WETLAND STEWARDSHIP PLAN

Gray's Woods Preserve

Patton Township
Centre County, PA

Prepared for:

Prepared by:

Wilson Ecological Consulting

SWS PCP PWS EDUCATION EXPERIENCE ETHICS
JOSEPH J. WILSON
001333
PROFESSIONAL WETLAND SCIENTIST

April 2023

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INTRODUCTION

Patton Township (Township) owns three adjoining properties in the Gray's Woods Development of Centre County just a short distance west of State College in Patton and Halfmoon Townships (see Location Map). The Township adopted a name for these parcels – *Gray's Woods Preserve* and is in the process of preparing a Conservation Plan for the long-term management of the parcels.

Overall, *Gray's Woods Preserve* (GWP) totals 193.2 acres and is accessible off two public roads, Gray's Woods Boulevard and Heritage Trail Road (see Resource Map). A private, gated road (Palustrine Lane) leading to a State College Borough Water Authority groundwater well parallels the western edge of the overall site. The northwestern portion of the project area is otherwise known as *Gray's Woods Park* and is comprised of 43.5 acres (Centre County Tax ID #18-003-,222-,0000-). The remainder of the GWP is comprised of two parcels totaling 149.7 acres (Centre County Tax ID #'s 18-003-,200A,0000- & 17-002-,005A,0000-). A small parcel owned by others and totaling 1.4 acres is located within the GWP (Centre County Tax ID #18-003-,080-,0000-).

The GWP abuts Pennsylvania State Game Lands #176 and is considered part of the Scotia Barrens Biological Diversity Area (WPC 2002). The site is located in the Valley and Ridge Physiographic Region of Pennsylvania and is underlain by the Gatesburg Geologic Formation. The Gatesburg formation is characterized by barrens and vernal pool habitats (WPC 2002). Much of the Gatesburg formation is a source of iron and consequently the GWP and surrounding landscape has historically been influenced by iron mining.

The GWP covers lands mapped as four different soil types: Hagerstown silty clay loam, Morrison sandy loam, Quarry, and Wyoming gravelly sandy loam (USDA NRCS 2023). These soil types range from well- to excessively well-drained and none are recognized as hydric soils. Hagerstown and Morrison soils are considered prime farmlands and Wyoming soils are considered farmland of statewide importance. However, none of the GWP is currently in agricultural land use.

Topography of the GWP ranges from about 1,450 feet above mean sea level (amsl) to about 1,360 feet amsl. The northern three-quarters of the site slopes to the north and the southern quarter of the site slopes to the south. On average, slopes on the site are rather gradual and about 5 to 6%. There are many scattered depressions, in particular in the northern third of the GWP site, and these depressions are likely historic man-made depressions created through past mining operations.

This report has been prepared to provide the Township with recommendations to maintain the ecological integrity of the wetlands of the GWP. The recommendations included herein are by no means mandatory and should not be considered absolutely necessary. Rather, recommendations within this report are intended to be weighed against other planned actions and activities at the GWP (i.e., forest management activities, public open-space improvement actions, etc.) such that best-practice decisions can be made for the property.

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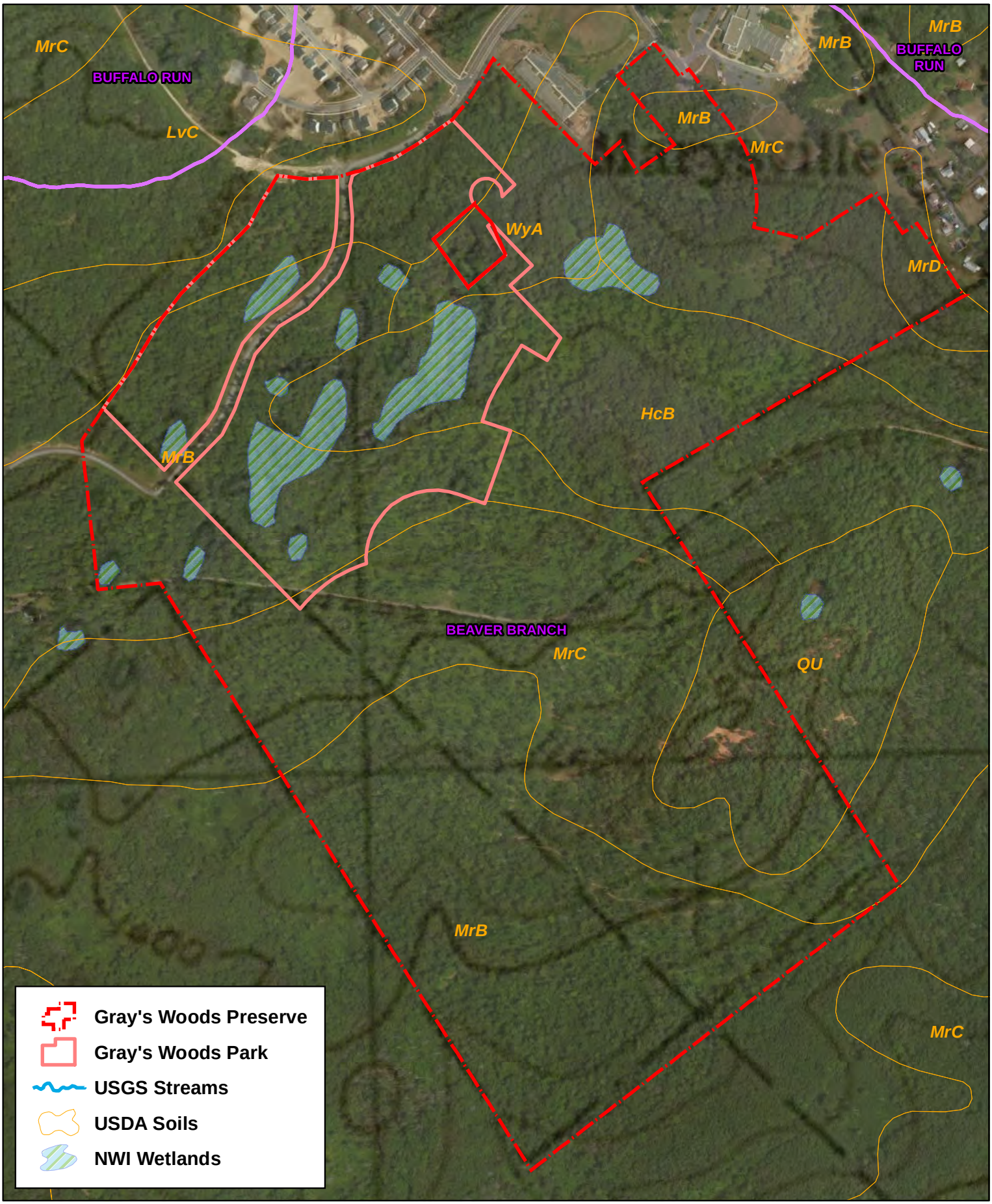
LOCATION MAP
GRAY'S WOODS PRESERVE

Patton Township, Centre County, PA

Wilson Ecological Consulting

Map created March 18, 2023
Julian USGS Quadrangle



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NATURAL RESOURCES MAP
GRAY'S WOODS PRESERVE

Patton Township, Centre County, PA

Wilson Ecological Consulting

Map created March 18, 2023
Julian USGS Quadrangle

METHODS

The first step in preparation of a *Wetland Stewardship Plan* (WSP) is the identification and delineation of wetlands. The GWP project area was investigated on foot by a *Senior Professional Wetland Scientist* (PWS #1333) from late May through early June 2022. The site investigations took place during the growing season and at a time when precipitation had ranged from slightly wetter than normal to normal (see Antecedent Precipitation Tool Printouts in Attachments). The investigation took place at a time when soils could be easily examined using a shovel and dominant herbaceous species could be identified.

Prior to the investigation, USFWS national wetland inventory (NWI) mapping, USGS topographic mapping, and FEMA floodplain mapping of the project area were reviewed in the office (see Resource Map). There are 11 NWI-mapped wetlands, no USGS-mapped streams, and no FEMA-mapped floodplains in the project area. The project area is within the Beaver Branch Watershed.

Wetland identification followed the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual*: *Eastern Mountains and Piedmont Region* (USACE 2012). This *Supplement* follows criteria established in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratories 1987) and allows for a more thorough characterization of vegetation and a more careful consideration of hydrology and wetland soil indicators. Vegetation was identified following a regionally specific source (Rhoads and Block 2007) and species indicator status followed an update to Reed (1988) that was established for this region of the United States (USACE 2020). When necessary, species identification was aided through the use of other keys and references (Magee 2014, Weakely *et al.* 2012, Lord and Travis 2006, Rhoads and Block 2005, Cobb *et al.* 2005, Holmgren 1998, FNA 1993+, Gleason and Cronquist 1991, Newcomb 1977, Strausbaugh and Core 1970, Britton and Brown 1970, Harlow 1959).

The boundaries of delineated wetlands were mapped with a sub-meter accurate GNSS/GPS (EPS 2015). Delineated wetlands were assigned classifications following Cowardin *et al.* (1979, FGDC 2013) for cover type, Brooks *et al.* (2011) for hydrogeomorphology type, and Zimmerman *et al.* (2012) for habitat type. Wetland habitats of the project area were generally described through data collection at representative circular plot sampling points where at each point – soils, hydrology, and vegetation were evaluated, and data was recorded on Wetland Determination Data Forms (see Attachments). One wetland sampling point was collected for each wetland for documentation of wetland habitat and no upland sampling points were collected, unlike typical practice for projects that require wetland permitting. Color photographs were taken at the time of study to document site conditions (see Attachments).

Once wetlands were identified and delineated, data was collected to document the quality of the habitat. This was achieved through two routine wetland assessment methods, *Floristic Quality Assessments* (FQA) and *Function and Value Assessments* (FVA). FQA are mathematical descriptions of habitat quality based on the composition of vascular plant species. Developed in the mid-1990s to assess habitat quality of sites in Illinois (Swink & Wilhelm 1994), FQAs have been tailored over the past 20+ years to fit all regions of the United States and beyond.

The basic premise of an FQA is that each plant species thrives in habitats ranging somewhere along a scale of highly disturbed to pristine. This ideal habitat disturbance range is called the coefficient of conservatism, or C-value. Taking into account native versus non-native status and the habitat associations of the native species, teams of regional expert botanists have assigned C-values to all of the vascular plant species in the United States. Non-native species are given a C-value of 0, native species that thrive in disturbed sites are given a C-value of 1 and native species that are found only in pristine habitats are given a C-value of 10. The majority of native species score somewhere between 3 and 8.

Using this approach, practitioners can generate a list of species for a particular habitat or study area and from the C-values a set of metrics can be determined. The most common metrics generated include mean C ($\bar{C}$), floristic quality index (I), and adjusted floristic quality index (I', Miller and Wardrop 2006). The values of $\bar{C}$ and I are often reported for all species and for all native species, $\bar{C}_n$ and I_n.

These metrics are calculated with the following equations:

- $\bar{C} = \sum C / N$ where C are the individual C-values and N is the number of species,
- $I = \bar{C} \sqrt{N}$ where N is the number of species, and
- $I' = (\bar{C}_n/10 * \sqrt{n}/\sqrt{N}) * 100$ where n is the number of native species and N is the number of all species.

From these simple metrics, habitat quality can be understood following these guidelines:

- The higher the $\bar{C}$ or $\bar{C}_n$, the higher the quality of the habitat,
- The higher the I or I_n, the higher the quality of the habitat such that <20 = low quality, 20 to 35 = moderate quality, and >35 = high quality, and
- The higher the I', the higher the quality of the habitat.

Vegetation data used in the FQA was collected through timed-meander surveys (Goff *et al.* 1982) performed throughout the 2022 growing season. Timed-meander surveys (TMS) involve walking a wandering path through a specific habitat (individual wetland in this case) and recording species presence until a period of time (usually ten minutes) passes where no new species are added to the list. TMS were conducted in the spring, summer, and fall to document as many species as possible.

FVA are tools that describe the ecological (functions) and human-use (values) roles of wetlands. The FVA used in this study was the U.S. Army Corps of Engineers' *Descriptive Approach*. This method was selected because it is rather simple, and it is comprehensive. Meaning, it can be done quickly and gives results that adequately describe the functions and values of the assessed wetland habitat.

The *Descriptive Approach* FVA assesses eight ecological functions and five human-use values commonly exhibited by wetlands. As such, any wetland assessed using this approach could have as many as 13 function and value categories assigned to it. These 13 function and value categories are

further defined by up to 218 individual traits/characteristics. Thus, a wetland could exhibit 13 functions and values as expressed through 218 individual traits/characteristics.

FVA results were converted into a number value by assigning five points for any of the 13 categories and one point for any of the 218 individual traits/characteristics. With this approach, a maximum total value for a wetland would equal 283 (65 for the categories plus 218 for the traits/characteristics). To put this value on a more understandable 100 scale, total values were divided by 2.83. Converting the FVA results to a number value was determined practical for this type of study because the purpose of the study is to rank the wetlands based on overall quality.

For this study, *I'* was used as the principal result of the FQA analysis and the 100-scale total score was used as the principal result of the FVA analysis. Those two scores were summed together to yield an overall score for each wetland. With this approach, wetland quality was determined as <50 = low, 50 – 75 = medium, and >75 = high.

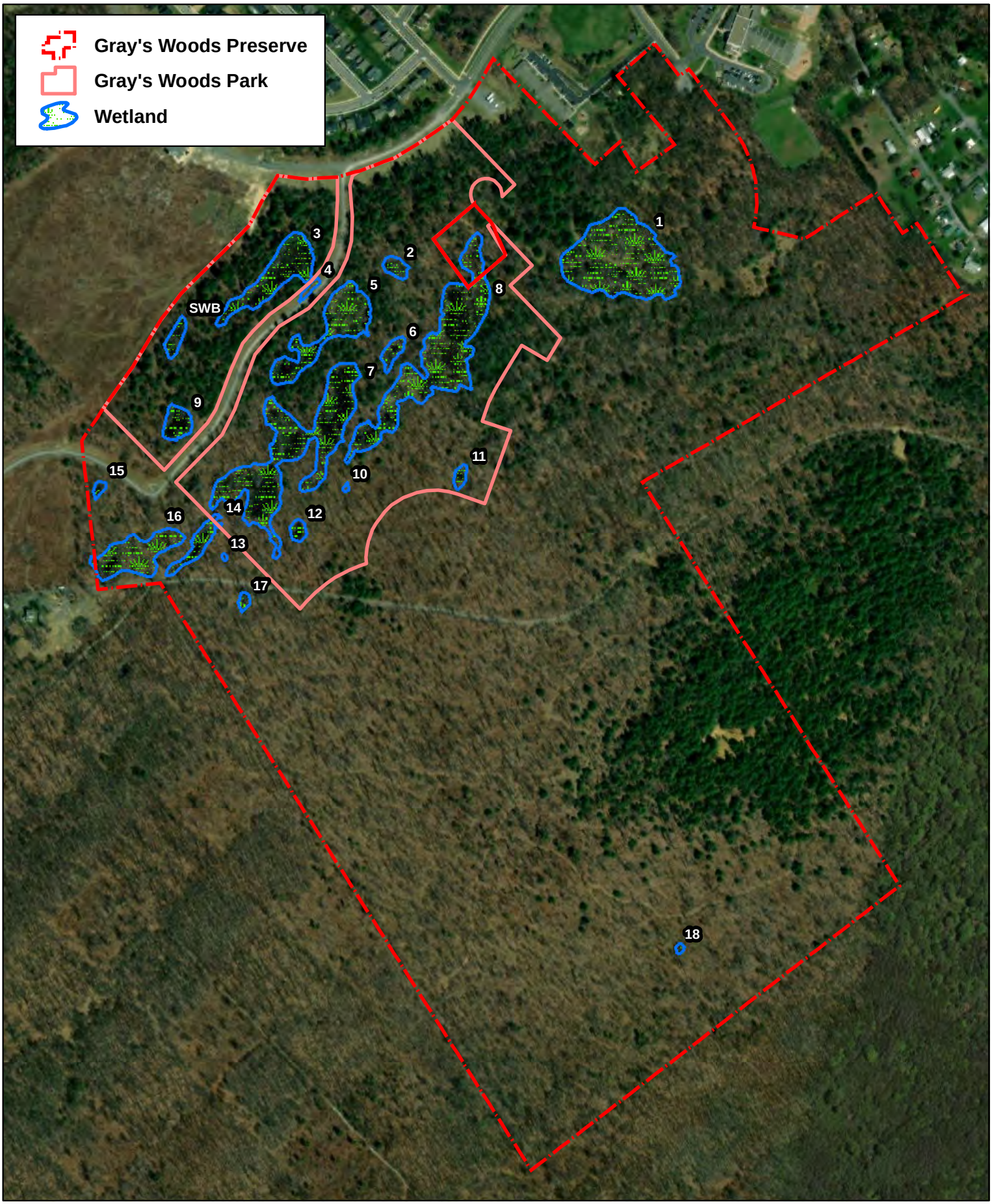
RESULTS

The wetland identification and delineation identified 18 palustrine wetlands and one man-influenced feature that is converting into a wetland on the GWP. These resources are displayed on the Wetland Map and summarized in Table 1. Overall, wetland habitat at the GWP totals 12.62 acres and the majority of this area is located north of Heritage Trail Road. In fact, most of the wetland acreage falls within the boundaries of Gray's Woods Park. The man-influenced feature is a flooded forest flat located downslope of a stormwater outfall associated with the neighboring development to the west.

