potential wetland(s) to be sampled. Assessment Areas (AAs) composed of relatively homogenous vegetation are defined prior to sampling. The survey consists of a search for all plant species present within an AA and an estimate of abundance and percent areal cover for each species at the end of the search period. The search takes place during timed intervals documented by the time keeper. All plant species are recorded when first observed and search intervals are documented on the Data Sheet. After

all search intervals are complete, abundance and percent areal cover over the entire AA is estimated for each plant species, and notes on disturbance and other observations are documented.

Several methods exist for surveying wetlands but timed-meander was the chosen vegetation survey method for several reasons. Timed-meander has advantages over plot-based sampling methods. More species are identified using this method. Several studies comparing timed-meander with plot-based methods have concluded that timed-meander is fairly consistent with the results of more rigorous plot-based methods. Timed-meander surveys can be conducted in about a quarter of the time it takes for an accurate plot-based survey. Also, the botanists who conducted this survey had previously developed and used this method for several years while working at Wisconsin DNR on Wetland Floristic Quality Benchmark surveys, so were well-practiced in its use.

The timed-meander SOP can be found on the Wisconsin DNR website: https://dnr.wi.gov/topic/Wetlands/documents/TimedMeanderSamplingProtocol.pdf.

Plant Identification Methods

Plants were identified in the field, typically while conducting timed-meander surveys, but also while conducting general walk-throughs of the wetlands. Plants were identified to species level whenever possible, however, some species could not be identified due to the timing of the survey. When this occurred, an entry on the Data Form as "(plant) sp." was added to the final page. Some plant samples were collected to be identified later. Taxonomic names follow the 2016 Wisconsin Flora protocol: http://wisflora.herbarium.wisc.edu/index.php.

Except for the cattails survey in Area 1 in 2018, most plants we observed showed a range of characteristics intermediate between the native broad-leaved cattail (*Typha latifolia*) and the non-native narrow-leaved cattail (*Typha angustifolia*). We identified these as hybrid cattail (*Typha* x *glauca*). Cattails are extremely variable and hybridization between native and non-native species is very common. Although absolute identification of species and hybrids is extremely difficult, the presence of both species increases the likelihood of hybrids being present.

All shrub willows we observed were identified in the 2022 survey as pussy willow (*Salix discolor*).

Wetland Plant Community Classification

The WDNR Natural Heritage Conservation Key to Wetland Natural Communities was used to determine the plant community classification for each wetland area surveyed. This key was designed for use with natural communities with minimal anthropogenic disturbance, however, areas that are disturbed (ruderal communities) are included for completeness.

Wisconsin Floristic Quality Assessment Calculator

Wetland plant communities surveyed were analyzed using the Wisconsin Floristic Quality Assessment (WFQA) method and the WFQA Calculator (https://dnr.wi.gov/topic/wetlands/methods.html). This method was developed to provide an intensive measure of wetland biological integrity on a site level based on the condition of the plant community. It requires a high degree of plant identification skill to correctly and thoroughly inventory a site.

The WFQA method is based on the concept of species conservatism. Each native plant species occurring in a regional flora is assigned a coefficient of conservatism (C) representing an estimated probability that a species is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition. The most conservative species require a narrow range of ecological conditions, are intolerant of disturbance and are unlikely to be found outside undegraded remnant natural areas. Least conservative species can be found in a wide variety of settings and thrive on disturbance. Coefficients range from 0 (highly tolerant of disturbance, little fidelity to any natural community) to 10 (highly intolerant of disturbance, restricted to pre-settlement remnants). Non-native species are given a default value of 0.

Floristic quality assessment uses two related, but separate, measures: 1) the average coefficient of conservatism or Mean C, and 2) the Floristic Quality Index or FQI. To use the WFQA, the plant community is inventoried or sampled to compile an accurate and complete species list of vascular flora on a site. The appropriate coefficient of conservatism is applied to each species, and the mean is calculated for the assessment area.

Mean C = Σ (c1+c2+c3+…cn)/N

c is the coefficient of conservatism for each species identified on the site and **N** is the total number of species inventoried in the assessment area.

The Floristic Quality Index (FQI) is calculated by multiplying the Mean C by the square root of the total number of species.

FQI = Mean C * √N

While the FQI of a specific plant community can yield useful results, it can be biased by size of the site. Mean C has been shown to more accurately represent the biological integrity of a site than FQI and is therefore used to calculate plant community benchmarks (Bourdaghs 2006, and Marti and Bernthal 2019).

Floristic quality metrics are most useful when percent cover estimates are considered in the calculations. Weighting by percent cover allows more influence to be given to species that are more dominant on a site. Weighted Mean C (wC□) is Mean C calculated as the sum of the product of each species' Coefficient of Conservatism (C) and its proportional cover (p), i.e. mean C with each species weighted by its relative abundance. Weighted FQI uses the weighted Mean C in its calculation.

Weighted Mean C = Σ (p1c1+p2c2+p3c3+…pncn)

Weighted FQI = Weighted Mean C * √N

These are the metrics we focused on in this report, particularly the weighted Mean C, because of it’s link to the Wetland Condition Benchmarks described below.

Other important metrics that are useful in assessing wetlands include native species richness and percent cover of native species. These and other site analysis metrics are automatically calculated by the Wisconsin Floristic Quality Assessment Calculator (FQA Calculator). The FQA Calculator is an Excel-based program designed to allow users to easily enter plant survey data (plant names and percent areal cover).

Data from the timed-meander wetland site surveys was entered into the calculator. Please see https://dnr.wi.gov/topic/wetlands/methods.html for more information about the WFQA Calculator.

WDNR Wetland Benchmark Study

The WDNR developed and refined the WFQA methodology to measure the biological condition of wetland plant communities. However, plant community metrics calculated as part of WFQA lacked an overall framework for interpretation and comparison at both regional and statewide scales. To adapt the WFQA method as a comprehensive, quantitative, and repeatable method for intensive, site-level monitoring and assessment of wetland condition, WDNR developed Floristic Quality Assessment Benchmarks for all common wetland community types across Wisconsin. (Marti, A.M. and T.W. Bernthal. 2019). WDNR surveyed nearly 1,100 wetland assessment areas using timed-meander survey and FQA methods to develop FQA Benchmarks. These consist of numeric, statistically-derived ranges of FQA scores for a given wetland natural community type, with each range corresponding to a narrative ranking category (e.g. “Excellent”, “Good”, “Fair”, “Poor”, “Very Poor”) along a gradient of ecosystem disturbance.

The provisional Benchmarks allow for relative comparisons of similar wetland plant communities across sites within Wisconsin’s four level III ecoregions. Understanding and documenting wetland condition, as well as the stressors, provides support for undertaking appropriate protection, management and restoration actions for wetlands.

Results

Eight timed-meander surveys were completed on two survey days in 2018 and 2022. Approximate locations of the six assessment areas surveyed in 2022 are mapped and shown in Figure 1. The 2018 surveys were in a small area where cattails were removed and an adjacent high quality intact sedge meadow. The data for the second area is not included in this report.

Plant data sheets for all wetlands are attached in Appendix 1. Data sheets include all plant metrics and also summaries of site observations. A summary of wetland plant community data is listed in Table 1.

All surveyed areas are southern sedge meadow plant communities.

2018 Survey Results

A plant survey was conducted on 8 July 2018 in a small (approximately 30 x 18 m [100 x 60 ft]) area soon after cattail treatment was done. This area is listed on the data sheets as Treated Cattail Area 1 (Area 1). This area is located in the general vicinity of areas treated in later years. Because the survey was conducted soon after the invasive species removal work was completed and the area was small in size, fewer species were observed. We documented 14 species within Area 1. Thirteen of these species are native. The relative cover of native species in 99%. These species are largely low Coefficient of Conservatism-value (C-value) pioneer species.

Vegetative cover in Area 1 is dominated by 40% duckweed (*Lemna turionifera*), 35% beggar-ticks (*Bidens cernua*), 5% broad-leaved cattail (*Typha latifolia*), 2% water horsetail (*Equisetum fluviatile*) and 2% prairie sedge (*Carex prairea*). Remaining species were present at 1% cover or less. The presence of prairie sedge, a highly conservative wetland sedge, is indicative of the high-quality sedge meadow

present in less disturbed areas of this wetland complex. Invasive cattails were under 30 cms. (12") tall and under 1% cover. This wetland area condition is rated as "fair".

2022 Survey Results

Pat Trochlell, Tom Bernthal and Rob Baller, together with Amanda Budyak and Kathie Brock, surveyed 6 wetland treatment areas on 20 September 2022. Invasive cattails and willows were the target species treated in 2020, 2021 and 2022. Other invasive species, like reed canary grass (*Phalaris arundinacea*) may have been treated incidentally. Some of these areas were also seeded with native wetland species. Approximate locations for Areas A to F are shown in Figure 1.

Area A

Area A was treated for cattails and willows in 2021. Forty-six plant species were observed, of which 41 are native. The relative cover of native species is 95%. The dominant plant species cover in Area A includes 35% shining aster (*Symphyotrichum firmum*), 35% fountain sedge (*Carex trichocarpa*), 20% joe-pye-weed (*Eutrochium maculatum*), 5% swamp lousewort (*Pedicularis lanceolata*), 2% boneset (*Eupatorium perfoliatum*) and 2% inland star sedge (*Carex interior*). Less than 1% cover of cattails and only one willow shrub was observed. We found no reed canary grass. The weighted mean C was 5.2. This area had higher floristic integrity, and the condition is rated as "good".

Area B

Area B is a narrow area west of Area A. It was treated for cattails in 2020 and 2022 and for willows in 2022. We observed a total of 26 species with 23 native plants. The relative cover of native species is 97%. The dominant plant species cover included 37% beggar-ticks (*Bidens cernua*), 15% shining aster (*Symphyotrichum firmum*), 10% prairie sedge (*Carex prairea*) and 2% joe-pye-weed (*Eutrochium maculatum*). Less than 1% cover of cattail was observed. Less than 1% cover of watercress (*Nasturtium officinale*), a potentially invasive species, was observed. The weighted mean C was 5.2. The condition is rated as "good".

Area C

Area C is a large area in the northwest corner of the property. This area was most recently treated for both cattails and willows in 2022. Because of the recent treatment it had few plant species. Of 15 total species, 13 were native. It had 97% native relative cover. Dead cattails and willow stumps were common. Exposed soil and standing water were observed. The dominant plant species cover included 55% clearweed (*Pilea pumila*) and 8% dark-green bulrush (*Scirpus atrovirens*), with less than 1% cover of the remaining species. We observed less than 1% cover of cattails and watercress. Many of the species, including the dominant species, are pioneer species, therefore the weighted mean C was relatively low at 3.2. The condition rated as "fair".

