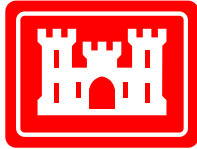


APPENDIX D: WETLAND DELINEATION REPORT

**Wetland Delineation Report
Barren Island
Dorchester County, Maryland**



Prepared for:

**Maryland Port Administration
401 E. Pratt Street
Baltimore, MD 21202**

Prepared by:

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Baltimore District, Planning Division
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Baltimore, Maryland 21201**

November 2020

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- Figure 4: USDA-NRCS Soil Survey
- Figure 5: FEMA Floodplain
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Appendix C: Routine Wetland Data Forms

Appendix D: Cowardin Classification Key

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1.0 INTRODUCTION

1.1 STUDY PURPOSE

The U.S. Army Corps of Engineers (USACE), Baltimore District, Planning Division prepared this report at the request of the Maryland Port Authority (MPA) to provide wetland delineation support and findings for the northern and southern extents of Barren Island, Dorchester County, Maryland. This delineation is one part of the comprehensive Mid-Chesapeake Bay Island (Mid-Bay Island) Ecosystem Restoration project which includes restorations to Barren and James Islands. The overall goal of the project is to restore and expand hundreds of acres of wetland and terrestrial habitat for native wildlife through the use of dredged material from the Baltimore Harbor.

To support environmental permitting associated with this effort, a site visit was conducted and a routine wetland delineation of the two extents was performed in accordance with the 1987 *Corps of Engineers Wetland Delineation Manual* and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)*.

1.2 STUDY AREA

The study area is the entire northern and southern extents of the island (Figure 1, Appendix A). The northern extent contains mostly low and high-marsh land along the perimeter of the island, with some upland forested land within the interior and eastern portions of the island. The southern extent contains a mosaic of wetlands and upland forest land intersected by man-made berms and an abundance of downed trees throughout. The entire study area is within the MDE 8-digit Honga River watershed (02130401) and USGS 8-digit Choptank Watershed (02060005).

2.0 METHODS

2.1 DATA COLLECTION AND ANALYSIS

Wetland information and GIS data were collected from various sources for preliminary analysis and identification of wetland areas on Barren Island. Additionally, U.S. Geological Survey (USGS) topographic quadrangles (USGS, 2019), U.S. Department of Agriculture (USDA) web soil survey (USDA, 2020), and U.S. Fish and Wildlife Service's (USFWS) National Wetland Inventory (NWI) on-line maps (USFWS, 2020) were accessed. The results of the delineation and data compilation are presented in Figures 3 through 6, Appendix A.

2.2 WETLAND DELINEATION

The wetland delineation was performed pursuant to the 1987 *Corps of Engineers Wetland Delineation Manual* and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*. The delineation field work was conducted on September 23, 2020 by a team of biologists from USACE, Baltimore District, Planning Division. The September 2020 field visit was used as a preliminary site investigation for

biologists to walk the boundary of the islands and understand the landscape. Photographs were taken throughout the investigation and can be found in Appendix B.

2.3 GLOBAL POSITIONING SYSTEM (GPS) METHODOLOGY

The field survey was completed using the handheld Global Positioning System (GPS). The objective of the GPS survey was to collect location data for each upland boundary. This survey horizontally references the North American Datum of 1983 (NAD83). This data was then transferred into ArcGIS for analysis and mapping.

3.0 FINDINGS

3.1 GENERAL WETLAND FINDINGS

Wetlands are defined by the presence of three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. Methods for determining if each of the three parameters met are described in the 1987 *Corps of Engineers Wetland Delineation Manual* and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (Version 2.0).

3.1.1 VEGETATION

For purposes of wetland delineation, many plants are assigned an indicator status (Table 3-1) by the United States Fish and Wildlife Service (USFWS) which is used to determine the probability of that species occurrence in wetlands. No plant species observed on the site are listed as rare, threatened, or endangered at either a federal or state level.

Table 3-1. Plant Indicator Status

Indicator Status	Abbreviation	% Chance of Occurrence in Wetlands
Obligate species – occur almost always in wetlands under natural conditions.	OBL	99
Facultative Wetland species – usually occur in wetlands but occasionally found in non-wetlands.	FACW	67-99
Facultative species – equally likely to occur in wetlands and non-wetlands.	FAC	34-66
Facultative Upland Species – Usually occur in non-wetlands but occasionally found in wetlands.	FACU	1-33
Upland species – occur almost always in non-wetlands under natural conditions in the regions specified. May occur in wetlands in another region.	UPL	1

USFWS, 2012

3.1.2 GENERAL SOIL CHARACTERISTICS

The USDA Natural Resources Conservation Service (NRCS) web soil survey (USDA, 2020) identifies six (6) soil series within the study area which are shown in Table 3.2 (see Figure 4, Appendix A). Elkton silt loam, Honga peat, and Sunken mucky silt loam are listed as hydric.

Table 3-2. Soils at Barren Island

Soil Name	Map Symbol	Drainage Class	Hydric Rating
Elkton Silt Loam, 0 to 2 percent slopes	EmA	Poorly Drained	Hydric
Honga peat, very frequently flooded, tidal	Ho	Very Poorly Drained	Hydric
Mattapex silt loam, 0 to 2 percent slopes, Northern Tidewater Area	MtdA	Moderately Well Drained	Predominantly Non-hydric
Mattapex silt loam, 2 to 5 percent slopes, Northern Tidewater Area	MtdB	Moderately Well Drained	Predominantly Non-hydric
Sunken mucky silt loam, 0 to 2 percent slopes, occasionally flooded, tidal	SuA	Very Poorly Drained	Hydric
Udorthents, loamy, 0 to 5 percent slopes	UzB	N/A	Not Hydric

3.1.3 HYDROLOGY

Evidence of wetland hydrology was observed throughout both extents during the site investigation, and included surface water, high water table, saturation, drift deposits, inundation visible on aerial imagery, aquatic fauna, hydrogen sulfide odor, drainage patterns, crayfish burrows, and geomorphic position.

