Middlesex Interceptor System Program Phase II (MP013710, MP013720 and MP013730/ C-515663G)

Draft

Environmental Assessment

Prepared For:

HRSD

Cleaning wastewater every day for a better Bay.

By:

Kimley»Horn

4525 Main Street
Suite 1000
Virginia Beach, VA 23462

TETRA TECH

4433 Corporation Lane
Suite 300
Virginia Beach, VA 23462

August 17, 2022

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Acronyms

°C	degrees Celsius
°F	degrees Fahrenheit
AADT	Annual Average Daily Traffic
ACAM	Air Conformity Applicability Model
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos Containing Material
AOC	Area of Concern
APE	Area of Potential Effect
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CWA	Clean Water Act
dB	decibels
DIP	ductile iron pipe
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EM	Electromagnetic
EPA	Environmental Protection Agency
EO	Executive Order
FEMA	Federal Emergency Management Agency
FS	Feasibility Study
GHG	Greenhouse gas
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
HDD	Horizontal Directional Drilling
HRSD	Hampton Roads Sanitation District

IDP	Installation Development Plan
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
JPA	Joint Permit Application
LBP	Lead-Based Paint
LCP	Lead Containing Paint
LOD	Limits of Disturbance
LOS	Level of service
Mini-HDD	Mini-Horizontal Directional Drilling
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFA	No Further Action
NHPA	National Historic Preservation Act
NHRP	National Register of Historic Places
NO_X	oxides of nitrogen
O_3	ozone
OSHA	Occupational Safety and Health Administration
PA	Programmatic Agreement
PCB	Polychlorinated Biphenyl
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
POI	Point of Interest
RCRA	Resource Conservation and Recovery Act
ROM	Rough Order of Magnitude
RONA	Record of Non-Applicability
RPA	Resource Protection Area
SA	Source Area
SAV	Submerged Aquatic Vegetation
SER	Statement of Environmental Review
SF	square feet
SHPO	State Historic Preservation Office

SI	Supplemental Investigation
SO_2	sulfur dioxide
SRM	Sustainment, Restoration, and Modernization
SVOC	Semi-Volatile Organic Compound
TCLP	Toxicity Characteristic Leaching Procedure
TNT	Tri-nitrotoluene
TPH	Total Petroleum Hydrocarbons
U.S.	United States
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USC	United States Code
USCB	United States Census Bureau
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USHUD	United States Department of Housing and Urban Development
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VDEQ	Virginia Department of Environmental Quality
VDOT	Virginia Department of Transportation
VMRC	Virginia Marine Resources Commission
VOC	Volatile Organic Compound
WWTP	Wastewater Treatment Plant

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Executive Summary

The Hampton Roads Sanitary District (HRSD) is proposing to decommission the Central Middlesex and Urbanna wastewater treatment plants and reroute the wastewater from these treatment plants to the York River wastewater treatment plant. The Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes design of approximately 3.2 miles of force main from Urbanna to Cook's Corner in addition to approximately 13 miles of force main along Route 33 between Cook's Corner and the connection to HRSD's Mathews Transmission force main. The new force main will convey wastewater from Middlesex County and will consist of transmission force mains, pump stations, and potential offline storage tanks.

This Environmental Assessment (EA) has been prepared to consider the potential effects to the human and natural environment associated with a new sewage conveyance system within the counties of Middlesex and Mathews, with new pump stations at four locations within two of the counties (Middlesex and Gloucester). This EA also identifies applicable management actions and best management practices that would avoid or minimize effects relevant to the implementation of the MISPPII and the No Action Alternative. This EA has been prepared according to the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321–4347), Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] §§ 1500–1508) (CEQ 2005), and the Environmental Review Process of the Clean Water Financing and Assistance Program (CWFAP) of Department of Environmental Quality (VDEQ). The lead agency for this NEPA analysis is the VDEQ.

Environmental consequences for all assessed parameters of the MSIPPII are expected to be negligible. However, because the project is still in the design phase, impacts to water resources and cultural resources are being determined through targeted studies. A draft Aquatic Resources Delineation Report has been prepared for submittal to the USACE, and a Joint Permit Application is being prepared in anticipation of permit requirements for impacts to waters of the United States. A Phase I Cultural Resources Survey was performed per the recommendation of the Virginia Department of Historical Resources (DHR) in their letter dated October 21, 2021, and provided data on any additional archaeological/architectural resources not yet identified in previous studies to ensure no significant impacts to these resources.

Per the findings of this report and careful review of the environmental and human effects, this EA concludes that the MSIPPII would not have a significant impact on the quality of the human or natural environment.

Disclosure Statement

This Draft Environmental Assessment (EA) is provided for public comment following the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 Code of Federal Regulations [CFR] §§1500-1508), and 32 CFR §989, Environmental Impact Analysis Process (EIAP) and the Environmental Review Process of the Clean Water Financing and Assistance Program (CWFAP) of Department of Environmental Quality (VDEQ).

