APPENDIX D – Example Wetland Assessments and Completed Data Forms

MDWAM EXAMPLE 1.

Figure 1. Example of a depressional wetland in Frederick County (blue polygon). Note the historic ditch that keeps the seasonal inundation at a lower level. The darker blue line illustrates the receiving ditch which is a man altered tributary from past agricultural use.

Figure 2. Illustration of the WAA (light blue), 500' buffer (thick red), and 1000' aquatic context (thin red) polygons. The red markers indicate aquatic resources to which the WAA is connected.

Figure 3. This is the largest community in the WAA which is forested. The historic ditch lowers the level of inundation in most of the WAA, but the area remains seasonally saturated. The area is dominated by silver maple (*Acer saccharinum)* with a very sparse understory.

Figure 4. A central open strip represents a second, but much smaller community where inundation is extended into the growing season. This area was less than 25% of the entire WAA so weighting was not necessary. This area was also dominated by *Acer saccharinum* but due to high mortality of *Fraxinus pennsylvanica*, increased light penetration enabled the central areas to be dominated by *Hibiscus moschutus*.

20240325 – MDWAM WETLAND SCORING FORM

Project/Site ID: Nolands Ferry C&O Canal Park Assessment Dates: 11-13-2020

Delineation Dates: 11-13-2020 Project Type: ☒Testing ☐Linear ☒Non-Linear ☐Mitigation (☐Creation ☐Restoration ☐Enhancement)

Evaluators: Plewa, Gaimaro, Ozburn, Neff, Tiralla Wetland ID/Name: WAA3NF1-2 NWI: PFO/SS1E

WAA #: 3 Size: 1.3 (acres) Wetland Type (HGM Class): Depression Regional Subtype: none

Ecoregion: ☐CP ☒EMP Aerial Photo Date and Source: June 2022 Google and numerous other google and WRR photography Photos: Yes

Notes: Depression wetland with two distinct communities, forested perimeter, and herbaceous central area. Historic ditch has silted in and currently has low impact. Wetland is surrounded by former cropland which has transitioned into Oldfield habitat dominated by various grasses and goldenrod and significant patches of shrub cover. Numerous spoil piles are located at the boundaries of the fields and the wetland. These were likely from historic clearing activities.

LANDSCAPE CORE ELEMENT

Aquatic Context metric – Confirm in office review. See figures in section 2.3.1.1 for examples.

Describe barriers or alterations that prevent connection: ☒No barriers.

Total aquatic resources within 1,000 feet of WAA to which wetland connects (minimum size ≥ 0.02 acres): 5 streams 10 wetlands 0 ponds

Score: _4_

Buffer – Evaluate to 500 feet from WAA boundary. Confirm in office review and field check. See figures in Section 2.3.1.2 for examples

Buffer Type/Description – total buffer area ~ 32 acres	*Score (See Narratives)*	*Percentage*	*Subtotal*
1. Mid to late deciduous forest ~16 acres	4	50	2.0
2. Low to early successional forest 1.6 acres	3	5	0.15
3. Low successional - old field habitat (reverting agricultural lands) ~6.9 acres	2	21	0.43
4. Unmanaged herbaceous rangeland – mixed species ~7.7 acres	1	24	0.24
5.			
6.			
			Score: 2.8

HYDROLOGY CORE ELEMENT

*Water source metric – Identify the **dominant** water source and degree of natural or unnatural/artificial influence (Confirm in office review for watershed).*

Natural Source: ☒Precipitation ☐Groundwater ☐Overland flow ☐Overbank flow/stream discharge ☐Beaver activity ☐Other:

Unnatural/Manipulated Source/Controls: ☐Impoundment ☐Outfall ☐Irrigation/pumping ☐Fill ☐Ditching/Channelization ☐Other Artificial influence or control.

Watershed/Drainage Area controls: ☐Development ☐Irrigated agriculture ☐Wastewater treatment plant ☐Impoundment ☐Stormwater retention ☒Change to flow/circulation from roads/ditching ☐Other:

Degree of artificial influence/control: ☐Complete ☐High ☒Low ☐None. Wetland created/restored/enhanced: ☐Sustainable/replicates natural ☐Controlled

Comments: historic ditching has a minimal effect on source Score: 3

Hydroperiod metric – Determine the natural variability and/or recent alteration of the duration, frequency, and magnitude of inundation/saturation.

Evaluate the hydroperiod including natural variation: Precipitation: ☐typical ☒atypical (☒deficit ☐surplus) Source: MARF

☒High variation ☐Low variation Evidence: redox features high in the soil profile, large deciduous tree species suggesting high ET rates, low carbon storage

Direct evidence of alteration: Natural: ☐Logjam ☐Channel migration ☒Other: elm ash borer – lowered ET rates

Human: ☐Diversions ☒Ditches/swales ☐Levees ☐Impoundments ☐Other:

Riverine (active floodplain only): ☐Recent channel in-stability/dis-equilibrium (☐Degradation or ☐Aggradation) ☐Stable Channel

Indirect evidence of alteration: ☐Wetland plant stress ☒Plant morphology ☐Upland species encroachment ☒Plant Community ☐Soil morphology ☐None

Change/Alteration of hydroperiod: ☐Due to natural events ☐Human influences (☐None ☒Slight or ☐High) largely recovered from ditching

Degree hydroperiod of wetland created/restored/enhanced replicates natural patterns:

Lacustrine fringe on human impoundment: ☐High variability ☐Low variability ☐Recent changes to hydroperiod

Comments: ash mortality has probably extended the hydroperiod somewhat Score: 2

Hydrologic flow metric – Movement of water to or from surrounding area and openness to water moving through the WAA (flow and circulation).

Flow: ☐Inlets: #_____ ☒Outlets: #_1___ [illegible]

Restrictions: ☒None ☐Levee ☐Berm/dam ☐Diversion ☐Ditch-Side Cast ☐Road w/culverts ☐Other:

High flow through: ☐Floodplain ☐Drift deposits ☐Drainage patterns ☐Sediment deposits ☐Partially buried debris/trunks ☐Scour ☐Other:

Low flow through: ☒High landscape position ☒Stagnant water ☐Closed contours ☐Debris dams ☒Constricted Outlet ☐ Surface Roughness ☐Other:

Comments: this is fill and spill only under extreme conditions Score: 1

Surface drainage feature metric: Identify and describe all natural and man-made or man-altered surface drainage features (SDF) present within the WAA which potentially impact wetland hydrology and or wetland function and circle impact potential to the WAA (High-Moderate-Low). SDFs are defined as confined features with OHWM and or bed and banks. Indiscrete flow patterns are not considered (e.g., wetland drainage patterns). Provide rational below or on separate report.

