



United States Department of the Interior

NATIONAL PARK SERVICE
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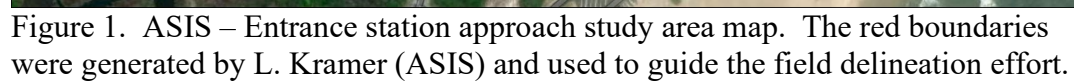
November 2023

Memorandum

To: Bill Hulslander, Chief of Resource Management ASIS
From: Peter Sharpe Ph.D., PWS, Hydrologist, Northeast Region
Subject: Wetland Delineation Report for Travel, ASIS, 20-23 April 2022

Summary

The objective of this investigation was to respond to a request for technical assistance for a comprehensive delineation of wetland habitats subject to jurisdiction under Section 404 of the Clean Water Act and all wetlands subject to National Park Service (NPS) procedures for implementing *Director's Order #77-1: Wetland Protection* for National Park Service lands within a proposed park entrance road corridor at Assateague Island National Seashore (ASIS). This work utilized the U.S. Army Corps of Engineers (USACE) Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Version 2.0 (November 2010) as the primary methodology for making wetland determinations in the field. A total of 11 palustrine wetlands encompassing 8.53 ac of land were identified and delineated from 20-23 April 2022 (Fig. 1 and Appendix A). Observed wetland habitats were primarily a combination of palustrine, emergent, persistent, habitat (PEM1) and broad-leaved deciduous shrub (PSS1) habitats. All the identified and mapped palustrine wetland systems meet both the U.S. Army Corps of Engineers criteria and the Cowardin et al. (1979) definitions of wetland habitat. Several small stands of loblolly pine were observed directly adjacent to the mapped wetland systems of the entrance way. The pine stands that were situated at lower elevations relative to the mapped wetland systems exhibited some symptoms of vegetation stress (i.e., stunted growth, dead limbs, reduced crown vigor, etc....) suggestive of excessive root zone saturation. This speculation was also based off observations of healthier looking loblolly pine stands located in the same study area but at higher surface elevations than those trees situated at lower elevations within and adjacent to the mapped wetland habitats. The working theory is that climate induced changes to the shallow groundwater table at this location may be expanding wetland hydrology into areas of the park that are lower elevation upland habitat and over time the park may see more loblolly pine decline and landscape conversion in these lower elevation zones from an upland to wetland condition.



Purpose and Objectives

The purpose was to provide detailed wetland/aquatic resource identification and boundary information for a proposed entrance station expansion project at Assateague Island National Seashore. The information may be utilized for park compliance purposes if they proceed with plans to expand vehicle access at this location within the park. Following a total study area traverse by foot, wetlands and associated aquatic resources were delineated in the field and located using a GPS system (Trimble R1) capable of obtaining sub-meter accurate readings for purposes of cataloging aquatic resources.

Field Participants

Peter J. Sharpe, NE Region – The National Park Service (Wetlands PI)
Jonathan Chase, ASIS – The National Park Service (GPS and Botanical Expertise)
Lauren Kramer, ASIS – GIS support

Introduction and Methods

It is the mission of the National Park Service to preserve and maintain the natural and cultural resources of the Assateague Island National Seashore (ASIS) and to interpret those same resources to the visiting public and the scientific and scholarly community.

The NPS through Director's Order #77-1 requires mapping of wetlands and all other "waters of the United States" via a slightly different criteria than the USACE 1987 manual and associated regional supplements, thus the two types of wetland determination methods employed at ASIS were: (1) the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual Atlantic and Gulf Coastal Plain Version 2.0 (November 2010) and (2) the 1979 USFWS *Classification of Wetlands and Deepwater Habitats of the United States*.

Interim Regional Supplement USACE Method (3-Parameter Approach)

The USACE method for identifying the wetland / upland boundary uses the definition as outlined in the U.S. Army Corps of Engineers *Wetlands Delineation Manual, 1987*, which defines a wetland as:

“Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

Wetland boundaries were primarily determined by establishing a series of transects from a known wetland into known upland locations surrounding the area under examination. At suspected boundary locations along the transect investigators looked for evidence of hydric soils, hydrophytic vegetation, and wetland hydrology. The wetland/upland boundary line was

thus delineated and any obvious topographic changes (e.g., abrupt toe-of-slope line) along the wetland/upland perimeter that might occur. In some cases, at ASIS abrupt toe-of-slope and ordinary high water mark boundaries were present and thus served as reliable indicators of wetland/upland boundaries. Waterway features (classified as riverine wetlands by Cowardin et al. 1979) were identified by the presence of a defined bed and banks, presence of natural channel substrates, and presence of two or more obligate aquatic taxa (e.g., fish and/or benthic macro-invertebrates). If riverine features were encountered, then they were delineated by a series of points located along the top of bank wherever needed though within this study area.

Parameter 1- Hydrophytic Vegetation Criteria

For determining the presence of hydrophytic vegetation, plant species within each community were visually identified by strata (e.g., trees, saplings/shrubs, herbs, and woody vines) and listed in descending order of dominance. The USACE defined sampling stratum has 5 percent or more total plant cover. If a stratum had less than 5 percent cover during the growing season, then those species and their cover values were recorded on the data form, assuming application of Indicator 3 (Prevalence Test) was necessary. However, these species were not generally included on the data sheets if the wetland determination could be made via Indicator 1 (Rapid Test) or Indicator 2 (Dominance Test). For Indicators 1 and 2 only those species that comprised 5% or more of a given strata were assessed.

Vegetation survey plots conformed to current USACE interim supplement guidelines and involved the use of a series of nested circular plots radiating outward from the soil/hydrology test pit (Fig. 2). Plot sizes were as follows:

1. Tree stratum – 30 ft (9.1 m) radius
2. Woody vines – 30 ft (9.1 m) radius
3. Herb stratum – 5 ft (1.5 m) radius
4. Sapling/shrub stratum – 15 ft (4.6 m) radius

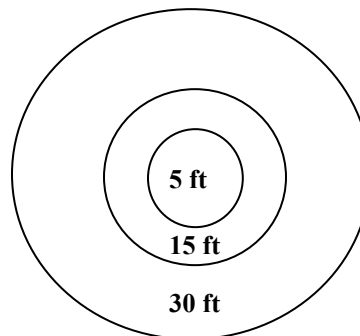


Figure 2. Typical wetland vegetation survey plot conforming to USACE interim regional supplement Atlantic and Gulf Coastal Plain Version 2.0 (November 2010) guidelines.

The wetland indicator status of observed dominant plant species was determined using the 2020 National Wetland Plant List for the Atlantic and Gulf Coastal Plain contained within an apple-based application for use with iPad and iPhone products (Sharpe et al. 2015):

- **OBL** (Obligate Wetland Plants) occur greater than 99 percent of the time in wetlands under natural conditions.