The EA provides an opportunity for public input on the Hampton Roads Sanitation District's (HRSD) decision-making, allows the public to offer inputs on alternative ways for HRSD to accomplish what it is proposing, and solicits comments on HRSD's analysis of environmental effects.

Public commenting allows HRSD to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfil requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the EA. However, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

Statement of Environmental Review

Environmental Assessment for the HRSD Middlesex Interceptor Program Phase II

Middlesex, Mathews and Gloucester Counties, Virginia

1.0 Introduction

This Environmental Assessment (EA) has been prepared to consider the potential effects to the human and natural environment associated with the Middlesex Interceptor System Program Phase II (MISPPII). The project includes a new sewage conveyance system within the counties of Middlesex and Mathews, with new pump stations at five locations within two of the counties (Middlesex and Gloucester). This EA also identifies applicable management actions and best management practices that would avoid or minimize effects relevant to the implementation of the HRSD MISPPII and the No Action Alternative. This EA has been prepared according to the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321–4347), Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] §§ 1500–1508) (CEQ 2005), and the Environmental Review Process of the Clean Water Financing and Assistance Program (CWFAP) of Department of Environmental Quality (VDEQ). The lead agency for this NEPA analysis is the VDEQ.

The purpose of the MISPPII is to provide reliable sanitary sewer service to Middlesex County and allow two existing HRSD wastewater treatment plants in Middlesex County to be decommissioned, thus providing enhanced water quality in the region. To accomplish this goal the HRSD must supplement the existing Mathews system which cannot accommodate anticipated 2030 flows from the proposed Middlesex system.

A preliminary analysis of environmental effects determined that the MISPPII could have greater than negligible effects on several resource areas, including biological resources, cultural resources, hazardous materials and waste, farmland and open space, irretrievable resources, and water resources.

2.0 HRSD Middlesex Interceptor System Program Phase II Proposed Action

The MISPPII incorporates all projects. The full implementation of all projects within all three concepts was carried forward for analysis as the reasonable upper bound of effects. Impacts would be less than those identified in the EA because not all alternatives will be implemented. The HRSD could implement any projects or project alternatives assessed in the EA.

3.0 Alternatives to the HRSD Middlesex Interceptor System Program Phase II

During the Preliminary Engineering Report (PER) phase, various alternatives were evaluated for the MISPPII project. The Selected Concept is the Preferred Alternative. Other Alternative Concepts were evaluated with the Desired Alternative being the second most favored alternative.

The process for selecting projects to be analyzed is initiated with a review of all projects to determine if they can be met with operational or engineering solutions while minimizing potential environmental effects on natural and man-made environments.

Two alternatives were in consideration for the location of the proposed Central Middlesex Pump Station. For Alternative 1, the pump station is proposed to be located in an existing parking lot north of the Middle Peninsula Regional Security Center (MPRSC) at Saluda, inside a 0.21-acre chain-linked fenced area. Currently, the Central Middlesex Treatment Plant receives influent wastewater via an 8-inch Ductile Iron Pipe (DIP) gravity sewer. The flow will be re-directed to the proposed pump station by inserting a new manhole in the existing gravity sewer line.

For Alternative 2, the selected alternative, the pump station is proposed to be on the same site as the existing Central Middlesex Wastewater Treatment Plant WWTP. The pump station will receive the wastewater from the 8-inch DIP gravity sewer via a new manhole, which is proposed to be 5-ft. deep and located between two manholes immediately upstream of the existing treatment plant. Construction at the existing wastewater treatment plant site will require the relocation of the existing chlorine feed tank, installation of a temporary electrical and control panel for the new pump station, and installation of shoring immediately adjacent to the treatment system to allow for the excavation and installation of the new pump station facilities.

The Locust Hill location is a parcel adjacent to the St. Clare Walker Middle School in Middlesex County. For the Gloucester pump stations, only preliminary locations were identified using the hydraulic model and coordination with Matthews County. The location of the Hartfield Pump Station is to be on the northern edge of the soil lot on the eastern side of Wood Brothers Road in Hartfield.

Six sites are in consideration for the location of Urbanna Pump Station. The first site is on or adjacent to Tabor Park, and the second site is adjacent to the existing Urbanna WWTP. Four (4) different alternatives are proposed for the Tabor Park site layout. These include:

- Alternative 1: a 200-ft. x 50-ft. site located on park property along the west property line.
- Alternative 2: a 100-ft. X 100-ft. site located on park property and including a new 16-ft. access road along the west property line and demolition of the existing pump station.
- Alternative 3: a 150-ft. X 150-ft. site in the vacant parcel next to the park, which was recently purchased from the Urbanna Oyster Festival.
- Alternative 4: a 100-ft. x 100-ft. site located within the vacant parcel next to the park.
- Alternative 5 : a 150-ft. x 150-ft. site adjacent to the existing Urbanna WWTP on a parcel that is privately owned. The site would be located on the northwest corner of the property and have an easement for the influent and effluent force mains.
- Alternative 6: the selected alternative. It is an approximately 0.365 acre residential property off of Linden Street . The residence is to be demolished.