3.2 WATERWAYS

Waterways were identified on both extents of Barren Island. Most of the waterways on the southern extent appear to be formed by man-made berms and impoundments. The waterways located on the northern extent appear more naturally formed and tidally influenced. All waterways observed appear to be perennial given the time of year the site investigation occurred.

3.3 WETLANDS

Barren Island is dominated by estuarine and palustrine wetlands within the northern and southern extents, with the exception of man-made berms and small upland plateaus and inclusions scattered throughout. The northern extent is comprised totally of estuarine systems, ranging from estuarine, intertidal, emergent (E2EM), estuarine, intertidal, forested (E2FO), and estuarine, unconsolidated shore (EUS). The southern extent follows similar characteristics but contains more palustrine emergent (PEM) and estuarine, intertidal, scrub-shrub (E2SS) systems within the northern and central portions of the island.

Wetland classifications were determined by ground observations, 2019 aerial imagery, and LIDAR. The northern extent of Barren Island consists of low marsh and high marsh areas. The

vegetation that dominates these wetland areas are consistent with estuarine systems and predominantly encompass saltgrass (*Distichlis spicata*), smooth cordgrass (*Spartina alterniflora*), soft rush (*Juncus effusus*), black needlerush (*Juncus roemerianus*), common reed (*Phragmites australis*), and in areas of less inundation, loblolly pine (*Pinus taeda*). A large upland area is located within the interior of the island and is dominated by loblolly pine. The understory is relatively sparse due to the amount of acidic pine needles that are shed by the trees.

The southern extent of Barren Island contains severe erosion around the west to northwest side of the island and exhibits less low/high marsh areas compared to the northern extent. The interior of the island contains areas of dense greenbriar (*Smilax rotundifolia*), common reed, Japanese stiltgrass (*Microstegium vimineum*), and common persimmon (*Diospyros virginiana*). The western side of the southern extent lacks vegetation due to constant wave energy. The eastern side of the southern extent experiences less wave energy but experiences similar vegetation as seen within the interior of the island. A map of the wetlands delineated on the site are shown in Figures 6A and 6B, Appendix A.

4.0 CONCLUSIONS

Several wetlands and waterways were identified and were field or desktop delineated by USACE, Baltimore District, Planning Division. The delineation was performed on September 23, 2020. The jurisdiction of the waterways and wetlands in this report have not been verified by USACE Regulatory and/or Maryland Department of the Environment (MDE).

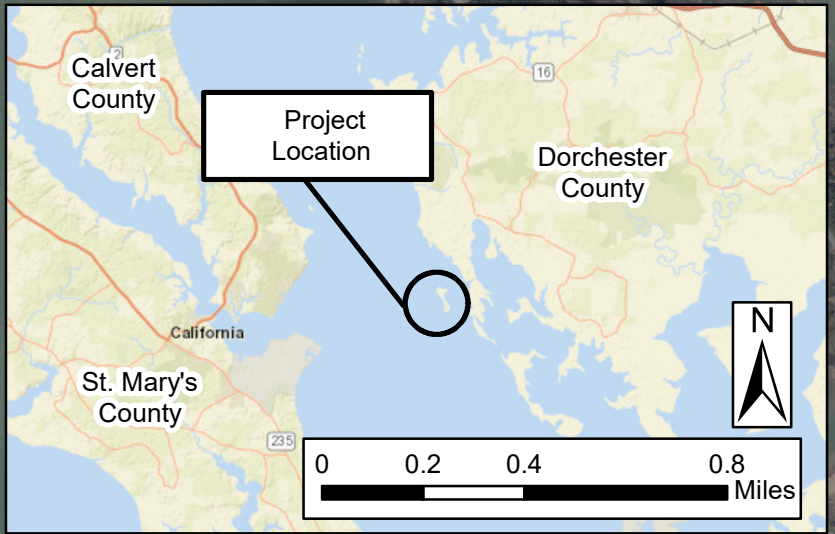
Any proposed impacts to the wetlands described in this report will require coordination with USACE, Baltimore District, Operations Division, Regulatory Branch, and MDE, specifically in regards to potential permitting actions within Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and all other potential permitting actions issued through USACE.

5.0 REFERENCES

- Cowardin, L. M., V. Carter, F. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deep-Water Habitats of the United States. United States Fish and Wildlife Service, Washington DC.
- Maryland Department of the Environment (MDE). 2005. "Maryland's 8-Digit Watersheds." <http://www.mde.state.md.us/programs/Water/TMDL/DataCenter/Pages/8DigitWatershed.aspx>. Accessed November 18, 2020.
- MD iMAP Services. 2020. "Imagery/MD_SixInchImagery". <http://geodata.md.gov/imap/services>. Accessed November 18, 2020.
- Munsell Color. 1992. Munsell Color Charts – 1992 Revised Edition. Kollmorgen Corporation. Baltimore, MD.
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service. 2020. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>.
- USDA Natural Resources Conservation Service. 2016. National Plants Database, available at <http://plants.usda.gov/index.html>
- U.S. Army Corps of Engineers. 2016. Atlantic and Gulf Coastal Plain 2016 Regional Wetland Plant List. http://wetlands_plants.usace.army.mil/
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings.
- U.S. Department of the Army, Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Final Report. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station. St. Petersburg, FL.
- U.S. Department of the Army, Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0). Technical Report 10-20. U.S. Army Engineer Research and Development Center. Vicksburg, MS.
- U.S. Fish and Wildlife Service. 2020. Wetlands Mapper. National Wetlands Inventory, Conterminous 48 States. Washington, D.C.
- U.S. Geological Survey (USGS). 2019. "USGS 7.5' X 7.5' Quadrangle for Barren Island, MD". <https://ngmdb.usgs.gov>. Accessed November 18, 2020.