SDF Types present: ☐None ☐Stream channel #_____ ☒Ditch/swale # 1____ ☐Diversion #_____ ☐Other_____

SDF(s) exhibits (circle degree High-Moderate-Low): ☐channel instability/migration(H-M-L) ☐active incision/downcutting(H-M-L) ☐bank instability(H-M-L) ☐raw unvegetated or vertical banks(H-M-L) ☐highly erodible materials(H-M-L) ☐lacks vertical controls(H-M-L) ☐excessive deposition/bar development(H-M-L) ☐ historic channel alteration(H-M-L) ☒proximity to WAA that presents potential impact to hydrology(Low)

☐ Restrictions associated with SDF cause backwater flooding within WAA: Type: ☐levee ☐fill/side cast ☐culvert/bridge ☐Other _____

Timing: ☐Recent (≤ 5 years) ☐Historic

Negative effect to: ☐flow and circulation within WAA ☐redirects or confines flows into/through WAA ☐reduced water table ☒level of inundation ☐No Impact

Rationale: it is likely the pool elevation of the depression is somewhat lower than originally. However, it was determined that the ongoing impact is likely minimal.

Score: 3

SOILS CORE ELEMENT

Soil organic carbon storage metric (average multiple sample scores, round to one decimal). See Section 2.2.5.2, for additional guidance regarding multiple samples.	*Sample Score #*		
	#1	*#2*	*#3*
Organic Layer(s) ≥2 (combined textures)	5	5	5
Organic Layer(s) <2" thick (combined textures) in the upper 16" OR, Dark* mineral surface horizon ≥10" thick	4	4	4
Dark* mineral surface horizon only, ≥4 and <10" thick	3	3	3
Dark* mineral surface horizon only, ≥1 and <4" thick	2	2	2
Mineral surface layer(s) only (any thickness) with matrix value >3 and ≤4 or chroma >2 and ≤3	1	1	1
Mineral surface layer(s) only (any thickness) with matrix chroma >3 or situations where the surface layer(s) have been removed	0	0	0
Sample represents % of the WAA	40 %	60 %	%
Sample score__ x % of the WAA/community =	0.8	0.6	

**Dark mineral surface-horizons have matrix value ≤3 and chroma ≤2*

Score: 1.4

Biogeochemical cycling metric: See Section 2.2.5.2, for additional guidance regarding multiple samples.

Sample #	% Of WAA	Sub-Metric Scores: Redox concentrations	Microtopography	Soil organic matter	Herbaceous cover
1		4	2	2	3
2		4	2	2	3
3					

[0.75 x (_ 4__+ _2__ + _2__ + _3__)] – 2 = __6.25__ Total Score
Redox MT SOM HC (round to one decimal)

Use this formula for each sample and average the number of samples

Score: 6.3

Sedimentation metric – Deposition of excess sediment due to human actions (in the WAA). Confirm in office review for landscape.

Landscape with stress that could lead to excess sedimentation: ☐Yes ☒No Landscape position: ☒High ☐Low

Magnitude of recent runoff/flooding events: ☐High ☐Low ☒None Percent of WAA with excess sediment deposition: none

☐ Sand deposits: ___% of area _____ average thickness ☐Silt/clay deposits: ___% of area _____ average thickness

Observation of deposits: ☐Frequent ☐Common ☐Occasional ☐ Infrequent ☐Rare ☐None

*Lacustrine fringe only: ☐ Upper end of impoundment ☐ Degrades wetland ☐ Contributes to wetland processes Score: 4

Soil modification metric – Physical changes by human activities. Confirm in office review for past.

☒Low level of modification or high level of recovery ☐High level of modification and low level of recovery ☐No detectable modifications

Type: ☐Agricultural use (☐Plowing ☐Discing ☐Harrowing) ☐Logging ☐Mining ☒Filling ☐Grading ☐Dredging ☐Off-road vehicles

☐ Other: _____

Percent of WAA with soil modification: ☐Recent _____% ☒Historic <5% Describe: some historic piles of fill noted likely from land clearing for the adjacent historical agricultural activities. No longer active.

Indicators of past modification: ☐None ☐Low organic matter ☐Lack of soil structure ☐Removal of horizons ☐Compaction (platy structure) ☐ Ap horizon ☐ Dramatic change in texture/color ☐Heterogeneous mixture ☐Recent Alluvium (e.g., legacy sediments) ☐Stratified layers ☐Soil subsidence ☒Fill

☐ Other _____

Comments: minimal fill encroachment into the wetland_____

_____ Score: 4

Project/Site ID/No. Nolands Ferry C&O Canal Park WAA 3 Assessment Date: 11-13-2020

PHYSICAL STRUCTURE CORE ELEMENT

Topographic complexity metric – See figures in Section 2.3.4.1 Record % micro-topography and % of WAA for each elevation gradient.

Of Elevation gradients present: 2 Evidence of gradients: ☒Plant assemblages ☒Level of saturation/inundation ☐Path of water flow ☐Slope
Micro-topography (surface roughness) of WAA: ☐ >50% ☒ 30-49% ☐ 10-29% ☐ <10%
Types: ☐Depression ☒Pools ☐Burrows ☐Swales ☒Wind-thrown tree holes ☒Mounds ☐Islands ☐Variable shorelines ☐Partially buried debris ☐Debris jams ☒Plant hummocks/roots ☐Other: _____ Score: 4

Edge complexity metric – Confirm in office review. See example figures in Section 2.3.4.2 to evaluate irregularity of wetland boundary and variability in vertical structure.

WAA is: ☒Surrounded by uplands ☐In seasonal floodplain ☐Abutting other wetland types ☐Has edge vertical structure variation (Low)
Horizontal variability: ☐High ☐Moderate ☐Low ☒None variability is very minumal _____ Score: 1

Physical habitat richness metric – See definitions and table in Section 2.3.4.3 for habitat types applicable to each wetland type. Located in the WAA or within 25 feet of the WAA boundary.

☒Concentric high-water marks ☐Secondary channels ☐Seasonally inundated swales ☒Un-vegetated pools ☐Un-vegetated flats ☐Vegetated islands ☐Slope with undercut, slump, or overhang ☐Rock piles with voids ☒Plant hummocks/vegetated mounds ☐Submerged/floating vegetation ☐Dense herbaceous cover ☐Brambles/thickets ☐Mature/late-successional stage of plant community (>24" DBH) ☐Drift deposits/organic debris ☐ Brush piles ☒ Fallen logs ☒Stumps/ Standing snags ☒Wind-thrown trees ☐Tree root cavities ☒Nesting cavities/dens ☐Other _____
# of Physical habitat types present (wetland type sensitive - see narrative table): % 7 Score: 4

BIOTIC STRUCTURE CORE ELEMENT

Plant strata metric – Use applicable wetland delineation regional supplement and wetland determination data form(s) 4 strata approach.