There are five Alternatives considered for the Gloucester Pump Station.

- Alternative 1 is located on 9375 John Clayton Memorial Highway. The parcel is 70 acres in area. The proposed site is 400-ft. x 350-ft. in total area.
- Alternative 2 is located at 9316 John Clayton Memorial Highway. The parcel is 5 acres in total area.
- Alternative 3 is located at Tax Map I. D. 26-22 John Clayton Memorial Highway. The parcel is 8.5 acres in total area.
- Alternative 4 is located at Tax Map I. D. 26-117B and is several thousand feet north of the Route 14 intersection with Rangtang Road, Route 661. The parcel is 2 acres in total area.
- Alternative 5, the selected alternative, is located at Tax Map I. D. 26-109 and is located at 8210 Waverly Lane. The parcel is 20.85 acres in total area.

The new sewage conveyance system includes a small diameter transmission force main that extends 3.2 miles from Urbanna to Cook's Corner and approximately 13 miles along Route 33 (General Puller Highway) from Cook's Corner to the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The new force main will convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the existing HRSD Urbanna and Central Middlesex Wastewater Treatment Plants. The force main will be installed beneath Urbanna Creek and the Piankatank River. Flows from the Middlesex Transmission Force Main will ultimately be conveyed from the main corridor through the Mathews transmission force main south to HRSD's Gloucester Interceptor Force Main across the York River to the York River Treatment Plant.

A Dominion Power circuit, a Verizon fiber optic cable, and a Metrocast fiber optic cable were installed along the same alignment as the proposed Middlesex line which is 220 ft. from the south side of the Piankatank River and 250 ft. from the north side of the Piankatank to avoid impacts to the shoreline. It will be installed in depth such that the construction of the proposed main line does not impact the utilities.

Horizontal directional drilling has been analyzed. Two different methods may be used and are being considered for planning and design purposes.

Constructed Horizontal Directional Drilling

Horizontal Directional Drilling (HDD) is needed from 40,000 pounds to over 100,000 pounds of thrust pullback. These ranges represent significant support equipment to include mud mixers, mud recycling units, control rigs, and medium to large drilling rigs. Staging areas can be 150-ft. x 250-ft. in size. Drilling mud is necessary for lubrication.

These units are capable of installing larger diameter force mains well over 2,000 linear ft. and at significant depth. The life cycle of the pipeline is 50 years.

Mini-Horizontal Directional Drilling Systems

The Mini-Horizontal Directional Drilling (Mini-HDD) systems are far smaller and may be used for shorter and shallower pipeline installations. Installing depths of no deeper than 14 ft. may be achieved with pipes up to 12 inches in diameter and using drill segments less than 1,000 ft. in length. Rigs typically have a pull force capacity of up to 30,000 pounds, Small quantities of drilling mud are necessary for lubrication, but the staging area is much smaller, as there typically is no additional support necessary other than the drilling unit.

Mini-HDD rigs should not be used in soils with significant cobbles, boulders, and obstructions greater than 4 inches in diameter. Due to the minimal number of interconnects on the project, installation by mini-HDD will be conducted on a case-by-case basis during the design phase of the project.

3.1 No Action Alternative

The CEQ regulation 40 CFR Section 1502.14(d) specifically requires analysis of the "No Action" alternative in all NEPA documents. Under the No Action Alternative, HRSD would not implement the MSIPPII as described above. HRSD would maintain its existing facilities and would not construct new facilities, upgrade its infrastructure, or demolish existing facilities. Under the No Action Alternative, the deficiencies identified in Chapter 2 would continue to impair the HRSD's ability to fulfill the greater community's needs. Although the No Action alternative does not meet any of the selection criteria or fulfill the purpose and need of the action, it has been carried forward for detailed analysis in this EA as required under NEPA.

4.0 Environmental Effects

Air Quality

The MISPPII would have short- and long-term less than significant effects on air quality. There would be short-term minor adverse effects from fugitive dust and the use of heavy equipment during construction, renovation, and demolition. There would be long-term negligible adverse effects for the MISPPII. The MISPPII does not include any new major stationary sources of air emissions but may include some small stationary sources of air emissions such as stand-by generators. The direct and indirect emissions from the MISPPII would be below the de minimis thresholds and would be located in an attainment area; therefore, the general conformity rules do not apply. No past, present, or reasonably foreseeable projects have been identified that when combined with the MISPPII, would have significant cumulative effects on air quality. The No Action Alternative would have no effects on air quality.