Area D

Area D is south of Areas B and C and further from the upland slope. It had been treated for cattails in 2020. This area is wetter than the other areas we surveyed with 10% open water. Twenty-three species were observed, 21 of which are native with a native relative cover of 98%. The dominant plant cover included 35% prairie sedge (*Carex prairea*), 30% clearweed (*Pilea pumila*), 10% bottlebrush sedge (*Carex comosa*), 5% nodding beggar-ticks (*Bidens cernua*) and 2% common beggar-ticks (*Bidens frondosa*).

Cattails cover was less than 1%. The high cover of prairie sedge, a very conservative species, resulted in a weighted mean C of 5.8. The condition rating for this area is “excellent”.

Area E

Area E is a narrow strip of land adjacent to the ridge. It was treated for cattails and willows in 2022. This area had 37 species, with 35 native plants. The relative native cover was 98%. The dominant plant species were 40% tussock sedge (*Carex stricta*), 20% fountain sedge (*Carex trichocarpa*), 5% clearweed (*Pilea pumila*), 4% joe-pye-weed (*Eutrochium maculatum*), 3% yellow lake sedge (*Carex utriculata*), 2% red-stemmed aster (*Symphyotrichum puniceum*) and 2% shining aster (*Symphyotrichum firmum*). Less than 1% cover of willow, cattail and reed canary grass was present. The dominance of relatively conservative species resulted in a weighted mean C of 6.0, the highest of the areas surveyed. The condition rated as “excellent”.

Area F

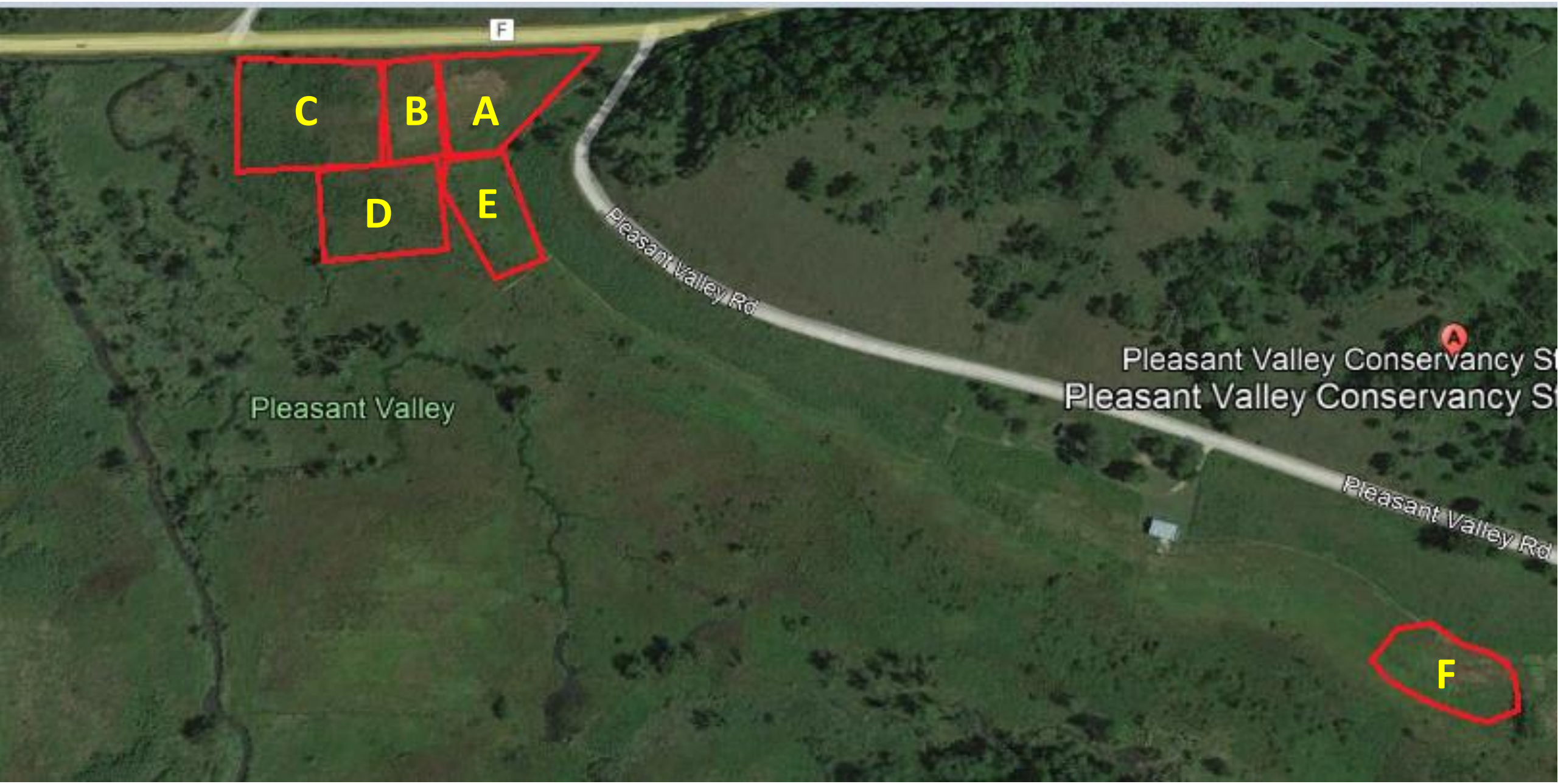
Area F is separate from the other treatment areas. It is located at the east end of the property, directly downslope from a path below the base of the ridge. This area was treated for cattails in 2021. Area F had 35 species, with 32 native plants. Native relative cover was 97%. Dominant plant species cover was 30% water-hemlock (*Cicuta maculata*), 30% tussock sedge (*Carex stricta*), 15% shining aster (*Symphyotrichum firmum*), 2% swamp thistle (*Cirsium muticum*) and 2% rice cut grass (*Leersia oryzoides*). Cattails occupied less than 1% of the total cover. Conservative species dominated this area so the weighted mean C was 5.8. The condition rated as “excellent”.

Conclusions

Of 8 areas surveyed after invasive species removal, the condition rating for 3 areas was “excellent”, 2 areas are “good” and 2 are “fair”. The wetland areas of lower floristic integrity are expected to recover as native species are reestablished. Continued management including prescribed burning, invasive species control and reestablishing native plants in treated areas is likely to result in high to excellent condition wetlands throughout the site.

Area	Treatment – Species, Year	Na	Nn	Relative % Cover Native Species	*w*FQI	w$\bar{C}$	Condition
1	Cattails, 2018	14	13	99	12.3	3.3	Fair
A	Cattails & willow, 2021	46	41	95	37	5.5	Good
B	Cattails & willow, 2022. Cattails in part of area, 2020	26	23	97	26.3	5.2	Good
C	Cattails & willow, 2022. Cattails in part of area, 2020	15	13	98	12.3	3.2	Fair
D	Cattails, 2020	23	21	98	19.4	5.8	Excellent
E	Cattails & willow, 2022	37	35	98	36.5	6.0	Excellent
F	Cattails, 2021	35	32	99	34.1	5.8	Excellent

Table 1: **Summary of Post-Treatment Wetland Plant Community Survey Data**. $\boldsymbol{w\bar{C}}$ is weighted mean coefficient of conservatism, ***w*FQI** is weighted floristic quality index, **Na** is total number of species and **Nn** is total number of native species. Condition categories are based on the Benchmarks for the Driftless Area Ecoregion. Ratings source: Marti, A.M. and T.W. Bernthal. 2019. Provisional wetland floristic quality benchmarks for wetland monitoring and assessment in Wisconsin. Final Report to US EPA Region V, Grants # CD00E01576 and #CD00E02075. Wisconsin Department of Natural Resources.


F
C
B
A
D
E
Pleasant Valley Rd
Pleasant Valley
Pleasant Valley Conservancy St
Pleasant Valley Conservancy St
Pleasant Valley Rd
F

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Pleasant Valley Conservancy		PLANT COMMUNITY:	Southern Sedge Meadow	
ASSESSMENT AREA NAME:	Treated Cattail Area		SURVEYORS:	Pat Trochlell and Tom Bernthal	
GPS COORDINATES (Decimal Degrees)	Latitude:		SURVEY DATE:	8-Jul-18	
	Longitude:		OTHER SITE NOTES:	Area 1: treated cattail area approximately 100' x 60'. Area 2: area adjacent to the NE, approximately 150' diameter. Birds: COYE, KILL, MODO, GBHE, AMGO, SWSP, CLSW, RWBL. Also, dragonfly, green frog. GW, cold throughout Areas 1 and 2. 1% Typha sp. small, under 12".	
COUNTY:	Dane				
ECOREGION (LEVEL III):	Driftless Area				
ECOL. LANDSCAPE:	Western Coulee and Ridges				
12 Digit HUC:	70700050601				

RESULTS:

Species Richness:				Floristic Quality Metrics: Native Species (n)				Floristic Quality Metrics: All Species (a)				wC_a By Plant Layer:			
N_a	N_n	$N_{int.}$	Relative Cover of Introduced Species	FQI_n	$w\,FQI_n$	Mean C C_n	Weighted Mean C wC_n	FQI_a	$w\,FQI_a$	Mean C C_a	Weighted Mean C wC_a	Tree	Shrub	Herb	Aquatic
14	13	1	1%	19.4	12.0	5.4	3.3	18.7	12.3	5.0	3.3	0.0	0.0	4.3	2.0
												0%	0%	52%	41%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Layer	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
lemtur	40	*Lemna turionifera*	*perennial duckweed, Turion duckweed*	2	OBL	Native	aquatic	perennial	0	0	*Lemna turionifera*
bidcer	35	*Bidens cernua*	*nodding beggar-ticks, nodding bur-marigc*	4	OBL	Native	herb	annual	0	0	*Bidens cernua*
typlat	5	*Typha latifolia*	*broad-leaved cat-tail, common cat-tail*	1	OBL	Native	herb	perennial	0	0	*Typha latifolia*
equflu	2	*Equisetum fluviatile*	*pipes, river horsetail, water horsetail*	7	OBL	Native	herb	perennial	0	0	*Equisetum fluviatile*
CARPRAI	2	*Carex prairea*	*fen panicled sedge, prairie sedge*	10	OBL/FACW	Native	herb	perennial	0	0	*Carex prairea*
leeory	1	*Leersia oryzoides*	*rice cut grass*	3	OBL	Native	herb	perennial	0	0	*Leersia oryzoides*
carcom	1	*Carex comosa*	*bristly sedge*	5	OBL	Native	herb	perennial	0	0	*Carex comosa*
saglat	1	*Sagittaria latifolia*	*broad-leaved arrowhead*	3	OBL	Native	aquatic	perennial	0	0	*Sagittaria latifolia*
perhyd	1	*Persicaria hydropiper*	*marsh-pepper smartweed, water-pepper*	0	OBL	Introduced	herb	annual	0	0	*Persicaria hydropiper*
cicbul	1	*Cicuta bulbifera*	*bulblet water-hemlock*	7	OBL	Native	herb	perennial	0	0	*Cicuta bulbifera*
bidcon	1	*Bidens connata*	*purple-stem beggar-ticks, purple-stemmec*	6	0	Native	herb	annual	0	0	*Bidens connata*
rumbri	1	*Rumex britannica*	*greater water dock, British dock*	8	OBL	Native	herb	perennial	0	0	*Rumex britannica*
eupper	1	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwort*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
epilep	1	*Epilobium leptophyllum*	*American marsh willow-herb, bog willow-*	8	OBL	Native	herb	perennial	0	0	*Epilobium leptophyllum*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Pleasant Valley Conservancy SNA	**PLANT COMMUNITY:**	Southern Sedge Meadow
ASSESSMENT AREA NAME:	Assessment Area A	**SURVEYORS:**	Pat Trochlell, Tom Bernthal, Rob Baller, Amanda Budyak, Kathie Brock
GPS COORDINATES (Decimal Degrees)	**Latitude:**		
	Longitude:	**SURVEY DATE:**	20 Sept. 2022
COUNTY:	Dane	**SITE NOTES:**	SEWR, Monarch, Ohio Buckeye. No PHAARU. 1 Salix sp. , Typha spp. <1%.
ECOREGION (LEVEL III):	Driftless Area		