- **FACW** (Facultative Wetland Plants) occur between 67 and 99 percent of the time in wetlands under natural conditions.
- **FAC** (Facultative Plants) occur between 33 and 67 percent of the time in wetlands under natural conditions.
- **FACU** (Facultative Upland Plants) occur between 1 and 33 percent of the time in wetlands under natural conditions.
- **UPL** (Obligate Upland Plants) occur less than 1 percent of the time in wetlands under natural conditions.

Plant species dominance was determined as the most abundant species that individually or collectively accounted for more than 50 percent of the total absolute coverage of vegetation in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total (i.e., the 50/20 Rule).

The interim regional supplement to the original 1987 USACE manual identifies 4 primary indicators of hydrophytic vegetation, any of which, when met, signifies that the community indicates a wetland plant community. For purposes of brevity this section will only cover the two most encountered indicators at ASIS (e.g., Indicators 1 and 2). For a complete description of all the indicators the reader is directed to view the U.S Army Corps of Engineers (USACE) Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Version 2.0 (2010).

For a plant community to meet the vegetation criteria under Indicator 1 the following description must be met: “All dominant species across all strata are rated OBL or FACW, or a combination of these two categories, based on a visual assessment.” Under Indicator 2 (a commonly employed indicator at ASIS) more than 50 percent of the dominant plant species across all strata must be rated OBL, FACW, or FAC.

Parameter 2 - Hydrology Criteria

Wetland hydrology indicators provide evidence that episodes of inundation or soil saturation lasting more than a few days during the growing season have occurred repeatedly over a period of years and that the timing, duration, and frequency of wet conditions have been sufficient to produce a characteristic wetland plant community and hydric soil morphology. The growing season begins when two or more non-evergreen vascular plant species growing within the study area exhibit one or more of the following biological indicators:

1. Emergence of herbaceous plants from the ground
2. Appearance of new growth from vegetative crowns (e.g., in graminoids,

bulbs, and corms)

3. Coleoptile/cotyledon emergence from seed
4. Bud burst on woody plants (i.e., some green foliage is visible between
5. spreading bud scales)
6. Emergence or elongation of leaves of woody plants
7. Emergence or opening of flowers

Growing season conditions can also be met if soil temperatures measured at 12 in. (30 cm) depth is 41 °F (5 °C) or higher. Hydrologic indicators of wetland conditions are based on the direct observation of surface water or groundwater during a site visit (Group A indicators), evidence that the site is subject to flooding or ponding, although the inundation need not be directly observed at the time of the investigation (Group B indicators). The inundation (Group B) indicators include water marks, drift deposits, sediment deposits, and similar features. Other hydrologic indicators consist of evidence that the soil is saturated currently or was saturated recently such as oxidized rhizospheres and the presence of reduced iron or sulfur in the soil profile (Group C indicators), which indicate that the soil has been saturated for an extended period. The final group of hydrologic indicators (Group D) consists of landscape, vegetation, and soil features that indicate contemporary rather than historical wet conditions. Wetland hydrology indicators are intended as one-time observations of site conditions that are sufficient evidence of wetland hydrology in areas where hydric soils and hydrophytic vegetation are present. For a site to meet the wetland hydrologic criteria it need only possess one primary indicator or two secondary indicators from one of the groups.

Parameter 3 - Hydric Soil Criteria

The National Technical Committee for Hydric Soils defines a hydric soil as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA Soil Conservation Service 1994). One of the most significant changes to the original 1987 USACE manual with regards to wetland boundary determinations is in hydric soil recognition and characterization. The new regional supplement still requires low chroma color soils and the presence of redoximorphic features; however, the revised indicators are much more specific and cover a broader range of potential wetland types than the original 1987 manual criteria.

Soil pits were excavated to a maximum depth of 20 inches (45.72 cm) using a sharp-shooter shovel unless on-site conditions such as shallow bedrock prohibited excavation or one or more of the hydric soil indicators were met. The data sheets for each mapped wetland include information on the soil profile colors, presence/absence of redoximorphic features, texture, and presence/absence of any shallow confining layers and their depths on-site.

GPS Survey of Wetland Boundaries

Pink wetland delineation flags were marked with a unique alpha numeric code and hung at regular intervals around the perimeter of each identified wetland habitat and located using a sub-meter accurate GPS system. Representative wetland test pits were also similarly flagged and located. GPS-based coordinates were collected for wetland test pit and boundary flags between 20-23 April 2022, using a Trimble R1 receiver in datum **NAD83, UTM – Zone 18N**, feet coordinates and Trimble Mobile Manager and ArcMap software. The data were then exported to shapefile format. Following this procedure, we have estimated accuracies in the X and Y direction of 0 to 1 meter (0-3.28 feet). No tests were done to confirm the X/Y direction accuracy during this investigation.

Results - Wetland Descriptions

Wetland 1 (Size – 0.24 ac): This habitat's landscape position relative to the park entrance and adjacent visitor parking lot, as well as clear signs of manipulated earthwork, suggest that this wetland as anthropogenic in origin. Subsequent feedback from park staff in February of 2023 confirmed this assessment as the site is a designed wetland mitigation system for the North Ocean Beach parking area. The habitat exhibited characteristics of a palustrine, emergent, non-persistent, seasonally flooded-saturated Cowardin Class wetland (PEM2E – Photograph 1). Wetland soils exhibited soil characteristics of a depleted matrix (Indicator F3) the site appeared to be a constructed habitat with clear topographic breaks between upland/wetland habitats. Primary wetland hydrology appeared to come from drainage associated with the adjacent parking lot and roadway along with direct precipitation. A potential for some tidal flooding/influence from the dual culvert system traversing the roadway and providing drainage connectivity between Wetlands 2 and 3 was also noted but no surface water flow between Wetland 1 and 2 was observed during this investigation. The dominant plant species observed within the wetland were *Morella cerifera* (primarily along the wetland boundary) and *Typha angustifolia*. Other notable plant species that were observed within the wetland but did not exhibit relative abundances great enough to qualify as dominant species via the 50/20 rule included: *Typha latifolia*, *Phalaris arundinacea*, *Juncus effusus* and *Solidago sempervirens*.



Photograph 1 (P1) – Wetland 1 (PEM2E) view is west looking at the habitat and boundary flags which terminate at the northern entrance road toe-of-slope in the background. Photo Date 20 April 2022 – P. Sharpe.

Wetland 2 (Size –2.42 ac): This wetland system is a *Morella cerifera* dominated palustrine, scrub-shrub, broad leaved deciduous, saltwater tidal, irregularly flooded habitat (PSS1P). The source of tidal influence is a pair of concrete culverts traversing Bayberry Drive connecting this system to the various habitats within Wetland 3. This site likely also receives hydrology from overland flows, direct precipitation, groundwater, and infrequent coastal over wash/flooding events. Wetland soils at this location were very dark (Indicator A11) with a very sandy soil texture indicative of the coastal setting. Apart from the *Morella cerifera* within the shrub layer, the other dominant plant species observed was *Phragmites australis* within the herbaceous zone along with non-dominate species such as *Juncus effusus* and *Solidago sempervirens*.