Biological Resources

Construction and demolition activities include facility construction, addition or alterations to existing facilities, and parking areas. These activities would have site-specific short-and long-term less than significant effects on biological resources. The proposed activities would require vegetation removal, but it would primarily be mowed and landscaped vegetation. Construction activities would displace locally common wildlife species that are adapted to high levels of human activity and disturbance. However,

any wildlife disturbed by construction activities could theoretically temporarily or permanently relocate to similar habitat nearby. There are no natural heritage areas or conservation/managed areas on public or private lands. All ground disturbed would be reseeded or planted with appropriate vegetation. These effects would be less than significant.

The proposed construction projects also include directional drilling under the Piankatank River and Urbanna Creek. The process is designed to avoid and minimize impacts to surface areas of the sediment, including sand, silt, and clay, to the extent practicable. Since the proposed project areas are in previously developed areas and other utilities have previously been installed via directional drilling in the same corridor, there would be no appreciable loss of wildlife habitat from the proposed construction activities. These activities would have short- and long-term less than significant effects on biological resources.

Operational Effects

There would be less than significant effects on biological resources due to the maintenance and operations associated with the MISPPII. The MISPPII would have few additional effects on vegetation, wildlife, or threatened and endangered species when compared to existing conditions; therefore, long-term effects on biological resources would be negligible.

The co-location and consolidation of facilities and functions specified in the MISPPII would provide operational efficiencies. The efficiencies gained from construction, renovation, and demolition would reduce the maintenance and operational requirements of facilities and project areas; therefore, the operational effects on biological resources would be negligible.

Short-term minor adverse effects would be due to site-specific temporary disturbance during construction. Long-term minor adverse effects would be due to ongoing activities at the facilities.

Cultural Resources

A Phase I Cultural Resources Survey was performed in June and July 2022 per the recommendation of the Virginia DHR in their letter dated October 21, 2021 and provided data on any additional archaeological/architectural resources not yet identified in previous studies to ensure no significant impacts to these resources. The MISPPII will have no adverse effect upon identified archaeological or architectural resources.

Hazardous Materials and Wastes

The HRSD MISPPII would have short- and long-term less than significant adverse effects concerning hazardous materials and wastes. Short-term minor adverse effects would be due to the use of hazardous materials and the generation of wastes during construction, renovation, and demolition activities. Long-term minor adverse effects would not occur during operation. The HRSD MISPPII would not (1) substantially increase the quantity or toxicity of hazardous substances, (2) increase risk to human health or the environment, or (3) generate solid waste in amounts that would appreciably decrease capacity or life span at receiving landfills. Based on the findings of the Environmental Data Resources report prepared in 2020 for the MISPPII, a targeted Phase II Environmental Site Assessment (ESA) is not recommended for this proposed activity. No past, present, or reasonably foreseeable projects have been identified that, when combined with the HRSD MISPPII, would have significant cumulative effects on

hazardous materials and wastes. The No Action Alternative would have no effects on hazardous materials and wastes.

Water Resources

The HRSD MISPPII would have short- and long-term less than significant adverse effects on water resources. Short-term minor adverse effects would be due to site-specific temporary changes in surface hydrology and the potential for soil erosion and transport during construction, renovation, and demolition activities. Long-term minor adverse effects would be due to an incremental increase in impervious surfaces from new construction. Effects to water resources would not reduce water availability or supply, exceed the safe annual yield of water supplies, adversely affect water quality, threaten, or damage hydrology, or violate water resources laws or regulations. No past, present, or reasonably foreseeable projects have been identified that, when combined with the HRSD MISPPII, would have significant cumulative effects on water resources. The No Action Alternative would have no effects on water resources.

5.0 Public Notice

NEPA, 40 CFR §§1500-1508, and 32 CFR Part 989 require public review of the EA before approval of the SER and implementation of the HRSD MISPPII. A Notice of Availability for public review of the Final EA will be published in the *Southside Sentinel* and the *Daily Press*. The Final EA will be made available for public review at the Middlesex, Gloucester, and Mathews public libraries. Through the Interagency and Intergovernmental Coordination for Environmental Planning process, the HRSD will notify relevant federal, state, and local agencies and allow 30 days to make known their environmental concerns specific to the MSIPPII. Copies of all current correspondence and agency letters received are provided in Appendix A.

6.0 Statement of Environmental Review

After a careful review of the potential effects of this document, I have concluded that the MSIPPII would not have a significant impact on the quality of the human or natural environment or generate significant controversy. Accordingly, the requirements of the NEPA, CEQ regulations, and 32 CFR Part 989, et seq. have been fulfilled, and an Environmental Impact Statement is not necessary and will not be prepared.

_____ _____

Title Date

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1.0 Introduction

This Environmental Assessment (EA) has been prepared to consider the potential consequences to the human and natural environment associated with the HRSD Middlesex Interceptor System Program Phase II (MISPPII) project. The proposed project includes a small diameter transmission force main that extends 3.2 miles from Urbanna to Cook's Corner and approximately 13 miles along Route 33 (General Puller Highway) from Cook's Corner to the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198) and includes upgrades to existing pump stations at Cooks Corner and Central Middlesex, and new pump stations at Urbanna, Central Middlesex, Hartfield, Locust Hill, and Gloucester. The existing HRSD County Line, Hartfield and Beaver Dam Pump Stations will be receiving upgrades. This EA also identifies applicable management actions, mitigation measures, and best management practices (BMPs) that would avoid or minimize effects relevant to the implementation of the HRSD MISPPII and alternatives (to include the No Action Alternative).