Number of plant strata: ☒≥ 4 ☐3 ☐2 ☐1 ☐0 Score: 4

Species richness metric – Use data from determination data form(s) to count species with 5% or more relative cover in a stratum. Species should be counted only once for all observations within the WAA.

Number of species across all strata and determination data forms (count species once) plus additional significant species (provide rationale for additional species outside plots). Plot Species 7 + Additional species (outside sample plots) 0 = Total species richness 7 Rationale for additional species: NA
_____ Score: 3

Non-native/Invasive Infestation metric – Use data from determination data form(s) and additional observations. See tables in section 2.3.5.3.2 for examples.

Average total relative cover of non-native/invasive species across all strata and determination data forms: <1 %
4 = <1% 3 = 1-10% 2 = 11-25% 1 = 26-50% 0 = 51-100%
☐ Additional species outside plots are included Rationale: _____ Score: 4

Interspersion metric – Confirm in office review. Use figure in section 2.3.5.4.2 to determine the degree of interspersion of plant zones (≥ 5% of WAA).

Degree of horizontal/plan view interspersion: ☐High ☐Moderate ☒Low ☐None Score: 2

Herbaceous cover metric – Estimate only herbaceous plant cover for entire WAA.

Total cover of herbaceous, emergent and submergent plants: ☐> 75% ☒51–75% ☐26–50% ☐≤ 25% Score: 3

Vegetation alterations metric – Unnatural (human-caused) stressors. Confirm in office review for past.

Type (Check those applicable and circle R for recent or P for past): ☐Disking-plowing R/P ☐Land clearing/leveling R/P ☐Mowing/shredding R/P ☐Silviculture R/P ☒Logging R/P Cutting Past ☐Trampling R/P ☐Herbicide treatment R/P ☐Herbivory R/P ☒Disease R/P ☐Chemical spill R/P ☐Pollution R/P ☐Grazing R/P ☐Woody debris removal R/P ☐Fire R/P ☐Other R/P: high mortality from emerald ash borer which has opened up the canopy resulting in the large patch of herbaceous growth. It is likely the canopy will recover but will result in different species composition. The wetland would appear to have recovered from any logging activity.
Percent of WAA with recent vegetation alteration: 40% Severity of alteration: ☐High ☒Moderate ☐Low
Percent of WAA with past vegetation alteration: no estimate % Degree of recovery: ☒Complete ☐High ☐Moderate ☐Low
☐ Alteration to improve wetland (degree of natural community recovery): _____
Rationale: _____
_____ Score: 2

Plant life forms metric - Life forms represent ≥ 5% of WAA.

☐Bryophytes (mosses, liverworts, hornworts) ☐Coniferous Trees ☒Deciduous Broadleaf Trees ☐Evergreen Broadleaf Trees ☐Ferns ☐Grasses ☒ Herbs ☒Lichens or Fungi ☐Sedges/Rushes ☐Shrubs ☐Vines ☐Floating/SAV

Total Number of Plant Life Forms: ☐ ≥ 6 = 4 ☒ 4 or 5 = 3 ☐ 3 = 2 ☐ 1 or 2 = 1 ☐0=0 Score 3

20240325 – MDWAM WETLAND FINAL SCORING FORM

Project/Site ID: Nolands Ferry C&O Canal Park Assessment Dates: 11-13-2020

Delineation Dates: 11-13-2020 Project Type: ☒Testing ☐Linear ☒Non-Linear ☐Mitigation (☐Creation ☐Restoration ☐Enhancement)

Evaluators: Plewa, Gaimaro, Ozburn, Neff, Tiralla Wetland ID/Name: WAA3NF1-2 NWI: PFO/SS1E

WAA #: 3 Size: 1.3 (acres) Wetland Type (HGM Class): Depression Regional Subtype: none

Ecoregion: ☐CP ☒EMP Aerial Photo Date and Source: June 2022 Google and numerous other google and WRR photography Photos: Yes

Notes: *Where multiple vegetative communities occur (≥ 25% of the WAA), perform an assessment for each community. Metric total scores should then be weighted as below.*

Core Element	*Metric*	*Metric score (each community or data point)*			*Core Element Score*	*Core Element Score (each community)*		
		1	2	3		1	2	3
Landscape	Aquatic context	4			Sum of metric scores 1 = 6.8 2=___ 3=___ / 8 x 15	12.75		
	Buffer	2.8						
Hydrology	Water source	3			Sum of metric scores 1 = 10 2=___ 3=___ / 16 x 30	18.75		
	Hydroperiod	2						
	Hydrologic flow	1						
	Surface drainage features	3						
Soils	Organic carbon storage	1.4			Sum of metric scores 1 = 9 2=___ 3=___ / 23 x 15	10.24		
	Biogeochemical cycling	6.3						
	Sedimentation	4						
	Soil modification	4						
Physical Structure	Topographic complexity	4			Sum of metric scores 1 = 9 2=___ 3=___ / 12 x 20	11.4		
	Edge complexity	1						
	Physical habitat richness	4						
Biotic Structure	Plant strata	4			Sum of metric scores 1 = 21 2=___ 3=___ / 28 x 20	15.0		
	Species richness	3						
	Non-native/invasive infestation	4						
	Interspersion	2						
	Herbaceous cover	3						
	Vegetation alterations	2						
	Plant life forms	3						
Sum of individual community core element scores = overall MDWAM wetland score:						68.14		
Community % of WAA:								
Partial Core Element Score:								

Weighted Sum of core element scores = overall MDWAM wetland score:	68
Additional points for unique resources = overall MDWAM wetland score x 0.10 if: ☐ Non-tidal wetlands of special state concern ☐ Areas with populations (>20%) of the following species: Bald cypress, Atlantic white cedar, red spruce, balsam fir, or American larch ☐ Delmarva Bay ☐ Peatlands (histic epipedon or histosol present)	0
Additional points for limited habitats = overall MDWAM wetland score x 0.05 if: ☐ Dominated by native trees greater than 24-inch diameter at breast height ☐ Dominated by hard mast (i.e., acorns and nuts) producing native species in the tree strata ☐ Large wetland tracts or corridors > 20 acres	0