Most of the wetlands in the GWP are comprised of palustrine forested (PFO) habitat. The next most common wetland habitat at the site is palustrine emergent (PEM) herbaceous wetlands and often these are co-dominant with palustrine scrub-shrub (PSS) wetland habitat. One wetland at the site is best classified as being comprised of palustrine unconsolidated bottom (PUB) habitat (a.k.a. – pond) but that wetland is rimmed with PFO habitat.

All of the wetlands at GWP are isolated depressions. As such, none of these wetlands are considered Waters of the United States (under current regulation) because they have no direct connection with other surface waters. Thus, the wetlands at the site are not regulated at the federal level by the U.S. Army Corps of Engineers through Section 404 of the Clean Water Act but they are considered Waters of the Commonwealth and are regulated by the Pennsylvania Department of Environmental Protection (PADEP) through Title 25, Chapter 105 of the PA Code.

The delineated wetlands at the GWP are represented by six different habitat types with Sparsely Vegetated Vernal Pool Community being the most common. Red Maple – Blackgum Forest, Circumneutral – Mixed Shrub Wetland, and Rice Cutgrass – Bulrush Vernal Pool Community wetlands habitats are also common at the site. One wetland, along the edge of the gated roadway to the municipal water well (Palustrine Lane) is best described as a Mixed Forb – Graminoid Wet Meadow. The PUB (pond) wetland habitat is best described as a Spatterdock – Water Lily Emergent Wetland.



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WETLAND MAP
GRAY'S WOODS PRESERVE

Patton Township, Centre County, PA

Wilson Ecological Consulting

Map created March 18, 2023
Julian USGS Quadrangle

TABLE 1 – WETLAND SUMMARY

Wetland ID	Cowardin Class	Brooks Class	Zimmerman Class	Area (ac)	Total Species (n)	Non-Native Species	Total Mean C ($\bar{C}$)	Adjust FQI (I')	100-Scale FVA	Overall Score
1	PFO[1]	Depression	RM-BF[2]	2.62	75	16	3.00	33.7	27.9	61.6
2	PFO	Depression	RM-BF	0.14	34	5	3.90	42.5	19.8	62.3
3	PSS[3]	Depression	C-MSW[4]	0.99	36	1	5.40	54.2	32.5	86.7
4	PEM[5]	Depression	MF-GWM[6]	0.06	41	9	2.60	30.0	8.8	38.8
5	PEM/PSS	Depression	RC-BVP[7]/C-MSW	1.17	72	10	3.70	39.0	39.6	78.6
6	PFO	Depression	SV VPC[8]	0.15	44	6	3.50	38.1	21.2	59.3
7	PEM/PSS	Depression	RC-BVP/C-MSW	2.83	83	6	4.30	44.3	34.6	78.9
8	PEM/PSS	Depression	RC-BVP/C-MSW	2.82	76	8	3.80	40.7	34.6	75.3
9	PUB[9]	Depression	S-WLEW[10]	0.28	34	2	4.30	43.7	22.3	66.0
10	PFO	Depression	SV VPC	0.01	8	0	5.50	55.0	6.4	61.4
11	PFO	Depression	SV VPC	0.08	32	5	3.40	36.7	12.4	49.1
12	PFO	Depression	SV VPC	0.10	23	2	4.60	47.8	12.4	60.2
13	PFO	Depression	SV VPC	0.01	6	0	4.50	45.0	6.4	51.4
14	PFO	Depression	SV VPC	0.31	57	6	3.60	37.8	15.5	53.3
15	PFO	Depression	SV VPC	0.06	32	1	4.00	40.4	18.0	58.4
16	PFO	Depression	RM-BF	0.91	80	10	3.30	35.5	18.4	53.9
17	PFO	Depression	SV VPC	0.06	23	4	3.40	38.2	11.7	49.9
18	PFO	Depression	RM-BF	0.02	11	0	4.70	47.0	10.2	57.2

[1] Palustrine Forested Wetland
[2] Red Maple-Blackgum Palustrine Forest
[3] Palustrine Scrub-Shrub Wetland
[4] Circumneutral Mixed Shrub Wetland
[5] Palustrine Emergent Wetland
[6] Mixed Forb-Graminoid Wet Meadow
[7] Rice Cutgrass-Bulrush Vernal Pool
[8] Sparsely Vegetated Vernal Pool Community
[9] Palustrine Unconsolidated Bottom Wetland
[10] Spatterdock Water Lily Emergent Wetland

The FQA and FVA results and overall scores for the wetlands of the GWP are summarized in Table 1 and total scores are displayed visually on the Wetland Quality Map on the following page. Results indicate that Wetland 3 is the highest quality wetland at the site and Wetlands 5, 7, and 8 are very similar in quality. Wetland 4 is by far the lowest quality wetland at the HFP site. Wetlands 11 and 17 scored out as low quality but these wetlands offer breeding habitat for amphibians during most years (precipitation dependent) and their total scores were very near the medium quality threshold.

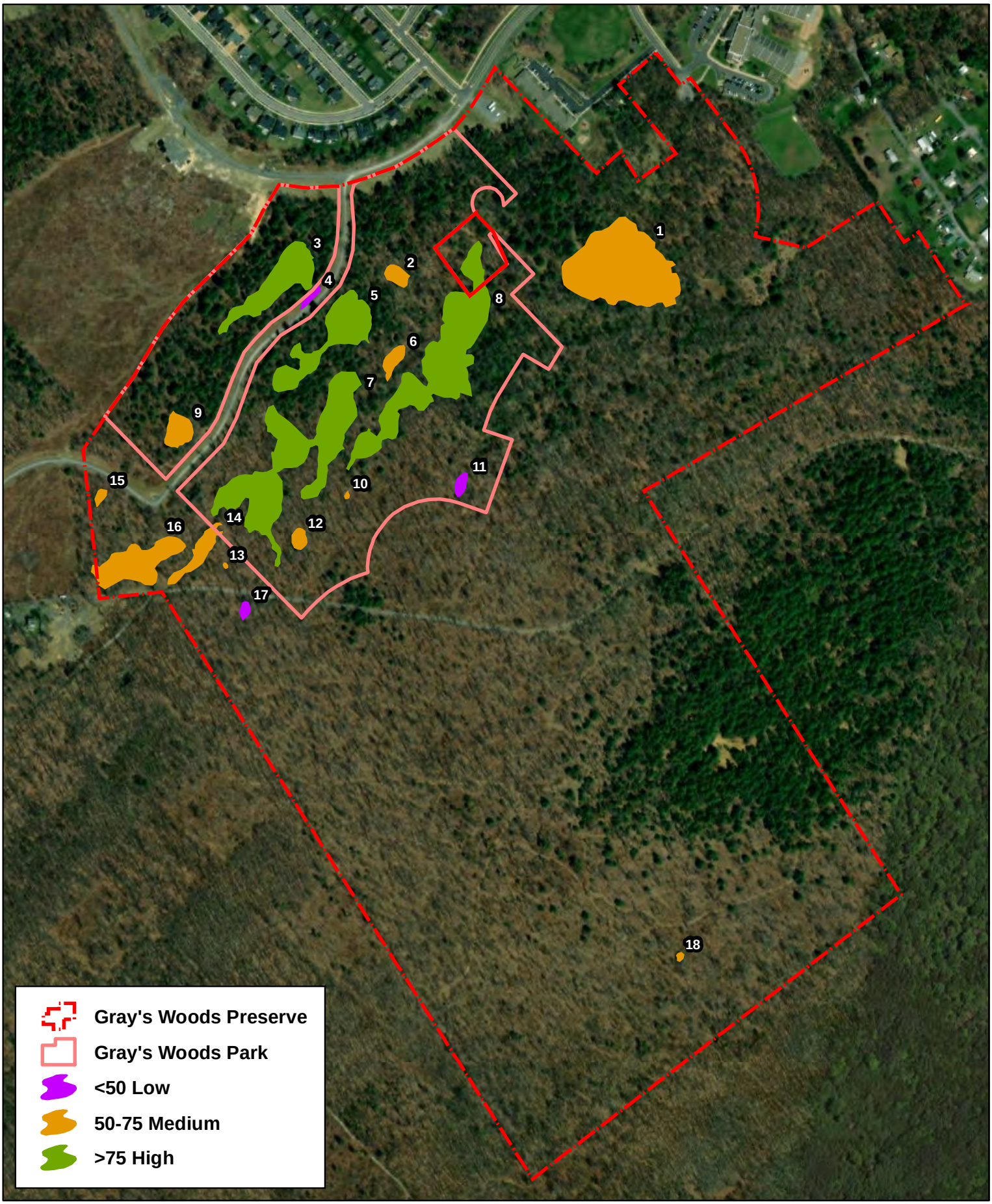
The FQA analysis demonstrates that most of the wetlands at the site are comprised of a healthy mix of native plant species. None of the wetlands are abundant with non-native botanical species, though a few wetlands do have a fair percentage of non-native species (e.g., Wetlands 1 and 4, 21% and 22% respectively). Wetlands at the GWP have an average $\bar{C}$ value of 4.0 and an average *I'* of 41.6.

The highest recorded *I'* score was 55.0 and this was recorded in Wetland 10. Wetland 10 is a very tiny, sparsely vegetated vernal pool community with only a few plant species growing within in it. This wetland is so small, that it offers very few ecological functions and no human use values. Thus, the overall score for Wetland 10 (61.4) is about the average overall score for the site (61.2). These results for Wetland 10 demonstrate why it was determined prudent to score the wetlands using both the FQA and FVA approach.

Wetlands at the GWP offer flood water storage capabilities, however, this function is usually not the principal function simply because these wetlands are not associated with a watercourse. They do capture sheet flow from surrounding uplands and impound runoff providing protection to downstream properties, but most often this is a secondary function. In most instances, the wetlands at GWP provide the principal function of wildlife habitat. Some wetlands on the property are important habitats for amphibian reproduction while others offer exceptional habitat for dragonflies, damselflies, and turtles. Several of the wetlands at the GWP site offer important habitat for birds and mammals.

In terms of human use values, the wetlands at GWP score rather high. This is largely because these wetlands are associated with Gray's Woods Park and are easily available for passive recreation along the many trails that exist at the park. Additionally, with GWP being located very close to a public school, many of the wetlands of the site offer exceptional educational opportunities. Furthermore, at least one wetland at the GWP is known to contain a population of a federally-listed endangered and state-listed threatened plant species (northeastern bulrush, *Scirpus ancistrochaetus*). This population has been monitored routinely for the past ten years or so and the number of stems was lower than usual in 2022. However, fluctuations in stem numbers vary greatly from year to year so there is no reason at this point to be concerned for this rare species population.

A few areas of concern were noted during the field investigations. These include areas where accelerated erosion is occurring as a result of upslope activities, as well as areas where dense populations of non-native and invasive species were noted. These few areas are displayed on the Areas of Concern Map and described more thoroughly in the Discussion. Overall, none of these areas are an immediate threat to the quality of the wetlands at the GWP. Rather, they are areas that efforts for site improvement should first focus upon as they are slowly contributing to lower the overall quality of some of the wetlands at the site.



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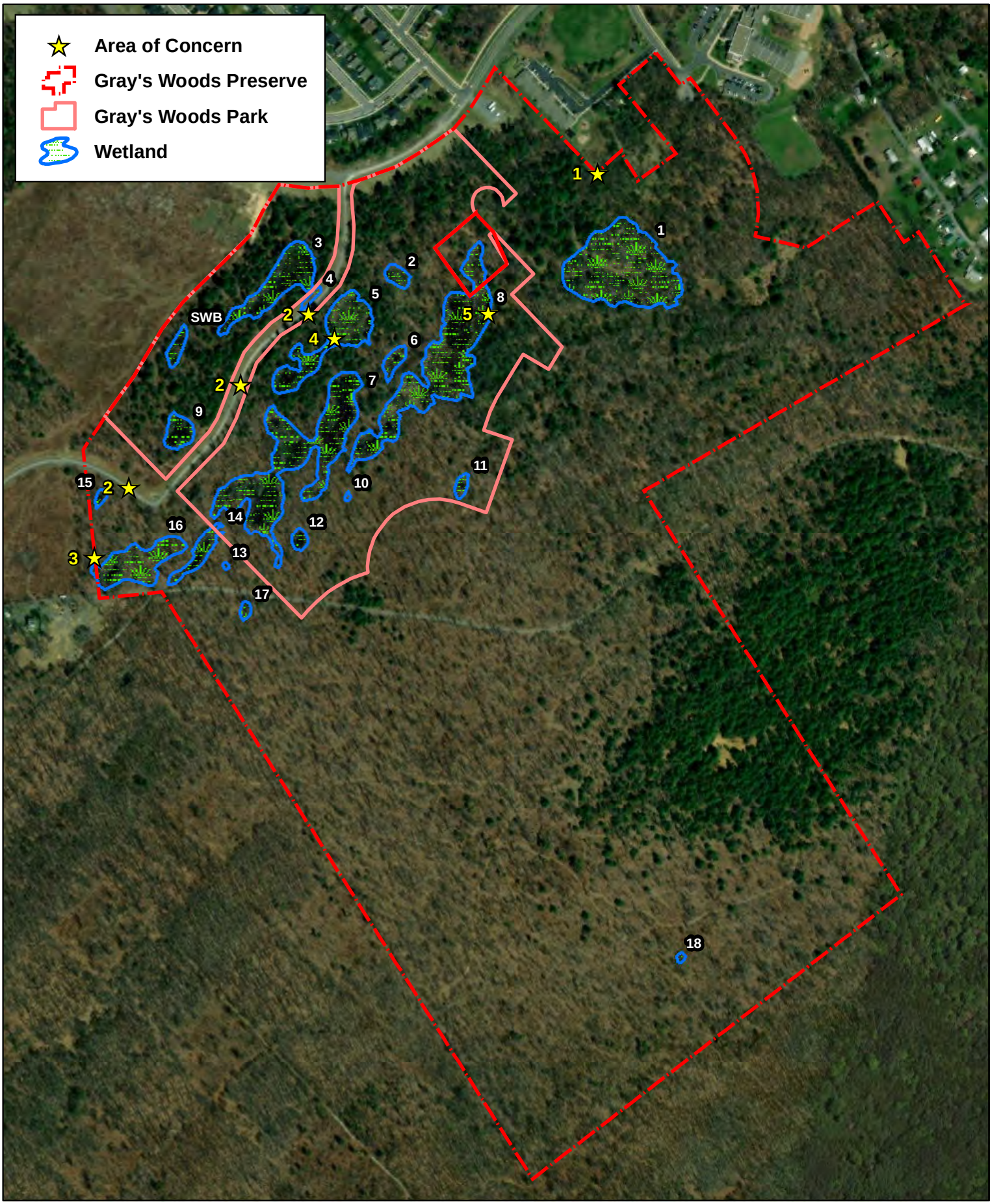
WETLAND QUALITY MAP
GRAY'S WOODS PRESERVE

Patton Township, Centre County, PA

Wilson Ecological Consulting

Map created April 2, 2023
Julian USGS Quadrangle



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AREAS OF CONCERN MAP
GRAY'S WOODS PRESERVE

Patton Township, Centre County, PA

Wilson Ecological Consulting

Map created March 20, 2023
Julian USGS Quadrangle

DISCUSSION

Wetland habitats of the GWP, for the most part, are medium to high quality, comprised of a diverse mix of primarily native plant species, and provide a mix of ecological functions and human use values. Most of the wetland habitats of the GWP are essentially permanently protected by virtue of the fact that they are located on public lands that are managed as park and/or public open space. Additionally, a conservation easement was recently placed on these lands, further protecting the habitats of the GWP.

With these understandings of existing protections, there is no need for immediate actions to further protect the wetland resources of the GWP. However, there are a few places where actions could improve upon current conditions and lead to an enhancement in wetland quality. Furthermore, there are some general best-practices that could be followed to maximize the ecological health of these wetlands. These recommendations are summarized below in Table 2 and discussed in greater detail in the paragraphs below.

TABLE 2 – BEST PRACTICE RECOMMENDATIONS

Activity ID	Action	Wetland ID Benefited	Schedule
1	Address stormwater discharge from off-site facility	1	2024 - 2026
2	Address gravel road erosion	5, 7, 16	2026 - 2028
3	Monitor stormwater discharge from off-site facility	16	2028 – 2030
4	Control/eradicate Japanese stiltgrass	5	2023 – 2033
5	Control / eradicate Japanese barberry	8	2023 – 2033
6	Adopt time of year tree clearing restrictions	All	2023 – 2033
7	Adopt best-practice invasive species management	All	2023 – 2033
8	Adopt buffers around wetlands	All	2023 – 2033

Proposed Activity 1 is recommended to improve existing conditions below a stormwater basin discharge on a neighboring property. This discharge results in concentrated flows following heavy runoff events and these concentrated flows result in surface scouring below the basin discharge and ultimately sedimentation in Wetland 1 (see Color Photographs in the Attachments). It seems practical that this situation could be improved with some minor engineering with rock armoring in the channel upslope of the wetland and/or a level spreader at the property line.