The HRSD has prepared this EA according to the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321–4347), Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] §§ 1500–1508) (CEQ 2005), and the Environmental Impact Analysis Process (EIAP) (32 CFR 989). The lead agency for this NEPA analysis is the VDEQ.

Based on the analysis in this EA, the VDEQ will determine whether to issue a Statement of Environmental Review (SER) and then proceed with the HRSD MISPPII, prepare an Environmental Impact Statement, or abandon the HRSD MISPPII. As required by NEPA and its implementing regulations, preparation of an environmental document must precede final decisions regarding the proposed projects and be available to inform decision-makers of the potential environmental effects of selecting the HRSD MISPPII, reasonable alternatives, or no action alternative.

1.1 Purpose and Need

The purpose of the HRSD MISPPII is to provide reliable sanitary sewer service to Middlesex County and allow two existing HRSD wastewater treatment plants in Middlesex County to be decommissioned, thus providing enhanced water quality in the region. To accomplish this goal the HRSD must supplement the existing Mathews system which cannot accommodate anticipated 2030 flows from the proposed Middlesex system.

Pump upgrades are necessary at the existing Mathews County Line, the Hartfield, and Beaver Dam pump stations to convey projected flows from Mathews and Middlesex Counties and convey excess flow during wet weather. Discussion of the necessary improvements in the Mathews system is included in the following section. The proposed construction and infrastructure projects, as well as the elimination of excess and inefficient structures, would conserve energy and resources through consolidation and modernization.

All of the proposed construction would meet the purpose of and need for the HRSD MISPPII. The period of construction, demolition, and renovation activities would be approximately 2 years.

1.2 Location and Description of ACTION

The Central Middlesex Treatment Plant is located on a 0.93-acre parcel inside an approximately 0.15-acre fenced area north of the Central Middlesex Correctional Facility. The treatment plant consists of an aeration packaged unit from Purestream Inc. with an electrical/control building, a backup generator, and a storage building.

The Urbanna Treatment Plant is located on a 1.07-acre plot on Laurel Hill Drive. The treatment plant receives wastewater from the town of Urbanna and Bethpage campground via a 4-inch force main.

Currently, the Central Middlesex Treatment Plant receives influent wastewater via an 8-inch Ductile Iron Pipe (DIP) gravity sewer. The flow would be re-directed to the proposed pump station by inserting a new manhole in the existing gravity sewer line.

For Alternative 1, the pump station is proposed to be located in an existing parking lot north of the Middle Peninsula Regional Security Center (MPRSC) at Saluda, inside a 0.21-acre chain-linked fenced area. For Alternative 2, the selected alternative, the pump station is proposed to be on the same site as the existing Central Middlesex Wastewater Treatment Plant WWTP. The pump station will receive the wastewater from the 8-inch DIP gravity sewer via a new manhole, which is proposed to be 5-ft. deep and located between two manholes immediately upstream of the existing treatment plant. Construction at the existing wastewater treatment plant site will require the relocation of the existing chlorine feed tank, installation of a temporary electrical and control panel for the new pump station, and installation of shoring immediately adjacent to the treatment system to allow for the excavation and installation of the new pump station facilities.

The Locust Hill location is a parcel adjacent to the St. Clare Walker Middle School in Middlesex County. The location of the Hartfield Pump Station is to be on the northern edge of the soil lot on the eastern side of Wood Brothers Road in Hartfield.

Six sites have been in consideration for the location of Urbanna Pump Station. Several sites are on or adjacent to Tabor Park, and the remaining are adjacent to or bordering the existing Urbanna WWTP. Four (4) different alternatives are proposed for the Tabor Park site layout. These include:

- Alternative 1: a 200-ft. x 50-ft. site located on park property along the west property line.
- Alternative 2: a 100-ft. X 100-ft. site located on park property and including a new 16-ft. access road along the west property line and demolition of the existing pump station. This alternative was eliminated due to lack of access.
- Alternative 3: a 150-ft. X 150-ft. site in the vacant parcel next to the park, which was recently purchased from the Urbanna Oyster Festival.
- Alternative 4: a 100-ft. x 100-ft. site located within the vacant parcel next to the park.
- Alternative 5: 150-ft. x 150-ft. site adjacent to the existing Urbanna WWTP on a parcel that is privately owned. The site would be located on the northwest corner of the property and have an easement for the influent and effluent force mains.

- Alternative 6: the selected alternative. It is an approximately 0.365 acre residential property on Linden Street which is to be demolished.