APPENDIX A

Figures



Chesapeake Bay

Barren Island

Tar Bay

Hoopers Island



Mid-Bay Island Ecosystem Restoration (Barren Island)
Dorchester County, Maryland

Figure 1:
Vicinity Map

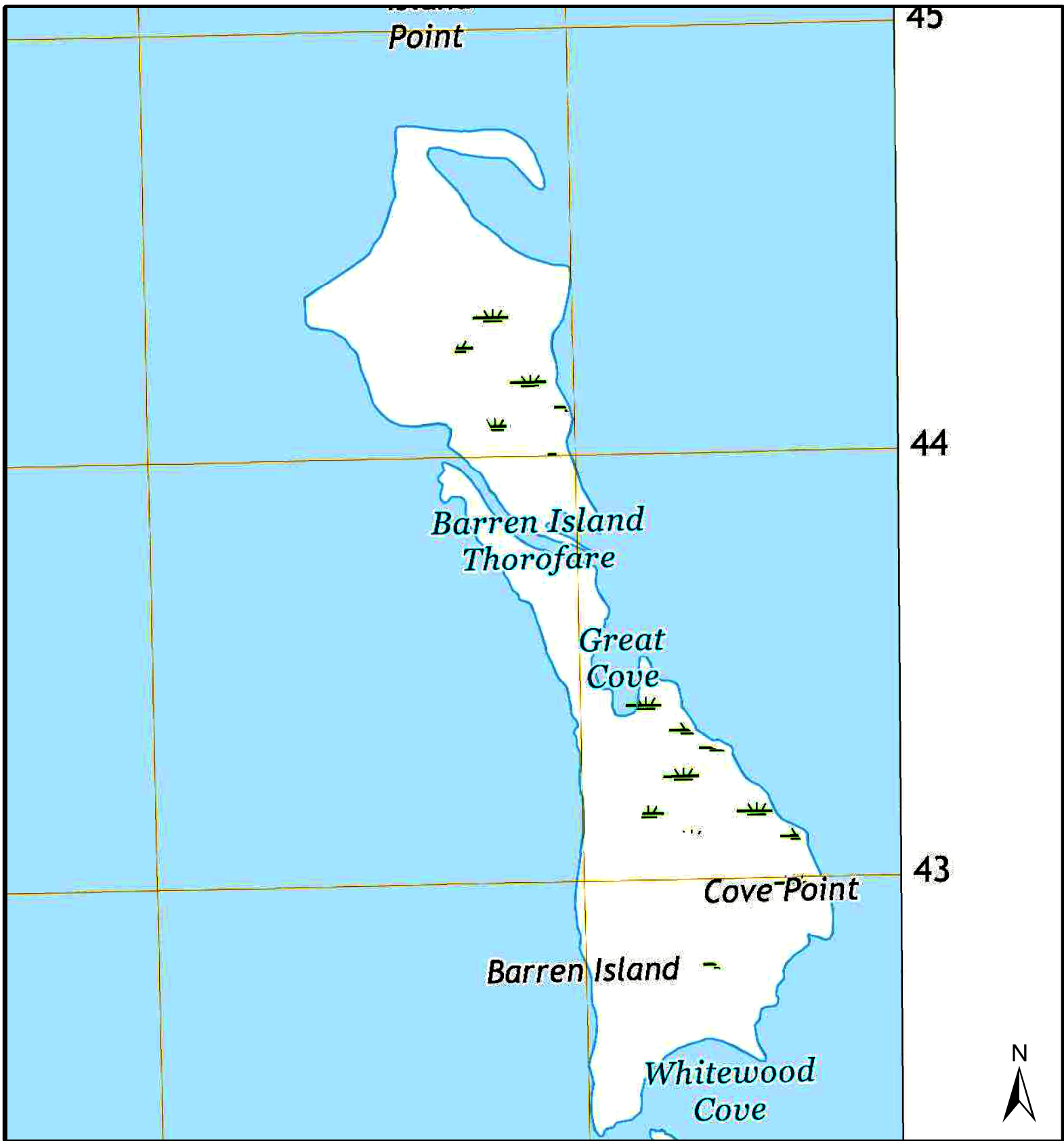


**US Army Corps of Engineers
Baltimore District**



1 inch = 2,000 feet

Source: ESRI/MD iMap
Date: November 2020

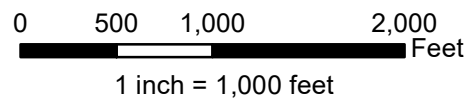


Mid-Bay Island Ecosystem Restoration (Barren Island)
Dorchester County, Maryland

Figure 2:
Barren Island
2019 Quadrangle



US Army Corps of Engineers
Baltimore District






Source: USGS Date: November 2020

Legend

NWI/MD DNR Wetlands

Type

-  Estuarine
-  Palustrine
-  Riverine

Chesapeake Bay

Barren Island

Tar Bay

No wetlands of Special State Concern were identified within the NWI/MD DNR database.