FINAL MDWAM SCORE: 68

Attach representative site photographs:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MDWAM Field Testing – Nolands Ferry C&O Canal Park City/County: Frederick Sampling Date:11-13-2020

Applicant/Owner: National Park Service State: MD Sampling Point:**WAA3-1**

Investigator(s): Plewa, Gaimaro, Ozburn, Neff, Tiralla Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0

Subregion: LRR: S MLRA: 148 Lat: 39°14'11.23"N Long: 77°27'38.88"W Datum: A

Soil Map Unit Name: Melvin NWI classification: PFO/SS1E

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

Are Vegetation_____, Soil_____, or Hydrology_____significantly disturbed? No Are "Normal Circumstances" present? **Yes X**_____No

Are Vegetation_____, Soil_____, or Hydrology_____naturally problematic? No (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 X**	**Is the Sampled Area within a Wetland?**	**Yes**
Hydric Soil Present?	**Yes X**		
Wetland Hydrology Present?	**Yes X**		

Remarks: area has experienced precipitation deficit over the past 90 and 365 days. Two heavy precipitation events in the past two weeks. This site has been historically impacted by a drainage ditch. The ditch has silted in somewhat and appears to have low ongoing impact.

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 X**____No_____Depth (inches): 0-12_____

Water Table Present? **Yes X**____No_____Depth (inches): 4_____

Saturation Present? (includes capillary fringe) **Yes X**____No_____Depth (inches): 0_____

Wetland Hydrology Present? Yes

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

FULL RANGE OF GOOGLE AND WRR AERIAL PHOTOGRAPHY

Remarks:

approximately 2 inches of rain within the past 24-28

hours soil pit located outside of standing water

Precipitation supporting data: ☐APT ☒MARF ☐Other

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: **WAA3-1**

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharinum silver maple	60	Y	FacW
2. Quercus palustris pin oak	18	Y	FacW
3.			
4. *dead Fraxinus pennsylvanica (not quantified)*	NA	NA	FacW
5.			
6.			
7.			

78 = Total Cover

50% of total cover: 39 20% of total cover: 15.6

Sapling/Shrub Stratum (Plot size:15' radius)			
1. unkown	1	no	?
2.			
3. *dead Fraxinus pennsylvanica (not quantified)*			
4.			
5.			
6.			
7.			
8.			
9.			

NA = Total Cover

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

Herb Stratum (Plot size: 5' radius)			
1. Carex lupulina hop sedge	15	Y	OBL
2. Persicaria hydropiper marsh pepper	4	Y	OBL
3. Saururus cernuum lizards tail	1		OBL
5. Lycopus Americanum water horehound	trace		OBL
6. Persicaria pennsylvanica	trace		FacW
7. Bohemeria cylindrica false nettle	trace		FacW
8. Arthraxon hispidus carp grass	trace		Fac
9. Quercus palustris pin oak	trace		FacW
10. unknown broadleaf	trace		?
11.			

20 = Total Cover

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

Woody Vine Stratum (Plot size: 30' radius)			
1. Toxicodendron radicans	9	Y	Fac
2.			
3.			
4.			
5.			

9 = 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: 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	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 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 Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes**

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

Morphological adaptations observed on multiple age classes of maples and ashes. High ash mortality

MORPHOLOGICAL PLANT ADAPTATIONS: ☒shallow roots ☒fluted trunks ☒ flared/buttressed trunks ☐elevated root wads/trunks

SOIL Nolands Ferry C&O Canal Park Sampling Point: **WAA3-1**

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
0-3	7.5YR 3/2		7.5YR 3/4	10-15	C	M/PL	SiL	soils saturated throughout
3-11	10YR 4/1		5YR 3/4	20-25	C	M	SiL	soils saturated throughout
11-15+	7.5YR 4/4	40	10YR 4/2	35	D	M/PL	CL	soils saturated throughout

[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)**
- X **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)
- X **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 NA

Depth (inches): ___

Hydric Soil Present? Yes

Remarks: LRR S MLRA 148

Meets two hydric soil indicators

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MDWAM Field Testing – Nolands Ferry C&O Canal Park City/County: Frederick Sampling Date:11-13-2020

Applicant/Owner: National Park Service State: MD Sampling Point:**WAA3-2**

Investigator(s): Plewa, Gaimaro, Ozburn, Neff, Tiralla Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0

Subregion: LRR: S MLRA: 148 Lat: 39°14'8.43"N Long: - 77°27'35.30"W Datum:NA

Soil Map Unit Name: Melvin NWI classification: PFO/SS1E

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

Are Vegetation_____, Soil_____, or Hydrology_____significantly disturbed? No Are "Normal Circumstances" present? **Yes X**_____No

Are Vegetation_____, Soil_____, or Hydrology_____naturally problematic? No (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 X**	**Is the Sampled Area within a Wetland?**	**Yes**
Hydric Soil Present?	**Yes X**		
Wetland Hydrology Present?	**Yes X**		

Remarks: area has experienced precipitation deficit over the past 90 and 365 days. Two heavy precipitation events in the past two weeks. This site has been historically impacted by a drainage ditch. The ditch has silted in somewhat and appears to have low ongoing impact.

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 X**	No	Depth (inches): 0-2
Water Table Present?	**Yes X**	No	Depth (inches): 4
Saturation Present? (includes capillary fringe)	**Yes X**	No	Depth (inches): 0

Wetland Hydrology Present? Yes

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

FULL RANGE OF GOOGLE AND WRR AERIAL PHOTOGRAPHY

Remarks:

approximately 2 inches of rain within the past 24-28 hours

soil pit located outside of standing water

Precipitation supporting data: ☐APT ☒MARF ☐Other

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: **WAA3-2**

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharinum silver maple	45	Y	FacW
2. many dead Fraxinus pennsylvanica (not quantified)	NA	NA	FacW
3.			
4.			
5.			
6.			
7.			

45 = Total Cover

50% of total cover: 22.5 20% of total cover: 9

Sapling/Shrub Stratum (Plot size:15' radius)			
1. none			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

NA = Total Cover

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

Herb Stratum (Plot size: 5' radius)			
1. Hibiscus moschutus marsh mallow	60	Y	OBL
2. Ludwidgia palustris water purslane	10		OBL
3.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

70 = Total Cover

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

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

NA = 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	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 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 Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes

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

Morphological adaptations observed on multiple age classes of maples and ashes. High ash mortality

Vegetation meets the Rapid Test Indicator. However, plants were quantified to provide data for MDWAM assessment data forms.

Azolla (Mosquito fern) and Lemma were abundant but not included in the herb quantification.

Adventitious roots observed on hibiscus.