RESULTS:		Non-Natives			Floristic Quality Metrics: Native Species (n)				Floristic Quality Metrics: All Species (a)				$w\bar{C}_a$ By Growth Form:			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
46	41	5	5%	4%	30.6	36.3	4.8	5.7	28.9	37.0	4.3	5.5	2.0	0.0	5.5	0.0
													1%	0%	138%	0%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
SYMFIR	35	*Symphyotrichum firmum*	*glossy-leaved aster*	6	OBL	Native	herb	perennial	0	0	*Symphyotrichum firmum*
CARTRIC	35	*Carex trichocarpa*	*hairy-fruit lake sedge, hairy-fruit sedge*	7	OBL	Native	herb	perennial	0	0	*Carex trichocarpa*
EUTMAC	20	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*
PEDLAN	5	*Pedicularis lanceolata*	*fen betony, swamp betony, swamp-lous*	8	OBL/FACW	Native	herb	perennial	0	0	*Pedicularis lanceolata*
EUPPER	2	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwo*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
CARINTE	2	*Carex interior*	*inland sedge, inland star sedge*	7	OBL	Native	herb	perennial	0	0	*Carex interior*
ANGATR	1	*Angelica atropurpurea*	*common great angelica, great angelica,*	6	OBL	Native	herb	perennial	0	0	*Angelica atropurpurea*
BIDCER	1	*Bidens cernua*	*nodding beggar-ticks, nodding bur-mari*	4	OBL	Native	herb	annual	0	0	*Bidens cernua*
HASSUA	1	*Hasteola suaveolens*	*hastate Indian-plantain, sweet Indian-pl*	8	FACW	Native	herb	perennial	0	0	*Senecio suaveolens*
IMPCAP	1	*Impatiens capensis*	*orange jewelweed, orange touch-me-nc*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
LEEORY	1	*Leersia oryzoides*	*rice cut grass*	3	OBL	Native	herb	perennial	0	0	*Leersia oryzoides*
CICMAC	1	*Cicuta maculata*	*common water-hemlock, spotted water*	6	OBL	Native	herb	perennial	0	0	*Cicuta maculata*
RUMBRI	1	*Rumex britannica*	*greater water dock, British dock*	8	OBL	Native	herb	perennial	0	0	*Rumex britannica*
EREHIE	1	*Erechtites hieraciifolius*	*American burn-weed, fireweed*	2	0	Native	herb	annual	0	0	*Erechtites hieraciifolius*
PERSAG	1	*Persicaria sagittata*	*arrow-leaved tearthumb, arrow vine*	6	OBL	Native	herb	annual	0	0	*Persicaria sagittata*
SALDIS	1	*Salix discolor*	*pussy willow*	2	FACW	Native	tree	perennial	0	0	*Salix discolor*
TYPGLA	1	*Typha X glauca*	*hybrid cat-tail, white cat-tail*	0	OBL	Introduced	herb	perennial	0	Restricted	*Typha X glauca*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
CIRMUT	1	*Cirsium muticum*	*swamp thistle*	8	OBL	Native	herb	biennial	0	0	*Cirsium muticum*
CALTPAL	1	*Caltha palustris*	*cowslip, marsh-marigold, yellow marsh-*	6	OBL	Native	herb	perennial	0	0	*Caltha palustris*
MUHMEX	1	*Muhlenbergia mexicana*	*leafy satin grass, Mexican muhly, wire-s*	4	FACW	Native	herb	perennial	0	0	*Muhlenbergia mexicana*
SOLGIG	1	*Solidago gigantea*	*giant goldenrod*	3	FACW	Native	herb	perennial	0	0	*Solidago gigantea*
APIAME	1	*Apios americana*	*common groundnut, Indian-potato, pot*	5	FACW	Native	herb	annual/perei	0	0	*Apios americana*
AGRGIG	1	*Agrostis gigantea*	*redtop*	0	FACW	Introduced	herb	perennial	0	0	*Agrostis gigantea*
SILPER	1	*Silphium perfoliatum*	*cup-plant*	4	FACW	Native	herb	0	0	0	*Silphium perfoliatum*
POAPRA	1	*Poa pratensis*	*Kentucky bluegrass*	0	FAC/FACU	Introduced	herb	perennial	0	0	*Poa pratensis*
EQUFLU	1	*Equisetum fluviatile*	*pipes, river horsetail, water horsetail*	7	OBL	Native	herb	perennial	0	0	*Equisetum fluviatile*
BROCIL	1	*Bromus ciliatus*	*fringed brome*	7	FACW	Native	herb	perennial	0	0	*Bromus ciliatus*
EPILEP	1	*Epilobium leptophyllum*	*American marsh willow-herb, bog willo*	8	OBL	Native	herb	perennial	0	0	*Epilobium leptophyllum*
THADAS	1	*Thalictrum dasycarpum*	*purple meadow-rue, tall meadow-rue*	4	FACW	Native	herb	perennial	0	0	*Thalictrum dasycarpum*
CUSGRO	1	*Cuscuta gronovii*	*common dodder, scald-weed, swamp dc*	4	0	Native	herb	annual/perei	0	0	*Cuscuta gronovii*
PYCVIR	1	*Pycnanthemum virginianum*	*common mountain mint, Virginia moun*	6	FACW	Native	herb	perennial	0	0	*Pycnanthemum virginianum*
ONOSEN	1	*Onoclea sensibilis*	*sensitive fern*	5	FACW	Native	herb	perennial	0	0	*Onoclea sensibilis*
AMPBRA	1	*Amphicarpaea bracteata*	*American hog-peanut, hog-peanut*	5	FAC	Native	herb	annual	0	0	*Amphicarpaea bracteata*
VIOSOR	1	*Viola sororia*	*door-yard violet, common blue violet, h*	3	FAC	Native	herb	annual/perei	0	0	*Viola sororia*
LOBSIP	1	*Lobelia siphilitica*	*great blue lobelia*	5	OBL/FACW	Native	herb	perennial	0	0	*Lobelia siphilitica*
SCIATR	1	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*
ASCINC	1	*Asclepias incarnata*	*swamp milkweed*	5	OBL	Native	herb	perennial	0	0	*Asclepias incarnata*
GLYSTR	1	*Glyceria striata*	*fowl manna grass, fowl meadow grass*	4	OBL	Native	herb	perennial	0	0	*Glyceria striata*
SYMNOV	1	*Symphyotrichum novae-angliae*	*New England aster*	3	FACW	Native	herb	perennial	0	0	*Symphyotrichum novae-angliae*
PILPUM	1	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
CARPEL	1	*Carex pellita*	*broad-leaved woolly sedge*	4	OBL	Native	herb	perennial	0	0	*Carex pellita*
LATPAL	1	*Lathyrus palustris*	*marsh pea, marsh vetchling, slender-ste*	5	FACW	Native	herb	perennial	0	0	*Lathyrus palustris*
CONCAN	1	*Conyza canadensis*	*Canadian horseweed, fleabane, hogwee*	0	FACU	Native	herb	0	0	0	*Conyza canadensis*
AMBTRI	1	*Ambrosia trifida*	*giant ragweed, great ragweed, horse-cc*	0	FAC	Native	herb	annual	0	0	*Ambrosia trifida*
DAUCAR	1	*Daucus carota*	*Queen Anne's-lace, wild carrot*	0	UPL	Introduced	herb	biennial	0	Non-Restricted	*Daucus carota*
PERHYD	1	*Persicaria hydropiper*	*marsh-pepper smartweed, water-peppe*	0	OBL	Introduced	herb	annual	0	0	*Persicaria hydropiper*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name

OPTIONAL: ADDITIONAL PLANT SPECIES OBSERVED IN ASSESSMENT AREA BUT NOT INCLUDED IN FQA CALCULATIONS:

(Include unknowns here as well as non-vascular species (i.e. Sphagnum Moss, charophytes) and other species with no C-Value at this time. Examples: SPHSP = sphagnum moss species; CARSP = Carex species; Grass species = GRASP; Salix species = SALSP; Viola species = VIOSP; see bottom of 2016 WIPlants Sheet for more.

ENTER SPECIES CODE:	ENTER % COVER:	Field Notes	Scientific Name	Common Name	WI Status	NHI Status	NR40 Status	Accepted ITIS Name
VIOSP	1		*Viola sp.*	*violet*	Native	0	0	Viola

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Pleasant Valley Conservancy SNA	**PLANT COMMUNITY:**	Southern Sedge Meadow
ASSESSMENT AREA NAME:	Assessment Area B	**SURVEYORS:**	Pat Trochlell, Tom Bernthal, Rob Baller, Amanda Budyak, Kathie Brock
GPS COORDINATES (Decimal Degrees)	**Latitude:**		
	Longitude:	**SURVEY DATE:**	20 Sept. 2022
COUNTY:	Dane	**SITE NOTES:**	Narrow area east of Assessment Area C.
ECOREGION (LEVEL III):	Driftless Area		

RESULTS:

Non-Natives					Floristic Quality Metrics: Native Species (n)				Floristic Quality Metrics: All Species (a)				$w\bar{C}_a$ By Growth Form:			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
26	23	3	3%	3%	25.4	25.7	5.3	5.3	23.9	26.3	4.7	5.2	2.0	0.0	5.2	2.0
													1%	0%	84%	1%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
BIDCER	37	*Bidens cernua*	*nodding beggar-ticks, nodding bur-mari*	4	OBL	Native	herb	annual	0	0	*Bidens cernua*
SYMFIR	15	*Symphyotrichum firmum*	*glossy-leaved aster*	6	OBL	Native	herb	perennial	0	0	*Symphyotrichum firmum*
CARPRAI	10	*Carex prairea*	*fen panicled sedge, prairie sedge*	10	OBL/FACW	Native	herb	perennial	0	0	*Carex prairea*
EUTMAC	2	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*
RUMBRI	1	*Rumex britannica*	*greater water dock, British dock*	8	OBL	Native	herb	perennial	0	0	*Rumex britannica*
CALTPAL	1	*Caltha palustris*	*cowslip, marsh-marigold, yellow marsh-*	6	OBL	Native	herb	perennial	0	0	*Caltha palustris*
CARTRIC	1	*Carex trichocarpa*	*hairy-fruit lake sedge, hairy-fruit sedge*	7	OBL	Native	herb	perennial	0	0	*Carex trichocarpa*
EUPPER	1	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwo*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
LEEORY	1	*Leersia oryzoides*	*rice cut grass*	3	OBL	Native	herb	perennial	0	0	*Leersia oryzoides*
CICMAC	1	*Cicuta maculata*	*common water-hemlock, spotted water*	6	OBL	Native	herb	perennial	0	0	*Cicuta maculata*
ANGATR	1	*Angelica atropurpurea*	*common great angelica, great angelica,*	6	OBL	Native	herb	perennial	0	0	*Angelica atropurpurea*
PILPUM	1	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
CARSTR	1	*Carex stricta*	*tussock sedge*	7	OBL	Native	herb	perennial	0	0	*Carex stricta*
TYPGLA	1	*Typha X glauca*	*hybrid cat-tail, white cat-tail*	0	OBL	Introduced	herb	perennial	0	Restricted	*Typha X glauca*
LEMTUR	1	*Lemna turionifera*	*perennial duckweed, Turion duckweed*	2	OBL	Native	aquatic	perennial	0	0	*Lemna turionifera*
SYMPUN	1	*Symphyotrichum puniceum*	*swamp aster*	5	OBL	Native	herb	perennial	0	0	*Symphyotrichum puniceum*
SCIATR	1	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
EPILEP	1	*Epilobium leptophyllum*	*American marsh willow-herb, bog willo*	8	OBL	Native	herb	perennial	0	0	*Epilobium leptophyllum*
MUHMEX	1	*Muhlenbergia mexicana*	*leafy satin grass, Mexican muhly, wire-s*	4	FACW	Native	herb	perennial	0	0	*Muhlenbergia mexicana*
EQUFLU	1	*Equisetum fluviatile*	*pipes, river horsetail, water horsetail*	7	OBL	Native	herb	perennial	0	0	*Equisetum fluviatile*
GALTRIFI	1	*Galium trifidum*	*northern three-lobed bedstraw, small be*	6	FACW	Native	herb	perennial	0	0	*Galium trifidum*
SALDIS	1	*Salix discolor*	*pussy willow*	2	FACW	Native	tree	perennial	0	0	*Salix discolor*
IMPCAP	1	*Impatiens capensis*	*orange jewelweed, orange touch-me-nc*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
CICBUL	1	*Cicuta bulbifera*	*bulblet water-hemlock*	7	OBL	Native	herb	perennial	0	0	*Cicuta bulbifera*
PERHYD	1	*Persicaria hydropiper*	*marsh-pepper smartweed, water-peppe*	0	OBL	Introduced	herb	annual	0	0	*Persicaria hydropiper*
NASOFF	1	*Nasturtium officinale*	*watercress*	0	OBL	Introduced	herb	perennial	0	Caution	*Nasturtium officinale*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name

OPTIONAL: ADDITIONAL PLANT SPECIES OBSERVED IN ASSESSMENT AREA BUT NOT INCLUDED IN FQA CALCULATIONS:

(Include unknowns here as well as non-vascular species (i.e. Sphagnum Moss, charophytes) and other species with no C-Value at this time. Examples: SPHSP = sphagnum moss species; CARSP = Carex species; Grass species = GRASP; Salix species = SALSP; Viola species = VIOSP; see bottom of 2016 WIPlants Sheet for more.

ENTER SPECIES CODE:	ENTER % COVER:	Field Notes	Scientific Name	Common Name	WI Status	NHI Status	NR40 Status	Accepted ITIS Name
ELESP	1		*Eleocharis sp.*	*Spike-rush*	0	0	0	Eleocharis
RICFLU	1		*Riccia fluitans*	*Slender riccia*	Native	0	0	Riccia fluitans

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Pleasant Valley Conservancy SNA	**PLANT COMMUNITY:**	Southern Sedge Meadow
ASSESSMENT AREA NAME:	Assessment Area C	**SURVEYORS:**	Pat Trochlell, Tom Bernthal, Rob Baller, Amanda Budyak, Kathie Brock
GPS COORDINATES (Decimal Degrees)	**Latitude:**		
	Longitude:	**SURVEY DATE:**	20 Sept. 2022
COUNTY:	Dane	**SITE NOTES:**	Cattail and willow control area at northwest edge of property. Lots of dead cattails. Green frog, crayfish burrows.
ECOREGION (LEVEL III):	Driftless Area		

RESULTS:		Non-Natives			Floristic Quality Metrics: Native Species (n)				Floristic Quality Metrics: All Species (a)				$w\bar{C}_a$ By Growth Form:			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
15	13	2	2%	3%	16.1	11.7	4.5	3.3	15.0	12.3	3.9	3.2	2.0	0.0	3.2	2.0
													1%	0%	74%	1%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
PILPUM	55	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
SCIATR	8	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*
TYPGLA	1	*Typha X glauca*	*hybrid cat-tail, white cat-tail*	0	OBL	Introduced	herb	perennial	0	Restricted	*Typha X glauca*
RUMBRI	1	*Rumex britannica*	*greater water dock, British dock*	8	OBL	Native	herb	perennial	0	0	*Rumex britannica*
CALTPAL	1	*Caltha palustris*	*cowslip, marsh-marigold, yellow marsh-*	6	OBL	Native	herb	perennial	0	0	*Caltha palustris*
EPILEP	1	*Epilobium leptophyllum*	*American marsh willow-herb, bog willo*	8	OBL	Native	herb	perennial	0	0	*Epilobium leptophyllum*
CARHYS	1	*Carex hystericina*	*bottlebrush sedge, porcupine sedge*	3	OBL	Native	herb	perennial	0	0	*Carex hystericina*
CARCOM	1	*Carex comosa*	*bristly sedge*	5	OBL	Native	herb	perennial	0	0	*Carex comosa*
LEMTUR	1	*Lemna turionifera*	*perennial duckweed, Turion duckweed*	2	OBL	Native	aquatic	perennial	0	0	*Lemna turionifera*
IMPCAP	1	*Impatiens capensis*	*orange jewelweed, orange touch-me-nc*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
NASOFF	1	*Nasturtium officinale*	*watercress*	0	OBL	Introduced	herb	perennial	0	Caution	*Nasturtium officinale*
SYMPUN	1	*Symphyotrichum puniceum*	*swamp aster*	5	OBL	Native	herb	perennial	0	0	*Symphyotrichum puniceum*
CHEGLAB	1	*Chelone glabra*	*turtlehead, white turtlehead*	7	OBL	Native	herb	perennial	0	0	*Chelone glabra*
SALDIS	1	*Salix discolor*	*pussy willow*	2	FACW	Native	tree	perennial	0	0	*Salix discolor*
EUTMAC	1	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name

OPTIONAL: ADDITIONAL PLANT SPECIES OBSERVED IN ASSESSMENT AREA BUT NOT INCLUDED IN FQA CALCULATIONS:

(Include unknowns here as well as non-vascular species (i.e. Sphagnum Moss, charophytes) and other species with no C-Value at this time. Examples: SPHSP = sphagnum moss species; CARSP = Carex species; Grass species = GRASP; Salix species = SALSP; Viola species = VIOSP; see bottom of 2016 WIPlants Sheet for more.

ENTER SPECIES CODE:	ENTER % COVER:	Field Notes	Scientific Name	Common Name	WI Status	NHI Status	NR40 Status	Accepted ITIS Name
ELESP	1		*Eleocharis sp.*	*Spike-rush*	0	0	0	Eleocharis

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Pleasant Valley Conservancy SNA		**PLANT COMMUNITY:**	Southern Sedge Meadow
ASSESSMENT AREA NAME:	Assessment Area D		**SURVEYORS:**	Pat Trochlell, Tom Bernthal, Rob Baller, Amanda Budyak, Kathie Brock
GPS COORDINATES (Decimal Degrees)	**Latitude:**			
	Longitude:		**SURVEY DATE:**	20 Sept. 2022
COUNTY:	Dane		**SITE NOTES:**	10% cover open water.
ECOREGION (LEVEL III):	Driftless Area			

RESULTS:		**Non-Natives**			**Floristic Quality Metrics: Native Species (n)**				**Floristic Quality Metrics: All Species (a)**				**$w\bar{C}_a$ By Growth Form:**			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
23	21	2	2%	2%	20.3	27.2	4.4	5.9	19.4	27.9	4.0	5.8	2.0	0.0	5.9	2.5
													1%	0%	97%	2%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
CARPRAI	35	*Carex prairea*	*fen panicled sedge, prairie sedge*	10	OBL/FACW	Native	herb	perennial	0	0	*Carex prairea*
PILPUM	30	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
CARCOM	10	*Carex comosa*	*bristly sedge*	5	OBL	Native	herb	perennial	0	0	*Carex comosa*
BIDCER	5	*Bidens cernua*	*nodding beggar-ticks, nodding bur-mari*	4	OBL	Native	herb	annual	0	0	*Bidens cernua*
BIDFRO	2	*Bidens frondosa*	*common beggar-ticks, devil's beggar-tic*	1	FACW	Native	herb	annual	0	0	*Bidens frondosa*
EPILEP	1	*Epilobium leptophyllum*	*American marsh willow-herb, bog willo*	8	OBL	Native	herb	perennial	0	0	*Epilobium leptophyllum*
IMPCAP	1	*Impatiens capensis*	*orange jewelweed, orange touch-me-nc*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
RUMBRI	1	*Rumex britannica*	*greater water dock, British dock*	8	OBL	Native	herb	perennial	0	0	*Rumex britannica*
SCIATR	1	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*
PERHYD	1	*Persicaria hydropiper*	*marsh-pepper smartweed, water-peppe*	0	OBL	Introduced	herb	annual	0	0	*Persicaria hydropiper*
TYPGLA	1	*Typha X glauca*	*hybrid cat-tail, white cat-tail*	0	OBL	Introduced	herb	perennial	0	Restricted	*Typha X glauca*
EUTMAC	1	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*
VIOAFF	1	*Viola affinis*	*Le Conte's violet, sand violet*	4	FACW	Native	herb	annual/perei	0	0	*Viola sororia var. affinis*
EUPPER	1	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwo*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
SYMPUN	1	*Symphyotrichum puniceum*	*swamp aster*	5	OBL	Native	herb	perennial	0	0	*Symphyotrichum puniceum*
SCHTAB	1	*Schoenoplectus tabernaemontani*	*great bulrush, soft-stem bulrush*	4	OBL	Native	herb	perennial	0	0	*Schoenoplectus tabernaemontani*
SALDIS	1	*Salix discolor*	*pussy willow*	2	FACW	Native	tree	perennial	0	0	*Salix discolor*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
CARSTR	1	*Carex stricta*	*tussock sedge*	7	OBL	Native	herb	perennial	0	0	*Carex stricta*
CARHYS	1	*Carex hystericina*	*bottlebrush sedge, porcupine sedge*	3	OBL	Native	herb	perennial	0	0	*Carex hystericina*
SYMFIR	1	*Symphyotrichum firmum*	*glossy-leaved aster*	6	OBL	Native	herb	perennial	0	0	*Symphyotrichum firmum*
LEMTUR	1	*Lemna turionifera*	*perennial duckweed, Turion duckweed*	2	OBL	Native	aquatic	perennial	0	0	*Lemna turionifera*
LEEORY	1	*Leersia oryzoides*	*rice cut grass*	3	OBL	Native	herb	perennial	0	0	*Leersia oryzoides*
SAGLAT	1	*Sagittaria latifolia*	*broad-leaved arrowhead*	3	OBL	Native	aquatic	perennial	0	0	*Sagittaria latifolia*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Pleasant Valley Conservancy SNA	**PLANT COMMUNITY:**	Southern Sedge Meadow
ASSESSMENT AREA NAME:	Assessment Area E	**SURVEYORS:**	Pat Trochlell, Tom Bernthal, Rob Baller, Amanda Budyak, Kathie Brock
GPS COORDINATES (Decimal Degrees)	**Latitude:**		
	Longitude:	**SURVEY DATE:**	20 Sept. 2022
COUNTY:	Dane	**SITE NOTES:**	Narrow strip along bottom of slope in cut willow area. SEWR, <1% *Phalaris arundinacea* , ~1% *Typha* spp.
ECOREGION (LEVEL III):	Driftless Area		