Proposed Activity 2 is recommended to improve erosion and sedimentation along the existing gated private road Palustrine Lane. This road has no cross-culverts and as a consequence there are a few places where heavy stormwater runoff tops the road and leads to the wash of gravels and sediments into or immediately upslope of adjacent wetlands. Ideally, cross-culverts would be installed with appropriate rock aprons on the upslope and downslope ends to address this issue. But as a private road, that may be difficult to do. Therefore, minor engineering is suggested to improve the condition. This could be achieved by construction of small stilling basins along the shoulder of the road on the downslope side of these existing discharges. Those basins would capture stormwater flows, reduce energies, and trap sediments and washed debris prior to the receiving wetlands.

Proposed Activity 3 is to simply monitor the stormwater basin discharge associated with the neighboring Gray's Woods Planned Development to the west of the site. This basin has had some documented issues in the past with the skimmer failing from time to time and resulting in a direct discharge of stormwater offsite and into Wetland 16. Furthermore, soils of the area contain very fine sediments that tend to be suspended in surface waters following heavy runoff events and these "cloudy" water discharges are common from this stormwater basin. As a result, Wetland 16 tends to be filled with "cloudy" water. These issues have been discussed with the PADEP and the Centre County Conservation District and provided the skimmer is working properly, the owner is under no obligation to change anything with the basin. Thus, it makes sense to routinely monitor the discharge and to notify the owner of any system failures.

Activity 4 is intended to improve the habitat of high-quality Wetland 5. This wetland is known to contain a population of the protected species northeastern bulrush. The rim of this wetland is densely populated with a non-native and invasive species, Japanese stiltgrass (*Microstegium vimineum*). When the northeastern bulrush population was first identified in this wetland, about twelve years ago, Japanese stiltgrass was noted along the southern rim of the PEM portion of the wetland and now it is widespread around the perimeter of the PEM portion of the wetland. Japanese stiltgrass probably offers no real threat to the northeastern bulrush population because Japanese stiltgrass is a plant of moist and seasonally wet soils whereas northeastern bulrush is a plant that requires seasonally inundated and permanently saturated soils. Thus, the northeastern bulrush grows in locations that are too wet for the Japanese stiltgrass to survive. However, controlling and/or eradicating the Japanese stiltgrass would be prudent to improve the overall habitat of this wetland. Controlling this species with herbicides is not recommended since it is growing in a diverse wetland with desirable species. Rather, hand removal and/or use of a string trimmer in July or early August is recommended. These actions would need repeated for up to five consecutive years because seeds are viable in the soils up to five years.

Activity 5 is intended to improve the habitat of high-quality Wetland 8. The northeastern edge of this wetland is densely overrun with the non-native and invasive shrub Japanese barberry (*Berberis thunbergii*). This shrub thrives in upland habitats and the majority of the population is just beyond the wetland boundary and in upland habitat but there are Japanese barberry shrubs within Wetland 8. Forest management practices designed to manage invasive species populations may want to focus efforts on this area and adopt methods that protect the native species within the wetland. This may require hand-cutting of Japanese barberry shrubs within the wetland and hand application of herbicide to the cut stems.

Activity 6 is recommended as an effort to protect amphibian populations. With the understanding that forest management will require some tree harvesting at some point in time at the GWP, it would be prudent to restrict those activities to the winter months when the ground is frozen, and amphibians are not active.

Activity 7 is aimed to prevent the introduction of invasive species at the site through equipment transfer. This can be achieved by requiring that any equipment brought onto the site for habitat management be pressure washed to remove weed seeds prior to arrival at the site.

Similarly, Activity 8 is recommended to further protect amphibian populations. Adopting a buffer around wetlands that restricts or limits tree clearing would be prudent. The buffer widths could coincide with the wetland quality, with larger buffers being adopted for the higher quality wetlands.

Finally, and certainly not of least importance, the GWP wetlands offer exceptional opportunities for education. The existing trail system allows easy public access to most of the wetlands of the site. With a public school within walking distance of the site, it may be worthwhile to attempt to establish some educational outreach program. One activity that would be easy for students to routinely perform is amphibian egg mass counts. These could be done at a handful of the wetlands on an annual basis each spring as a type of monitoring system. Other activities to consider include control of unwanted invasive species and wildlife viewing.

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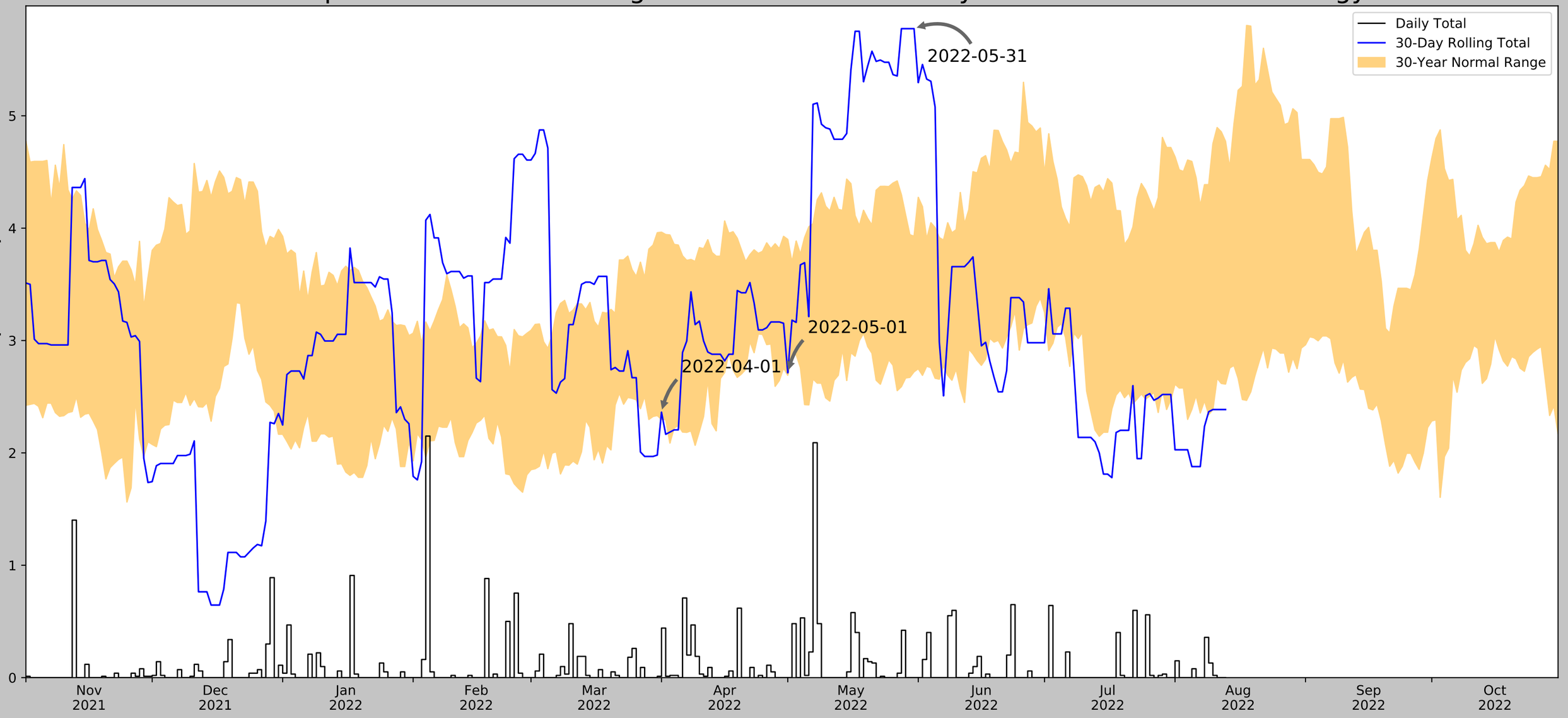
PREPARED BY

Joseph J. Wilson, M.S.
Senior Professional Wetland Scientist, Society of Wetland Scientists (#1333)
Professional Wetland Delineator, Commonwealth of Virginia (#46)
Senior Ecologist, Ecological Society of America
Qualified Botanist, Carnegie Museum of Natural History / PADCNR
Wilson Ecological Consulting, LLC
314 Hill Top Lane, Port Matilda, PA 16870
814-933-2488, jjw@wilsonecological.com

ATTACHMENTS

ANTECEDANT PRECIPITATION TOOL PRINTOUTS

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	40.79485, -77.96150
Observation Date	2022-05-31
Elevation (ft)	1390.35
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-05-31	2.721654	3.928347	5.775591	Wet	3	3	9
2022-05-01	2.690551	3.899606	2.712599	Normal	2	2	4
2022-04-01	2.297244	3.964173	2.362205	Normal	2	1	2
Result							Wetter than Normal - 15

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STATE COLLEGE	40.7933, -77.8672	1169.948	4.934	220.402	3.308	11321	90
MILLHEIM	40.8847, -77.475	1120.079	21.452	49.869	10.723	32	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network

Coordinates	40.79485, -77.96150
Observation Date	2022-06-01
Elevation (ft)	1390.35
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-06-01	2.522441	4.516142	5.370079	Wet	3	3	9
2022-05-02	2.64252	4.148425	2.716536	Normal	2	2	4
2022-04-02	2.352362	3.982677	1.751969	Dry	1	1	1
Result							Normal Conditions - 14

Figure and tables made by the
Antecedent Precipitation Tool
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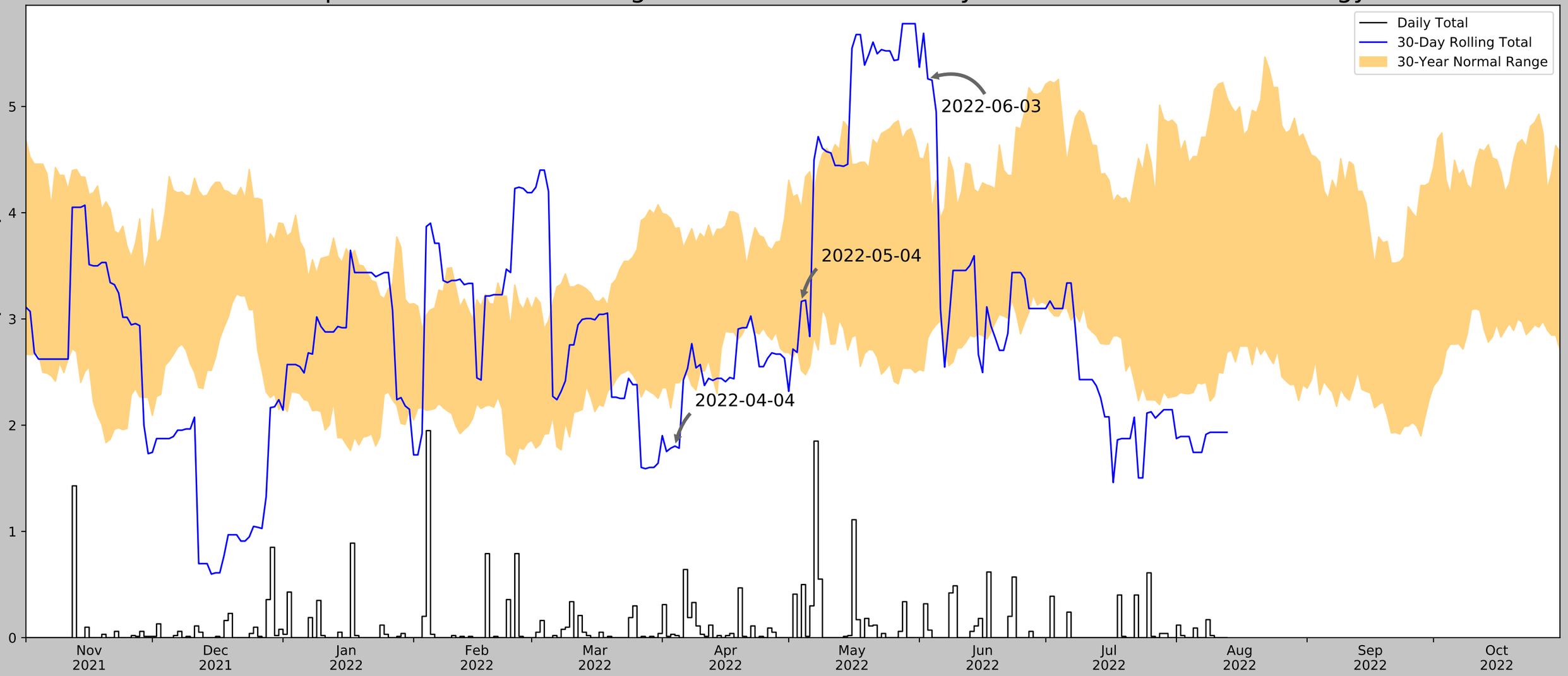
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STATE COLLEGE 2.4 ENE	40.8067, -77.8167	1096.129	7.618	294.221	5.669	5362	85
STATE COLLEGE 1.7 NW	40.8064, -77.8828	1170.932	4.193	219.418	2.807	72	0
PORT MATILDA 6.4 ENE	40.8252, -77.9358	1243.11	2.491	147.24	1.488	145	0
RAMBLEWOOD 3.7 WNW	40.7442, -78.0191	1213.911	4.619	176.439	2.894	32	0
BOALSBURG 1.0 NNW	40.7869, -77.7979	1102.034	8.576	288.316	6.332	16	0
BELLEFONTE 4.3 E	40.9249, -77.6869	1014.108	16.931	376.242	13.989	115	5
BOALSBURG 0.4 E	40.7736, -77.7847	1165.026	9.365	225.324	6.324	3	0
STATE COLLEGE 0.4 SE	40.7869, -77.8518	1099.081	5.765	291.269	4.273	57	0
STATE COLLEGE 2.6 NW	40.8162, -77.8954	1234.908	3.759	155.442	2.276	7	0
CLARENCE	41.0489, -77.9411	1390.092	17.585	0.258	7.918	5544	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	40.79485, -77.96150
Observation Date	2022-06-03
Elevation (ft)	1390.35
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Dry Season

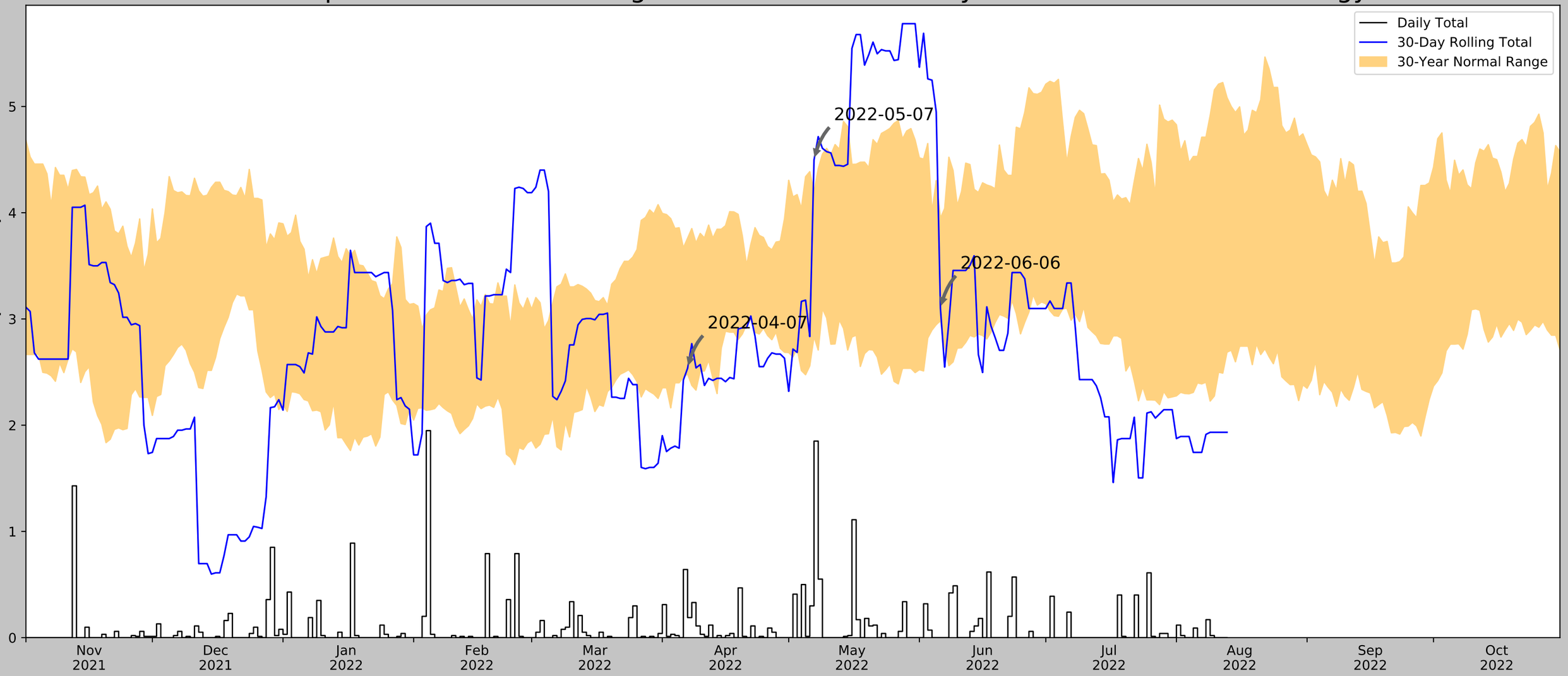
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-06-03	2.820866	4.651575	5.259843	Wet	3	3	9
2022-05-04	2.514567	4.039764	3.165354	Normal	2	2	4
2022-04-04	2.399213	3.852756	1.80315	Dry	1	1	1
Result							Normal Conditions - 14