Photograph 2 (P2) – Wetland 2 (PSS1P) view is East looking at the extensive *Morella cerifera* shrub dominated community within this site. Photo Date 20 April 2022 – P. Sharpe.

Wetland 3 (Habitat Sizes – 1.15 ac PEM1N; 0.68 ac PSS1P; 0.03 ac PUB3N): This wetland system is a mosaic of tidally influenced habitats directly adjacent to the Sinepuxent Bay. The largest of these habitats shown in Photo 3 is the palustrine, emergent, persistent, regularly flooded-saturated wetland component. This emergent wetland system appears to be under tidal influence and was characterized by *Spartina patens* and *Phragmites australis* with scattered patches of *Eleocharis acicularis* throughout. The scrub/shrub community was nearly identical in plant species composition and hydrologic nature as the PSS1P habitat found in Wetland 2 and there was also a very small tidally influenced palustrine, unconsolidated bottom, regularly flooded, mud bottomed habitat (PUB3N) which served as the primary hydrologic outfall point for Wetland 2. As evidenced in Photo 3 wild horse herbivory was evident throughout the site.



Photograph 3 (P3) – Wetland 3 (PSS1P/PEM1N) view is southwest looking at the emergent wetland habitat and active wild pony grazing. Photo Date 20 April 2022 – P. Sharpe.



Photograph 4 (P4) – Wetland 4 (PSS) view is southwest looking through the shrub layer. Photo Date 20 April 2022 – P. Sharpe.

Wetland 4 (Total Size – 3.88 ac PSS1P and 0.06 ac PUB3N): Wetland 4 is comprised of the same scrub/shrub habitat evident throughout wetlands 2 and 3, (PSS1P) (Photo 4).

Soil test pits indicated high levels of sandy material within the upper 14 inches of the soil like the other sites and dark indicator F3 (Depleted Matrix) soils. Hydrology at this location appeared to be less tidally influenced (compared to Wetland 3 for example), but the wetland boundaries that extended beyond our study area limits quickly changed to a more tidally influenced emergent marsh consistent

with the PEM1N habitat found within Wetland 3. One difference between the PSS community of Wetland 4 to that of Wetlands 2 and 3 was the presence of some mature *Acer rubrum* trees. While these red maple trees were present and met the 50/20 dominance test for vegetation their aerial coverage (17.5%) was dwarfed by the scrub/shrub layer of *Morella cerifera* (87.5%). Additionally, the red maple trees that appeared to exhibit the greatest health and vigor were typically located on high hummocks or along the saturated edges of the wetland system see Photo 4. The herbaceous plant species cover was sparse at this time of year but dominated by *Andropogon virginicus* and *Agrostis* sp. Another small likely tidally influenced open water area (PUB3N) was also mapped within this habitat.

Wetland 5 (Size – 0.06 ac PUB3N): This wetland system appeared to be a shallow concave wetland system primarily receiving its hydrology from direct precipitation, some overland flows (though this is likely a minor component of the sites water budget) and potentially ground water.



Photograph 5 (P5) – Wetland 5 (PUB) view is south looking at the main wetland prism, note the sparse cover of macrophytic plants except for *Huperzia lucidula* found throughout the wetted perimeter of this photo. Photo Date 20 April 2022 – P. Sharpe.

As a sparsely vegetated concave surface (see Photo 5) there was very little vascular plants

present within the wetland prism excluding *Hyperzia lucidula* which was present throughout the wetted perimeter of the wetland area. Soils at this location displayed a very thin peat layer (0-3) inches followed by a 12-inch-thick sandy loam textured stripped matrix (Indicator S6).

Wetlands 6, 7, and 8 – non-vegetated small PUB2B (pools) (Sizes 0.01 ac; 0.002 ac; 0.001 ac)

Though these mapped systems were below what we would typically identify and map in the field (0.1 ac is the usual threshold), their clustered presence and proximity to Wetland 5 warranted mapping and inclusion within this report. None of these systems exhibited hydrophytic plant characteristics at the time of the investigation or obvious surface water connections to each other or the nearby bay. These systems lie within a forested area dominated by *Pinus taeda* with a sparse understory layer primarily composed of *Smilax rotundifolia*. The current theory regarding their origin is that these pockets of standing water may have been the remnants of past excavation activities and that they are currently deep enough to intercept a seasonally high groundwater table. Water depths within these small pools ranged from 9-2.5 inches and no vascular plants were observed within the wetland prisms, nor were any signs of aquatic or semi-aquatic life observed as well. *Sphagnum* moss was evident throughout the wetted perimeter of the sites and as this was a single point in time survey conclusions regarding wildlife use (or non-use) as well as wetland hydroperiods (wet/dry cycles) should be taken with caution. Wetlands 5-8 represent a wetland mosaic of shallow sparsely vegetated isolated depressions located within a small stand of loblolly pines that could serve as excellent habitat



Wetland 6 (PUB) small pool. View is south
21 April 2022 by P. Sharpe



Wetland 7 (PUB) small pool. View is south
21 April 2022 by P. Sharpe.



Wetland 8 (PUB) small pool View is south.
21 April 2022 by P. Sharpe

for obligate vernal pool species and these would be prime locations for inclusion in any herpetological follow-up investigations.

Recommendations and Conclusions

A total of 11 individual palustrine wetland habitats were delineated as part of this investigation (Table 1) and no riverine systems were observed or mapped within the study area boundary. Most of these wetland habitats were mapped using a sub-meter accurate GPS system, however, due to access and safety concerns deeper water traverses through the two tidal ponds were not attempted. As such, the two ponds west of Bayberry Drive and the associated PSS habitat bordering them were heads up digitized in ArcGIS Pro. All boundaries were verified in the field for accuracy, but should the park proceed with an infrastructure project that would produce wetland impacts to those specific resources this information should be conveyed to the regulatory branch of the Army Corps of Engineers who have Section 404 permitting authority as they may require additional GPS work at those locations.

Table 1. Summary of Wetland Delineation Results

Wetland ID	Cowardin Class	Size (Ac)	Mapping Method	Federal Wetlands Policy and Regulatory Determination	
				NPS	Clean Water Act
Wetland 1	PEM2E	0.24	GPS	Yes	Yes
Wetland 2	PSS1P	2.42	GPS	Yes	Yes
Wetland 3	PEM1N	1.15	GPS	Yes	Yes
Wetland 3	PSS1P	0.68	Heads up Digitized	Yes	Yes
Wetland 3 Tidal Pond 2	PUB3N	0.03	Heads up Digitized	Yes	Yes
Wetland 4	PSS1P	3.88	GPS	Yes	Yes
Wetland 4 Tidal Pond 1	PUB3N	0.06	Heads up Digitized	Yes	Yes
Wetland 5	PUB4R	0.06	GPS	Yes	No
Wetland 6	PUB2B	0.01	GPS	Yes	No
Wetland 7	PUB2B	0.002	GPS	Yes	No
Wetland 8	PUB2B	0.001	GPS	Yes	No

Additionally, no wetland function and value information has been provided to the park as part of the scope of this technical assistance request. However, such information can be produced and

provided to the park in supplemental form should they proceed with plans for an entrance station and associated road configuration that impacts wetland habitats within this study area.