MORPHOLOGICAL PLANT ADAPTATIONS: ☒shallow roots ☒fluted trunks ☒ flared/buttressed trunks ☐elevated root wads/trunks

SOIL Nolands Ferry C&O Canal Park Sampling Point: **WAA3-2**

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
0-3	10YR 4/1		10YR 3/4	5	C	M	SiL	soils saturated throughout
3-11	10YR 4/2		2.5YR 3/4	20	C	M	SiL	soils saturated throughout
11-15+	7.5YR 4/4	40	10YR 4/2	30	D	M	CL	moist
			5YR 3/3	10	C	M		
			2.5YR 3/6	20	C	M		

[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)
- **X 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): 11

Hydric Soil Present? Yes

Remarks: LRR S MLRA 148

Meets two hydric soil indicators

MDWAM EXAMPLE 2:

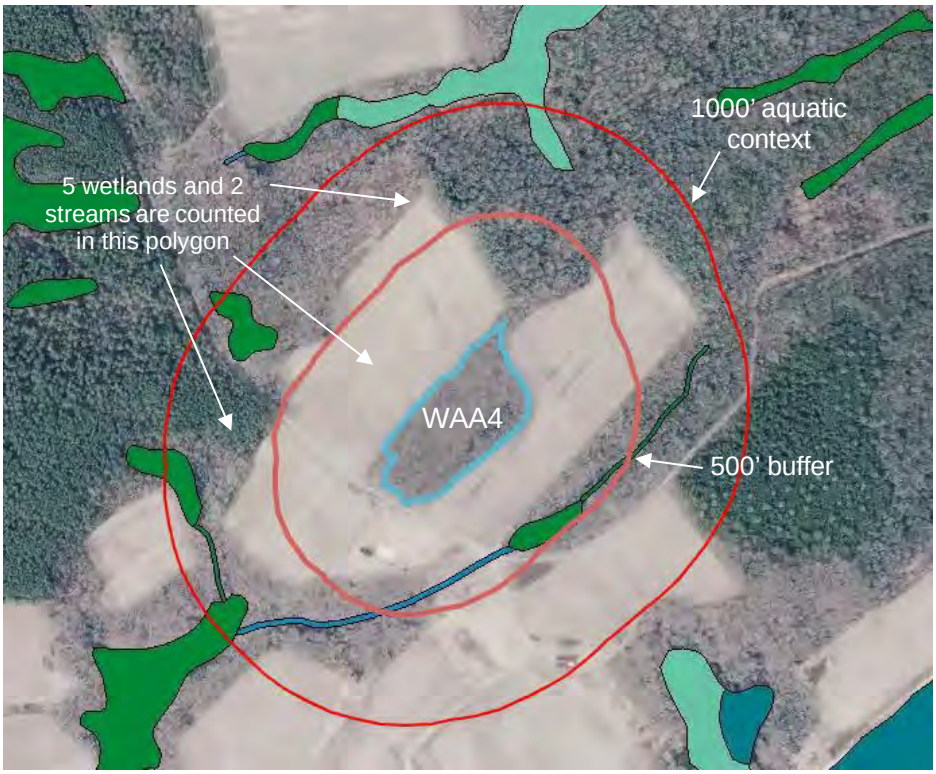

Figure 1. A mineral flat wetland example located Cedar Point State Park in Charles County. This aerial illustrates the WAA (blue polygon), 1000' aquatic context polygon (thin red), and 500' buffer polygon (thick red). There are 5 wetlands and two streams located in this polygon. *Note, field inspection may increase this score if aquatic resources are identified that were too small to detect from aerial imagery.* This WAA is surrounded by mostly cropland which produces a low score for the buffer metric. Also included are NWI polygons which were used to determine the aquatic context score.

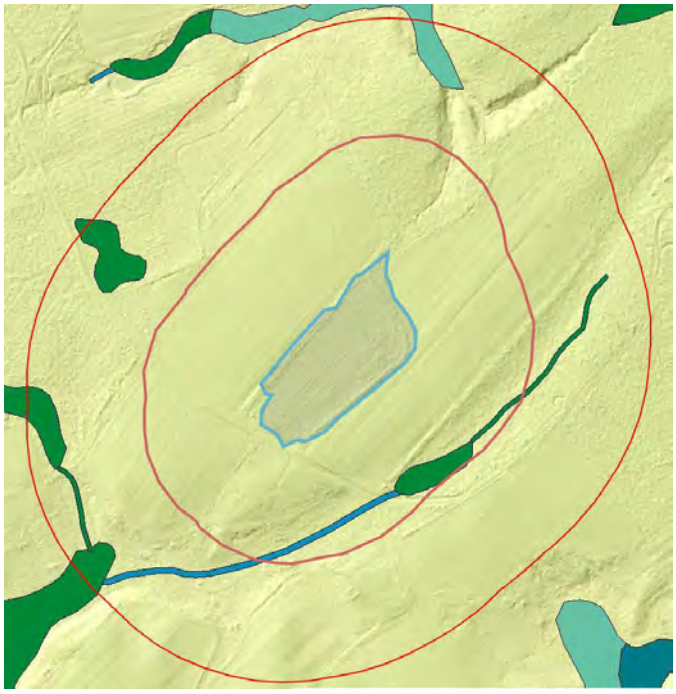

Figure 2. The same area using hill shade LiDAR and NWI mapping.

Figure 3. Photo within WAA4, a mineral flat wetland illustrating a mixed mid to late successional forest with a sparce understory typical of many mineral flats. The area is dominated by *Quercus phellos* and *Q. palustris* with some patches of *Cinna arundinacea* are in the background where the light source is greater. This wetland is a remnant patch of forest surrounded by cropland.

Figure 4. Another shot of WAA4 further illustrating the lack of understory vegetation typical of mineral flat wetlands in the Coastal Plain ecoregion. Note the mixture of larger and smaller trees. While this wetland was larger than 5 acres, only one sample point was used due to the homogeneity of the community.

20240513 – MDWAM WETLAND SCORING FORM

Project/Site ID: Cedar Point Wildlife Management Area Assessment /Delineation Date: September 29, 2021

Project Type: ☒Testing ☐Linear ☐Non-Linear ☐Mitigation (☐Creation ☐Restoration ☐Enhancement) ☐Other _____

Evaluators: Plewa and Gaimaro Wetland ID/Name: PFO1E NWI: PFO1E

WAA #: 4 Size: 5.8 (acres) Wetland Class (HGM): Mineral Flat Regional Subclass: Mineral Flat

Ecoregion: ☒CP ☐EMP Aerial Photo Date and Source: NAIP 2018 Google May 2021 Photos: Yes

Notes: Forested block surrounded by cropland.