Mid-Bay Island Ecosystem Restoration (Barren Island) Dorchester County, Maryland

Figure 3:
National Wetlands
Inventory/ MD DNR
Wetlands



US Army Corps of Engineers
Baltimore District

0 750 1,500 3,000
Feet

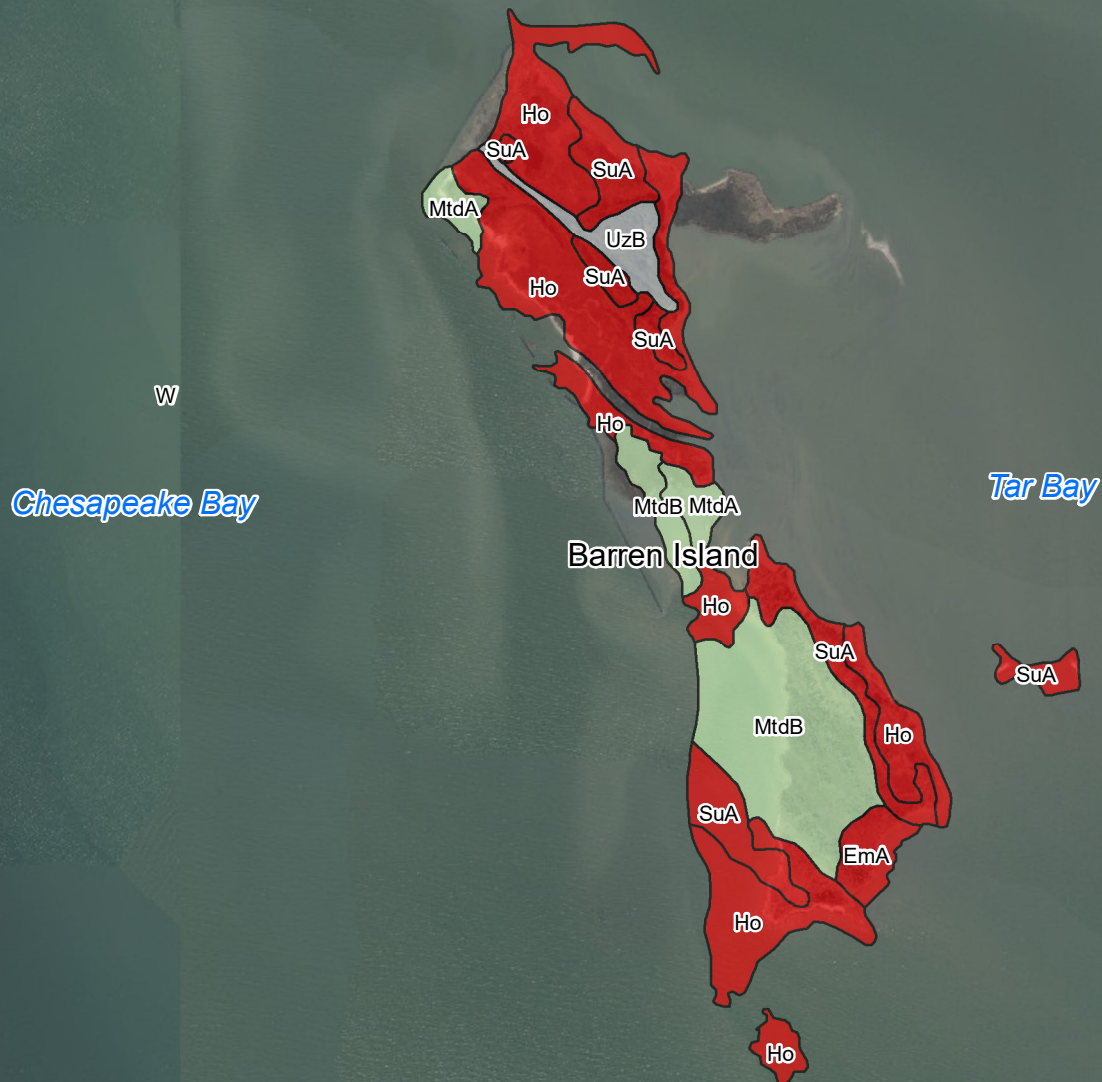
1 inch = 1,500 feet
Source: NWI/MD DNR
Date: November 2020

Legend

Hydric Rating

- Hydric
- Predominately Non-Hydric
- Not Hydric

Soils Classification			
Map Unit Symbol	Map Unit Name	Hydric Rating	K-Factor
EmA	Elkton silt loam, 0 to 2 percent slopes	Hydric	N/A
Ho	Honga peat, very frequently flooded, tidal	Hydric	N/A
MtdA	Mattapex silt loam, 0 to 2 percent slopes, Northern Tidewater Area	Predominately Non-Hydric	0.49
MtdB	Mattapex silt loam, 0 to 2 percent slopes, Northern Tidewater Area	Predominately Non-Hydric	0.49
SuA	Sunken mucky silt loam, 0 to 2 percent slopes, occasionally flooded, tidal	Hydric	N/A
UzB	Udortheents, loamy, 0 to 5 percent slopes	Not Hydric	0.37