Any proposed activities that would involve either permanent or temporary impacts to riverine or palustrine/tidal wetland systems are likely to require coordination with NPS and Army Corps of Engineers (Regulatory Branch) personnel. The findings of this report including the associated wetland spatial data collected in the field could be used for D.O. #77.1 and Section 404 Clean Water Act compliance purposes to assist with these activities. Dr. Kevin Noon (NPS-WRD) and I would be your principal point of contacts for guidance related to the development of a formal wetland and floodplain statement of findings should any proposed projects proceed, and it is determined that permanent or temporary wetland impacts should arise because of any park related infrastructure projects.

Mature loblolly pine and red maple trees located in the lower elevations bordering some of these mapped wetland systems appeared to be showing signs of stress associated with excessive root zone saturation. These symptoms of plant stress included dead and dying limbs, dead mature trees, and apparent stunted growth. It is also likely that increases in root zone flooding frequency/saturation aren't the only sources of plant stress at this location and without additional study these observations should be taken as "professional opinion" only until additional data or documented wetland expansion into these lower elevation upland zones can be shown.

If you have any questions regarding this report, please call Peter Sharpe (267) 858-1001. Wetland data sheets and supporting GIS data will be provided to ASIS staff and posted to IRMA.

cc: (by e-mail only)

WRD - K. Noon

NER/IRMA – File ASIS Entrance Station (P. Sharpe)

References

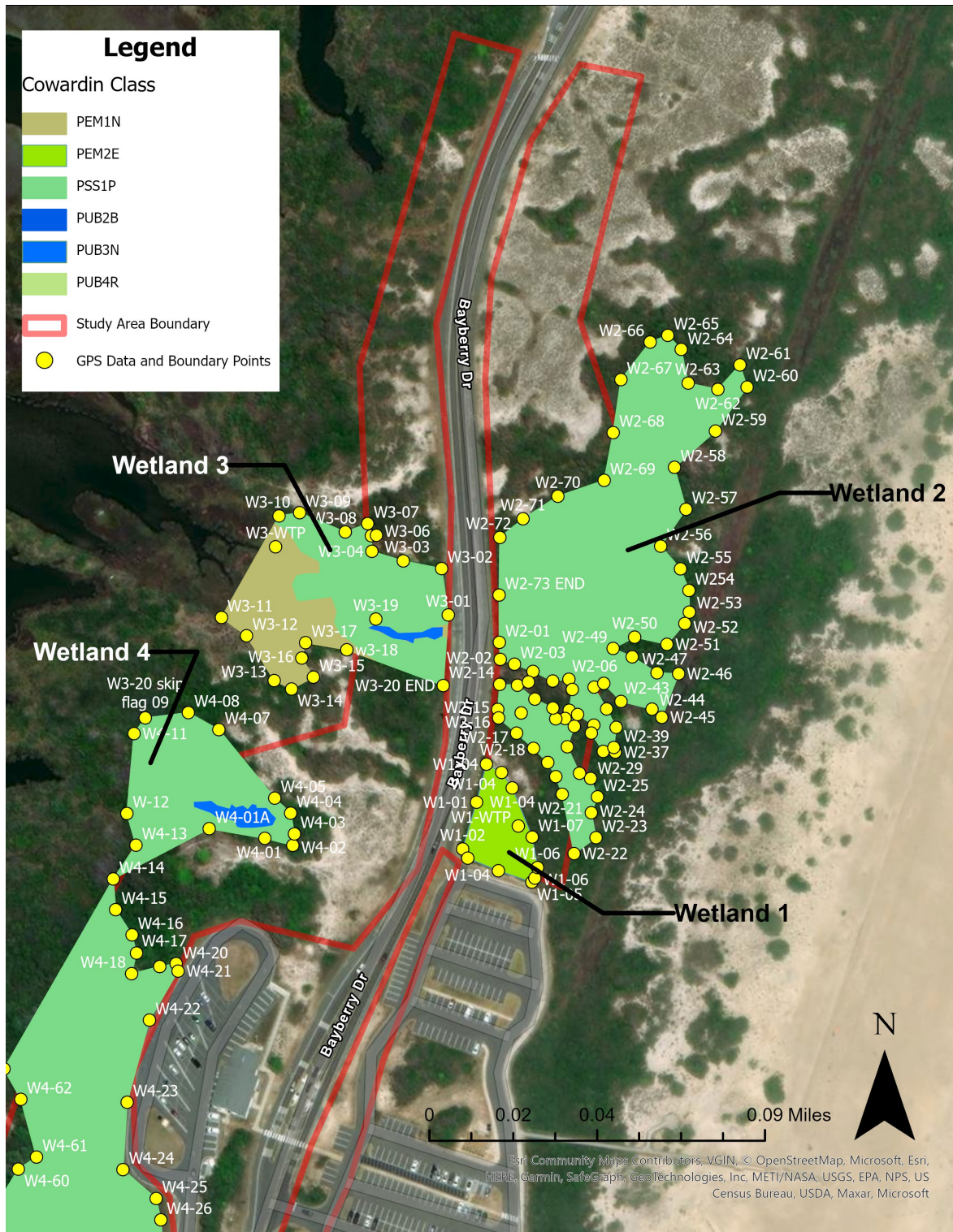
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Appendix A – Detailed Project Mapping