LANDSCAPE CORE ELEMENT

Aquatic Context metric – Confirm in office review. See figures in section 2.3.1.1 for examples.

Describe barriers or alterations that prevent connection: _____ ☒No barriers.
Total aquatic resources within 1,000 feet of WAA to which wetland connects (minimum size ≥ 0.02 acres): 1 streams 5 wetlands 0 ponds
Score: 3

Buffer – Evaluate to 500 feet from WAA boundary. Confirm in office review and field check. See figures in Section 2.3.1.2 for examples

Buffer Type/Description	Score (See Narratives)	Percentage	Subtotal
1. Mid to mature forest	4	21	0.83
2. Oldfield/low successional	2	6	0.12
3. Herbaceous rangeland	1	5	0.04
4. Cropland	0	66	0.0
5. Gravel road and parking area	0	2	0.0
6.			
			Score: 0.99

HYDROLOGY CORE ELEMENT

*Water source metric – Identify the **dominant** water source and degree of natural or unnatural/artificial influence (Confirm in office review for watershed).*

Natural Source: ☒Precipitation ☐Groundwater ☐Overland flow ☐Overbank flow/stream discharge ☐Beaver activity ☐Other: _____
Unnatural/Manipulated Source/Controls: ☐Impoundment ☐Outfall ☐Irrigation/pumping ☒Fill ☐Ditching/Channelization ☐Other Artificial influence or control.
Watershed/Drainage Area controls: ☐Development ☐Irrigated agriculture ☐Wastewater treatment plant ☐Impoundment ☐Stormwater retention ☐Change to flow/circulation from roads/ditching ☐Other: _____
Degree of artificial influence/control: ☐Complete ☐High ☒Low ☐None. Wetland created/restored/enhanced: ☐Sustainable/replicates natural ☐Controlled
Comments: _____ Score: 4

Hydroperiod metric – Determine the natural variability and/or recent alteration of the duration, frequency, and magnitude of inundation/saturation.

Evaluate the hydroperiod including natural variation: Precipitation: ☐typical ☒atypical (☐deficit ☒surplus) Source: _____
☒High variation ☐Low variation Evidence: _____
Direct evidence of alteration: Natural: ☐Logjam Channel migration ☐Other: _____
Human: ☐Diversions ☐Ditches/swales ☐Levees ☐Impoundments ☐Other: _____
Riverine (active floodplain only): ☐Recent channel in-stability/dis-equilibrium (☐Degradation or ☐Aggradation) ☐Stable Channel _____
Indirect evidence of alteration: ☐Wetland plant stress ☐Plant morphology ☐Upland species encroachment ☐Plant Community ☐Soil morphology ☐None
Change/Alteration of hydroperiod: ☐Due to natural events ☐Human influences (☒None ☐Slight or ☐High) _____
Degree hydroperiod of wetland created/restored/enhanced replicates natural patterns: _____
Lacustrine fringe on human impoundment: ☐High variability ☐Low variability ☐Recent changes to hydroperiod
Comments: _____ Score: 4

Hydrologic flow metric – Movement of water to or from surrounding area and openness to water moving through the WAA (flow and circulation).

Flow: ☐Inlets: # 0 ☐Outlets: # 0 ☐Signs of water movement to or from WAA: none
Restrictions: ☐None ☐Levee ☐Berm/dam ☐Diversion ☐Ditch-Side Cast ☐Road w/culverts ☐Other: _____
High flow through: ☐Floodplain ☐Drift deposits ☐Drainage patterns ☐Sediment deposits ☐Partially buried debris/trunks ☐Scour ☐Other: _____
Low flow through: ☐High landscape position ☐Stagnant water ☐Closed contours ☐Debris dams ☐Constricted Outlet ☐ Surface Roughness ☐Other: _____
Comments: _____ Score: 1

Surface drainage feature metric: Identify and describe all natural and man-made or man-altered surface drainage features (SDF) present within the WAA which potentially impact wetland hydrology and or wetland function and circle impact potential to the WAA (High-Moderate-Low). SDFs are defined as confined features with OHWM and or bed and banks. Indiscrete flow patterns are not considered (e.g., wetland drainage patterns). Provide rational below or on separate report.

SDF Types present: ☐None ☐Stream channel #_____ ☒Ditch/swale # 1 ☐Diversion #_____ ☐Other_____

SDF(s) exhibits (circle degree High-Moderate-Low): ☐channel instability/migration(H-M-L) ☐active incision/downcutting(H-M-L) ☐bank instability(H-M-L) ☐raw unvegetated or vertical banks(H-M-L) ☐highly erodible materials(H-M-L) ☐lacks vertical controls(H-M-L) ☐excessive deposition/bar development(H-M-L) ☐ historic channel alteration(H-M-L) ☐proximity to WAA that presents potential impact to hydrology(H-M-L)

☐ Restrictions associated with SDF cause backwater flooding within WAA: Type: ☐levee ☐fill/side cast ☐culvert/bridge ☐Other _____

Timing: ☐Recent (≤ 5 years) ☒Historic

Negative effect to: ☐flow and circulation within WAA ☐redirects or confines flows into/through WAA ☐reduced water table ☐level of inundation ☒No Impact

Rationale: minimal effect from ditch as it is located outside of the side cast and does not impound water to any degree

Score: 3

SOILS CORE ELEMENT

Soil organic carbon storage metric (average multiple sample scores, round to one decimal). See Section 2.2.5.2, for additional guidance regarding multiple samples.	*Sample Score #*		
	#1	*#2*	*#3*
Organic Layer(s) ≥2 (combined textures)	5	5	5
Organic Layer(s) <2" thick (combined textures) in the upper 16" OR, Dark* mineral surface horizon ≥10" thick	4	4	4
Dark* mineral surface horizon only, ≥4 and <10" thick	3	3	3
Dark* mineral surface horizon only, ≥1 and <4" thick	2	2	2
Mineral surface layer(s) only (any thickness) with matrix value >3 and ≤4 or chroma >2 and ≤3	1	1	1
Mineral surface layer(s) only (any thickness) with matrix chroma >3 or situations where the surface layer(s) have been removed	0	0	0
Sample represents % of the WAA	%	%	%
Sample score__ x % of the WAA/community =			

**Dark mineral surface-horizons have matrix value ≤3 and chroma ≤2*

Score: 2

Biogeochemical cycling metric: See Section 2.2.5.2, for additional guidance regarding multiple samples.