RESULTS:		Non-Natives			Floristic Quality Metrics: Native Species (n)				Floristic Quality Metrics: All Species (a)				$w\bar{C}_a$ By Growth Form:			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
37	35	2	2%	2%	30.6	36.2	5.2	6.1	29.8	36.5	4.9	6.0	2.0	0.0	6.0	0.0
													1%	0%	105%	0%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
CARSTR	40	*Carex stricta*	*tussock sedge*	7	OBL	Native	herb	perennial	0	0	*Carex stricta*
CARTRIC	20	*Carex trichocarpa*	*hairy-fruit lake sedge, hairy-fruit sedge*	7	OBL	Native	herb	perennial	0	0	*Carex trichocarpa*
PILPUM	5	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
EUTMAC	4	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*
CARUTR	3	*Carex utriculata*	*common yellow lake sedge, Northwest*	7	OBL	Native	herb	perennial	0	0	*Carex utriculata*
SYMPUN	2	*Symphyotrichum puniceum*	*swamp aster*	5	OBL	Native	herb	perennial	0	0	*Symphyotrichum puniceum*
SYMFIR	2	*Symphyotrichum firmum*	*glossy-leaved aster*	6	OBL	Native	herb	perennial	0	0	*Symphyotrichum firmum*
ANGATR	1	*Angelica atropurpurea*	*common great angelica, great angelica,*	6	OBL	Native	herb	perennial	0	0	*Angelica atropurpurea*
SCIATR	1	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*
EUPPER	1	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwo*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
ASCINC	1	*Asclepias incarnata*	*swamp milkweed*	5	OBL	Native	herb	perennial	0	0	*Asclepias incarnata*
ONOSEN	1	*Onoclea sensibilis*	*sensitive fern*	5	FACW	Native	herb	perennial	0	0	*Onoclea sensibilis*
EQUFLU	1	*Equisetum fluviatile*	*pipes, river horsetail, water horsetail*	7	OBL	Native	herb	perennial	0	0	*Equisetum fluviatile*
EPILEP	1	*Epilobium leptophyllum*	*American marsh willow-herb, bog willo*	8	OBL	Native	herb	perennial	0	0	*Epilobium leptophyllum*
VIOSOR	1	*Viola sororia*	*door-yard violet, common blue violet, h*	3	FAC	Native	herb	annual/perei	0	0	*Viola sororia*
PEDLAN	1	*Pedicularis lanceolata*	*fen betony, swamp betony, swamp-lous*	8	OBL/FACW	Native	herb	perennial	0	0	*Pedicularis lanceolata*
MUHMEX	1	*Muhlenbergia mexicana*	*leafy satin grass, Mexican muhly, wire-s*	4	FACW	Native	herb	perennial	0	0	*Muhlenbergia mexicana*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
CHEGLAB	1	*Chelone glabra*	*turtlehead, white turtlehead*	7	OBL	Native	herb	perennial	0	0	*Chelone glabra*
TYPGLA	1	*Typha X glauca*	*hybrid cat-tail, white cat-tail*	0	OBL	Introduced	herb	perennial	0	Restricted	*Typha X glauca*
HASSUA	1	*Hasteola suaveolens*	*hastate Indian-plantain, sweet Indian-pl*	8	FACW	Native	herb	perennial	0	0	*Senecio suaveolens*
CUSGRO	1	*Cuscuta gronovii*	*common dodder, scald-weed, swamp dc*	4	0	Native	herb	annual/perei	0	0	*Cuscuta gronovii*
CIRMUT	1	*Cirsium muticum*	*swamp thistle*	8	OBL	Native	herb	biennial	0	0	*Cirsium muticum*
IMPCAP	1	*Impatiens capensis*	*orange jewelweed, orange touch-me-nc*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
LOBSIP	1	*Lobelia siphilitica*	*great blue lobelia*	5	OBL/FACW	Native	herb	perennial	0	0	*Lobelia siphilitica*
PHAARU	1	*Phalaris arundinacea*	*reed canary grass*	0	FACW	Introduced	herb	perennial	0	Non-restricted	*Phalaris arundinacea*
HELAUT	1	*Helenium autumnale*	*common sneezeweed*	4	FACW	Native	herb	perennial	0	0	*Helenium autumnale*
SALDIS	1	*Salix discolor*	*pussy willow*	2	FACW	Native	tree	perennial	0	0	*Salix discolor*
BROCIL	1	*Bromus ciliatus*	*fringed brome*	7	FACW	Native	herb	perennial	0	0	*Bromus ciliatus*
CALTPAL	1	*Caltha palustris*	*cowslip, marsh-marigold, yellow marsh-*	6	OBL	Native	herb	perennial	0	0	*Caltha palustris*
PYCVIR	1	*Pycnanthemum virginianum*	*common mountain mint, Virginia mouni*	6	FACW	Native	herb	perennial	0	0	*Pycnanthemum virginianum*
SYMNOV	1	*Symphyotrichum novae-angliae*	*New England aster*	3	FACW	Native	herb	perennial	0	0	*Symphyotrichum novae-angliae*
THADAS	1	*Thalictrum dasycarpum*	*purple meadow-rue, tall meadow-rue*	4	FACW	Native	herb	perennial	0	0	*Thalictrum dasycarpum*
SOLGIG	1	*Solidago gigantea*	*giant goldenrod*	3	FACW	Native	herb	perennial	0	0	*Solidago gigantea*
POAPAL	1	*Poa palustris*	*fowl meadow grass, marsh bluegrass*	5	FACW	Native	herb	perennial	0	0	*Poa palustris*
CARHYS	1	*Carex hystericina*	*bottlebrush sedge, porcupine sedge*	3	OBL	Native	herb	perennial	0	0	*Carex hystericina*
BIDCER	1	*Bidens cernua*	*nodding beggar-ticks, nodding bur-mari*	4	OBL	Native	herb	annual	0	0	*Bidens cernua*
CICMAC	1	*Cicuta maculata*	*common water-hemlock, spotted water*	6	OBL	Native	herb	perennial	0	0	*Cicuta maculata*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Pleasant Valley Conservancy SNA	**PLANT COMMUNITY:**	Southern Sedge Meadow
ASSESSMENT AREA NAME:	Assessment Area F	**SURVEYORS:**	Pat Trochlell, Tom Bernthal, Rob Baller, Amanda Budyak, Kathie Brock
GPS COORDINATES (Decimal Degrees)	**Latitude:**		
	Longitude:	**SURVEY DATE:**	20-Sep-22
COUNTY:	Dane	**SITE NOTES:**	Assessment area located along path, northeast side of wetland. 1% *Typha* spp.
ECOREGION (LEVEL III):	Driftless Area		