There were five alternatives considered for the Gloucester Pump Station.

- Alternative 1 is located on 9375 John Clayton Memorial Highway. The parcel is 70 acres in area. Only the northwest corner of the parcel is being considered. This corner of the parcel is 400-ft. x 350-ft. in total area.
- Alternative 2 is located at 9316 John Clayton Memorial Highway. The parcel is 5 acres in total area.
- Alternative 3 is located at Tax Map I. D. 26-22 John Clayton Memorial Highway. The parcel is 8.5 acres in total area.
- Alternative 4 is located at Tax Map I. D. 26-117B and is several thousand ft. north of the Route 14 intersection with Rangtang Road, Route 661. The parcel is 2 acres in total area.
- Alternative 5, the selected alternative, is located at Tax Map I. D. 26-109 and is located at 8210 Waverly Lane. The parcel is 20.85 acres in total area.

The new sewage conveyance system includes a small diameter transmission force main that extends 3.2 miles from Urbanna to Cook's Corner and approximately 13 miles along Route 33 (General Puller Highway) from Cook's Corner to the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The new force main will convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the existing HRSD Urbanna and Central Middlesex Wastewater Treatment Plants. The force main will be installed beneath Urbanna Creek and the Piankatank River. Flows from the Middlesex Transmission Force Main will ultimately be conveyed from the main corridor through the Mathews transmission force main south to HRSD's Gloucester Interceptor Force Main across the York River to the York River Treatment Plant.

A Dominion Power circuit, a Verizon fiber optic cable, and a Metrocast fiber optic cable were installed along the same alignment as the proposed Middlesex Interceptor. Record drawings indicate that the existing utility cables were installed via Horizontal Directional Drilling approximately 220 ft. from the south side of the Piankatank River and 250 ft. from the north side of the Piankatank to avoid impacts to the shoreline. The remainder of the utility lines were installed via drivers at an approximate depth of 3-ft. The proposed Middlesex Interceptor will be installed at a depth such that the construction of the proposed main line does not impact the utilities.

For the installation of the Middlesex Interceptor, HDD has been analyzed. Two different methods may be used and are being considered.

Constructed Horizontal Directional Drilling

Constructed HDD is needed from 40,000 pounds to over 100,000 pounds of thrust pullback. These ranges represent significant support equipment to include mud mixers, mud recycling units, control rigs, and

medium to large drilling rigs. Staging areas can be 150-ft. x 250-ft. in size. Drilling mud is necessary for lubrication.

These units are capable of installing larger diameter force mains well over 2,000 linear ft. and at significant depth. The life cycle of the pipeline is 50 years.

Mini-Horizontal Directional Drilling Systems

The Mini-Horizontal Directional Drilling (Mini-HDD) systems are far smaller and may be used for shorter and shallower pipeline installations. Installing depths of no deeper than 14 ft. may be achieved with pipes up to 12 inches in diameter and using drill segments less than 1,000 ft. in depth. Rigs typically have a pull force capacity of up to 30,000 pounds, Small quantities of drilling mud are necessary for lubrication, but the staging area is much smaller, as there typically is no additional support necessary other than the drilling unit.

Mini-HDD rigs should not be used in soils with significant cobbles, boulders, and obstructions greater than 4 inches in diameter. Due to the minimal number of interconnects on the project, installation by mini-HDD will be conducted on a case-by-case basis during the design phase of the project.