Sample #	% Of WAA	Sub-Metric Scores: Redox concentrations	Microtopography	Soil organic matter	Herbaceous cover
1		4	3	2	2
2					
3					

[0.75 x (4 + 3 + 2 + 2)] – 2 = 6.3 Total Score
Redox MT SOM HC (round to one decimal)
Use this formula for each sample and average the number of samples

Score: 6.3

Sedimentation metric – Deposition of excess sediment due to human actions (in the WAA). Confirm in office review for landscape.

Landscape with stress that could lead to excess sedimentation: ☐Yes ☒No Landscape position: ☒High ☐Low

Magnitude of recent runoff/flooding events: ☐High ☐Low ☒None Percent of WAA with excess sediment deposition: 0

☐ Sand deposits: ___% of area _____ average thickness ☐Silt/clay deposits: ___% of area _____ average thickness

Observation of deposits: ☐Frequent ☐Common ☐Occasional ☐ Infrequent ☐Rare ☒None

*Lacustrine fringe only: ☐ Upper end of impoundment ☐ Degrades wetland ☐ Contributes to wetland processes

Score: 4

Soil modification metric – Physical changes by human activities. Confirm in office review for past.

☒Low level of modification or high level of recovery ☐High level of modification and low level of recovery ☐No detectable modifications

Type: ☐Agricultural use (☐Plowing ☐Discing ☐Harrowing) ☒Logging ☐Mining ☐Filling ☐Grading ☐Dredging ☐Off-road vehicles

☐ Other: _____

Percent of WAA with soil modification: ☐Recent _____% ☒Historic _____% Describe: Soil disturbance was likely minimal and limited

Indicators of past modification: ☐None ☐Low organic matter ☐Lack of soil structure ☐Removal of horizons ☐Compaction (platy structure) ☐ Ap horizon ☐ Dramatic change in texture/color ☐Heterogeneous mixture ☐Recent Alluvium (e.g., legacy sediments) ☐Stratified layers ☐Soil subsidence ☐Fill

☐ Other _____

Comments: _____

Score: 4

Project/Site ID/No. Cedar Point WMA_____WAA 4_____ Assessment Date: September 29, 2021

PHYSICAL STRUCTURE CORE ELEMENT

Topographic complexity metric – See figures in Section 2.3.4.1 Record % micro-topography and % of WAA for each elevation gradient.

Of Elevation gradients present: 1 Evidence of gradients: ☐Plant assemblages ☐Level of saturation/inundation ☐Path of water flow ☐Slope
Micro-topography (surface roughness) of WAA: ☐ >50% ☒ 30-49% ☐ 10-29% ☐ <10%
Types: ☐Depression ☐Pools ☐Burrows ☐Swales ☐Wind-thrown tree holes ☐Mounds ☐Islands ☐Variable shorelines ☐Partially buried debris ☐Debris jams ☐Plant hummocks/roots ☐Other: _____ Score: 3

Edge complexity metric – Confirm in office review. See example figures in Section 2.3.4.2 to evaluate irregularity of wetland boundary and variability in vertical structure.

WAA is: ☐Surrounded by uplands ☐In seasonal floodplain ☐Abutting other wetland types ☒Has edge vertical structure variation (H-M-L)
Horizontal variability: ☐High ☐Moderate ☐Low ☒None _____ Score: 2

Physical habitat richness metric – See definitions and table in Section 2.3.4.3 for habitat types applicable to each wetland type. Located in the WAA or within 25 feet of the WAA boundary.

☐ Concentric high water marks ☐Secondary channels ☐Seasonally inundated swales ☐Un-vegetated pools ☒Un-vegetated flats ☐Vegetated islands ☐Slope with undercut, slump, or overhang ☐Rock piles with voids ☐Plant hummocks/vegetated mounds ☐Submerged/floating vegetation ☐Dense herbaceous cover ☒Brambles/thickets ☐Mature/late-successional stage of plant community (>24" DBH) ☐Drift deposits/organic debris ☐ Brush piles ☒ Fallen logs ☒Stumps/ Standing snags ☒Wind-thrown trees ☒Tree root cavities ☒Nesting cavities/dens ☐Other _____
# of Physical habitat types present (wetland type sensitive - see narrative table): % 7 Score: 3

BIOTIC STRUCTURE CORE ELEMENT

Plant strata metric – Use applicable wetland delineation regional supplement and wetland determination data form(s) 4 strata approach.

Number of plant strata: ☐≥ 4 ☒3 ☐2 ☐1 ☐0 Score: 3

Species richness metric – Use data from determination data form(s) to count species with 5% or more relative cover in a stratum. Species should be counted only once for all observations within the WAA.

Number of species across all strata and determination data forms (count species once) plus additional significant species (provide rationale for additional species outside plots). Plot Species 8 + Additional species (outside sample plots) 0 = Total species richness 8 Rationale for additional species: _____
_____ Score: 3

Non-native/Invasive Infestation metric – Use data from determination data form(s) and additional observations. See tables in section 2.3.5.3.2 for examples.

Average total relative cover of non-native/invasive species across all strata and determination data forms: 0 %
4 = <1% 3 = 1-10% 2 = 11-25% 1 = 26-50% 0 = 51-100%
☐ Additional species outside plots are included Rationale: _____ Score: 4

Interspersion metric – Confirm in office review. Use figure in section 2.3.5.4.2 to determine the degree of interspersion of plant zones (≥ 5% of WAA).

Degree of horizontal/plan view interspersion: ☐High ☐Moderate ☐Low ☒None Score: 1

Herbaceous cover metric – Estimate only herbaceous plant cover for entire WAA.

Total cover of herbaceous, emergent and submergent plants: ☐> 75% ☐51–75% ☒26–50% ☐≤ 25% Score:2

Vegetation alterations metric – Unnatural (human-caused) stressors. Confirm in office review for past.

Type (Check those applicable and circle R for recent or P for past): ☐Disking-plowing R/P ☐Land clearing/leveling R/P ☐Mowing/shredding R/P ☐Silviculture R/P ☒Logging R/P Cutting R/P ☐Trampling R/P ☐Herbicide treatment R/P ☐Herbivory R/P ☐Disease R/P ☐Chemical spill R/P ☐Pollution R/P ☐Grazing R/P ☐Woody debris removal R/P ☐Fire R/P ☐Other R/P: _____
Percent of WAA with recent vegetation alteration: _____% Severity of alteration: ☐High ☐Moderate ☐Low
Percent of WAA with past vegetation alteration: 100% Degree of recovery: ☒Complete ☐High ☐Moderate ☐Low
☐ Alteration to improve wetland (degree of natural community recovery): _____
Rationale: _____
_____ Score: 4

Plant life forms metric - Life forms represent ≥ 5% of WAA.