ASIS Entrance Station – Soils Map



ASIS Entrance Station – Delineated Wetlands Habitat Map 1 of 3

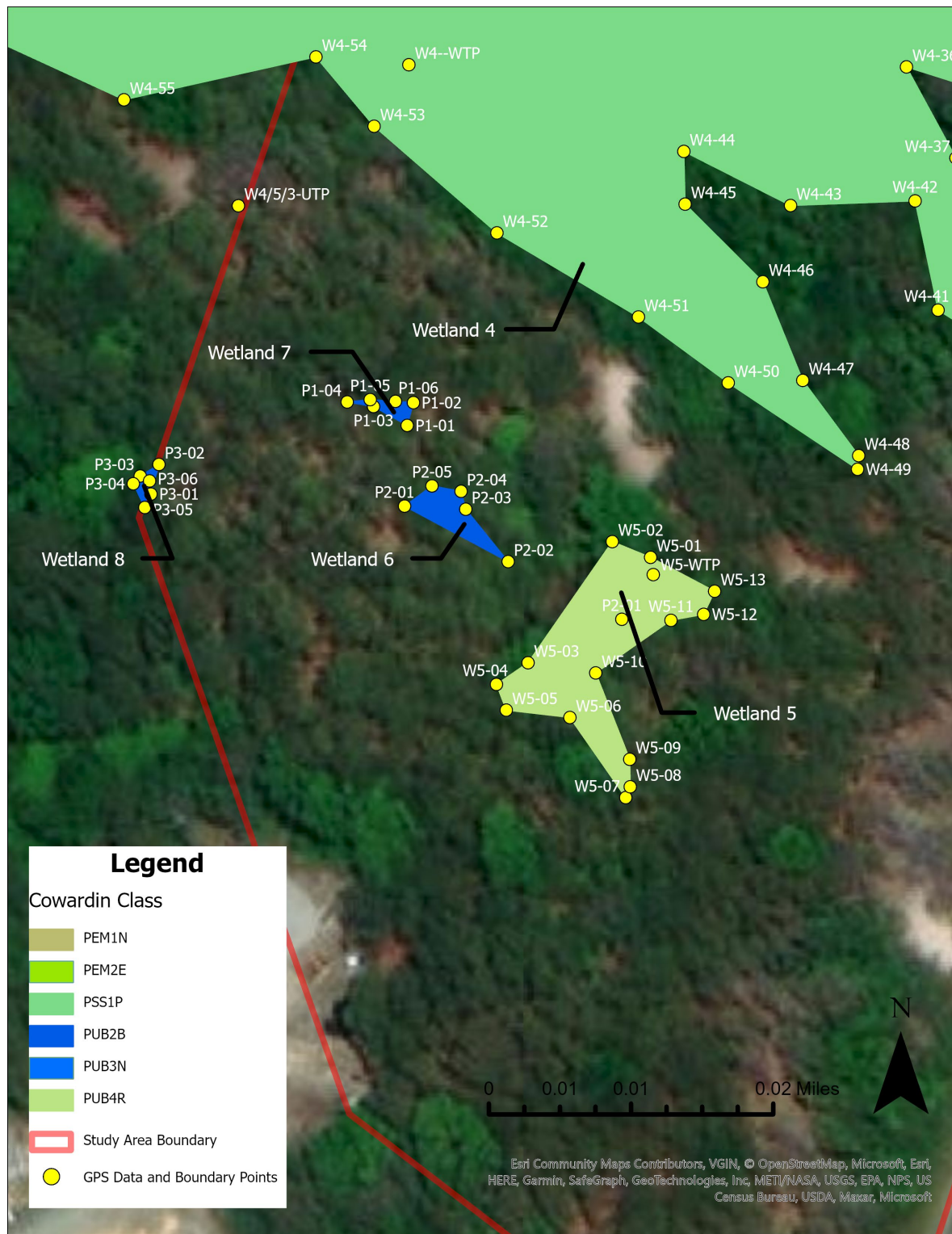


This map displays two wetland areas, Wetland 4 and Wetland 5, overlaid on an aerial photograph. The wetlands are color-coded according to the Cowardin Class legend:

- PEM1N (Light Green)
- PEM2E (Yellow)
- PSS1P (Light Green)
- PUB2B (Blue)
- PUB3N (Blue)
- PUB4R (Light Green)

The Study Area Boundary is indicated by a red line. GPS Data and Boundary Points are marked with yellow dots. The map includes a scale bar (0 to 0.08 Miles) and a North arrow. The map is titled "Wetland 4" and "Wetland 5".

ASIS Entrance Station – Delineated Wetlands Habitat Map 3 of 3



Appendix B – Wetland Delineation Data Sheets

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ASIS Entrance City/County: Worcester Sampling Date: 9/10/2019
 Applicant/Owner: NPS State: MD Sampling Point: WTP-1
 Investigator(s): P. Sharpe, J. Chase Section, Township, Range: Berlin
 Landform (hillslope, terrace, etc.): Coastal Local relief (concave, convex, none): Concave Slope (%): 0-1%
 Subregion (LRR or MLRA): MLRA 149A Lat: 38.2093501 Long: -75.1515066 Datum: WGS 84
 Soil Map Unit Name: AcC (Acquango Sand) NWI Classification: PEM2E

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

Are ☐ Vegetation ☒ Soil ☐ Hydrology significantly disturbed? Are "Normal Circumstances" present? ☒ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ 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:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☒ Surface Water (A1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☒ High Water Table (A2) ☐ Presence of Reduced Iron (C4) ☒ Saturation (A3) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Water Marks (B1) ☐ Thin Muck Surface (C7) ☐ Sediment Deposits (B2) ☐ Other (Explain in Remarks) ☐ Drift Deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water Stained Leaves (B9) ☐ Aquatic Fauna (B13) ☐ Marl Deposits (B15) (LRR U) ☐ Hydrogen Sulfide Odor (C1)		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) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum Moss (D8) (LRR T, U)
Field Observations: Surface Water Present? ☒ Yes ☐ No Depth (inches): <u>4.5</u> Water Table Present? ☒ Yes ☐ No Depth (inches): <u>0.0</u> Saturation Present? ☒ Yes ☐ No Depth (inches): <u>0.0</u> (includes capillary fringe)		Wetland Hydrology Present? ☐ Yes ☐ No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP-1

Tree Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species? ☐ Yes ☐ No	Indicator Status
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
		_____ = Total Cover		
		50% of total cover: _____ 20% of total cover: _____		
Sapling/Shrub Stratum	(Plot size: _____)			
1.	<i>Morella cerifera</i>	37.5	☐ Yes ☐ No	FAC
2.			☐ Yes ☐ No	
3.				
4.				
5.				
6.				
7.				
8.				
		_____ = Total Cover		
		50% of total cover: 18.75 20% of total cover: 7.5		
Herb Stratum	(Plot size: _____)			
1.	<i>Typha angustifolia</i>	17.5	☒ Yes ☐ No	OBL
2.	<i>Typha latifolia</i>	7.5	☐ Yes ☒ No	OBL
3.	<i>Phalaris arundinacea</i>	7.2	☐ Yes ☒ No	OBL
4.	<i>Juncus effusus</i>	3.5	☐ Yes ☒ No	OBL
5.	<i>Solidago sempervirens</i>	3.5	☐ Yes ☒ No	FACW
6.			☐ Yes ☐ No	
7.				
8.				
9.				
10.				
11.				
12.				
		_____ = Total Cover		
		50% of total cover: 19.6 20% of total cover: 7.84		
Woody Vine Stratum	(Plot size: _____)			
1.			☐ Yes ☐ No	
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: 100.000 % (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species 35.7 x 1 = 35.7
 FACW species 3.5 x 2 = 7
 FAC species 37.5 x 3 = 112.5
 FACU species 0 x 4 = 0
 UPL species 0 x 5 = 0
 Column Totals: 76.7 (A) 155.2 (B)
 Prevalence Index = B/A = 2.023

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☒ 3 - Prevalence Index is ≤3.0*
☐ Problematic Hydrophytic Vegetation* (Explain)

*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 ☐ No

Remarks: (If observed, list morphological adaptations below).
Dichanthelium sp. also present and at high relative abundance 37.5% cover. Unable to ID plant to species however.