RESULTS:		Non-Natives			Floristic Quality Metrics: Native Species (n)				Floristic Quality Metrics: All Species (a)				$w\bar{C}_a$ By Growth Form:			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
35	32	3	3%	3%	27.8	33.6	4.9	5.9	26.5	34.1	4.5	5.8	0.0	0.0	5.8	0.0
													0%	0%	109%	0%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
CICMAC	30	*Cicuta maculata*	*common water-hemlock, spotted water*	6	OBL	Native	herb	perennial	0	0	*Cicuta maculata*
CARSTR	30	*Carex stricta*	*tussock sedge*	7	OBL	Native	herb	perennial	0	0	*Carex stricta*
SYMFIR	15	*Symphyotrichum firmum*	*glossy-leaved aster*	6	OBL	Native	herb	perennial	0	0	*Symphyotrichum firmum*
CIRMUT	2	*Cirsium muticum*	*swamp thistle*	8	OBL	Native	herb	biennial	0	0	*Cirsium muticum*
LEEORY	2	*Leersia oryzoides*	*rice cut grass*	3	OBL	Native	herb	perennial	0	0	*Leersia oryzoides*
SOLGIG	1	*Solidago gigantea*	*giant goldenrod*	3	FACW	Native	herb	perennial	0	0	*Solidago gigantea*
SCIATR	1	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*
SOLCAN	1	*Solidago canadensis*	*Canadian goldenrod*	1	FACU	Native	herb	perennial	0	0	*Solidago canadensis*
RUDTRI	1	*Rudbeckia triloba*	*brown-eyed Susan, three-lobed coneflo*	4	FACU	Native	herb	0	0	0	*Rudbeckia triloba*
LOBSIP	1	*Lobelia siphilitica*	*great blue lobelia*	5	OBL/FACW	Native	herb	perennial	0	0	*Lobelia siphilitica*
TYPGLA	1	*Typha X glauca*	*hybrid cat-tail, white cat-tail*	0	OBL	Introduced	herb	perennial	0	Restricted	*Typha X glauca*
EUTMAC	1	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*
DESCANA	1	*Desmodium canadense*	*Canadian tick-trefoil, showy tick-trefoil*	4	FACU/FAC	Native	herb	perennial	0	0	*Desmodium canadense*
GENCRI1	1	*Gentianopsis crinita*	*fringed gentian, greater fringed gentian*	6	OBL/FACW	Native	herb	annual/bienr	0	0	*Gentianopsis crinita*
CUSGRO	1	*Cuscuta gronovii*	*common dodder, scald-weed, swamp dc*	4	0	Native	herb	annual/perei	0	0	*Cuscuta gronovii*
SILPER	1	*Silphium perfoliatum*	*cup-plant*	4	FACW	Native	herb	0	0	0	*Silphium perfoliatum*
CARVUL	1	*Carex vulpinoidea*	*brown fox sedge, fox sedge*	2	FACW/OBL	Native	herb	perennial	0	0	*Carex vulpinoidea*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
EUPPER	1	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwo*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
VIOSOR	1	*Viola sororia*	*door-yard violet, common blue violet, h*	3	FAC	Native	herb	annual/perei	0	0	*Viola sororia*
AMPBRA	1	*Amphicarpaea bracteata*	*American hog-peanut, hog-peanut*	5	FAC	Native	herb	annual	0	0	*Amphicarpaea bracteata*
AGRGIG	1	*Agrostis gigantea*	*redtop*	0	FACW	Introduced	herb	perennial	0	0	*Agrostis gigantea*
HELAUT	1	*Helenium autumnale*	*common sneezeweed*	4	FACW	Native	herb	perennial	0	0	*Helenium autumnale*
PEDLAN	1	*Pedicularis lanceolata*	*fen betony, swamp betony, swamp-lous*	8	OBL/FACW	Native	herb	perennial	0	0	*Pedicularis lanceolata*
GENQUI	1	*Gentianella quinquefolia*	*ague-weed, stiff gentian*	7	FAC	Native	herb	0	0	0	*Gentianella quinquefolia*
SILTER	1	*Silphium terebinthinaceum*	*prairie-dock*	7	FAC	Native	herb	0	0	0	*Silphium terebinthinaceum*
PYCVIR	1	*Pycnanthemum virginianum*	*common mountain mint, Virginia moun*	6	FACW	Native	herb	perennial	0	0	*Pycnanthemum virginianum*
POAPRA	1	*Poa pratensis*	*Kentucky bluegrass*	0	FAC/FACU	Introduced	herb	perennial	0	0	*Poa pratensis*
MICPEN	1	*Micranthes pensylvanica*	*Pennsylvania saxifrage, marsh saxifrage*	7	OBL	Native	herb	perennial	0	0	*Micranthes pensylvanica*
HASSUA	1	*Hasteola suaveolens*	*hastate Indian-plantain, sweet Indian-pl*	8	FACW	Native	herb	perennial	0	0	*Senecio suaveolens*
GLYSTR	1	*Glyceria striata*	*fowl manna grass, fowl meadow grass*	4	OBL	Native	herb	perennial	0	0	*Glyceria striata*
LILMIC	1	*Lilium michiganense*	*Michigan lily, Turk's-cap lily*	6	FACW	Native	herb	perennial	0	0	*Lilium michiganense*
CIRDIS	1	*Cirsium discolor*	*field thistle, pasture thistle, prairie thist*	4	FACU/UPL	Native	herb	(biennial?)/p	0	0	*Cirsium discolor*
SYMNOV	1	*Symphyotrichum novae-angliae*	*New England aster*	3	FACW	Native	herb	perennial	0	0	*Symphyotrichum novae-angliae*
ASCINC	1	*Asclepias incarnata*	*swamp milkweed*	5	OBL	Native	herb	perennial	0	0	*Asclepias incarnata*
SYMLAN	1	*Symphyotrichum lanceolatum*	*panicled aster*	4	FAC/FACW	Native	herb	perennial	0	0	*Symphyotrichum lanceolatum*

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

February 25, 2020

Tom and Kathy Brock
Pleasant Valley Conservancy
4609 Pleasant Valley Road
Black Earth, Wisconsin 53515

Dear Mr. and Mrs. Brock,
Thank you for allowing the WDNR Bureau of Natural Heritage Conservation (NHC) to conduct Reference Wetlands research at your property in the summer of 2019. Our field work was conducted on August 15, 2019 by myself and Kevin Doyle and included an inventory of plant species in a portion of the southern sedge meadow. We also evaluated disturbance factors that affect the site. Please find enclosed a copy of all associated data.

The assessment area (AA) we evaluated (see map) was dominated by tussock sedge (*Carex stricta*, 60% cover), broad-leaved cat-tail (*Typha latifolia*, 15% cover), and orange jewelweed (*Impatiens capensis*, 10% cover). We also observed a small population of glade mallow (*Napaea dioica*), a species concern species. Please see the attached plant list for a list of all species found in the AA.

The purpose of the research was to create objective quantitative floristic quality benchmarks for sedge meadows in the Driftless region. Previous work has shown that cover-weighted mean C is strongly correlated with disturbance, and your site was integral to setting these benchmarks. Overall, we rated the AA on your property "minimally disturbed" with minimal changes in the structure and function of the plant community. These field measures of habitat quality were confirmed by floristic quality metrics, with the site having a cover-weighted mean C of 5.2, placing it in the "good" category of the floristic quality assessment benchmarks for sedge meadows in the Driftless Area (Table 1).

Table 1. Provisional Floristic Quality Assessment benchmarks using cover-weighted Mean Coefficient of Conservatism ($w\overline{C}$) scores for the Wisconsin Driftless Region Ecoregion. From Marti et al. 2019.

Plant community type	Tier 1 "Excellent"	Tier 2 "Good"	Tier 3 "Fair"	Tier 4 "Poor"	Tier 5 "Very poor"
Southern sedge meadow	>5.7	5.0 – 5.7	3.0 – 4.9	1.1 – 2.9	<1.1

From a habitat management standpoint, the overall site was in good quality, though the amount of cat-tail in the larger wetland is a concern. Cat-tail is spreading in many wetlands due to sedimentation and eutrophication, and once established tends to aggressively crowd out other species, including native sedges. Burning also stimulates cat-tail expansion and is not recommended as a control strategy.

Thanks again for allowing us to use your property in our research. Your participation has been invaluable, and we sincerely appreciate your partnership.

Sincerely,

Ryan O'Connor,
Ecologist, Wisconsin DNR

Wisconsin Floristic Quality Assessment for Wetlands
Disturbance Factors Field Checklist Form WFQA~~2015~~

Project: Reference Wetlands 2019

Site Location Information		
Site/Assessment Area Name: Pleasant Valley Conservancy	**Plant Community Type:** Southern Sedge Meadow	**County:** Dane
Date: 8/15/19 **Time:**	**Observers:** Ryan O'Connor, Kevin Doyle	

Hydrological or Habitat Alteration (Stressor):	Stressor	AA (Assess. Area)	30m Buffer	Historic	Impact Level (L, M, H)
Is there a hydrological or habitat alteration present at the site?	Ditch				
	Tile				
Check the box if current stressors are observed in the AA (Assessment Area) or within a 30m Buffer (around the AA).	Dike				
	Water Control				
	Dredging				
Check the Historic box if a stressor is evident but occurred in the past.	Filling/grading				
	Excavation				
Rank the level of impact as L (low), M (medium) or H (high).	Clear/Selective cut*				
	Herb removal				
Other Stressors or Comments: Note and describe any additional stressors. Make additional comments related to disturbance (this could include how commonly the stressor occurs in the watershed/region of interest.)	Entire Vegetation stratum removal				
	Mowing/Grazing			?	
	Plowing/Ag				
	Sedimentation	X		Legacy	L-M
Buffer (30m): Describe how much of the buffer was observed and the degree of survey effort to detect stressors in the buffer e.g., casual vs extensive survey effort.	StormH20 input				
	Eutrophication				
	Motor vehicle use				
	Road/RR/trails		? CTH E	may impound water somewhat	
	Invasive Animals**				

Other Stressors or Comments:

Historic/legacy sedimentation, possibly historic grazing & from upslope/upstream farming

30m Buffer:

CTH E downstream may back up water somewhat

* Tree Age class on next page
** Invasive plants on next page

Tree Age Class: *Wooded wetlands: Estimate the degree of logging disturbance. Age is approximated by the average size (dbh) of the taller trees. Size is not always a reliable indicator of age.* ***Select only one.***	☒ Not applicable □ (1) Seedlings: < 2.5 cm (<1") - Very Recent, Very High Disturbance □ (2) Saplings: 2.5-10cm (1-4") Recent, High Disturbance □ (3) Middle-Age:10-25 cm (4-10") - Not Recent, Moderate Disturbance □ (4) Mature: >25 cm (>10") - Low Disturbance

% Coverage Invasive Plants[1]: *Consider the entire site. List the invasive plants present at the site. What percent of the site is covered by each invasive plant?* ***Select only one coverage class for each plant listed. List additional invasive plants in General Comments if needed.***	Invasive Plant 1: Phalaris	☒ (1) Present: 1% or less aerial cover. □ (2) Sparse: 2-5% aerial cover. □ (3) Medium: 6-25% aerial cover. □ (4) Extensive: 26-50% aerial cover. □ (5) Very Extensive: >50% aerial cover.
	Invasive Plant 2:	□ (1) Present: 1% or less aerial cover. □ (2) Sparse: 2-5% aerial cover. □ (3) Medium: 6-25% aerial cover. □ (4) Extensive: 26-50% aerial cover. □ (5) Very Extensive: >50% aerial cover.
	Invasive Plant 3:	□ (1) Present: 1% or less aerial cover. □ (2) Sparse: 2-5% aerial cover. □ (3) Medium: 6-25% aerial cover. □ (4) Extensive: 26-50% aerial cover. □ (5) Very Extensive: >50% aerial cover.

[1]See the WDNR website for detailed information on invasive species: go to: dnr.wi.gov/, search "invasive plants"

Overall Disturbance: *Based on all the disturbance factors, what is the overall disturbance level at the site?* ***Select only one.***	□ (1) Non-disturbed (Very Few alterations, none greater than low intensity) ☒ (2) Minimal (Small number of alterations of low intensity, none greater than moderate intensity) □ (3) Moderate (Alterations of mostly low and moderate intensity, no high intensity alterations) □ (4) Major (Many alterations, including at least one of high intensity) □ (5) Severe (Many alterations, including multiple high intensity ones)

Plant Community Condition Assessment: *Based on the vegetation survey, what is your best professional judgment of plant community condition in this Assessment Area?* ***Select only one.***	□ (1) Natural structure & function of plant community maintained. ☒ (2) Minimal changes in structure & function. □ (3) Evident changes in structure & minimal changes in function. □ (4) Moderate changes in structure & minimal changes in function. □ (5) Major changes in structure & moderate changes in function. □ (6) Severe changes in structure & function.