☐Bryophytes (mosses, liverworts, hornworts) ☐Coniferous Trees ☒Deciduous Broadleaf Trees ☒Evergreen Broadleaf Trees ☐Ferns ☒Grasses ☐Herbs ☐Lichens or Fungi ☐Sedges/Rushes ☐Shrubs ☒Vines ☐Floating/SAV

Total Number of Plant Life Forms: ☐ ≥ 6 = 4 ☒ 4 or 5 = 3 ☐ 3 = 2 ☐ 1 or 2 = 1 ☐0=0 Score 3

20240513 – MDWAM WETLAND FINAL SCORING FORM

Project/Site ID: Cedar Point Wildlife Management Area Assessment /Delineation Date: September 29, 2021

Project Type: ☒Testing ☐Linear ☐Non-Linear ☐Mitigation (☐Creation ☐Restoration ☐Enhancement) ☐Other _____

Evaluators: Plewa and Gaimaro Wetland ID/Name: PFO1E NWI: PFO1E

WAA #: 4 Size: 5.8 (acres) Wetland Class (HGM): Mineral Flat Regional Subclass: Mineral Flat

Ecoregion: ☒CP ☐EMP Aerial Photo Date and Source: NAIP 2018 Google May 2021 Photos: Yes

Notes: *Where multiple vegetative communities occur (≥ 25% of the WAA), perform an assessment for each community. Metric <u>total</u> scores should then be weighted as below.*

Core Element	*Metric*	*Metric score (each community or data point)*			*Core Element Score*	*Core Element Score (each community)*		
		1	2	3		1	2	3
Landscape	Aquatic context	3			Sum of metric scores 4 / 8 x 15	7.5		
	Buffer	1						
Hydrology	Water source	4			Sum of metric scores 12 / 16 x 30	22.5		
	Hydroperiod	4						
	Hydrologic flow	1						
	Surface drainage features	3						
Soils	Organic carbon storage	2			Sum of metric scores 16 / 23 x 15	10.6		
	Biogeochemical cycling	6.3						
	Sedimentation	4						
	Soil modification	4						
Physical Structure	Topographic complexity	3			Sum of metric scores 8 / 12 x 20	13.3		
	Edge complexity	2						
	Physical habitat richness	3						
Biotic Structure	Plant strata	3			Sum of metric scores 20 / 28 x 20	14.3		
	Species richness	3						
	Non-native/invasive infestation	4						
	Interspersion	1						
	Herbaceous cover	2						
	Vegetation alterations	4						
	Plant life forms	3						
Sum of individual community core element scores = overall MDWAM wetland score:						68.2		
Community % of WAA:						100		
Partial Core Element Score:						-		
Weighted Sum of core element scores = overall MDWAM wetland score:						68.2		

Additional points for unique resources = overall MDWAM wetland score x 0.10 if: **0**

- ☐ Non-tidal wetlands of special state concern
- ☐ Areas with populations (>20%) of the following species: Bald cypress, Atlantic white cedar, red spruce, balsam fir, or American larch
- ☐ Delmarva Bay wetlands
- ☐ Peatlands (histic epipedon or histosol present)

Additional points for limited habitats = overall MDWAM wetland score x 0.05 if: **0**

- ☐ Dominated (>50%) by native trees greater than 24-inch diameter at breast height
- ☐ Dominated (>50%) by hard mast (i.e., acorns and nuts) producing native species in the tree strata
- ☐ Large unfragmented wetland tracts and continuous riparian wetland corridors > 20 acres

FINAL MDWAM SCORE: 68

Attach representative site photographs:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: MDWAM Field Testing – Cedar Point WMA City/County: Charles Sampling Date: 29 Sept 2021

Applicant/Owner: MD DNR State: MD Sampling Point: WAA 4

Investigator(s): Plewa, Gaimaro Section, Township, Range:NA

Landform (hillslope, terrace, etc.):interfluve/flat Local relief (concave, convex, none):none Slope (%): 0-2

Subregion LRR: S MLRA: 149A Lat: 38.4373 Long:-77.0699 Datum:NA

Soil Map Unit Name: Lenni and Quindocqua NWI classification: none

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

Are Vegetation , Soil , or Hydrology significantly disturbed? no Are "Normal Circumstances" present? Yes

Are Vegetation , Soil , or Hydrology naturally problematic? no (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 Hydric Soil Present? Yes Wetland Hydrology Present? Yes	**Is the Sampled Area within a Wetland? Yes**

Remarks: precipitation deficit (MARF)

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)
- ☐ (C9)Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☒ Inundation Visible on Aerial Imagery (B7)
- **X** Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- Sphagnum moss (D8) (LRR T, U)

Field Observations:

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

Wetland Hydrology Present? Yes

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
FULL RANGE OF GOOGLE AND WATERSHED RESOURCES REGISTRY AERIAL PHOTOGRAPHY

Remarks: precipitation deficit (MARF)

Precipitation supporting data: ☐APT ☒MARF ☐Other

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

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus palustris	37	yes	FacW
2. Quercus phellos	25	yes	FacW
3. Nyssa sylvatica	15		Fac
4. Acer rubrum	11		Fac
5. Liquidambar styraciflua	6		Fac
6.			
7.			
8.			

84 = Total Cover

50% of total cover: 42 20% of total cover: 16.8

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Ilex opaca	7	yes	Fac
2. Acer rubrum	4	yes	Fac
3. Nyssa sylvatica	2		Fac
4.			
5.			
6.			
7.			
8.			

13 = Total Cover

50% of total cover: 6.5 20% of total cover: 2.6

Herb Stratum (Plot size: 5'radius)			
1. Chasmanthium arundinacea	30	yes	Fac
2. Smilax rotundifolia	15	yes	Fac
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

45 = Total Cover

50% of total cover: 22.5 20% of total cover: 9

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

NA = 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	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes**

Remarks: (If observed, list morphological adaptations below).

MORPHOLOGICAL PLANT ADAPTATIONS: ☒shallow roots ☒fluted trunks ☐ flared/buttressed trunks ☐elevated root wads/trunks

SOIL Sampling Point: WAA 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	10YR 3/1						SiL	
2-5	10YR 5/2		10YR 5/6	20	C	M	SiL	
5-15+	10 YR 6/1		10YR 5/6	5	C	M	SiCL	
			7.5 YR 4/6	20	C	M		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ 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: NA

Depth (inches): _____

Hydric Soil Present? Yes

Remarks: LRR – S MLRA 149A