Sampling Point: WTP-1

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ASIS Entrance City/County: Worcester Sampling Date: 4/20/2022
Applicant/Owner: NPS State: MD Sampling Point: WTP-2
Investigator(s): P. Sharpe, J. Chase Section, Township, Range: Berlin
Landform (hillslope, terrace, etc.): Coastal Local relief (concave, convex, none): Concave Slope (%): 0-1%
Subregion (LRR or MLRA): MLRA 149 Lat: 38.2097956 Long: -75.1514903 Datum: NAD83
Soil Map Unit Name: FxdA (Fox Hill Sand) NWI Classification: PSS1P

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

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "Normal Circumstances" present? ☒ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ 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:	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
☐ Surface Water (A1)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Surface Soil Cracks (B6)	
☒ High Water Table (A2)	☐ Presence of Reduced Iron (C4)	☐ Sparsely Vegetated Concave Surface (B8)	
☒ Saturation (A3)	☐ Recent Iron Reduction in Tilled Soils (C6)	☒ Drainage Patterns (B10)	
☐ Water Marks (B1)	☐ Thin Muck Surface (C7)	☐ Moss Trim Lines (B16)	
☒ Sediment Deposits (B2)	☐ Other (Explain in Remarks)	☐ Dry-Season Water Table (C2)	
☐ Drift Deposits (B3)		☐ Crayfish Burrows (C8)	
☐ Algal Mat or Crust (B4)		☐ Saturation Visible on Aerial Imagery (C9)	
☐ Iron Deposits (B5)		☒ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)		☐ Shallow Aquitard (D3)	
☒ Water Stained Leaves (B9)		☐ FAC-Neutral Test (D5)	
☐ Aquatic Fauna (B13)		☐ Sphagnum Moss (D8) (LRR T, U)	
☐ Marl Deposits (B15) (LRR U)			
☐ Hydrogen Sulfide Odor (C1)			
Field Observations:			
Surface Water Present? ☐ Yes ☒ No	Depth (inches):	Wetland Hydrology Present? ☒ Yes ☐ No	
Water Table Present? ☒ Yes ☐ No	Depth (inches): 5.0		
Saturation Present? ☒ Yes ☐ No	Depth (inches): 0.0		
(includes capillary fringe)			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP-2

Tree Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			☐ Yes ☐ No	
2.				
3.				
4.				
5.				
6.				
7.				
8.				
		_____ = Total Cover		
		50% of total cover: _____	20% of total cover: _____	
Sapling/Shrub Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Morella cerifera</i>	87.5	☒ Yes ☐ No	FAC
2.			☐ Yes ☐ No	
3.				
4.				
5.				
6.				
7.				
8.				
		87.5 = Total Cover		
		50% of total cover: 43.75	20% of total cover: 17.5	
Herb Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Juncus effusus</i>	7.5	☒ Yes ☐ No	OBL
2.	<i>Phragmites australis</i>	17.5	☒ Yes ☐ No	FACW
3.	<i>Solidago sempervirens</i>	1.5	☐ Yes ☐ No	FACW
4.			☐ Yes ☐ No	
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
		26.5 = Total Cover		
		50% of total cover: 13.25	20% of total cover: 5.3	
Woody Vine Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			☐ Yes ☐ No	
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: 100.000 % (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species 7.5 x 1 = 7.5

FACW species 19 x 2 = 38

FAC species 87.5 x 3 = 262.5

FACU species 0 x 4 = 0

UPL species 0 x 5 = 0

Column Totals: 114 (A) 308 (B)

Prevalence Index = B/A = 2.702

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index is ≤3.0*

☐ Problematic Hydrophytic Vegetation* (Explain)

*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 ☐ No

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

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ASIS Entrance City/County: Worcester Sampling Date: 4/20/2022
Applicant/Owner: NPS State: MD Sampling Point: WTP-3
Investigator(s): P. Sharpe, J. Chase Section, Township, Range: Berlin
Landform (hillslope, terrace, etc.): Coastal Local relief (concave, convex, none): CONVEX Slope (%): 1-2%
Subregion (LRR or MLRA): MLRA 149 Lat: 38.2104367 Long: 75.1527126 Datum: NAD83
Soil Map Unit Name: FxdA (Fox Hill Sand) NWI Classification: PEM1N/PSS1P

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

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "Normal Circumstances" present? ☒ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ 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:	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		☐ Surface Soil Cracks (B6)
☐ Surface Water (A1)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Sparsely Vegetated Concave Surface (B8)
☒ High Water Table (A2)	☐ Presence of Reduced Iron (C4)	☒ Drainage Patterns (B10)
☒ Saturation (A3)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Moss Trim Lines (B16)
☐ Water Marks (B1)	☐ Thin Muck Surface (C7)	☐ Dry-Season Water Table (C2)
☐ Sediment Deposits (B2)	☐ Other (Explain in Remarks)	☐ Crayfish Burrows (C8)
☐ Drift Deposits (B3)		☐ Saturation Visible on Aerial Imagery (C9)
☐ Algal Mat or Crust (B4)		☒ Geomorphic Position (D2)
☐ Iron Deposits (B5)		☐ Shallow Aquitard (D3)
☐ Inundation Visible on Aerial Imagery (B7)		☐ FAC-Neutral Test (D5)
☒ Water Stained Leaves (B9)		☐ Sphagnum Moss (D8) (LRR T, U)
☐ Aquatic Fauna (B13)		
☐ Marl Deposits (B15) (LRR U)		
☐ Hydrogen Sulfide Odor (C1)		
Field Observations:		
Surface Water Present? ☐ Yes ☐ No	Depth (inches): _____	Wetland Hydrology Present? ☐ Yes ☐ No
Water Table Present? ☐ Yes ☐ No	Depth (inches): _____	
Saturation Present? ☐ Yes ☐ No	Depth (inches): _____	
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP-3

Tree Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			☐ Yes ☐ No	
2.				
3.				
4.				
5.				
6.				
7.				
8.				
_____ = Total Cover 50% of total cover: _____ 20% of total cover: _____				
Sapling/Shrub Stratum (Plot size: _____)				
1.	<i>Morella cerifera</i>	87.5	☒ Yes ☐ No	FAC
2.			☐ Yes ☐ No	
3.				
4.				
5.				
6.				
7.				
8.				
_____ = Total Cover 50% of total cover: 43.75 20% of total cover: 17.5				
Herb Stratum (Plot size: _____)				
1.	<i>Phragmites australis</i>	37.5	☒ Yes ☐ No	FACW
2.	<i>Spartina patens</i>	37.5	☒ Yes ☐ No	FACW
3.	<i>Eleocharis acicularis</i>	7.5	☐ Yes ☐ No	OBL
4.			☐ Yes ☐ No	
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
_____ = Total Cover 50% of total cover: 41.25 20% of total cover: 16.5				
Woody Vine Stratum (Plot size: _____)				
1.			☐ Yes ☐ No	
2.				
3.				
4.				
5.				
_____ = Total Cover 50% of total cover: _____ 20% of total cover: _____				
Remarks: (If observed, list morphological adaptations below).				