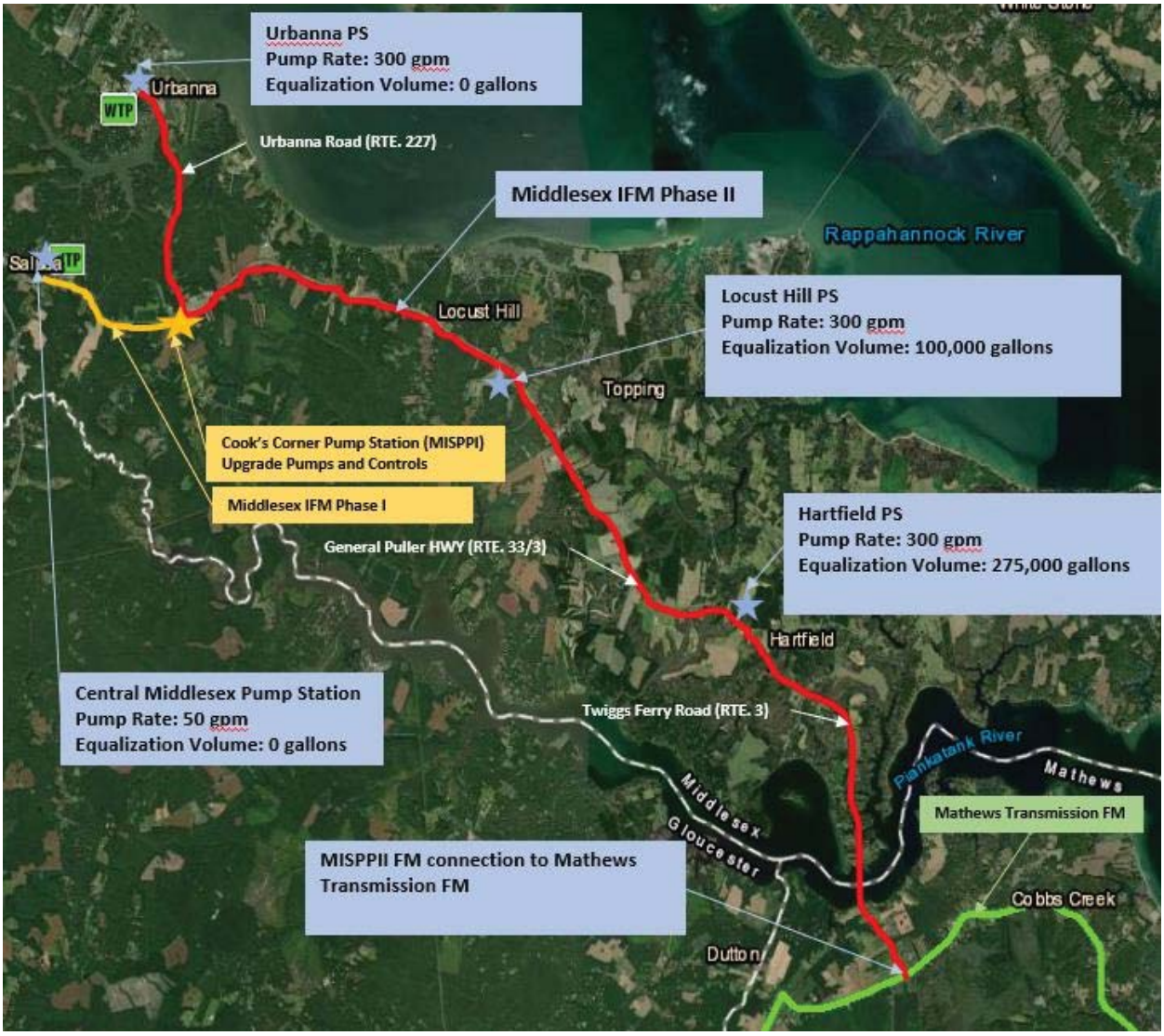

Figure 1. Middlesex Location Map

Figure 2. Mathews and Gloucester Location Map

1.3 Summary of Key Environmental Study Requirements

1.3.1 National Environmental Policy Act

NEPA requires Federal agencies to take into consideration the potential environmental consequences of the proposed HRSD MISPPII in their decision-making process. NEPA intends to protect, restore, and enhance the environment through well-informed Federal decisions. The CEQ was established under NEPA to implement and oversee Federal policy in this process. The CEQ subsequently issued the *Regulations for Implementing the Procedural Provisions of the NEPA* (40 CFR Sections 1500–1508) (CEQ 2005). The activities addressed within this document constitute a Federal action and therefore must be assessed following NEPA.

1.3.2 Air Conformity Requirements

The Clean Air Act (CAA) (42 USC §§ 7401-7671q, as amended) provided the authority for the U.S. Environmental Protection Agency (USEPA) to establish nationwide air quality standards to protect public health and welfare. Federal agencies are required (40 CFR § 51, Subpart W) to determine the HRSD MISPPII's conformity with the CAA and its 1990 amendments, which require each state to prepare a State Implementation Plan for the achievement of air quality standards.

1.3.3 Cultural Resources

The National Historic Preservation Act (NHPA) of 1966 (16 USC § 470) established the National Register of Historic Places (NRHP) and the Advisory Council on Historic Preservation outlining procedures for the management of cultural resources in projects using state funds. Cultural resources can include archaeological remains, architectural structures, and traditional cultural properties such as ancestral settlements, historic trails, and places where significant historical events occurred. NHPA requires federal agencies to consider potential effects to cultural resources that are listed, nominated to, or eligible for listing on the NRHP; designated as a National Historic Landmark; or valued by modern Native Americans for maintaining their traditional culture. Section 106 of NHPA requires federal agencies to consult with State Historic Preservation Officers if their undertakings might affect such resources.

The Archaeological Resources Protection Act of 1979 (16 USC §§ 470aa-mm) was created to protect archaeological resources and sites on public and Native American lands in addition to encouraging cooperation and exchange of information between governmental authorities, professionals, and private individuals. The act establishes civil and criminal penalties for the destruction and alteration of cultural resources.

1.3.4 Irretrievable Resources

The Procedural Guidelines for the Virginia Clean Water Revolving Loan Fund establishes that the NEPA document shall include a discussion of the impacts of the HRSD MISPPII on irretrievable resources, those that if used, will not be recovered. These include paleontological resources and geological resources such as minerals, oil, and gas. These also include prime farmland which, if converted to non-agricultural use, will not be recovered. The resources also include Chesapeake Bay Preservation Area buffers (offset by BMPs).