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STATE COLLEGE 2.4 ENE	40.8067, -77.8167	1096.129	7.618	294.221	5.669	5362	85
STATE COLLEGE 1.7 NW	40.8064, -77.8828	1170.932	4.193	219.418	2.807	72	0
PORT MATILDA 6.4 ENE	40.8252, -77.9358	1243.11	2.491	147.24	1.488	145	0
RAMBLEWOOD 3.7 WNW	40.7442, -78.0191	1213.911	4.619	176.439	2.894	32	0
BOALSBURG 1.0 NNW	40.7869, -77.7979	1102.034	8.576	288.316	6.332	16	0
BELLEFONTE 4.3 E	40.9249, -77.6869	1014.108	16.931	376.242	13.989	115	5
BOALSBURG 0.4 E	40.7736, -77.7847	1165.026	9.365	225.324	6.324	3	0
STATE COLLEGE 0.4 SE	40.7869, -77.8518	1099.081	5.765	291.269	4.273	57	0
STATE COLLEGE 2.6 NW	40.8162, -77.8954	1234.908	3.759	155.442	2.276	7	0
CLARENCE	41.0489, -77.9411	1390.092	17.585	0.258	7.918	5544	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	40.79485, -77.96150
Observation Date	2022-06-06
Elevation (ft)	1390.35
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-06-06	2.983465	3.949213	3.098425	Normal	2	3	6
2022-05-07	2.833071	4.191339	4.496063	Wet	3	2	6
2022-04-07	2.48189	3.760236	2.535433	Normal	2	1	2
Result							Normal Conditions - 14

Figure and tables made by the
Antecedent Precipitation Tool
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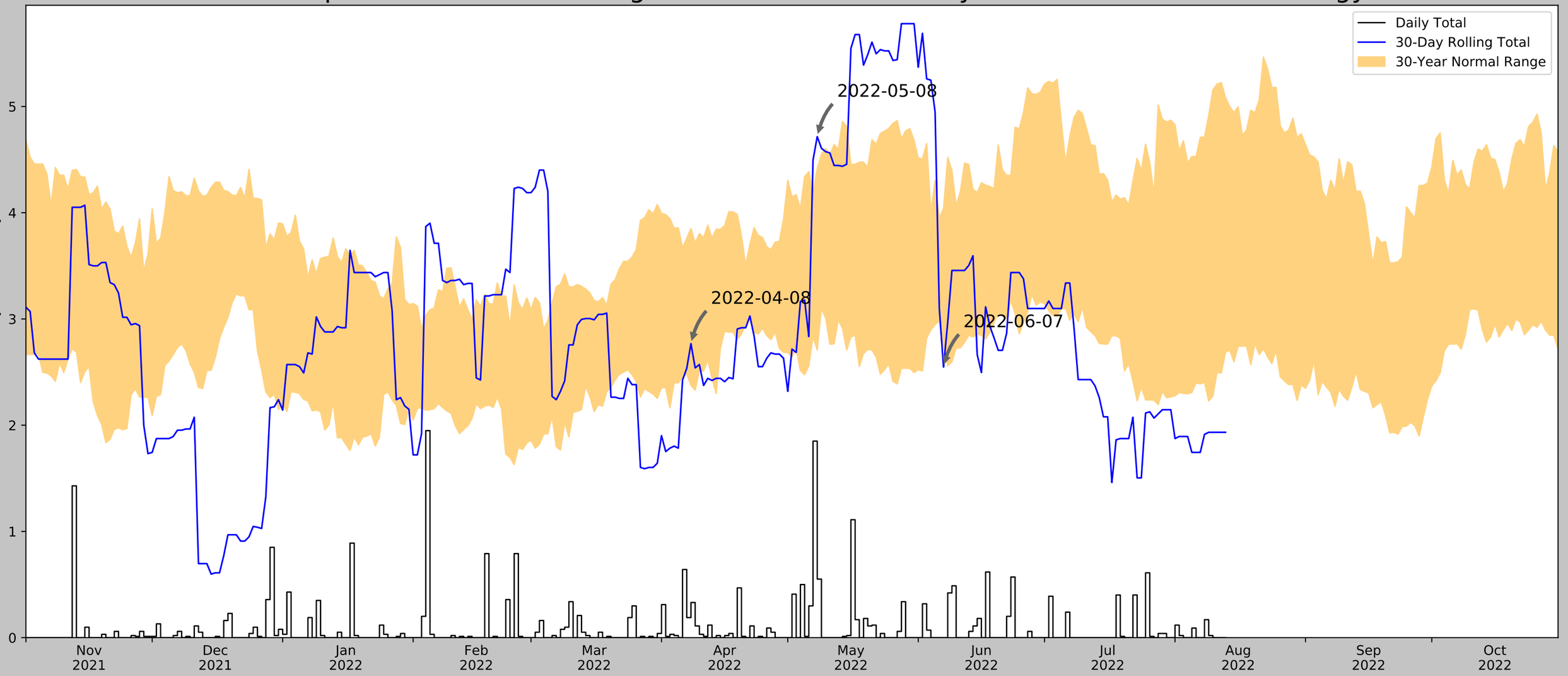
Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STATE COLLEGE 2.4 ENE	40.8067, -77.8167	1096.129	7.618	294.221	5.669	5362	85
STATE COLLEGE 1.7 NW	40.8064, -77.8828	1170.932	4.193	219.418	2.807	72	0
PORT MATILDA 6.4 ENE	40.8252, -77.9358	1243.11	2.491	147.24	1.488	145	0
RAMBLEWOOD 3.7 WNW	40.7442, -78.0191	1213.911	4.619	176.439	2.894	32	0
BOALSBURG 1.0 NNW	40.7869, -77.7979	1102.034	8.576	288.316	6.332	16	0
BELLEFONTE 4.3 E	40.9249, -77.6869	1014.108	16.931	376.242	13.989	115	5
BOALSBURG 0.4 E	40.7736, -77.7847	1165.026	9.365	225.324	6.324	3	0
STATE COLLEGE 0.4 SE	40.7869, -77.8518	1099.081	5.765	291.269	4.273	57	0
STATE COLLEGE 2.6 NW	40.8162, -77.8954	1234.908	3.759	155.442	2.276	7	0
CLARENCE	41.0489, -77.9411	1390.092	17.585	0.258	7.918	5544	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	40.79485, -77.96150
Observation Date	2022-06-07
Elevation (ft)	1390.35
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-06-07	2.751969	4.040158	2.547244	Dry	1	3	3
2022-05-08	2.70748	4.414567	4.716536	Wet	3	2	6
2022-04-08	2.374803	3.851181	2.767717	Normal	2	1	2
Result							Normal Conditions - 11

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

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U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STATE COLLEGE 2.4 ENE	40.8067, -77.8167	1096.129	7.618	294.221	5.669	5362	85
STATE COLLEGE 1.7 NW	40.8064, -77.8828	1170.932	4.193	219.418	2.807	72	0
PORT MATILDA 6.4 ENE	40.8252, -77.9358	1243.11	2.491	147.24	1.488	145	0
RAMBLEWOOD 3.7 WNW	40.7442, -78.0191	1213.911	4.619	176.439	2.894	32	0
BOALSBURG 1.0 NNW	40.7869, -77.7979	1102.034	8.576	288.316	6.332	16	0
BELLEFONTE 4.3 E	40.9249, -77.6869	1014.108	16.931	376.242	13.989	115	5
BOALSBURG 0.4 E	40.7736, -77.7847	1165.026	9.365	225.324	6.324	3	0
STATE COLLEGE 0.4 SE	40.7869, -77.8518	1099.081	5.765	291.269	4.273	57	0
STATE COLLEGE 2.6 NW	40.8162, -77.8954	1234.908	3.759	155.442	2.276	7	0
CLARENCE	41.0489, -77.9411	1390.092	17.585	0.258	7.918	5544	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network

Coordinates	40.79485, -77.96150
Observation Date	2022-06-10
Elevation (ft)	1390.35
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-06-10	2.725197	4.067323	3.456693	Normal	2	3	6
2022-05-11	2.762599	4.545669	4.562992	Wet	3	2	6
2022-04-11	2.510236	3.762992	2.374016	Dry	1	1	1
Result							Normal Conditions - 13

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
STATE COLLEGE 2.4 ENE	40.8067, -77.8167	1096.129	7.618	294.221	5.669	5362	85
STATE COLLEGE 1.7 NW	40.8064, -77.8828	1170.932	4.193	219.418	2.807	72	0
PORT MATILDA 6.4 ENE	40.8252, -77.9358	1243.11	2.491	147.24	1.488	145	0
RAMBLEWOOD 3.7 WNW	40.7442, -78.0191	1213.911	4.619	176.439	2.894	32	0
BOALSBURG 1.0 NNW	40.7869, -77.7979	1102.034	8.576	288.316	6.332	16	0
BELLEFONTE 4.3 E	40.9249, -77.6869	1014.108	16.931	376.242	13.989	115	5
BOALSBURG 0.4 E	40.7736, -77.7847	1165.026	9.365	225.324	6.324	3	0
STATE COLLEGE 0.4 SE	40.7869, -77.8518	1099.081	5.765	291.269	4.273	57	0
STATE COLLEGE 2.6 NW	40.8162, -77.8954	1234.908	3.759	155.442	2.276	7	0
CLARENCE	41.0489, -77.9411	1390.092	17.585	0.258	7.918	5544	0

WETLAND DETERMINATION

DATA FORMS

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 5/31/2022

Applicant/Owner: Patton Township State: PA Sampling Point: 1

Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR or MLRA): LRR S Lat: 40.798535 Long: -77.95961 Datum: WGS84

Soil Map Unit Name: Morrison sandy loam (MrC) NWI classification: PSS1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

Wetland 1, PFO, Depression, Red Maple - Blackgum Palustrine Forest

Conditions have been slightly wetter than normal this spring (see APT report)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No ____	Depth (inches): 1*
Water Table Present?	Yes ✓	No ____	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

* there is shallow water, about 1" deep in various places in this wetland but not at the soil pit location

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum (red maple)	30	Yes	FAC
2. Nyssa sylvatica (blackgum)	25	Yes	FAC
3. Pinus strobus (white pine)	10	No	FACU
4. Populus grandidentata (big-tooth aspen)	5	No	FACU
5.			
6.			
	70	= Total Cover	

50% of total cover: 35 20% of total cover: 14

Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
		= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
		= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5')			
1. Carex sp. (sedge)	3	No	n/a
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	3	= Total Cover	

50% of total cover: 1.5 20% of total cover: 0.6

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species 55	x 3 = 165
FACU species 15	x 4 = 60
UPL species	x 5 =
Column Totals: 70 (A)	225 (B)

Prevalence Index = B/A = 3.2

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

Herbaceous hydrophytes will be dominant later in the growing season, most likely knotweeds (Polygonum spp.)

SOIL Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	7.5YR 4/2	100					ML	
1-9	7.5YR 5/2	60	5YR 5/6	40	C	M	ML	
9-15	7.5YR 5/1	75	5YR 5/6	25	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

ML = silt loam
SL = sandy loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 5/31/2022

Applicant/Owner: Patton Township State: PA Sampling Point: 2

Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR or MLRA): LRR S Lat: 40.79863 Long: -77.962857 Datum: WGS84

Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:

Wetland 2, PFO, Depression, Red Maple - Blackgum Palustrine Forest

Portions of this wetland beyond the plot area are NWI-mapped as PSS1E
Conditions have been slightly wetter than normal this spring (see APT report)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ✓ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ____ Depth (inches): 6*

Water Table Present? Yes ✓ No ____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

* there are places in this wetland with at least 6 inches of water, but not at the soil pit location

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica (blackgum)	60	Yes	FAC
2. Acer rubrum (red maple)	25	Yes	FAC
3.			
4.			
5.			
6.			
	85 = Total Cover		

50% of total cover: 42.5 20% of total cover: 17

Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: 20% of total cover:

Shrub Stratum (Plot size: 15')			
1. Ilex verticillata (winterberry)	15	Yes	FACW
2. Nyssa sylvatica (blackgum)	10	Yes	FAC
3.			
4.			
5.			
6.			
	25 = Total Cover		

50% of total cover: 12.5 20% of total cover: 5

Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		

50% of total cover: 20% of total cover:

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: 20% of total cover:

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species 15	x 2 = 30
FAC species 95	x 3 = 285
FACU species	x 4 =
UPL species	x 5 =
Column Totals: 110 (A)	315 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Herbaceous hydrophytes likely dominate the herb stratum later in the growing season, after the standing water is gone.

SOIL Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 2.5/1	100					OL	
2-7	7.5YR 4/1	80	5YR 4/6	20	C	M	ML	
7-14	7.5YR 5/1	75	5YR 4/6	25	C	M	ML	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

OL = organic loam
ML = silt loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 5/31/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 3
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1
Subregion (LRR or MLRA): LRR S Lat: 40.798261 Long: -77.964933 Datum: WGS84
Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✓ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Wetland 3, PSS, Depression, Circumneutral Mixed Shrub Wetland

Portions of this wetland beyond the plot area are NWI-mapped as PSS1E
Conditions have been slightly wetter than normal this spring (see APT report)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ✓ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 12*
Water Table Present? Yes ✓ No _____ Depth (inches): 1
Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Portions of this wetland are inundated with at least 12 inches of water, but not at the soil pit location.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum (red maple)	20	Yes	FAC
2. Nyssa sylvatica (blackgrum)	15	Yes	FAC
3.			
4.			
5.			
6.			
	35 = Total Cover		
50% of total cover: 17.5	20% of total cover: 7		

Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Shrub Stratum (Plot size: 15')			
1. Aronia melanocarpa (black chokeberry)	25	Yes	FAC
2. Vaccinium corymbosum (highbush blueberry)	10	Yes	FACW
3. Quercus rubra (red oak)	1	No	FACU
4. Quercus alba (white oak)	1	No	FACU
5. Betula lenta (sweet birch)	1	No	FACU
6.			
	38 = Total Cover		
50% of total cover: 19	20% of total cover: 7.6		

Herb Stratum (Plot size: 5')			
1. Torreyochloa pallida (pale manna grass)	25	Yes	OBL
2. Carex stipata (awl-fruit sedge)	10	Yes	OBL
3. Carex canescens (hoary sedge)	5	No	OBL
4. Lemna minor (lesser duckweed)	1	No	OBL
5. Triadenum fraseri (marsh St. John's-wort)	1	No	OBL
6. Mitchella repens (partridgeberry)	1	No	FACU
7. Medeola virginiana (Indian cucumber-root)	1	No	FAC
8. Gaultheria procumbens (teaberry)	1	No	FACU
9.			
10.			
11.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	42	x 1 =	42
FACW species	10	x 2 =	20
FAC species	61	x 3 =	183
FACU species	5	x 4 =	20
UPL species		x 5 =	
Column Totals:	118 (A)		265 (B)

Prevalence Index = B/A = 2.2

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 3/1	100					OL	
3-7	7.5YR 4/1	90	5YR 4/6	10	C	M	SML	
7-12	7.5YR 5/1	100					SML	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

OL = organic
SML = sandy silt loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/1/2022

Applicant/Owner: Patton Township State: PA Sampling Point: 4

Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR or MLRA): LRR S Lat: 40.798259 Long: -77.964105 Datum: WGS84

Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Wetland 4, PEM, Depression, Mixed Forb - Graminoid Wet Meadow

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ✓ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): 0.25*
Water Table Present?	Yes ✓	No _____	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Places in this wetland have shallow surface water of about 0.25 inch deep.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 4

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5')			
1. Scirpus hattorianus (mosquito bulrush)	30	Yes	OBL
2. Microstegium vimineum (Japanese stiltgrass)	20	Yes	FAC
3. Carex scoparia (pointed broom sedge)	10	No	FACW
4. Carex hirsutella (fuzzy wuzzy sedge)	5	No	UPL
5. Juncus tenuis (path rush)	5	No	FAC
6. Carex vulpinoidea (fox sedge)	5	No	OBL
7. Juncus effusus (soft rush)	2	No	FACW
8. Solidago rugosa (wrinkle-leaf goldenrod)	2	No	FAC
9. Acer rubrum (red maple)	1	No	FAC
10.			
11.			
	80 = Total Cover		

50% of total cover: 40 20% of total cover: 16

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	12	x 2 =	24
FAC species	28	x 3 =	84
FACU species		x 4 =	
UPL species	5	x 5 =	25
Column Totals:	80 (A)		168 (B)

Prevalence Index = B/A = 2.1

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 2.5/2	100					OL	
2-4	7.5YR 5/1	100					ML	
4-8	7.5YR 6/1	90	5YR 5/6	10	C	PL&M	SML	
8-12	7.5YR 7/1	80	5YR 6/6	20	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: sandy clay loam