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: 100.000 % (A/B)

Prevalence Index worksheet:
Total % Cover of: _____ Multiply by: _____
OBL species 7.5 x 1 = 7.5
FACW species 75 x 2 = 150
FAC species 87.5 x 3 = 262.5
FACU species 0 x 4 = 0
UPL species 0 x 5 = 0
Column Totals: 170 (A) 420 (B)
Prevalence Index = B/A = 2.471

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☒ 3 - Prevalence Index is ≤3.0*
☐ Problematic Hydrophytic Vegetation* (Explain)

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 ☐ No

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ASIS Entrance City/County: Worcester Sampling Date: 4/20/2022
 Applicant/Owner: NPS State: MD Sampling Point: WTP-4
 Investigator(s): P. Sharpe, J. Chase Section, Township, Range: Berlin
 Landform (hillslope, terrace, etc.): Coastal Local relief (concave, convex, none): CONVEX Slope (%): 2-5%
 Subregion (LRR or MLRA): MLRA-49 Lat: 38.2074459 Long: -75.1541879 Datum: NAD83
 Soil Map Unit Name: FxdA (Fox Hill Sand) NWI Classification: PSS1P

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

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "Normal Circumstances" present? ☒ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ 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:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☒ Surface Water (A1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☒ High Water Table (A2) ☐ Presence of Reduced Iron (C4) ☒ Saturation (A3) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Water Marks (B1) ☐ Thin Muck Surface (C7) ☐ Sediment Deposits (B2) ☐ Other (Explain in Remarks) ☐ Drift Deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☒ Water Stained Leaves (B9) ☐ Aquatic Fauna (B13) ☐ Marl Deposits (B15) (LRR U) ☐ Hydrogen Sulfide Odor (C1)		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) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum Moss (D8) (LRR T, U)
Field Observations: Surface Water Present? ☒ Yes ☐ No Depth (inches): 6.0 Water Table Present? ☒ Yes ☐ No Depth (inches): 0.0 Saturation Present? ☒ Yes ☐ No Depth (inches): 0.0 (includes capillary fringe)		Wetland Hydrology Present? ☒ Yes ☐ No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP-4

Tree Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Acer rubrum</i>	17.5	☒ Yes ☐ No	FAC
2.			☐ Yes ☐ No	
3.				
4.				
5.				
6.				
7.				
8.				
		17.5 = Total Cover		
		50% of total cover: 8.75	20% of total cover: 3.5	
Sapling/Shrub Stratum (Plot size: _____)				
1.	<i>Morella cerifera</i>	87.5	☒ Yes ☐ No	FAC
2.			☐ Yes ☐ No	
3.				
4.				
5.				
6.				
7.				
8.				
		87.5 = Total Cover		
		50% of total cover: 43.75	20% of total cover: 17.5	
Herb Stratum (Plot size: _____)				
1.	<i>Andropogon virginicus</i>	17.5	☒ Yes ☐ No	FAC
2.	<i>Juncus sp.</i>	7.5	☐ Yes ☒ No	
3.	<i>Agrostis sp.</i>	17.5	☒ Yes ☐ No	
4.			☐ Yes ☐ No	
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
		42.5 = Total Cover		
		50% of total cover: 21.25	20% of total cover: 8.5	
Woody Vine Stratum (Plot size: _____)				
1.	<i>Smilax rotundifolia</i>	37.5	☒ Yes ☐ No	FAC
2.			☐ Yes ☐ No	
3.				
4.				
5.				
		37.5 = Total Cover		
		50% of total cover: 18.75	20% of total cover: 7.5	
Remarks: (If observed, list morphological adaptations below).				
Due to the time of year we could not ID the <i>Agrostis</i> to species. We included it as a NI in the data section as a conservative measure and it's inclusion did not significantly affect the Wetland determination for this habitat.				

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: 80.000 % (A/B)

Prevalence Index worksheet:
Total % Cover of: Multiply by:
OBL species 0 x 1 = 0
FACW species 0 x 2 = 0
FAC species 160 x 3 = 480
FACU species 0 x 4 = 0
UPL species 0 x 5 = 0
Column Totals: 160 (A) 480 (B)
Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0*
☐ Problematic Hydrophytic Vegetation* (Explain)

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 ☐ No

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ASIS Entrance City/County: Worcester Sampling Date: 4/20/2022
Applicant/Owner: NPS State: MD Sampling Point: WTP-5
Investigator(s): P. Sharpe, J. Chase Section, Township, Range: Berlin
Landform (hillslope, terrace, etc.): Coastal Local relief (concave, convex, none): Concave Slope (%): 0-2%
Subregion (LRR or MLRA): MLRA-49 Lat: 38.2069317 Long: 75.1538719 Datum: NAD83
Soil Map Unit Name: FxdA (Fox Hill Sand) NWI Classification: PUB4R

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

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "Normal Circumstances" present? ☒ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ 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:	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
☒ Surface Water (A1)	☒ Oxidized Rhizospheres along Living Roots (C3)	☐ Surface Soil Cracks (B6)
☒ High Water Table (A2)	☐ Presence of Reduced Iron (C4)	☒ Sparsely Vegetated Concave Surface (B8)
☒ Saturation (A3)	☐ Recent Iron Reduction in Tilled Soils (C6)	☒ Drainage Patterns (B10)
☐ Water Marks (B1)	☐ Thin Muck Surface (C7)	☐ Moss Trim Lines (B16)
☐ Sediment Deposits (B2)	☐ Other (Explain in Remarks)	☐ Dry-Season Water Table (C2)
☐ Drift Deposits (B3)		☐ Crayfish Burrows (C8)
☐ Algal Mat or Crust (B4)		☐ Saturation Visible on Aerial Imagery (C9)
☐ Iron Deposits (B5)		☒ Geomorphic Position (D2)
☐ Inundation Visible on Aerial Imagery (B7)		☐ Shallow Aquitard (D3)
☒ Water Stained Leaves (B9)		☐ FAC-Neutral Test (D5)
☐ Aquatic Fauna (B13)		☐ Sphagnum Moss (D8) (LRR T, U)
☐ Marl Deposits (B15) (LRR U)		
☐ Hydrogen Sulfide Odor (C1)		
Field Observations:		
Surface Water Present? ☒ Yes ☐ No	Depth (inches): 1-2	Wetland Hydrology Present? ☒ Yes ☐ No
Water Table Present? ☒ Yes ☐ No	Depth (inches): 0.0	
Saturation Present? ☒ Yes ☐ No	Depth (inches): 0.0	
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP-5

Tree Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			☐ Yes ☐ No	
2.				
3.				
4.				
5.				
6.				
7.				
8.				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling/Shrub Stratum (Plot size: _____)				
1.			☐ Yes ☐ No	
2.				
3.				
4.				
5.				
6.				
7.				
8.				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: _____)				
1.	<i>Huperzia lucidula</i>	87.5	☒ Yes ☐ No	FACW
2.			☐ Yes ☐ No	
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
_____ = Total Cover				
50% of total cover: 43.75 20% of total cover: 17.5				
Woody Vine Stratum (Plot size: _____)				
1.			☐ Yes ☐ No	
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: 100.000 % (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				
☒ 2 - Dominance Test is >50%				
☐ 3 - Prevalence Index is ≤3.0*				
☐ Problematic Hydrophytic Vegetation* (Explain)				
*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 ☐ No				
Remarks: (If observed, list morphological adaptations below).				
Unable to ID the Sphagnum moss definitely to species within the sparsely vegetated concave surface. We believe this is likely a Wetland herb based on strong soils and hydrology information collected at the time of this investigation. Our best guess in April was <i>Huperzia lucidula</i> (FACW).				