Mid-Bay Island Ecosystem Restoration (Barren Island) Dorchester County, Maryland

Figure 4:
USDA-NRCS
Soil Survey



**US Army Corps of Engineers
Baltimore District**

0 750 1,500 3,000
Feet

1 inch = 1,500 feet

Source: USDA-NRCS
Date: November 2020

Legend

 100-Year Effective Floodplain



**Mid-Bay Island Ecosystem Restoration (Barren Island)
Dorchester County, Maryland**

Figure 5:
FEMA Floodplain

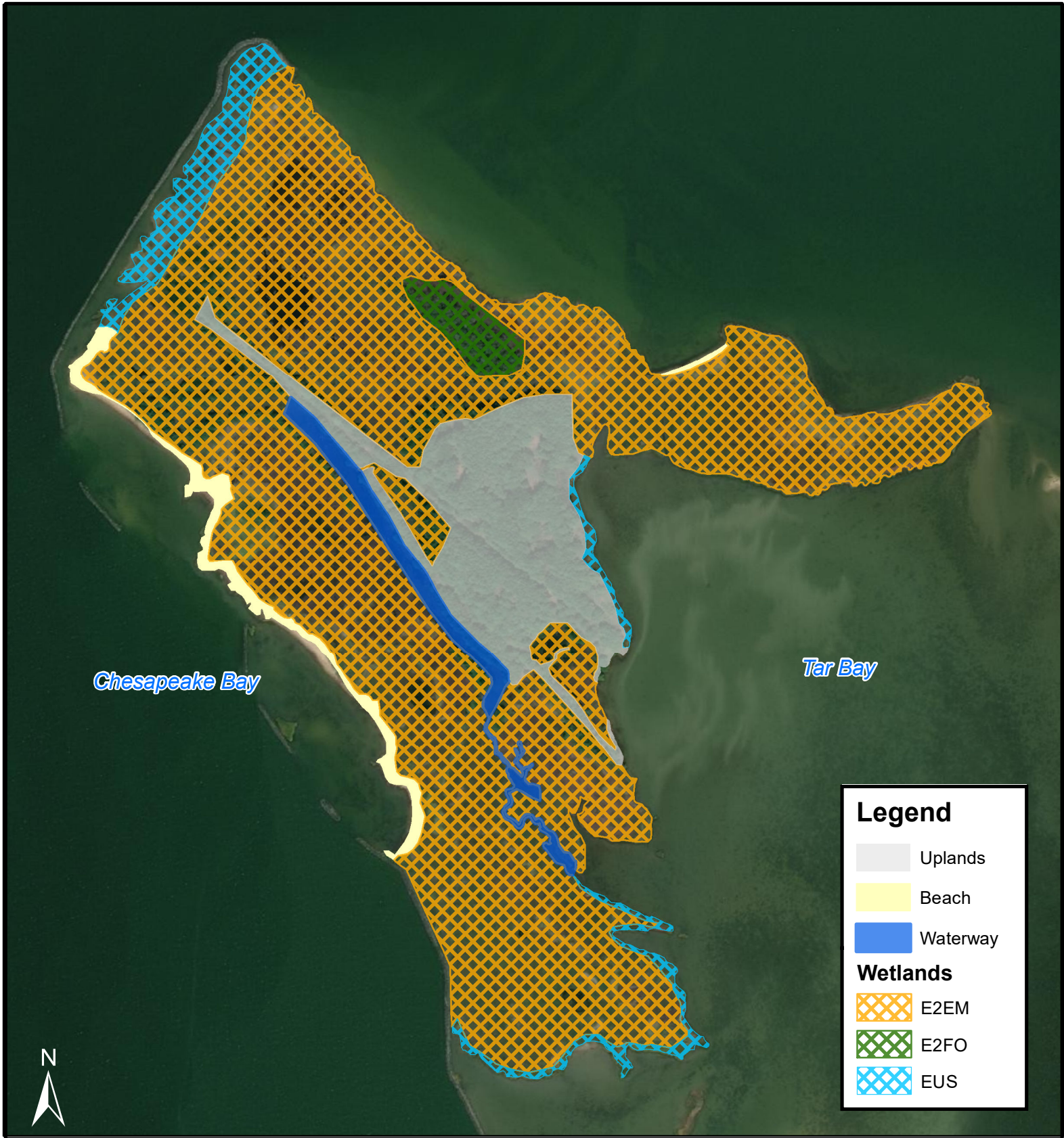


**US Army Corps of Engineers
Baltimore District**

0 750 1,500 3,000 Feet

1 inch = 1,500 feet

Source: FEMA
Date: November 2020

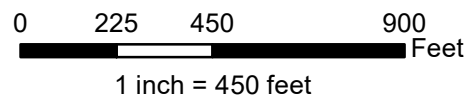


Mid-Bay Island Ecosystem Restoration (Barren Island)
Dorchester County, Maryland

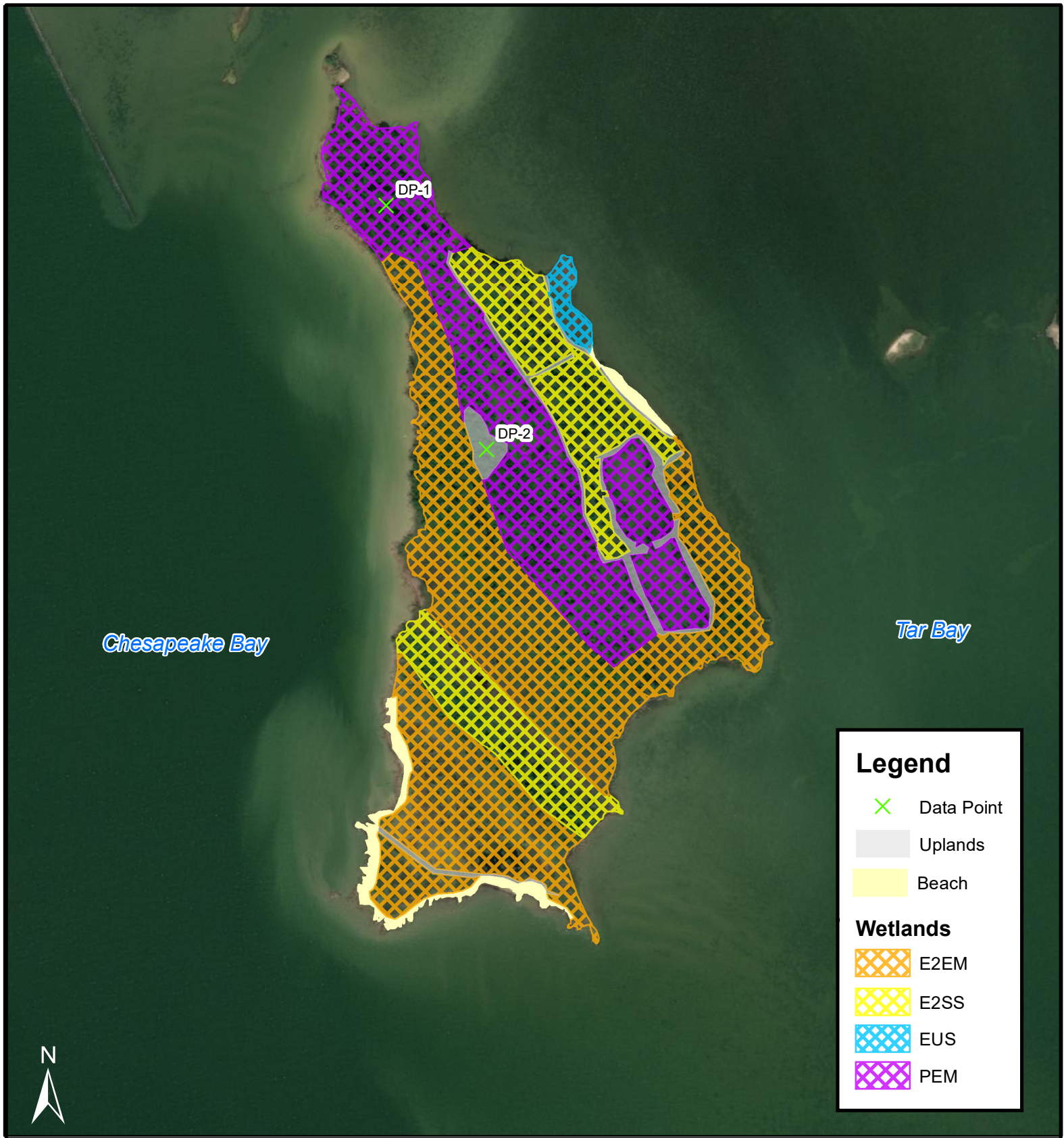
Figure 6A:
Northern Extent
Delineated Resources