Depth (inches): 8

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

OL = organic loam
ML = silt loam
SML = sandy silt loam
SCL = sandy clay loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/1/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 5
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1
Subregion (LRR or MLRA): LRR S Lat: 40.797855 Long: -77.963635 Datum: WGS84
Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: PSS1E
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Wetland 5, PEM/PSS, Depression, Rice Cutgrass - Bulrush Vernal Pool/Circumneutral Mixed Shrub Wetland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ✓ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): 3*
Water Table Present?	Yes ✓	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Many portions of this wetland are shallowly inundated with about 3 inches of water, but not at the soil pit location.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 5

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum (red maple)	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		

50% of total cover: 5 20% of total cover: 2

Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1. Ilex verticillata (winterberry)	20	Yes	FACW
2.			
3.			
4.			
5.			
6.			
	20 = Total Cover		

50% of total cover: 10 20% of total cover: 4

Herb Stratum (Plot size: 5')			
1. Torreyochloa pallida (pale manna grass)	75	Yes	OBL
2. Boehmeria cylindrica (false nettle)	5	No	FACW
3. Carex lurida (shallow sedge)	3	No	OBL
4. Onoclea sensibilis (sensitive fern)	2	No	FACW
5. Carex canescens (hoary sedge)	2	No	OBL
6. Triadenum fraseri (marsh St. John's-wort)	1	No	OBL
7. Microstegium vimineum (Japanese stiltgrass)	1	No	FAC
8. Galium obtusum (blunt-leaf bedstraw)	1	No	FACW
9.			
10.			
11.			
	90 = Total Cover		

50% of total cover: 45 20% of total cover: 18

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	81	x 1 =	81
FACW species	28	x 2 =	56
FAC species	11	x 3 =	33
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	120 (A)		170 (B)

Prevalence Index = B/A = 1.4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5YR 3/1	100					OL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ✓ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

OL = organic loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/3/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 6
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR or MLRA): LRR S Lat: 40.797538 Long: -77.962937 Datum: WGS84
Soil Map Unit Name: Hagerstown silt clay loam (HcB) NWI classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Wetland 6, PFO, Depression, Sparsely Vegetated Vernal Pool Community

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 3*
Water Table Present? Yes _____ No ✓ Depth (inches): _____
Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

There are places with shallow water as much as 3 inches deep but not at the soil pit location.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 6

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus alba (white oak)	20	Yes	FACU
2. Acer rubrum (red maple)	10	Yes	FAC
3. Nyssa sylvatica (blackgum)	10	Yes	FAC
4.			
5.			
6.			
	40 = Total Cover		

50% of total cover: 20 20% of total cover: 8

Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1. Sambucus nigra (black elderberry)	3	No	FAC
2. Ilex verticillata (winterberry)	1	No	FACW
3.			
4.			
5.			
6.			
	4 = Total Cover		

50% of total cover: 2 20% of total cover: 0.8

Herb Stratum (Plot size: 5')			
1. Boehmeria cylindrica (false nettle)	20	Yes	FACW
2. Onoclea sensibilis (sensitive fern)	15	Yes	FACW
3. Cardamine sp. (bittercress)	10	Yes	n/a
4. Carex hirsutella (fuzzy wuzzy sedge)	5	No	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	50 = Total Cover		

50% of total cover: 25 20% of total cover: 10

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species 36	x 2 = 72
FAC species 23	x 3 = 69
FACU species 20	x 4 = 80
UPL species 5	x 5 = 25
Column Totals: 84 (A)	246 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2.5	7.5YR 2.5/1	100					OL	
2.5-4	7.5YR 4/1	97	5YR 4/4	3	C	PL	ML	
4-14	7.5YR 5/2	70	5YR 4/6	30	C	M	ML	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

OL = organic loam
ML = silt loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/3/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 7
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1
Subregion (LRR or MLRA): LRR S Lat: 40.796642 Long: -77.963877 Datum: WGS84
Soil Map Unit Name: Hagerstown silt clay loam (HcB) NWI classification: PFO/SS1E
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Wetland 7, PEM/PSS, Depression, Rice Cutgrass - Bulrush Vernal Pool/Circumneutral Mixed Shrub Wetland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): 1*
Water Table Present?	Yes ✓	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 1

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Much of this wetland is inundated with about an inch of water, but not at the soil pit location.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica (blackgum)	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	5 = Total Cover		

50% of total cover: 2.5 20% of total cover: 0.1

Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1. Cephalanthus occidentalis (buttonbush)	40	Yes	OBL
2. Ilex verticillata (winterberry)	10	Yes	FACW
3.			
4.			
5.			
6.			
	50 = Total Cover		

50% of total cover: 25 20% of total cover: 10

Herb Stratum (Plot size: 5')			
1. Torreyochloa pallida (pale manna grass)	75	Yes	OBL
2. Osmunda cinnamomea (cinnamon fern)	5	No	FACW
3. Boehmeria cylindrica (false nettle)	2	No	FACW
4. Galium obtusum (blunt-leaf bedstraw)	1	No	FACW
5. Triadenum fraseri (marsh St. John's-wort)	1	No	OBL
6. Galium asprellum (rough bedstraw)	1	No	OBL
7.			
8.			
9.			
10.			
11.			
	85 = Total Cover		

50% of total cover: 42.5 20% of total cover: 17

Woody Vine Stratum (Plot size: 30')			
1. Smilax rotundifolia (greenbrier)	3	No	FAC
2. Parthenociccus quinquefolia (Virginia creeper)	1	No	FACU
3.			
4.			
5.			
	4 = Total Cover		

50% of total cover: 2 20% of total cover: 0.8

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	117	x 1 =	117
FACW species	18	x 2 =	36
FAC species	8	x 3 =	24
FACU species	1	x 4 =	4
UPL species		x 5 =	
Column Totals:	144 (A)		181 (B)

Prevalence Index = B/A = 1.2

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 2.5/1	100					OL	
4-7	7.5YR 4/1	97	5YR 4/4	3	C	PL	ML	
7-15	7.5YR 5/1	80	5YR 4/6	20	C	M	SML	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

OL = organic loam
ML = silt loam
SML = sandy silt loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/6/2022

Applicant/Owner: Patton Township State: PA Sampling Point: 8

Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR or MLRA): LRR S Lat: 40.79665 Long: -77.96387 Datum: WGS84

Soil Map Unit Name: Hagerstown silty clay loam (HcB) NWI classification: PFO/SS1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Wetland 8, PEM/PSS, Depression, Rice Cutgrass - Bulrush Vernal Pool/Circumneutral Mixed Shrub Wetland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ✓ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): 3*
Water Table Present?	Yes ✓	No _____	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Many places in this wetland have water as deep as 3 inches, but not at the soil pit location.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 8

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum (red maple)	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		

50% of total cover: 5 20% of total cover: 2

Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: 20% of total cover:

Shrub Stratum (Plot size: 15')			
1. Cephalanthus occidentalis (buttonbush)	20	Yes	OBL
2. Ilex verticillata (winterberry)	20	Yes	FACW
3.			
4.			
5.			
6.			
	40 = Total Cover		

50% of total cover: 20 20% of total cover: 8

Herb Stratum (Plot size: 5')			
1. Carex lurida (shallow sedge)	20	Yes	OBL
2. Scirpus cyperinus (woolgrass)	5	No	FACW
3. Osmunda cinnamomea (cinnamon fern)	3	No	FACW
4. Triadenum fraseri (marsh St. John's-wort)	2	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30 = Total Cover		

50% of total cover: 15 20% of total cover: 6

Woody Vine Stratum (Plot size: 30')			
1. Smilax rotundifolia (greenbrier)	3	No	FAC
2. Vitis sp. (grape)	1	No	n/a
3.			
4.			
5.			
	4 = Total Cover		

50% of total cover: 1 20% of total cover: 0.8

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	30	x 2 =	60
FAC species	13	x 3 =	39
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	83 (A)		139 (B)

Prevalence Index = B/A = 1.7

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 2/1	100					OL	
3-8	7.5YR 3/1	100					SL	
8-11	7.5YR 5/1	97	5YR 5/6	3	C	M	SML	
11-16	7.5YR 6/1	90	5YR 6/6	10	C	M	SML	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

OL = organic loam
SL = sandy loam
SML = sandy silt loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/7/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 9
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1
Subregion (LRR or MLRA): LRR S Lat: 40.796917 Long: -77.965863 Datum: WGS84
Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: PSS1E
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Wetland 9, PUB, Depression, Spatterdock - Water Lily Emergent Wetland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ✓ Aquatic Fauna (B13)
- ✓ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): >12*
Water Table Present?	Yes ✓	No _____	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Much of this wetland is inundated with more than one foot of water, but not at the soil pit location.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 9

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica (blackgum)	75	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	75 = Total Cover		

50% of total cover: 37.5 20% of total cover: 15

Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1. Vaccinium corymbosum (highbush blueberry)	20	Yes	FACW
2. Nyssa sylvatica (blackgum)	3	No	FAC
3. Quercus rubra (red oak)	2	No	FACU
4.			
5.			
6.			
	25 = Total Cover		

50% of total cover: 12.5 20% of total cover: 5

Herb Stratum (Plot size: 5')			
1. Osmunda cinnamomea (cinnamon fern)	20	Yes	FACW
2. Torreyochloa pallida (pale mannagrass)	10	Yes	OBL
3. Lemna minor (lesser duckweed)	5	No	OBL
4. Mitchella repens (teaberry)	1	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	36 = Total Cover		

50% of total cover: 18 20% of total cover: 7.2

Woody Vine Stratum (Plot size: 30')			
1. Smilax rotundifolia (greenbrier)	5	Yes	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		

50% of total cover: 2.5 20% of total cover: 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	40	x 2 =	80
FAC species	83	x 3 =	249
FACU species	3	x 4 =	12
UPL species		x 5 =	
Column Totals:	141 (A)		356 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 2.5/1	100					OL	
2-8	7.5YR 4/2	100					ML	
8-13	7.5YR 5/1	95	5YR 5/4	5	C	M	ML	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

OL = organic loam
ML = silt loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/7/2022

Applicant/Owner: Patton Township State: PA Sampling Point: 10

Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR or MLRA): LRR S Lat: 40.796107 Long: -77.963537 Datum: WGS84

Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Wetland 10, PFO, Depression, Sparsely Vegetated Vernal Pool Community

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ✓ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 10

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica (blackgum)	10	Yes	FAC
2. Acer rubrum (red maple)	10	Yes	FAC
3.			
4.			
5.			
6.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5')			
1. Carex tribuloides (blunt broom sedge)	5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species 5	x 2 = 10
FAC species 20	x 3 = 60
FACU species	x 4 =
UPL species	x 5 =
Column Totals: 25 (A)	70 (B)

Prevalence Index = B/A = 2.8

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 2.5/1	100					OL	
3-12	N 5/0	80	5YR 5/6	20	C	M	MCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ✓ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: silty clay loam

Depth (inches): 3

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

OL = organic loam
MCL = silty clay loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/7/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 11
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1
Subregion (LRR or MLRA): LRR S Lat: 40.796118 Long: -77.961918 Datum: WGS84
Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Wetland 11, PFO, Depression, Sparsely Vegetated Vernal Pool Community

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ✓ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 11

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica (blackgum)	10	Yes	FAC
2. Quercus alba (white oak)	10	Yes	FACU
3.			
4.			
5.			
6.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 5		
Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Shrub Stratum (Plot size: 15')			
1. Gaylussacia baccata (black huckleberry)	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Herb Stratum (Plot size: 5')			
1. Carex tribuloides (blunt broom sedge)	20	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Woody Vine Stratum (Plot size: 30')			
1. Smilax rotundifolia (greenbrier)	5	Yes	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species 20	x 2 = 40
FAC species 15	x 3 = 45
FACU species 15	x 4 = 60
UPL species	x 5 =
Column Totals: 50 (A)	145 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

There is big scarlet oak at the edge of this wetland and if included, it would set the vegetation as slightly upland dominated. It was not included.

SOIL Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 2.5/1	100					OL	
4-12	N 5/0	80	5YR 5/6	20	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ✓ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: clay loam

Depth (inches): 4

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

OL = organic loam
CL = clay loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/7/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 12
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1
Subregion (LRR or MLRA): LRR S Lat: 40.795714 Long: -77.964151 Datum: WGS84
Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Wetland 12, PFO, Depression, Sparsely Vegetated Vernal Pool Community

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ✓ Aquatic Fauna (B13)
- ✓ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ✓ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): >12*
Water Table Present? Yes _____ No ✓ Depth (inches): _____
Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

* water is greater than one foot deep in this wetland, but not at the soil pit location.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 12

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica (blackgum)	20	Yes	FAC
2. Acer rubrum (red maple)	5	Yes	FAC
3.			
4.			
5.			
6.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Shrub Stratum (Plot size: 15')			
1. Nyssa sylvatica (blackgum)	1	No	FAC
2.			
3.			
4.			
5.			
6.			
	1 = Total Cover		
50% of total cover: 0.5	20% of total cover: 0.2		
Herb Stratum (Plot size: 5')			
1. Osmunda cinnamomea (cinnamon fern)	40	Yes	FACW
2. Lemna minor (lesser duckweed)	5	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	40	x 2 =	80
FAC species	26	x 3 =	72
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	71 (A)		157 (B)

Prevalence Index = B/A = 2.2

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 2.5/1	100					OL	
3-5	7.5YR 3/1	100					ML	
5-9	7.5YR 5/1	95	5YR 4/6	5	C	M	SL	
9-13	7.5YR 6/1	90	5YR 5/6	10	C	M	SC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: sandy clay

Depth (inches): 9

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

OL = organic loam
ML = silt loam
SL = sandy loam
SC = sandy clay

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/7/2022

Applicant/Owner: Patton Township State: PA Sampling Point: 13

Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR or MLRA): LRR S Lat: 40.79535 Long: -77.965304 Datum: WGS84

Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Wetland 13, PFO, Depression, Sparsely Vegetated Vernal Pool Community

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ✓ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 13

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. Acer rubrum (red maple)	25	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Shrub Stratum (Plot size: 15')			
1. Quercus alba (white oak)	20	Yes	FACU
2. Gaylussacia baccata (black huckleberry)	5	No	FACU
3. Quercus coccinea (scarlet oak)	3	No	UPL
4. Nyssa sylvatica (blackgum)	2	No	FAC
5.			
6.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		
Herb Stratum (Plot size: 5')			
1. Carex tribuloides (blunt broom sedge)	5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	5	x 2 =	10
FAC species	27	x 3 =	81
FACU species	25	x 4 =	100
UPL species	3	x 5 =	15
Column Totals:	60 (A)		206 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 2.5/1	100				OL		
2-7	7.5YR 5/1	95	5YR 5/6	5	C	M	MCL	
7-13	7.5YR	60	5YR 4/6	40	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: silty clay loam

Depth (inches): 2

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

OL = organic loam
MCL = silty clay loam
CL = clay loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/7/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 14
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1
Subregion (LRR or MLRA): LRR S Lat: 40.795484 Long: -77.965542 Datum: WGS84
Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Wetland 14, PFO, Depression, Sparsely Vegetated Vernal Pool Community

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Aquatic Fauna (B13)
- ✓ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ✓ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): >12*
Water Table Present? Yes _____ No ✓ Depth (inches): _____
Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Standing water in this wetland is greater than a foot, but there is none at the soil pit location.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 14

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica (blackgum)	10	Yes	FAC
2. Quercus alba (white oak)	10	Yes	FACU
3. Acer rubrum (red maple)	5	Yes	FAC
4.			
5.			
6.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Shrub Stratum (Plot size: 15')			
1. Nyssa sylvatica (blackgum)	5	Yes	FAC
2. Rubus allegheniensis (Allegheny blackberry)	5	Yes	FACU
3. Ilex verticillata (winterberry)	3	Yes	FACW
4. Amelanchier sp. (serviceberry)	1	No	n/a
5. Vaccinium angustifolium (low-bush blueberry)	1	No	FACU
6.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		
Herb Stratum (Plot size: 5')			
1. Carex tribuloides (blunt broom sedge)	5	Yes	FACW
2. Lemna minor (lesser duckweed)	1	No	OBL
3. Impatiens capensis (jewelweed)	1	No	FACW
4. Acer rubrum (red maple)	1	No	FAC
5. Ageratina altissima (white snakeroot)	1	No	FACU
6. Lycopus virginicus (Virginia water horehound)	1	No	OBL
7.			
8.			
9.			
10.			
11.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	9	x 2 =	18
FAC species	21	x 3 =	63
FACU species	17	x 4 =	64
UPL species		x 5 =	
Column Totals:	49 (A)		147 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 2.5/1	100					OL	
4-6	7.5YR 3/1	100					ML	
6-14	7.5YR 5/1	80	5YR 4/6	20	C	M	MCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: silty clay loam

Depth (inches): 6

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

OL = organic loam
ML = silt loam
MCL = silty clay loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/10/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 15
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): <1
Subregion (LRR or MLRA): LRR S Lat: 40.796109 Long: -77.96705 Datum: WGS84
Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Wetland 15, PFO, Depression, Sparsely Vegetated Vernal Pool Community

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 2*
Water Table Present? Yes ✓ No _____ Depth (inches): 3
Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water depth as great as 2 inches in places in this wetland, but not at the soil pit location.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 15

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica (blackgum)	90	Yes	FAC
2. Quercus alba (white oak)	5	No	FACU
3.			
4.			
5.			
6.			
	95 = Total Cover		