General Comments:

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:		Pleasant Valley Conservancy SSM	**PLANT COMMUNITY:**		southern sedge meadow
ASSESSMENT AREA:		Pleasant Valley Conservancy	**SURVEYORS:**		Ryan O'Connor and Kevin Doyle
START GPS	**Latitude:**	43.10588	**SURVEY DATE:**		15-Aug-19
	Longitude:	-89.81321	**START TIME:**		4:00pm
ACCESS ROUTE:			**TOTAL MEANDER TIME**		30
END GPS	**Latitude:**	43.10595	**SOIL SAMPLE:**		0-6" Peat, 6-10" Silt loam, 10-14" Silty Clay, 14"+ Clay
	Longitude:	-89.81255	**Other:**		

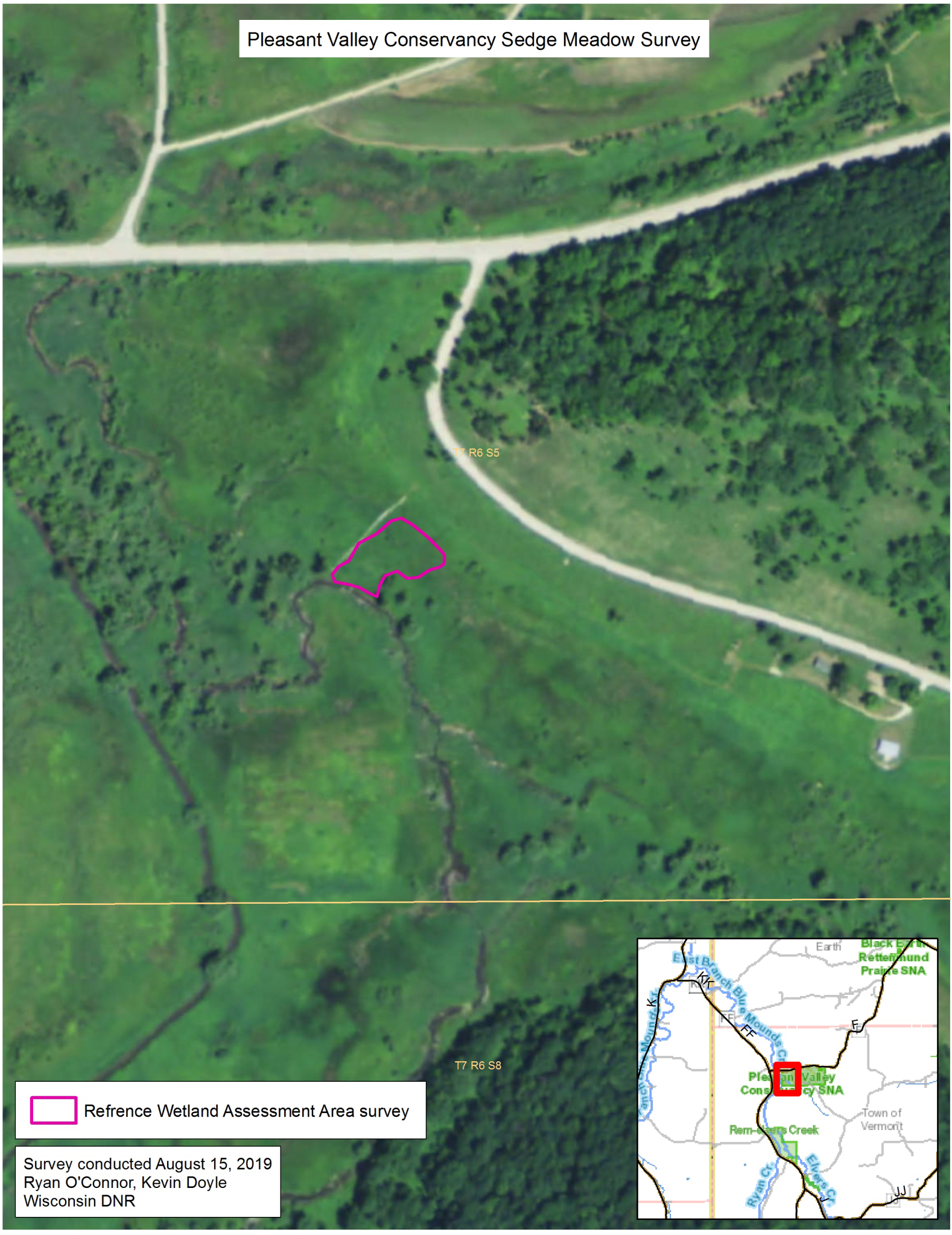
RESULTS:

Species Richness:				Floristic Quality Metrics: Native Species (n)				Floristic Quality Metrics: All Species (a)				$w\bar{C}_a$ By Plant Layer:			
N_a	N_n	$N_{int.}$	Relative Cover of Introduced Species	FQI_n	$w FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
48	46	2	1%	32.9	36.0	4.8	5.3	32.2	36.3	4.6	5.2	2.0	0.0	5.3	3.0
												1%	0%	145%	3%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Layer	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
cartric	7	*Carex trichocarpa*	*hairy-fruit lake sedge, hairy-fruit sedge*	7	OBL	Native	herb	perennial	0	0	*Carex trichocarpa*
impcap	10	*Impatiens capensis*	*orange jewelweed, orange touch-me-not,*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
astfir	4	*Symphyotrichum firmum*	*shining aster, shiny-leaved aster*	6	OBL	Native	herb	perennial	0	0	*Symphyotrichum firmum*
cheglab	1	*Chelone glabra*	*turtlehead, white turtlehead*	7	OBL	Native	herb	perennial	0	0	*Chelone glabra*
solgig	1	*Solidago gigantea*	*giant goldenrod*	3	FACW	Native	herb	perennial	0	0	*Solidago gigantea*
eutmac	3	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*
ranhis	1	*Ranunculus hispidus*	*bristly buttercup, hispid buttercup, rough*	6	FAC	Native	herb	perennial	0	0	*Ranunculus hispidus*
pilfon	1	*Pilea fontana*	*bog clearweed, lesser clearweed*	7	FACW	Native	herb	annual	0	0	*Pilea fontana*
verstr	1	*Verbena stricta*	*hoary verbena, hoary vervain*	3	0	Native	herb	annual/peren	0	0	*Verbena stricta*
typlat	15	*Typha latifolia*	*broad-leaved cat-tail, common cat-tail*	1	OBL	Native	herb	perennial	0	0	*Typha latifolia*
napdio	1	*Napaea dioica*	*glade mallow*	6	FACW	Native	herb	perennial	Special concern	0	*Napaea dioica*
hassua	1	*Hasteola suaveolens*	*hastate Indian-plantain, sweet Indian-pla*	8	FACW	Native	herb	perennial	0	0	*Senecio suaveolens*
ascinc	1	*Asclepias incarnata*	*swamp milkweed*	5	OBL	Native	herb	perennial	0	0	*Asclepias incarnata*
eupper	1	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwort*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
calcan	1	*Calamagrostis canadensis*	*blue-joint grass*	5	OBL	Native	herb	perennial	0	0	*Calamagrostis canadensis*
helaut	1	*Helenium autumnale*	*common sneezeweed*	4	FACW	Native	herb	perennial	0	0	*Helenium autumnale*
cusgro	1	*Cuscuta gronovii*	*common dodder, scald-weed, swamp dod*	4	0	Native	herb	annual/peren	0	0	*Cuscuta gronovii*
phaaru	1	*Phalaris arundinacea*	*reed canary grass*	0	FACW	Introduced	herb	perennial	0	Non-restricted	*Phalaris arundinacea*
angatr	1	*Angelica atropurpurea*	*common great angelica, great angelica, p*	6	OBL	Native	herb	perennial	0	0	*Angelica atropurpurea*
persag	1	*Persicaria sagittata*	*arrow-leaved tearthumb, arrow vine*	6	OBL	Native	herb	annual	0	0	*Persicaria sagittata*
leeory	2	*Leersia oryzoides*	*rice cut grass*	3	OBL	Native	herb	perennial	0	0	*Leersia oryzoides*
cicbul	1	*Cicuta bulbifera*	*bulblet water-hemlock*	7	OBL	Native	herb	perennial	0	0	*Cicuta bulbifera*
rumbri	4	*Rumex britannica*	*greater water dock, British dock*	8	OBL	Native	herb	perennial	0	0	*Rumex britannica*
sciatr	1	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*
silper	1	*Silphium perfoliatum*	*cup-plant*	4	FACW	Native	herb	0	0	0	*Silphium perfoliatum*
bidcer	1	*Bidens cernua*	*nodding beggar-ticks, nodding bur-marig*	4	OBL	Native	herb	annual	0	0	*Bidens cernua*
carlac	3	*Carex lacustris*	*common lake sedge*	6	OBL	Native	herb	perennial	0	0	*Carex lacustris*
caltpal	1	*Caltha palustris*	*cowslip, marsh-marigold, yellow marsh-m*	6	OBL	Native	herb	perennial	0	0	*Caltha palustris*
mencan	1	*Mentha canadensis*	*field mint, wild mint*	3	FACW	Native	herb	perennial	0	0	*Mentha arvensis*
carstr	60	*Carex stricta*	*tussock sedge*	7	OBL	Native	herb	perennial	0	0	*Carex stricta*
saglat	3	*Sagittaria latifolia*	*broad-leaved arrowhead*	3	OBL	Native	aquatic	perennial	0	0	*Sagittaria latifolia*
lycuni	1	*Lycopus uniflorus*	*northern bugleweed, northern water-hore*	4	OBL	Native	herb	perennial	0	0	*Lycopus uniflorus*
carsti	1	*Carex stipata*	*common fox sedge, owl-fruit sedge*	2	OBL	Native	herb	perennial	0	0	*Carex stipata*
scugal	1	*Scutellaria galericulata*	*common skullcap, marsh skullcap*	5	OBL	Native	herb	perennial	0	0	*Scutellaria galericulata*
saldis	1	*Salix discolor*	*pussy willow*	2	FACW	Native	tree	perennial	0	0	*Salix discolor*
scicyp	1	*Scirpus cyperinus*	*wool-grass*	4	OBL	Native	herb	perennial	0	0	*Scirpus cyperinus*
onosen	1	*Onoclea sensibilis*	*sensitive fern*	5	FACW	Native	herb	perennial	0	0	*Onoclea sensibilis*
carbeb	1	*Carex bebbii*	*Bebb's oval sedge, Bebb's sedge*	4	OBL	Native	herb	perennial	0	0	*Carex bebbii*
galtrifi	1	*Galium trifidum*	*northern three-lobed bedstraw, small bed*	6	FACW	Native	herb	perennial	0	0	*Galium trifidum*
epilep	1	*Epilobium leptophyllum*	*American marsh willow-herb, bog willow-*	8	OBL	Native	herb	perennial	0	0	*Epilobium leptophyllum*
perpun	1	*Persicaria punctata*	*dotted smartweed*	5	OBL	Native	herb	annual/peren	0	0	*Persicaria punctata*
carhys	1	*Carex hystericina*	*bottlebrush sedge, porcupine sedge*	3	OBL	Native	herb	perennial	0	0	*Carex hystericina*
sculat	1	*Scutellaria lateriflora*	*blue skullcap, mad-dog skullcap*	5	OBL	Native	herb	perennial	0	0	*Scutellaria lateriflora*
bidcor	1	*Bidens trichosperma*	*northern tickseed-sunflower, tall swamp*	7	OBL	Native	herb	0	0	0	*Bidens trichosperma*
astpun	1	*Symphyotrichum puniceum*	*bristly aster, purple-stem aster, swamp as*	5	OBL	Native	herb	perennial	0	0	*Symphyotrichum puniceum var. pu*
eleery	1	*Eleocharis erythropoda*	*bald spike-rush*	3	0	Native	herb	perennial	0	0	*Eleocharis erythropoda*
nasoff	1	*Nasturtium officinale*	*watercress*	0	OBL	Introduced	herb	perennial	0	Caution	*Nasturtium officinale*
galtin	1	*Galium tinctorium*	*southern three-lobed bedstraw, stiff beds*	5	OBL	Native	herb	perennial	0	0	*Galium tinctorium*

Pleasant Valley Conservancy Sedge Meadow Survey



APPENDIX D: Baseline Vegetation Survey of the Pleasant Valley Conservancy Wetland (prior to 2016).