US Army Corps of Engineers
Baltimore District



Source: MD iMap Date: February 2021

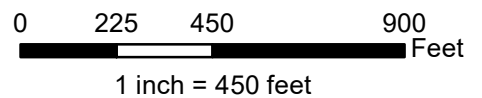


Mid-Bay Island Ecosystem Restoration (Barren Island)
Dorchester County, Maryland

Figure 6B:
Southern Extent
Delineated Resources



US Army Corps of Engineers
Baltimore District



Source: MD iMap Date: February 2020

APPENDIX B
Photograph Documentation

Barren Island Photo Log

Southern Extent



1) Data Point 1 facing east



2) Data Point 2 facing south



3) Wetland-Upland Transition Area on east side of island, facing southeast



4) Shoreline along eastern portion of island, facing northwest



5) Wetland features in northern-center portion of island, facing west



6) Wetland features in northern-center portion of island, facing south



7) *Phragmites australis* and climbing ivy in northeast portion of island, facing southwest



8) Shoreline on western portion of island, facing south



9) Shoreline on western portion of island, facing west

Northern Extent



10) Tidal marsh along southwestern portion of island, facing south



11) Tidal marsh along southwestern portion of island, facing east



12) Tidal marsh along southwestern portion of island, facing north



13) Tidal marsh along southwestern portion of island, facing south



14) Open water feature in northern portion of island, facing east



15) Upland berm intersecting middle of island, facing northwest



16) Tidal wetland and open water features in northern portion of island, facing northwest



17) Tidal wetland in eastern portion of island, facing east



18) Upland area adjacent to tidal marsh in northern portion of island



19) Box Turtle



20) Fiddler Crab



21) Bald Eagle nest located on eastern side of northern extent

APPENDIX C
Routine Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Barren Island (Southern Extent) City/County: Dorchester Sampling Date: 23-Sept-2020
 Applicant/Owner: Maryland Port Administration State: MD Sampling Point: DP-1
 Investigator(s): D. Cockerham, C. Johnson Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 2
 Subregion (LRR or MLRA): MLRA 153D Lat: 38.331787 Long: -76.256422 Datum: NAD83
 Soil Map Unit Name: SuA - Sunken mucky silt loam, 0 to 2 percent slopes, occasionally flooded, tidal NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Data point 1 is taken within the northern tip of the southern extent. Hydrology is minimal but present in the form of saturation within the soil test pit. The sample plot is dominated by saltmarsh hay.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <table style="width: 100%; border: none;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)																															
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)																															
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)																															
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)																															
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)																															
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)																															
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<input type="checkbox"/> FAC-Neutral Test (D5)																																
<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)																																
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>10</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																															
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks:																																

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

Sampling Point: DP - 1

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>20'</u> radius)				
1. <u><i>Prunus serotina</i></u>	5	Yes	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
5 = Total Cover				
50% of total cover: <u>2.5</u>		20% of total cover: <u>1</u>		
Sapling/Shrub Stratum (Plot size: <u>20'</u> radius)				
1. <u><i>Diospyros virginiana</i></u>	15	Yes	FAC	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species <u>80</u> x 2 = <u>160</u> FAC species <u>15</u> x 3 = <u>45</u> FACU species <u>10</u> x 4 = <u>40</u> UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = <u>245/105 = 2.3</u>
2. <u><i>Viburnum prunifolium</i></u>	5	Yes	FACU	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
20 = Total Cover				
50% of total cover: <u>10</u>		20% of total cover: <u>4</u>		
Herb Stratum (Plot size: <u>10'</u> radius)				
1. <u><i>Spartina patens</i></u>	80	Yes	FACW	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u><i>Iva annua</i></u>	5	No	FAC	
3. <u><i>Phragmites australis</i></u>	10	No	FACW	
4. <u><i>Panicum virgatum</i></u>	10	No	FAC	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
110 = Total Cover				
50% of total cover: <u>55</u>		20% of total cover: <u>22</u>		
Woody Vine Stratum (Plot size: <u>20'</u> radius)				
1. _____				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.
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
50% of total cover: _____		20% of total cover: _____		
Remarks: (If observed, list morphological adaptations below).				Hydrophytic Vegetation Present? Yes <u>X</u> No _____