50% of total cover: 47.5 20% of total cover: 19

Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5')			
1. Carex tribuloides (blunt broom sedge)	2	No	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	2 = Total Cover		

50% of total cover: 1 20% of total cover: 0.4

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species 2	x 2 = 4
FAC species 90	x 3 = 270
FACU species 5	x 4 = 20
UPL species	x 5 =
Column Totals: 97 (A)	294 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1.5	7.5YR 2.5/1	100					OL	
1.5-4	7.5YR 4/2	95	5YR 4/6	5	C	M	ML	
4-13	7.5YR 4/1	100					ML	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

OL = organic loam
ML = silt loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/10/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 16
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR or MLRA): LRR S Lat: 40.795455 Long: -77.966406 Datum: WGS84
Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Wetland 16, PFO, Depression, Red Maple - Blackgum Palustrine Forest

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): 2*
Water Table Present?	Yes ✓	No _____	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland is shallowly inundated with about 2 inches of water, but not at the soil pit location.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 16

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. Acer rubrum (red maple)	50	Yes	FAC
2. Quercus alba (white oak)	10	No	FACU
3. Quercus rubra (red oak)	5	No	FACU
4.			
5.			
6.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		
Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Shrub Stratum (Plot size: 15')			
1. Acer rubrum (red maple)	20	Yes	FAC
2. Quercus rubra (red oak)	5	Yes	FACU
3.			
4.			
5.			
6.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Herb Stratum (Plot size: 5')			
1. Impatiens capensis (jewelweed)	25	Yes	FACW
2. Solidago gigantea (late goldenrod)	20	Yes	FACW
3. Poa sylvestris (woodland bluegrass)	10	No	FACW
4. Microstegium vimineum (Japanese stiltgrass)	5	No	FAC
5. Cardamine impatiens (narrow-leaf bittercress)	3	No	FAC
6. Carex radiata (star sedge)	2	No	FAC
7.			
8.			
9.			
10.			
11.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		
Woody Vine Stratum (Plot size: 30')			
1. Smilax rotundifolia (greenbrier)	1	No	FAC
2.			
3.			
4.			
5.			
	1 = Total Cover		
50% of total cover: 0.5	20% of total cover: 0.2		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species 55	x 2 = 110
FAC species 81	x 3 = 243
FACU species 20	x 4 = 80
UPL species	x 5 =
Column Totals: 156 (A)	433 (B)

Prevalence Index = B/A = 2.8

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	7.5YR 2.5/1	100					OL	
1-5	7.5YR 4/1	60	5YR 4/6	40	C	M	ML	
5-13	7.5YR 5/1	80	5YR 4/6	20	C	M	ML	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

OL = organic loam
ML = silt loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/10/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 17
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 3
Subregion (LRR or MLRA): LRR S Lat: 40.794812 Long: -77.96502 Datum: WGS84
Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Wetland 17, PFO, Depression, Sparsely Vegetated Vernal Pool Community

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ✓ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): >12*
Water Table Present? Yes ✓ No _____ Depth (inches): 6
Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water depth more than a foot in many parts of this wetland, but not at the soil pit location.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 17

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. Acer rubrum (red maple)	20	Yes	FAC
2. Nyssa sylvatica (black gum)	20	Yes	FAC
3. Quercus alba (white oak)	10	No	FACU
4. Quercus coccinea (scarlet oak)	5	No	UPL
5. Quercus rubra (red oak)	5	No	FACU
6.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		
Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Shrub Stratum (Plot size: 15')			
1. Quercus alba (white oak)	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species 40	x 3 = 120
FACU species 20	x 4 = 80
UPL species 5	x 5 = 25
Column Totals: 65 (A)	225 (B)

Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 3/1	100					ML	
2-12	N 4/0	65	5YR 4/6	35	C	M	ML	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ✓ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

ML = silt loam

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Gray's Woods Preserve, Wetland Stewardship Plan City/County: Centre Sampling Date: 6/10/2022
Applicant/Owner: Patton Township State: PA Sampling Point: 18
Investigator(s): J. Wilson, Wilson Ecological Consulting, LLC Section, Township, Range: Patton Township
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR or MLRA): LRR S Lat: 40.791066 Long: -77.95872 Datum: WGS84
Soil Map Unit Name: Morrison sandy loam (MrB) NWI classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** **Yes ✓ No _____**
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Wetland 18, PFO, Depression, Red Maple - Blackgum Palustrine Forest

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____
Water Table Present? Yes _____ No ✓ Depth (inches): _____
Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: 18

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. Nyssa sylvatica (blackgum)	75	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	75 = Total Cover		
50% of total cover: 37.5	20% of total cover: 15		
Sapling Stratum (Plot size: w/ shrubs)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Shrub Stratum (Plot size: 15')			
1. Nyssa sylvatica (blackgum)	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Herb Stratum (Plot size: 5')			
1. Danthonia spicata (poverty grass)	5	Yes	FACU
2. Nyssa sylvatica (blackgum)	3	Yes	FAC
3. Acer rubrum (red maple)	1	No	FAC
4. Carex swanii (Swan's sedge)	1	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species 89	x 3 = 267
FACU species 6	x 4 = 24
UPL species	x 5 =
Column Totals: 95 (A)	291 (B)

Prevalence Index = B/A = 3.1

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: 18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 3/3	100					OL	
4-9	7.5YR 2.5/1	100					ML	
9-12	7.5YR 5/1	75	5YR 4/6	25	C	M	ML	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ✓ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ___

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

OL = organic loam
ML = silt loam

FLORISTIC QUALITY ASSESSMENT

DATA FORMS

Inventory Assessment

Edit This Inventory | Download Report | Done

Wetland 1

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **3**
Native Mean C: **3.8**
Total FQI: **26**
Native FQI: **29.2**
Adjusted FQI: **33.7**
% C value 0: **22.7%**
% C value 1-3: **30.7%**
% C value 4-6: **42.7%**
% C value 7-10: **4%**
Native Tree Mean C: **4.8**
Native Shrub Mean C: **3**
Native Herbaceous Mean C: **3.5**

» Species Richness:

Total Species: **75**
Native Species: **59 (78.7%)**
Non-native Species: **16 (21.3%)**

» Species Wetness:

Mean Wetness: **-0.3**
Native Mean Wetness: **-0.4**

» Physiognomy Metrics:

Tree: **14 (18.7%)**
Shrub: **5 (6.7%)**
Vine: **2 (2.7%)**
Forb: **23 (30.7%)**
Grass: **7 (9.3%)**
Sedge: **7 (9.3%)**
Rush: **2 (2.7%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **8 (10.7%)**
Perennial: **52 (69.3%)**
Biennial: **0 (0%)**

Native Annual: **8 (10.7%)**
Native Perennial: **51 (68%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

Edit This Inventory | Download Report | Done

Wetland 2

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **3.9**
Native Mean C: **4.6**
Total FQI: **22.7**
Native FQI: **24.8**
Adjusted FQI: **42.5**
% C value 0: **14.7%**
% C value 1-3: **26.5%**
% C value 4-6: **47.1%**
% C value 7-10: **11.8%**
Native Tree Mean C: **4.8**
Native Shrub Mean C: **3.8**
Native Herbaceous Mean C: **4.8**

» Species Richness:

Total Species: **34**
Native Species: **29 (85.3%)**
Non-native Species: **5 (14.7%)**

» Species Wetness:

Mean Wetness: **0**
Native Mean Wetness: **0**

» Physiognomy Metrics:

Tree: **6 (17.6%)**
Shrub: **7 (20.6%)**
Vine: **1 (2.9%)**
Forb: **12 (35.3%)**
Grass: **1 (2.9%)**
Sedge: **3 (8.8%)**
Rush: **0 (0%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **1 (2.9%)**
Perennial: **29 (85.3%)**
Biennial: **0 (0%)**

Native Annual: **1 (2.9%)**
Native Perennial: **28 (82.4%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 3

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **5.4**
Native Mean C: **5.5**
Total FQI: **32.4**
Native FQI: **32.5**
Adjusted FQI: **54.2**
% C value 0: **2.8%**
% C value 1-3: **11.1%**
% C value 4-6: **58.3%**
% C value 7-10: **27.8%**
Native Tree Mean C: **5**
Native Shrub Mean C: **6.7**
Native Herbaceous Mean C: **5.4**

» Species Richness:

Total Species: **36**
Native Species: **35 (97.2%)**
Non-native Species: **1 (2.8%)**

» Species Wetness:

Mean Wetness: **-0.4**
Native Mean Wetness: **-0.4**

» Physiognomy Metrics:

Tree: **8 (22.2%)**
Shrub: **6 (16.7%)**
Vine: **0 (0%)**
Forb: **12 (33.3%)**
Grass: **2 (5.6%)**
Sedge: **7 (19.4%)**
Rush: **0 (0%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **2 (5.6%)**
Perennial: **33 (91.7%)**
Biennial: **0 (0%)**

Native Annual: **2 (5.6%)**
Native Perennial: **33 (91.7%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 4

» Date & Location:

2023-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **2.6**
Native Mean C: **3.4**
Total FQI: **16.6**
Native FQI: **19.2**
Adjusted FQI: **30**
% C value 0: **24.4%**
% C value 1-3: **43.9%**
% C value 4-6: **26.8%**
% C value 7-10: **4.9%**
Native Tree Mean C: **1**
Native Shrub Mean C: **3**
Native Herbaceous Mean C: **3.5**

» Species Richness:

Total Species: **41**
Native Species: **32 (78%)**
Non-native Species: **9 (22%)**

» Species Wetness:

Mean Wetness: **-0.8**
Native Mean Wetness: **-1**

» Physiognomy Metrics:

Tree: **1 (2.4%)**
Shrub: **3 (7.3%)**
Vine: **0 (0%)**
Forb: **16 (39%)**
Grass: **1 (2.4%)**
Sedge: **8 (19.5%)**
Rush: **3 (7.3%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **3 (7.3%)**
Perennial: **29 (70.7%)**
Biennial: **0 (0%)**

Native Annual: **3 (7.3%)**
Native Perennial: **28 (68.3%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 5

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **3.7**
Native Mean C: **4.2**
Total FQI: **31.4**
Native FQI: **33.1**
Adjusted FQI: **39**
% C value 0: **16.7%**
% C value 1-3: **31.9%**
% C value 4-6: **38.9%**
% C value 7-10: **12.5%**
Native Tree Mean C: **5**
Native Shrub Mean C: **4.4**
Native Herbaceous Mean C: **4.1**

» Species Richness:

Total Species: **72**
Native Species: **62 (86.1%)**
Non-native Species: **10 (13.9%)**

» Species Wetness:

Mean Wetness: **-1**
Native Mean Wetness: **-1.2**

» Physiognomy Metrics:

Tree: **8 (11.1%)**
Shrub: **8 (11.1%)**
Vine: **1 (1.4%)**
Forb: **29 (40.3%)**
Grass: **8 (11.1%)**
Sedge: **8 (11.1%)**
Rush: **0 (0%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **9 (12.5%)**
Perennial: **53 (73.6%)**
Biennial: **0 (0%)**

Native Annual: **9 (12.5%)**
Native Perennial: **52 (72.2%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 6

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **3.5**
Native Mean C: **4.1**
Total FQI: **23.2**
Native FQI: **25.3**
Adjusted FQI: **38.1**
% C value 0: **13.6%**
% C value 1-3: **34.1%**
% C value 4-6: **45.5%**
% C value 7-10: **6.8%**
Native Tree Mean C: **4.8**
Native Shrub Mean C: **3**
Native Herbaceous Mean C: **4**

» Species Richness:

Total Species: **44**
Native Species: **38 (86.4%)**
Non-native Species: **6 (13.6%)**

» Species Wetness:

Mean Wetness: **-0.6**
Native Mean Wetness: **-0.7**

» Physiognomy Metrics:

Tree: **8 (18.2%)**
Shrub: **4 (9.1%)**
Vine: **1 (2.3%)**
Forb: **17 (38.6%)**
Grass: **1 (2.3%)**
Sedge: **8 (18.2%)**
Rush: **0 (0%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **6 (13.6%)**
Perennial: **33 (75%)**
Biennial: **0 (0%)**

Native Annual: **6 (13.6%)**
Native Perennial: **32 (72.7%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 7

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **4.3**
Native Mean C: **4.6**
Total FQI: **39.2**
Native FQI: **40.4**
Adjusted FQI: **44.3**
% C value 0: **9.6%**
% C value 1-3: **27.7%**
% C value 4-6: **43.4%**
% C value 7-10: **19.3%**
Native Tree Mean C: **4.8**
Native Shrub Mean C: **5.8**
Native Herbaceous Mean C: **4.4**

» Species Richness:

Total Species: **83**
Native Species: **77 (92.8%)**
Non-native Species: **6 (7.2%)**

» Species Wetness:

Mean Wetness: **-1.1**
Native Mean Wetness: **-1.2**

» Physiognomy Metrics:

Tree: **13 (15.7%)**
Shrub: **11 (13.3%)**
Vine: **1 (1.2%)**
Forb: **33 (39.8%)**
Grass: **7 (8.4%)**
Sedge: **11 (13.3%)**
Rush: **2 (2.4%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **6 (7.2%)**
Perennial: **72 (86.7%)**
Biennial: **0 (0%)**

Native Annual: **6 (7.2%)**
Native Perennial: **71 (85.5%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 8

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **3.8**
Native Mean C: **4.3**
Total FQI: **33.1**
Native FQI: **35.5**
Adjusted FQI: **40.7**
% C value 0: **11.8%**
% C value 1-3: **31.6%**
% C value 4-6: **48.7%**
% C value 7-10: **7.9%**
Native Tree Mean C: **5.1**
Native Shrub Mean C: **4.3**
Native Herbaceous Mean C: **4**

» Species Richness:

Total Species: **76**
Native Species: **68 (89.5%)**
Non-native Species: **8 (10.5%)**

» Species Wetness:

Mean Wetness: **-0.9**
Native Mean Wetness: **-1**

» Physiognomy Metrics:

Tree: **16 (21.1%)**
Shrub: **5 (6.6%)**
Vine: **2 (2.6%)**
Forb: **29 (38.2%)**
Grass: **7 (9.2%)**
Sedge: **9 (11.8%)**
Rush: **1 (1.3%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **7 (9.2%)**
Perennial: **62 (81.6%)**
Biennial: **0 (0%)**

Native Annual: **7 (9.2%)**
Native Perennial: **61 (80.3%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 9

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **4.3**
Native Mean C: **4.5**
Total FQI: **25.1**
Native FQI: **25.5**
Adjusted FQI: **43.7**
% C value 0: **8.8%**
% C value 1-3: **29.4%**
% C value 4-6: **47.1%**
% C value 7-10: **14.7%**
Native Tree Mean C: **6.3**
Native Shrub Mean C: **5**
Native Herbaceous Mean C: **3.8**

» Species Richness:

Total Species: **34**
Native Species: **32 (94.1%)**
Non-native Species: **2 (5.9%)**

» Species Wetness:

Mean Wetness: **-1.2**
Native Mean Wetness: **-1.3**

» Physiognomy Metrics:

Tree: **8 (23.5%)**
Shrub: **4 (11.8%)**
Vine: **0 (0%)**
Forb: **16 (47.1%)**
Grass: **3 (8.8%)**
Sedge: **1 (2.9%)**
Rush: **0 (0%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **4 (11.8%)**
Perennial: **28 (82.4%)**
Biennial: **0 (0%)**

Native Annual: **4 (11.8%)**
Native Perennial: **28 (82.4%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 10

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **5.5**
Native Mean C: **5.5**
Total FQI: **15.6**
Native FQI: **15.6**
Adjusted FQI: **55**
% C value 0: **0%**
% C value 1-3: **12.5%**
% C value 4-6: **62.5%**
% C value 7-10: **25%**
Native Tree Mean C: **5**
Native Shrub Mean C: **7**
Native Herbaceous Mean C: **5**

» Species Richness:

Total Species: **8**
Native Species: **8 (100%)**
Non-native Species: **0 (0%)**

» Species Wetness:

Mean Wetness: **0.1**
Native Mean Wetness: **0.1**

» Physiognomy Metrics:

Tree: **4 (50%)**
Shrub: **2 (25%)**
Vine: **0 (0%)**
Forb: **1 (12.5%)**
Grass: **0 (0%)**
Sedge: **1 (12.5%)**
Rush: **0 (0%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **0 (0%)**
Perennial: **8 (100%)**
Biennial: **0 (0%)**

Native Annual: **0 (0%)**
Native Perennial: **8 (100%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 11

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **3.4**
Native Mean C: **4**
Total FQI: **19.2**
Native FQI: **20.8**
Adjusted FQI: **36.7**
% C value 0: **18.8%**
% C value 1-3: **25%**
% C value 4-6: **50%**
% C value 7-10: **6.3%**
Native Tree Mean C: **5.4**
Native Shrub Mean C: **4.3**
Native Herbaceous Mean C: **3.4**

» Species Richness:

Total Species: **32**
Native Species: **27 (84.4%)**
Non-native Species: **5 (15.6%)**

» Species Wetness:

Mean Wetness: **-0.3**
Native Mean Wetness: **-0.3**

» Physiognomy Metrics:

Tree: **7 (21.9%)**
Shrub: **5 (15.6%)**
Vine: **1 (3.1%)**
Forb: **9 (28.1%)**
Grass: **3 (9.4%)**
Sedge: **3 (9.4%)**
Rush: **0 (0%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **3 (9.4%)**
Perennial: **25 (78.1%)**
Biennial: **0 (0%)**

Native Annual: **3 (9.4%)**
Native Perennial: **24 (75%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 12

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **4.6**
Native Mean C: **5**
Total FQI: **22.1**
Native FQI: **22.9**
Adjusted FQI: **47.8**
% C value 0: **8.7%**
% C value 1-3: **21.7%**
% C value 4-6: **47.8%**
% C value 7-10: **21.7%**
Native Tree Mean C: **4.6**
Native Shrub Mean C: **5.5**
Native Herbaceous Mean C: **5**

» Species Richness:

Total Species: **23**
Native Species: **21 (91.3%)**
Non-native Species: **2 (8.7%)**

» Species Wetness:

Mean Wetness: **1.1**
Native Mean Wetness: **1.2**

» Physiognomy Metrics:

Tree: **5 (21.7%)**
Shrub: **4 (17.4%)**
Vine: **1 (4.3%)**
Forb: **11 (47.8%)**
Grass: **0 (0%)**
Sedge: **0 (0%)**
Rush: **0 (0%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **2 (8.7%)**
Perennial: **19 (82.6%)**
Biennial: **0 (0%)**

Native Annual: **2 (8.7%)**
Native Perennial: **19 (82.6%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 13

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **4.5**
Native Mean C: **4.5**
Total FQI: **11**
Native FQI: **11**
Adjusted FQI: **45**
% C value 0: **0%**
% C value 1-3: **33.3%**
% C value 4-6: **33.3%**
% C value 7-10: **33.3%**
Native Tree Mean C: **4.7**
Native Shrub Mean C: **4.5**
Native Herbaceous Mean C: **4**

» Species Richness:

Total Species: **6**
Native Species: **6 (100%)**
Non-native Species: **0 (0%)**

» Species Wetness:

Mean Wetness: **1.3**
Native Mean Wetness: **1.3**

» Physiognomy Metrics:

Tree: **3 (50%)**
Shrub: **2 (33.3%)**
Vine: **0 (0%)**
Forb: **0 (0%)**
Grass: **0 (0%)**
Sedge: **1 (16.7%)**
Rush: **0 (0%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **0 (0%)**
Perennial: **6 (100%)**
Biennial: **0 (0%)**

Native Annual: **0 (0%)**
Native Perennial: **6 (100%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 14

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **3.6**
Native Mean C: **4**
Total FQI: **27.2**
Native FQI: **28.6**
Adjusted FQI: **37.8**
% C value 0: **12.3%**
% C value 1-3: **38.6%**
% C value 4-6: **35.1%**
% C value 7-10: **14%**
Native Tree Mean C: **5.4**
Native Shrub Mean C: **4.2**
Native Herbaceous Mean C: **3.7**

» Species Richness:

Total Species: **57**
Native Species: **51 (89.5%)**
Non-native Species: **6 (10.5%)**

» Species Wetness:

Mean Wetness: **-0.4**
Native Mean Wetness: **-0.4**

» Physiognomy Metrics:

Tree: **7 (12.3%)**
Shrub: **7 (12.3%)**
Vine: **1 (1.8%)**
Forb: **27 (47.4%)**
Grass: **5 (8.8%)**
Sedge: **4 (7%)**
Rush: **0 (0%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **8 (14%)**
Perennial: **43 (75.4%)**
Biennial: **0 (0%)**

Native Annual: **8 (14%)**
Native Perennial: **42 (73.7%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

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Wetland 15

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **4**
Native Mean C: **4.1**
Total FQI: **22.6**
Native FQI: **22.8**
Adjusted FQI: **40.4**
% C value 0: **3.1%**
% C value 1-3: **40.6%**
% C value 4-6: **46.9%**
% C value 7-10: **9.4%**
Native Tree Mean C: **5.4**
Native Shrub Mean C: **4**
Native Herbaceous Mean C: **3.9**

» Species Richness:

Total Species: **32**
Native Species: **31 (96.9%)**
Non-native Species: **1 (3.1%)**

» Species Wetness:

Mean Wetness: **1**
Native Mean Wetness: **1.1**

» Physiognomy Metrics:

Tree: **5 (15.6%)**
Shrub: **5 (15.6%)**
Vine: **1 (3.1%)**
Forb: **10 (31.3%)**
Grass: **5 (15.6%)**
Sedge: **4 (12.5%)**
Rush: **2 (6.3%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **1 (3.1%)**
Perennial: **31 (96.9%)**
Biennial: **0 (0%)**

Native Annual: **1 (3.1%)**
Native Perennial: **30 (93.8%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

Edit This Inventory | Download Report | Done

Wetland 16

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **3.3**
Native Mean C: **3.8**
Total FQI: **29.5**
Native FQI: **31.8**
Adjusted FQI: **35.5**
% C value 0: **13.8%**
% C value 1-3: **42.5%**
% C value 4-6: **37.5%**
% C value 7-10: **6.3%**
Native Tree Mean C: **4.7**
Native Shrub Mean C: **5**
Native Herbaceous Mean C: **3.3**

» Species Richness:

Total Species: **80**
Native Species: **70 (87.5%)**
Non-native Species: **10 (12.5%)**

» Species Wetness:

Mean Wetness: **0.1**
Native Mean Wetness: **0.1**

» Physiognomy Metrics:

Tree: **15 (18.8%)**
Shrub: **9 (11.3%)**
Vine: **2 (2.5%)**
Forb: **31 (38.8%)**
Grass: **5 (6.3%)**
Sedge: **7 (8.8%)**
Rush: **1 (1.3%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **4 (5%)**
Perennial: **66 (82.5%)**
Biennial: **0 (0%)**

Native Annual: **4 (5%)**
Native Perennial: **65 (81.3%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

Edit This Inventory | Download Report | Done

Wetland 17

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **3.4**
Native Mean C: **4.2**
Total FQI: **16.3**
Native FQI: **18.3**
Adjusted FQI: **38.2**
% C value 0: **17.4%**
% C value 1-3: **30.4%**
% C value 4-6: **43.5%**
% C value 7-10: **8.7%**
Native Tree Mean C: **5.2**
Native Shrub Mean C: **4.5**
Native Herbaceous Mean C: **3.7**

» Species Richness:

Total Species: **23**
Native Species: **19 (82.6%)**
Non-native Species: **4 (17.4%)**

» Species Wetness:

Mean Wetness: **0.1**
Native Mean Wetness: **0.1**

» Physiognomy Metrics:

Tree: **5 (21.7%)**
Shrub: **3 (13%)**
Vine: **1 (4.3%)**
Forb: **6 (26.1%)**
Grass: **1 (4.3%)**
Sedge: **3 (13%)**
Rush: **1 (4.3%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **2 (8.7%)**
Perennial: **18 (78.3%)**
Biennial: **0 (0%)**

Native Annual: **2 (8.7%)**
Native Perennial: **17 (73.9%)**
Native Biennial: **0 (0%)**

» Species:

Inventory Assessment

Edit This Inventory | Download Report | Done

Wetland 18

» Date & Location:

2022-02-22
GWP WSP

» Custom FQA Database:

Name: **WEC - Ridge & Valley with Exotics**
Description:
Ridge & Valley with Exotics

» Original FQA Database:

Region: **Mid-Atlantic Ridge and Valley Region**
Year Published: **2012**
Description:
Mid-Atlantic Wetland Workgroup (MAWWG). 2012. Floristic Quality Assessment Index (FQAI) calculator.

» Details:

Practitioner: **Joe Wilson**
Latitude:
Longitude:
Weather Notes:
Duration Notes:
Community Type Notes:

Other Notes:
This assessment is **private** (viewable only by you).

» Conservatism-Based Metrics:

Total Mean C: **4.7**
Native Mean C: **4.7**
Total FQI: **15.6**
Native FQI: **15.6**
Adjusted FQI: **47**
% C value 0: **0%**
% C value 1-3: **27.3%**
% C value 4-6: **45.5%**
% C value 7-10: **27.3%**
Native Tree Mean C: **5**
Native Shrub Mean C: **6.5**
Native Herbaceous Mean C: **3.8**

» Species Richness:

Total Species: **11**
Native Species: **11 (100%)**
Non-native Species: **0 (0%)**

» Species Wetness:

Mean Wetness: **1.9**
Native Mean Wetness: **1.9**

» Physiognomy Metrics:

Tree: **4 (36.4%)**
Shrub: **2 (18.2%)**
Vine: **0 (0%)**
Forb: **3 (27.3%)**
Grass: **0 (0%)**
Sedge: **1 (9.1%)**
Rush: **1 (9.1%)**
Fern: **0 (0%)**
Bryophyte: **0 (0%)**

» Duration Metrics:

Annual: **0 (0%)**
Perennial: **11 (100%)**
Biennial: **0 (0%)**

Native Annual: **0 (0%)**
Native Perennial: **11 (100%)**
Native Biennial: **0 (0%)**

» Species:

WETLAND FUNCTION & VALUE ASSESSMENT DATA FORMS

Wetland Function-Value Evaluation Form

Total area of wetland 2.62 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 440 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin? _____

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 1 GWP

Latitude 40.79867 Longitude -77.95949

Prepared by: JJW Date 03/09/2023

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 6, 7, 8, 9, 10		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 4, 5, 9		
Nutrient Removal	Y	3, 4, 5, 7, 8, 9, 11		
Production Export	Y	1, 4, 7		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 9, 11, 13, 16, 17, 18	X	
Recreation	Y	3, 4, 11, 12		
Educational/Scientific Value	Y	2, 6, 8, 9, 10, 12, 13		
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				79/2.83 = 27.9

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.14 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 400 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 2 GWP

Latitude 40.79852 Longitude -77.96282

Prepared by: JJW Date 03/09/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 9		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	4, 9		
Nutrient Removal	Y	5, 7, 9		
Production Export	Y	1, 2, 4		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 11, 13, 16, 17	X	
Recreation	Y	1, 4, 10, 11, 12		
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				56/2.83 = 19.8

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.98 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 250 ft

Dominant wetland systems present PSS Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 3 GWP

Latitude 40.79857 Longitude -77.96438

Prepared by: JJW Date 03/09/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 6, 8, 9, 10		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 4, 5, 9		
Nutrient Removal	Y	3, 5, 6, 7, 8, 9, 11		
Production Export	Y	1, 2, 4, 5, 7, 8		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21	X	
Recreation	Y	1, 4, 10, 11, 12		
Educational/Scientific Value	Y	2, 3, 4, 6, 8, 9, 10, 13		
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				92/2.83 = 32.5

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.05 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest/gated road Distance to nearest roadway or other development 450 ft

Dominant wetland systems present PEM Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 4 GWP

Latitude 40.79829 Longitude -77.96401

Prepared by: JJW Date 03/09/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	N			
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	3, 4, 9	X	
Nutrient Removal	Y	3, 7, 8, 9		
Production Export	N			
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	3, 5, 7		
Recreation	N			within a park but so low quality, does not qualify for this value
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				25/2.83 = 8.8

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 1.16 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest/gated road Distance to nearest roadway or other development 450 ft

Dominant wetland systems present PEM/PSS Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 5 GWP

Latitude 40.79829 Longitude -77.96401

Prepared by: JJW Date 03/09/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 6, 8, 9, 18		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 3, 4, 5, 9		
Nutrient Removal	Y	3, 5, 6, 7, 8, 9, 11		
Production Export	Y	1, 4, 5, 7, 8		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18, 19, 21		
Recreation	Y	1, 4, 7, 10, 11, 12		
Educational/Scientific Value	Y	1, 2, 3, 4, 6, 8, 9, 10, 13		
Uniqueness/Heritage	Y	2, 4, 6, 8, 9, 10, 12, 13, 16, 19, 24		
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	Y	1, 2	X	
Other				112/2.83 = 39.6

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.15 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 450 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 6 GWP

Latitude 40.79763 Longitude -77.96291

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 8, 9		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	3, 4, 5, 9		
Nutrient Removal	Y	3, 7		
Production Export	N			
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 11, 16, 17	X	
Recreation	Y	1, 4, 10, 12		
Educational/Scientific Value	Y	2, 4, 6, 8, 9, 10, 13		
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				60/2.83 = 21.2

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 2.83 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 800 ft

Dominant wetland systems present PEM/PSS Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 7 GWP

Latitude 40.79706 Longitude -77.96369

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 6, 8, 9, 18		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	3, 4, 5, 9		
Nutrient Removal	Y	3, 5, 7, 8, 9, 11		
Production Export	Y	1, 4, 5, 7, 8		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18,19, 20, 21	X	
Recreation	Y	1, 4, 7, 10, 11, 12		
Educational/Scientific Value	Y	2, 3, 4, 6, 8, 9, 10, 13		
Uniqueness/Heritage	Y	2, 4, 5, 8, 9, 10		
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				98/2.83 = 34.6

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 2.81 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 580 ft

Dominant wetland systems present PEM/PSS Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 8 GWP

Latitude 40.79822 Longitude -77.96194

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 6, 8, 9, 18		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	3, 4, 5, 9		
Nutrient Removal	Y	3, 5, 7, 8, 9, 11		
Production Export	Y	1, 4, 5, 7, 8		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18,19, 20, 21	X	
Recreation	Y	1, 4, 7, 10, 11, 12		
Educational/Scientific Value	Y	2, 3, 4, 6, 8, 9, 10, 13		
Uniqueness/Heritage	Y	2, 4, 5, 8, 9, 10		
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				98/2.83 = 34.6

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.28 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 1,150 ft

Dominant wetland systems present PUB Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 9 GWP

Latitude 40.79680 Longitude -77.96600

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 7, 8, 9		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 3, 4, 5, 9		
Nutrient Removal	Y	2, 3, 5, 6, 7		
Production Export	Y	1, 2, 4, 5		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 16, 17, 18,19, 20	X	
Recreation	Y	1, 10, 11, 12		
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				63/2.83 = 22.3

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.01 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 1,300 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 10 GWP

Latitude 40.79613 Longitude -77.96354

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 7, 9	X	
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	N			
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 4, 5, 7		
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				18/2.83 = 6.4

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.08 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 1,300 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 11 GWP

Latitude 40.79621 Longitude -77.96191

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 7, 8, 9		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1, 2, 4, 8		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 11, 15, 16, 17, 20	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				35/2.83 = 12.4

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.10 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 1,400 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 12 GWP

Latitude 40.79566 Longitude -77.96421

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 7, 8, 9		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1, 2, 4, 5		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 11, 16, 17, 18, 19, 20	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				35/2.83 = 12.4

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.01 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 1,600 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 13 GWP

Latitude 40.79533 Longitude -77.96526

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 7, 9	X	
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	N			
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 4, 5, 7		
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				18/2.83 = 6.4

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.31 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 1,500 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 14 GWP

Latitude 40.79564 Longitude -77.96556

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 7, 8, 9		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 3, 4, 5, 9		
Nutrient Removal	N			
Production Export	Y	1, 2, 4, 5		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 11, 16, 17, 18, 20	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				44/2.83 = 15.5

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.05 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 1,600 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 15 GWP

Latitude 40.79621 Longitude -77.96706

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 7, 8, 9		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 4, 5, 9		
Nutrient Removal	Y	3, 4, 5, 7		
Production Export	Y	1, 2, 4		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 11, 16, 17, 20	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				51/2.83 = 18.0

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.91 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 1,600 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 16 GWP

Latitude 40.79548 Longitude -77.96647

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 6, 7, 8, 9		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	Y	1, 3, 4, 5, 9		
Nutrient Removal	Y	3, 4, 5, 7, 11		
Production Export	Y	1, 4, 7, 8		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 11, 14, 15, 16, 17, 20	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				52/2.83 = 18.4

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.06 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 1,750 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 17 GWP

Latitude 40.79483 Longitude -77.96504

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 7, 8, 9		
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1, 2, 4		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 11, 16, 17, 20	X	
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				33/2.83 = 11.7

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 0.02 Human made? No Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use forest Distance to nearest roadway or other development 3,350 ft

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present yes

Is the wetland a separate hydraulic system? yes If not, where does the wetland lie in the drainage basin?

How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. 18 GWP

Latitude 40.79106 Longitude -77.95875

Prepared by: JJW Date 03/10/2023

Wetland Impact:
Type Area

Evaluation based on:
Office x Field x

Corps manual wetland delineation completed? Y x N

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	N			
Floodflow Alteration	Y	2, 5, 6, 8, 9	X	
Fish and Shellfish Habitat	N			
Sediment/Toxicant Retention	N			
Nutrient Removal	N			
Production Export	Y	1, 7		
Sediment/Shoreline Stabilization	N			
Wildlife Habitat	Y	1, 3, 4, 5, 7, 8, 11		
Recreation	N			
Educational/Scientific Value	N			
Uniqueness/Heritage	N			
Visual Quality/Aesthetics	N			
ES Endangered Species Habitat	N			
Other				29/2.83 = 10.2

Notes:

* Refer to backup list of numbered considerations.

WETLAND FUNCTION & VALUE ASSESSMENT
APPENDIX A

Appendix A

Wetland evaluation supporting documentation; Reproducible forms.