Botanical Name	Common Name	C value	Botanist
Allium canadense	Wild Onion	**4**	Patricia Trochlell
Anemone canadensis	Meadow Anemone	**4**	Patricia Trochlell
Anaphalis margaritacea	Pearly Everlasting	**3**	Patricia Trochlell
Angelica atropurpurea	Great Angelica	**6**	Patricia Trochlell
Arnoglossum atriplicifolia	Pale Indian Plantain	**4**	Patricia Trochlell
Asclepias exaltata	Poke Milkweed	**7**	Patricia Trochlell
Asclepias incarnata	Swamp Milkweed (Modal Fen)	**5**	Patricia Trochlell
Asclepias syriaca	Common Milkweed	**1**	Patricia Trochlell
Bidens cernuus	Nodding Beggar's Ticks	**4**	Patricia Trochlell
Bromus ciliatus	Fringed Brome	**7**	Patricia Trochlell
Calamagrostis canadensis	Blue-Joint Grass (Modal Fen)	**5**	Patricia Trochlell
Caltha palustris	Marsh Marigold (Modal Fen)	**6**	Patricia Trochlell
Campanula aparinoides	Marsh Bellflower (Modal Fen)	**7**	Patricia Trochlell
Carex bebbii	Bebb's Oval Sedge	**4**	Josh Sulman
Carex diandra	Bog Panicled Sedge (FNA Fen)	**9**	Ted Cochrane
Carex hystericina	Porcupine Sedge	**3**	Josh Sulman
Carex granularis	Limestone Meadow Sedge (FNA Calc.)	**3**	Josh Sulman
Carex interior	Oak Sedge	**7**	Josh Sulman
Carex lacustris	Lake Sedge	**6**	Josh Sulman
Carex leptalea	Slender Sedge (FNA Fen)	**9**	Josh Sulman
Carex pellita	Broad-Leaved Wooly Sedge (FNA Fen)	**4**	Josh Sulman
Carex prairea	Fen Panicled Sedge (FNA Fen)	**10**	Josh Sulman
Carex stipata	Fox Sedge	**2**	Josh Sulman
Carex stricta	Tussock Sedge	**7**	Josh Sulman
Carex trichocarpa	Hairy-Fruit Sedge	**7**	Josh Sulman
Carex utricularia	Yellow Lake Sedge	**7**	Josh Sulman
Carex vulpinoidea	Brown Fox Sedge	**2**	Josh Sulman
Chelone glabra	Turtlehead	**7**	Patricia Trochlell
Cicuta maculata	Water-Hemlock	**6**	Patricia Trochlell
Circaea lutetiana canadensis	Enchanter's Nightshade	**2**	Patricia Trochlell
Cirsium muticum	Swamp Thistle	**8**	Patricia Trochlell
Doellingera [Aster] umbellatum	Flat-Topped Aster	**6**	Patricia Trochlell
Elymus riparius	Riverbank Wild Rye	**6**	Patricia Trochlell
Epilobium coloratum	Willow Herb	**3**	Patricia Trochlell
Erigeron pulchellus	Robin's Plantain	**4**	Patricia Trochlell
Erigeron strigosus	Daisy Fleabane	**2**	Patricia Trochlell
Eutrochium [Eupatorium] maculatum	Spotted Joe-Pye Weed	**4**	Patricia Trochlell
Eupatorium perfoliatum	Boneset (Modal Fen)	**6**	Patricia Trochlell
Galearis spectabilis	Showy Orchis	**6**	Patricia Trochlell
Galium aparine	Catchweed	**2**	Patricia Trochlell
Galium boreale	Northern Bedstraw (Modal Fen)	**5**	Patricia Trochlell
Geum aleppicum strictum	Yellow Avens	**3**	Patricia Trochlell
Geum canadense	White Avens	**2**	Patricia Trochlell
Glyceria grandis	American Manna Grass	**6**	Patricia Trochlell
Glyceria striata	Fowl Manna Grass (Modal Fen)	**4**	Patricia Trochlell
Hasteola suavolens	**Sweet Indian Plantain (SPECIAL CONCERN)**	**8**	Patricia Trochlell/P. Michler
Helenium autumnale	Sneezeweed	**4**	Patricia Trochlell
Helianthus grosseserratus	Saw-Toothed Sunflower	**2**	Patricia Trochlell
Helianthus tuberosus	Jerusalem Artichoke	**2**	Patricia Trochlell
Heracleum lanatum	Cow Parsnip	**3**	Patricia Trochlell
Impatiens capensis	Jewel Weed	**2**	Patricia Trochlell
Iris virginica shrevei	Blue Flag Iris (Modal Fen as *I. shrevei*)	**5**	Patricia Trochlell
Juncus dudleyi	Dudley's Rush (Modal Fen)	**4**	Patricia Trochlell
Lathyrus palustris	Marsh Pea	**5**	Patricia Trochlell

Botanical Name	Common Name	C value	Botanist
Leersia oryzoides	Rice Cut Grass	**3**	Patricia Trochlell
Lilium michiganense	Turk's Cap Lily	**6**	Patricia Trochlell
Lobelia cardnalis	Cardnal Flower	**7**	Patricia Trochlell
Lobelia siphilitica	Great Blue Lobelia (Modal Fen)	**5**	Patricia Trochlell
Lysimachia ciliata	Fringed Loosestrife	**5**	Patricia Trochlell
Lycopus americanus	Water Horehound (Modal Fen)	**4**	Patricia Trochlell
Mentha [arvensis] canadensis	Wild Mint	**3**	Patricia Trochlell
Monarda fistulosa	Wild Bergamont	**3**	Patricia Trochlell
Napaea dioica	**Glade Mallow (SPECIAL CONCERN)**	**6**	**Patricia Trochlell**
Oxalis stricta	Yellow Wood Sorrel	**0**	Patricia Trochlell
Oxypolis rigidor	Cowbane	**6**	Patricia Trochlell
Pedicularis lanceolata	Swamp Betony (Modal Fen)	**8**	Patricia Trochlell
Persicaria [Polygonum] hydropiperoides	Water Pepper	**6**	Patricia Trochlell
Persicaria [Polygonum] punctata	Smartweed	**5**	Patricia Trochlell
Poa palustris	Marsh Bluegrass	**5**	Patricia Trochlell
Polemonium reptans	Jacob's Ladder	**6**	Patricia Trochlell
Pycnanthemum virginianum	Virginia Mountain Mint	**6**	Patricia Trochlell
Ranunculus hispidus var. *nitidus*	Swamp Buttercup	**6**	Patricia Trochlell
Ranunculus recurvatus	Hooked Buttercup	**5**	Patricia Trochlell
Ribes americanum	Black Currant	**4**	Patricia Trochlell
Rudbeckia hirta	Black-Eyed Susan	**4**	Patricia Trochlell
Rudbeckia laciniata	Cut-Leaved Coneflower	**6**	Patricia Trochlell
Rumex britannica	Water Dock	**8**	Patricia Trochlell
Salix bebbiana	Bebb's Willow	**7**	Patricia Trochlell
Salix discolor	Sage Willow	**2**	Patricia Trochlell
Salix nigra	Black Willow	**4**	Patricia Trochlell
Sambucus canadesis	Elderberry	**3**	Patricia Trochlell
Saxifraga pensylvanica	Swamp Saxifrage	**7**	Patricia Trochlell
Schoenoplectus tabernaemontani	Soft-Stem Bulrush	**4**	Patricia Trochlell
Scirpus cyperinus	Woolgrass	**4**	Patricia Trochlell
Scutellaria galericulata	Marsh Skullcap	**5**	Patricia Trochlell
Silphium perfoliatum	Cup Plant	**4**	Patricia Trochlell
Sium suave	Water Parsnip	**5**	Patricia Trochlell
Solidago canadensis	Canada Goldenrod	**1**	Patricia Trochlell
Solidago gigantea	Late Goldenrod	**3**	Patricia Trochlell
Stachys palustris	Hedge Nettle	**5**	Patricia Trochlell
Stellaria longifolia	Stitchwort (Modal Fen)	**5**	Patricia Trochlell
Symplocarpus foetidus	Skunk Cabbage (FNA Fen)	**8**	Patricia Trochlell
Symphyotrichum [Aster] firmum	Shining Aster	**6**	Patricia Trochlell
Symphyotrichum [Aster] lanceolatum	Panicled Aster (Modal Fen as *A. simplex*)	**4**	Patricia Trochlell
Symphyotrichum [Aster] novae-angliae	New England Aster	**3**	Patricia Trochlell
Symphyotrichum [Aster] pilosum	Frost Aster	**1**	Patricia Trochlell
Symphyotrichum [Aster] prenanthoides	Crooked Aster	**9**	Patricia Trochlell
Symphyotrichum [Aster] puniceum	Red-Stemmed Aster	**6**	Patricia Trochlell
Thalictrum dasycarpum	Purple Meadow-Rue (Modal Fen)	**4**	Patricia Trochlell
Typha latifolia	Broad-Leaved Cattail	**1**	Patricia Trochlell
Urtica dioica	Stinging Nettle	**1**	Patricia Trochlell
Verbena hastata	Blue Vervain	**3**	Patricia Trochlell
Verbena stricta	Hoary Vervain	**3**	Patricia Trochlell
Veronia faciculata	Ironweed	**5**	Patricia Trochlell
Viburnum sp.	Highbush Cranberry	**NR**	Patricia Trochlell
Vicia americana	American Vetch	**4**	Patricia Trochlell
Viola sororia	Dooryard Violet	**3**	Patricia Trochlell
Zizia aurea	Golden Alexander	**7**	Patricia Trochlell

Mean C	4.71
Modal C	4.00
Species Richness	108
FQA	49.0
Proportion of species C ≥ 7 (S = 21)	19.4%
Proportion of species C ≥ 8 (S = 8)	7.4%

Integrated Restorations, LLC

(608) 547-1713
308 North Nine Mound Road
Verona, WI 53593-1036
annen00@aol.com
www.ir-wi.com