SOIL

Sampling Point: DP - 1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - .5	10YR 2/1	90	7.5YR 3/4	10	C	PL	Loam	
.5 - 3	10YR 3/2	100					Silt Loam	
3-10	10YR 4/3	100					Clay Loam	
10-12	10YR 5/4	100					Clay Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: 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 Soils³:

- 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Barren Island (Southern Extent) City/County: Dorchester Sampling Date: 23-Sept-2020
 Applicant/Owner: Maryland Port Administration State: MD Sampling Point: DP-2
 Investigator(s): D. Cockerham, C. Johnson Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 1
 Subregion (LRR or MLRA): MLRA 153D Lat: 38.331787 Long: -76.256422 Datum: NAD83
 Soil Map Unit Name: MtdB- Mattapex silt loam, 2 to 5 percent slopes, Northern Tidewater Area NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Data point 2 is taken within the central interior of the southern extent.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <table style="width:100%; border: none;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input type="checkbox"/> FAC-Neutral Test (D5)</td></tr> <tr><td><input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)</td></tr> </table>	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)																															
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)																															
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)																															
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)																															
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)																															
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)																															
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)																															
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)																															
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)																																
<input type="checkbox"/> Water-Stained Leaves (B9)																																
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<input type="checkbox"/> FAC-Neutral Test (D5)																																
<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)																																
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>																															
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																
Remarks:																																

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

Sampling Point: DP - 2

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>20'</u> radius)				
1. <u><i>Diospyros virginiana</i></u>	10	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83</u> (A/B)
2. <u><i>Pinus taeda</i></u>	15	Yes	FAC	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
<u>25</u> = Total Cover				
50% of total cover: <u>12.5</u>		20% of total cover: <u>5</u>		
Sapling/Shrub Stratum (Plot size: <u>20'</u> radius)				
1. <u><i>Diospyros virginiana</i></u>	15	Yes	FAC	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 = _____
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
<u>15</u> = Total Cover				
50% of total cover: <u>7.5</u>		20% of total cover: <u>3</u>		
Herb Stratum (Plot size: <u>10'</u> radius)				
1. <u><i>Microstegium vimineum</i></u>	20	Yes	FAC	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u><i>Setaria pumila</i></u>	50	Yes	FAC	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
<u>70</u> = Total Cover				
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>		
Woody Vine Stratum (Plot size: <u>20'</u> radius)				
1. <u><i>Lonicera japonica</i></u>	15	Yes	FACU	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.
2. _____				
3. _____				
4. _____				
5. _____				
<u>15</u> = Total Cover				
50% of total cover: <u>7.5</u>		20% of total cover: <u>3</u>		
Hydrophytic Vegetation Present?				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: (If observed, list morphological adaptations below).				

SOIL

Sampling Point: DP - 2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - .5	10YR 3/4	100					Loam	
.5 - 8	10YR 4/3	100					Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: 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 Soils³:

- 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)

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

Restrictive Layer (if observed):

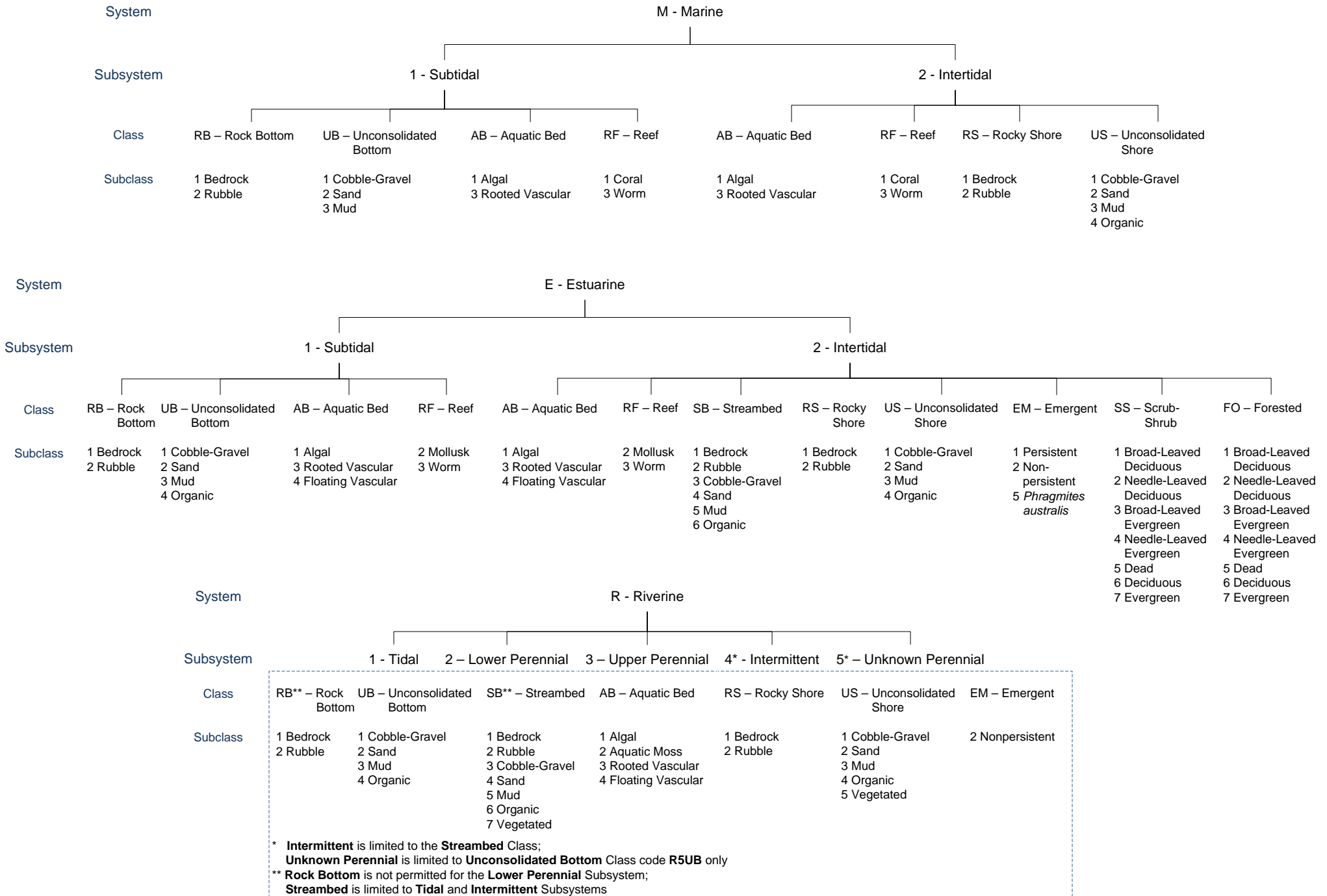
Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