Below is an example list of considerations that was used for a New Hampshire highway project. Considerations are flexible, based on best professional judgment and interdisciplinary team consensus. This example provides a comprehensive base, however, and may only need slight modifications for use in other projects.

GROUNDWATER RECHARGE/DISCHARGE— This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.

CONSIDERATIONS/QUALIFIERS

1. Public or private wells occur downstream of the wetland.
2. Potential exists for public or private wells downstream of the wetland.
3. Wetland is underlain by stratified drift.
4. Gravel or sandy soils present in or adjacent to the wetland.
5. Fragipan does not occur in the wetland.
6. Fragipan, impervious soils, or bedrock does occur in the wetland.
7. Wetland is associated with a perennial or intermittent watercourse.
8. Signs of groundwater recharge are present or piezometer data demonstrates recharge.
9. Wetland is associated with a watercourse but lacks a defined outlet or contains a constricted outlet.
10. Wetland contains only an outlet, no inlet.
11. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards.
12. Quality of water associated with the wetland is high.
13. Signs of groundwater discharge are present (e.g., springs).
14. Water temperature suggests it is a discharge site.
15. Wetland shows signs of variable water levels.
16. Piezometer data demonstrates discharge.
17. Other

FLOODFLOW ALTERATION (Storage & Desynchronization) — This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

CONSIDERATIONS/QUALIFIERS

1. Area of this wetland is large relative to its watershed.
2. Wetland occurs in the upper portions of its watershed.
3. Effective flood storage is small or non-existent upslope of or above the wetland.
4. Wetland watershed contains a high percent of impervious surfaces.
5. Wetland contains hydric soils which are able to absorb and detain water.
6. Wetland exists in a relatively flat area that has flood storage potential.
7. Wetland has an intermittent outlet, ponded water, or signs are present of variable water level.
8. During flood events, this wetland can retain higher volumes of water than under normal or average rainfall conditions.
9. Wetland receives and retains overland or sheet flow runoff from surrounding uplands.
10. In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse.
11. Valuable properties, structures, or resources are located in or near the floodplain downstream from the wetland.
12. The watershed has a history of economic loss due to flooding.
13. This wetland is associated with one or more watercourses.
14. This wetland watercourse is sinuous or diffuse.
15. This wetland outlet is constricted.
16. Channel flow velocity is affected by this wetland.
17. Land uses downstream are protected by this wetland.
18. This wetland contains a high density of vegetation.
19. Other

FISH AND SHELLFISH HABITAT (FRESHWATER) — This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in question for fish and shellfish habitat.

CONSIDERATIONS/QUALIFIERS

1. Forest land dominant in the watershed above this wetland.
2. Abundance of cover objects present.

STOP HERE IF THIS WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE

3. Size of this wetland is able to support large fish/shellfish populations.
4. Wetland is part of a larger, contiguous watercourse.
5. Wetland has sufficient size and depth in open water areas so as not to freeze solid and retain some open water during winter.
6. Stream width (bank to bank) is more than 50 feet.
7. Quality of the watercourse associated with this wetland is able to support healthy fish/shellfish populations.
8. Streamside vegetation provides shade for the watercourse.
9. Spawning areas are present (submerged vegetation or gravel beds).
10. Food is available to fish/shellfish populations within this wetland.
11. Barrier(s) to anadromous fish (such as dams, including beaver dams, waterfalls, road crossing) are absent from the stream reach associated with this wetland.
12. Evidence of fish is present.
13. Wetland is stocked with fish.
14. The watercourse is persistent.
15. Man-made streams are absent.
16. Water velocities are not too excessive for fish usage.
17. Defined stream channel is present.
18. Other

Although the above example refers to freshwater wetlands, it can also be adapted for marine ecosystems. The following is an example provided by the National Marine Fisheries Service (NMFS) of an adaptation for the fish and shellfish function.

FISH AND SHELLFISH HABITAT (MARINE) — This function considers the effectiveness of wetlands, embayments, tidal flats, vegetated shallows, and other environments in supporting marine resources such as fish, shellfish, marine mammals, and sea turtles.

CONSIDERATIONS/QUALIFIERS

1. Special aquatic sites (tidal marsh, mud flats, eelgrass beds) are present.
2. Suitable spawning habitat is present at the site or in the area.
3. Commercially or recreationally important species are present or suitable habitat exists.
4. The wetland/waterway supports prey for higher trophic level marine organisms.
5. The waterway provides migratory habitat for anadromous fish.
6. Essential fish habitat, as defined by the 1996 amendments to the Magnuson-Stevens Fishery & Conservation Act, is present (consultation with NMFS may be necessary).
7. Other

SEDIMENT/TOXICANT/PATHOGEN RETENTION — This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens in runoff water from surrounding uplands or upstream eroding wetland areas.

CONSIDERATIONS/QUALIFIERS

1. Potential sources of excess sediment are in the watershed above the wetland.
2. Potential or known sources of toxicants are in the watershed above the wetland.
3. Opportunity for sediment trapping by slow moving water or deepwater habitat are present in this wetland.
4. Fine grained mineral or organic soils are present.
5. Long duration water retention time is present in this wetland.
6. Public or private water sources occur downstream.
7. The wetland edge is broad and intermittently aerobic.
8. The wetland is known to have existed for more than 50 years.
9. Drainage ditches have not been constructed in the wetland.

STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.

10. Wetland is associated with an intermittent or perennial stream or a lake.
11. Channelized flows have visible velocity decreases in the wetland.
12. Effective floodwater storage in wetland is occurring. Areas of impounded open water are present.
13. No indicators of erosive forces are present. No high water velocities are present.
14. Diffuse water flows are present in the wetland.
15. Wetland has a high degree of water and vegetation interspersion.
16. Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation by dense vegetation is present.
17. Other

NUTRIENT REMOVAL/RETENTION/TRANSFORMATION — This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries.

CONSIDERATIONS/QUALIFIERS

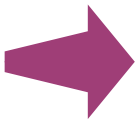
1. Wetland is large relative to the size of its watershed.
2. Deep water or open water habitat exists.
3. Overall potential for sediment trapping exists in the wetland.

4. Potential sources of excess nutrients are present in the watershed above the wetland.
5. Wetland saturated for most of the season. Ponded water is present in the wetland.
6. Deep organic/sediment deposits are present.
7. Slowly drained fine grained mineral or organic soils are present.
8. Dense vegetation is present.
9. Emergent vegetation and/or dense woody stems are dominant.
10. Opportunity for nutrient attenuation exists.
11. Vegetation diversity/abundance sufficient to utilize nutrients.

STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.

12. Waterflow through this wetland is diffuse.
13. Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation.
14. Water moves slowly through this wetland.
15. Other

PRODUCTION EXPORT (Nutrient) — This function evaluates the effectiveness of the wetland to produce food or usable products for humans or other living organisms.



CONSIDERATIONS/QUALIFIERS

1. Wildlife food sources grow within this wetland.
2. Detritus development is present within this wetland
3. Economically or commercially used products found in this wetland.
4. Evidence of wildlife use found within this wetland.
5. Higher trophic level consumers are utilizing this wetland.
6. Fish or shellfish develop or occur in this wetland.
7. High vegetation density is present.
8. Wetland exhibits high degree of plant community structure/species diversity.
9. High aquatic vegetative diversity/abundance is present.
10. Nutrients exported in wetland watercourses (permanent outlet present).
11. “Flushing” of relatively large amounts of organic plant material occurs from this wetland.
12. Wetland contains flowering plants that are used by nectar-gathering insects.
13. Indications of export are present.
14. High production levels occurring, however, no visible signs of export (assumes export is attenuated).
15. Other

SEDIMENT/SHORELINE STABILIZATION — This function considers the effectiveness of a wetland to stabilize streambanks and shorelines against erosion.

CONSIDERATIONS/QUALIFIERS

1. Indications of erosion or siltation are present.
2. Topographical gradient is present in wetland.
3. Potential sediment sources are present up-slope.
4. Potential sediment sources are present upstream.
5. No distinct shoreline or bank is evident between the waterbody and the wetland or upland.
6. A distinct step between the open waterbody or stream and the adjacent land exists (i.e., sharp bank) with dense roots throughout.
7. Wide wetland (>10’) borders watercourse, lake, or pond.
8. High flow velocities in the wetland.
9. The watershed is of sufficient size to produce channelized flow.
10. Open water fetch is present.
11. Boating activity is present.
12. Dense vegetation is bordering watercourse, lake, or pond.
13. High percentage of energy-absorbing emergents and/or shrubs border a watercourse, lake, or pond.
14. Vegetation is comprised of large trees and shrubs that withstand major flood events or erosive incidents and stabilize the shoreline on a large scale (feet).
15. Vegetation is comprised of a dense resilient herbaceous layer that stabilizes sediments and the shoreline on a small scale (inches) during minor flood events or potentially erosive events.
16. Other

WILDLIFE HABITAT — This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species must be considered. Species lists of observed and potential animals should be included in the wetland assessment report.[1]

CONSIDERATIONS/QUALIFIERS

1. Wetland is not degraded by human activity.
2. Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards.
3. Wetland is not fragmented by development.
4. Upland surrounding this wetland is undeveloped.
5. More than 40% of this wetland edge is bordered by upland wildlife habitat (e.g., brushland, woodland, active farmland, or idle land) at least 500 feet in width.
6. Wetland is contiguous with other wetland systems connected by a watercourse or lake.
7. Wildlife overland access to other wetlands is present.
8. Wildlife food sources are within this wetland or are nearby.
9. Wetland exhibits a high degree of interspersion of vegetation classes and/or open water.
10. Two or more islands or inclusions of upland within the wetland are present.
11. Dominant wetland class includes deep or shallow marsh or wooded swamp.
12. More than three acres of shallow permanent open water (less than 6.6 feet deep), including streams in or adjacent to wetland, are present.
13. Density of the wetland vegetation is high.
14. Wetland exhibits a high degree of plant species diversity.
15. Wetland exhibits a high degree of diversity in plant community structure (e.g., tree/shrub/vine/grasses/mosses)
16. Plant/animal indicator species are present. (List species for project)
17. Animal signs observed (tracks, scats, nesting areas, etc.)
18. Seasonal uses vary for wildlife and wetland appears to support varied population diversity/abundance during different seasons.
19. Wetland contains or has potential to contain a high population of insects.
20. Wetland contains or has potential to contain large amphibian populations.
21. Wetland has a high avian utilization or its potential.
22. Indications of less disturbance-tolerant species are present.
23. Signs of wildlife habitat enhancement are present (birdhouses, nesting boxes, food sources, etc.).
24. Other

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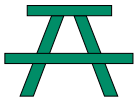
[1]In March 1995, a rapid wildlife habitat assessment method was completed by a University of Massachusetts research team with funding and oversight provided by the New England Transportation Consortium. The method is called WEThings (wetland habitat indicators for non-game species). It produces a list of potential wetland-dependent mammal, reptile, and amphibian species that may be present in the wetland. The output is based on observable habitat characteristics documented on the field data form. This method may be used to generate the wildlife species list recommended as backup information to the wetland evaluation form and to augment the considerations. Use of this method should first be coordinated with the Corps project manager. A computer program is also available to expedite this process.

RECREATION (Consumptive and Non-Consumptive) — This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting, and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals, or other resources that are intrinsic to the wetland. Non-consumptive opportunities do not consume or diminish these resources of the wetland.



CONSIDERATIONS/QUALIFIERS

1. Wetland is part of a recreation area, park, forest, or refuge.
2. Fishing is available within or from the wetland.
3. Hunting is permitted in the wetland.
4. Hiking occurs or has potential to occur within the wetland.
5. Wetland is a valuable wildlife habitat.
6. The watercourse, pond, or lake associated with the wetland is unpolluted.
7. High visual/aesthetic quality of this potential recreation site.
8. Access to water is available at this potential recreation site for boating, canoeing, or fishing.
9. The watercourse associated with this wetland is wide and deep enough to accommodate canoeing and/or non-powered boating.
10. Off-road public parking available at the potential recreation site.
11. Accessibility and travel ease is present at this site.
12. The wetland is within a short drive or safe walk from highly populated public and private areas.
13. Other

EDUCATIONAL/SCIENTIFIC VALUE — This value considers the suitability of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.

CONSIDERATIONS/QUALIFIERS

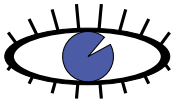
1. Wetland contains or is known to contain threatened, rare, or endangered species.
2. Little or no disturbance is occurring in this wetland.
3. Potential educational site contains a diversity of wetland classes which are accessible or potentially accessible.
4. Potential educational site is undisturbed and natural.
5. Wetland is considered to be a valuable wildlife habitat.
6. Wetland is located within a nature preserve or wildlife management area.
7. Signs of wildlife habitat enhancement present (bird houses, nesting boxes, food sources, etc.).
8. Off-road parking at potential educational site suitable for school bus access in or near wetland.
9. Potential educational site is within safe walking distance or a short drive to schools.
10. Potential educational site is within safe walking distance to other plant communities.
11. Direct access to perennial stream at potential educational site is available.
12. Direct access to pond or lake at potential educational site is available.
13. No known safety hazards exist within the potential educational site.
14. Public access to the potential educational site is controlled.
15. Handicap accessibility is available.
16. Site is currently used for educational or scientific purposes.
17. Other

UNIQUENESS/HERITAGE — This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values. These may include archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical wetland class for this geographic location. These functions are clearly valuable wetland attributes relative to aspects of public health, recreation, and habitat diversity.

CONSIDERATIONS/QUALIFIERS

1. Upland surrounding wetland is primarily urban.
2. Upland surrounding wetland is developing rapidly.
3. More than 3 acres of shallow permanent open water (less than 6.6 feet deep), including streams, occur in wetlands.
4. Three or more wetland classes are present.
5. Deep and/or shallow marsh or wooded swamp dominate.
6. High degree of interspersion of vegetation and/or open water occur in this wetland.
7. Well-vegetated stream corridor (15 feet on each side of the stream) occurs in this wetland.
8. Potential educational site is within a short drive or a safe walk from schools.
9. Off-road parking at potential educational site is suitable for school buses.
10. No known safety hazards exist within this potential educational site.
11. Direct access to perennial stream or lake exists at potential educational site.
12. Two or more wetland classes are visible from primary viewing locations.
13. Low-growing wetlands (marshes, scrub-shrub, bogs, open water) are visible from primary viewing locations.
14. Half an acre of open water or 200 feet of stream is visible from the primary viewing locations.
15. Large area of wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons.
16. General appearance of the wetland visible from primary viewing locations is unpolluted and/or undisturbed.
17. Overall view of the wetland is available from the surrounding upland.
18. Quality of the water associated with the wetland is high.
19. Opportunities for wildlife observations are available.
20. Historical buildings are found within the wetland.
21. Presence of pond or pond site and remains of a dam occur within the wetland.
22. Wetland is within 50 yards of the nearest perennial watercourse.
23. Visible stone or earthen foundations, berms, dams, standing structures, or associated features occur within the wetland.
24. Wetland contains critical habitat for a state- or federally-listed threatened or endangered species.
25. Wetland is known to be a study site for scientific research.
26. Wetland is a natural landmark or recognized by the state natural heritage inventory authority as an exemplary natural community.
27. Wetland has local significance because it serves several functional values.
28. Wetland has local significance because it has biological, geological, or other features that are locally rare or unique.
29. Wetland is known to contain an important archaeological site.
30. Wetland is hydrologically connected to a state or federally designated scenic river.
31. Wetland is located in an area experiencing a high wetland loss rate.
32. Other

VISUAL QUALITY/AESTHETICS — This value considers the visual and aesthetic quality or usefulness of the wetland.



CONSIDERATIONS/QUALIFIERS

1. Multiple wetland classes are visible from primary viewing locations.
2. Emergent marsh and/or open water are visible from primary viewing locations.
3. A diversity of vegetative species is visible from primary viewing locations.
4. Wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons.
5. Land use surrounding the wetland is undeveloped as seen from primary viewing locations.
6. Visible surrounding land use form contrasts with wetland.
7. Wetland views absent of trash, debris, and signs of disturbance.
8. Wetland is considered to be a valuable wildlife habitat.
9. Wetland is easily accessed.
10. Low noise level at primary viewing locations.
11. Unpleasant odors absent at primary viewing locations.
12. Relatively unobstructed sight line exists through wetland.
13. Other

ENDANGERED SPECIES HABITAT — This value considers the suitability of the wetland to support threatened or endangered species.

ES

CONSIDERATIONS/QUALIFIERS

1. Wetland contains or is known to contain threatened or endangered species.
2. Wetland contains critical habitat for a state or federally listed threatened or endangered species.

COLOR PHOTOGRAPHS

View of Wetland 1

View of Wetland 2

View of Wetland 3

View of Wetland 4

View of Wetland 5

View of Wetland 6

View of Wetland 7

View of Wetland 8

View of Wetland 9

View of Wetland 10

View of Wetland 11

View of Wetland 12

View of Wetland 13

View of Wetland 14

View of Wetland 15

View of Wetland 16

View of Wetland 17

View of Wetland 18

View of scoured channel leading to Wetland 1

Typical view of Palustrine Lane roadside drainage swale leading to a wetland

Typical view of sediment observation in Wetland 16 below stormwater basin

Typical view of Japanese barberry along eastern edge of Wetland 8