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ASIS Entrance City/County: Worcester Sampling Date: 4/20/2022
 Applicant/Owner: NPS State: MD Sampling Point: UTP-1/2
 Investigator(s): P. Sharpe, J. Chase Section, Township, Range: Berlin
 Landform (hillslope, terrace, etc.): Coastal Local relief (concave, convex, none): CONVEX Slope (%): 1%
 Subregion (LRR or MLRA): MLRA 149 Lat: 38.209483 Long: -75.151522 Datum: NAD83
 Soil Map Unit Name: AcC (Acquango Sand) NWI Classification: NA

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

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "Normal Circumstances" present? ☒ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ 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 Hydric Soil Present? ☐ Yes ☒ No Wetland Hydrology Present? ☐ Yes ☒ No	Is the Sampled Area within a Wetland? ☐ Yes ☒ No
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☐ High Water Table (A2) ☐ Presence of Reduced Iron (C4) ☐ Saturation (A3) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Water Marks (B1) ☐ Thin Muck Surface (C7) ☐ Sediment Deposits (B2) ☐ Other (Explain in Remarks) ☐ Drift Deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water Stained Leaves (B9) ☐ Aquatic Fauna (B13) ☐ Marl Deposits (B15) (LRR U) ☐ Hydrogen Sulfide Odor (C1)		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) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum Moss (D8) (LRR T, U)
Field Observations: Surface Water Present? ☐ Yes ☒ No Depth (inches): _____ Water Table Present? ☐ Yes ☒ No Depth (inches): _____ Saturation Present? ☐ Yes ☒ No Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? ☐ Yes ☒ No	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UTP-1/2

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Pinus taeda</i>	37.5	☒ Yes ☐ No	FAC
2. _____		☐ Yes ☐ No	
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

37.5 = Total Cover
50% of total cover: 18.75 20% of total cover: 7.5

Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____		☐ Yes ☐ No	
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Andropogon virginicus</i>	17.5	☒ Yes ☐ No	FAC
2. <i>Phragmites australis</i>	7.5	☒ Yes ☐ No	FACW
3. <i>Pinus taeda</i> (seedlings)	1.5	☐ Yes ☐ No	FAC
4. _____		☐ Yes ☐ No	
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

26.5 = Total Cover
50% of total cover: 13.25 20% of total cover: 5.3

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____		☐ Yes ☐ No	
2. _____			
3. _____			
4. _____			
5. _____			

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

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

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: 100.000 % (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species 0 x 1 = 0

FACW species 7.5 x 2 = 15

FAC species 56.5 x 3 = 169.5

FACU species 0 x 4 = 0

UPL species 0 x 5 = 0

Column Totals: 64 (A) 184.5 (B)

Prevalence Index = B/A = 2.883

Hydrophytic Vegetation Indicators:

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

*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 ☐ No

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ASIS Entrance City/County: Worcester Sampling Date: 4/20/2022
Applicant/Owner: NPS State: MD Sampling Point: UTP - 3/4/5
Investigator(s): P. Sharpe, J. Chase Section, Township, Range: Berlin
Landform (hillslope, terrace, etc.): Coastal Local relief (concave, convex, none): CONVEX Slope (%): 0-5%
Subregion (LRR or MLRA): MLRA 149 Lat: 38.2073109 Long: -75.1544094 Datum: NAD83
Soil Map Unit Name: AcC (Acquango Sand) NWI Classification: NA

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

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "Normal Circumstances" present? ☒ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ 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:	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
☐ Surface Water (A1)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Presence of Reduced Iron (C4)	☐ Sparsely Vegetated Concave Surface (B8)	
☐ Saturation (A3)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Drainage Patterns (B10)	
☐ Water Marks (B1)	☐ Thin Muck Surface (C7)	☐ Moss Trim Lines (B16)	
☐ Sediment Deposits (B2)	☐ Other (Explain in Remarks)	☐ Dry-Season Water Table (C2)	
☐ Drift Deposits (B3)		☐ Crayfish Burrows (C8)	
☐ Algal Mat or Crust (B4)		☐ Saturation Visible on Aerial Imagery (C9)	
☐ Iron Deposits (B5)		☐ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)		☐ Shallow Aquitard (D3)	
☐ Water Stained Leaves (B9)		☐ FAC-Neutral Test (D5)	
☐ Aquatic Fauna (B13)		☐ Sphagnum Moss (D8) (LRR T, U)	
☐ Marl Deposits (B15) (LRR U)			
☐ Hydrogen Sulfide Odor (C1)			
Field Observations:			
Surface Water Present? ☐ Yes ☒ No	Depth (inches): _____	Wetland Hydrology Present? ☐ Yes ☒ No	
Water Table Present? ☐ Yes ☒ No	Depth (inches): _____		
Saturation Present? ☐ Yes ☒ No	Depth (inches): _____		
(includes capillary fringe)			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UTP -

Tree Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Pinus taeda</i>	67.5	☒ Yes ☐ No	FAC
2.			☐ Yes ☐ No	
3.				
4.				
5.				
6.				
7.				
8.				

67.5 = Total Cover
50% of total cover: 33.75 20% of total cover: 13.5

Sapling/Shrub Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			☐ Yes ☐ No	
2.				
3.				
4.				
5.				
6.				
7.				
8.				

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

Herb Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Smilax rotundifolia</i>	7.5	☒ Yes ☐ No	FAC
2.			☐ Yes ☐ No	
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				

7.5 = Total Cover
50% of total cover: 3.75 20% of total cover: 1.5

Woody Vine Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			☐ Yes ☐ No	
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: 100.000 % (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species 0 x 1 = 0
 FACW species 0 x 2 = 0
 FAC species 75 x 3 = 225
 FACU species 0 x 4 = 0
 UPL species 0 x 5 = 0
 Column Totals: 75 (A) 225 (B)
 Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0*
☐ Problematic Hydrophytic Vegetation* (Explain)

*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 ☐ No

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

Sampling Point: UTP -