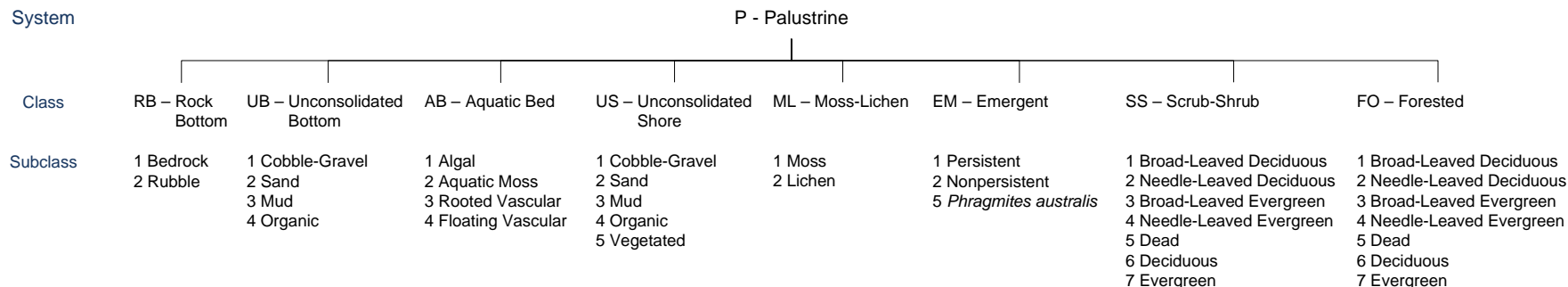
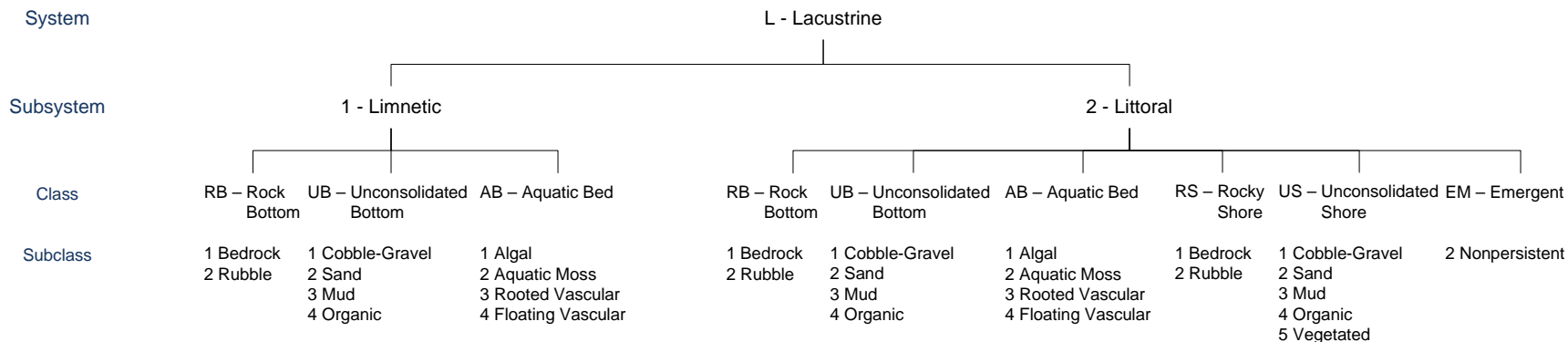
Remarks:

APPENDIX D
Cowardin Classification Key

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION



WETLANDS AND DEEPWATER HABITATS CLASSIFICATION



MODIFIERS							
In order to more adequately describe the wetland and deepwater habitats, one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.							
Water Regime			Special Modifiers	Water Chemistry			Soil
Nontidal	Saltwater Tidal	Freshwater Tidal		Coastal Halinity	Inland Salinity	pH Modifiers for all Fresh Water	
A Temporarily Flooded	L Subtidal	S Temporarily Flooded-Tidal	b Beaver	1 Hyperhaline	7 Hypersaline	a Acid	g Organic
B Saturated	M Irregularly Exposed	R Seasonally Flooded-Tidal	d Partly Drained/Ditched	2 Euhaline	8 Eusaline	t Circumneutral	n Mineral
C Seasonally Flooded	N Regularly Flooded	T Semipermanently Flooded-Tidal	f Farmed	3 Mixohaline (Brackish)	9 Mixosaline	i Alkaline	
E Seasonally Flooded/ Saturated	P Irregularly Flooded	V Permanently Flooded-Tidal	h Diked/Impounded	4 Polyhaline	0 Fresh		
F Semipermanently Flooded			r Artificial	5 Mesohaline			
G Intermittently Exposed			s Spoil	6 Oligohaline			
H Permanently Flooded			x Excavated	0 Fresh			
J Intermittently Flooded							
K Artificially Flooded							