1.3.5 Endangered Species Act

The Endangered Species Act of 1973 (16 USC §§ 1531-1544, as amended) established measures for the protection of plant and animal species that are federally listed as threatened and endangered, and for the conservation of habitats that are critical to the continued existence of those species. Federal agencies must evaluate the effects and impacts of their proposed actions through a set of defined procedures, which can include the preparation of a Biological Assessment and can require formal consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Act.

1.3.6 Water Resources

The Clean Water Act (CWA) of 1977 (33 USC § 1251 *et seq*.) regulates pollutant discharges that could affect aquatic life forms or human health and safety. Sections 404 and 401 of the CWA regulate dredge and fill activities in Waters of the United States (U.S.), including wetlands. Executive Order (EO) 11990, *Protection of Wetlands,* directs federal agencies to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. The U.S. Army Corps of Engineers (USACE) and/or state agencies with delegated authority are responsible for the implementation of the Section 404 program. Section 10 of The Rivers and Harbors Act of 1899 ((33 U.S.C. 403), regulates all construction, including excavation, in navigable waterways.

EO 13690 (January 30, 2015) updated EO 11988, *Floodplain Management,* and established a Federal Flood Risk Management Standard and a process for further soliciting and considering stakeholder input. The new standard gives agencies the flexibility to select one of three approaches for establishing the flood elevation and hazard area they use in siting, design, and construction. Federal agencies are directed to consider the proximity of their actions to or within floodplains.

1.3.7 Other Executive Orders

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, provides that citizens in either of these categories are not disproportionately affected by federal action. Additionally, potential health and safety effects that could disproportionately affect children are considered under the guidelines established by EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*.

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions occur from natural processes as well as human activities. EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, and EO 13693, *Planning for Federal Sustainability into the Next Decade*, were enacted to address GHGs in detail, including GHG emissions inventory, reduction, and reporting.

1.4 Detailed Analysis

1.4.1 Aesthetics and Visual Resources

The HRSD MISPPII is not anticipated to have appreciable effects to aesthetics or visual resources. The existing view is a rural area, the small urban area of the town of Urbanna and the suburban community at the town of Saluda, and tidal waterways. The existing communities have lighting in the urbanized areas and at entrances and parking areas for businesses, municipal buildings, the HRSD facilities themselves, schools, recreation areas, and places of worship. During the construction and demolition activities, the visual and aesthetic characteristics of areas undergoing land-disturbing activities would be temporarily altered by the use of construction equipment, and the delivery and stockpiling of construction materials. Following completion of construction, the proposed new pump stations and associated infrastructure would remain as permanent visual features within the viewshed; however, the principal visual features of the facility would remain consistent with existing conditions. These effects would be negligible.

1.4.2 Noise

Noise is sound that is produced at levels that can be harmful and may be considered unwanted by the surrounding community, properties, and residences. The Noise Control Act of 1972 and EO 12088 require that federal agencies assess the impact of noise on the environment. The distance rapidly attenuates noise; therefore, it is not anticipated that the proposed stormwater diversion operations will occur close enough to existing residential areas to the north and the west of the Project area to cause disturbances. In addition, stormwater diversion operations would occur during daytime hours when residents are away from their homes and would be less disturbed than nighttime hours; therefore, those living in the vicinity are not likely to be affected by noise generated by the Project. Because only five noise-sensitive land uses (i.e., religious, commercial, retail, residential, recreational, and educational) are in the immediate vicinity the Project is not expected to impact noise-sensitive land uses.

The MISPPII would not result in any appreciable changes in the noise environment. The construction and demolition activities would require the use of heavy equipment that would generate short-term increases in noise near the project sites. Construction will be within a predominantly rural area. There would be no new permanent sources of noise associated with the MISPPII, and there would be no permanent changes in daily traffic operations. Therefore, no long-term changes in the noise environment would be expected. Overall, these effects would be negligible.

1.4.3 Socioeconomics and Environmental Justice

The MISPPII would not have appreciable effects to the local or regional socioeconomic environment. Environmental justice considers sensitive minority and low-income populations in the community to determine whether the MISPPII and its alternatives may have a disproportionately high and adverse human health or environmental effect on those populations. Environmental justice analysis is conducted in compliance with Executive Order (EO) 12898. The 2020 U.S. Census Bureau (USCB) data has been examined to determine minority and low-income population percentages in the affected area of the Project to facilitate the qualitative assessment of potential environmental justice impacts from the Project. The U. S. Department of Housing and Urban Development (USHUD) data assists in determining eligibility for their low-income housing tax credits which focus upon the low-income minority, low-

income seniors, and low-income under the age of 18. “Environmental justice communities” are communities wherein there is a population of low-income minority, low-income children under 18, and/or low-income seniors over 65 that exceeds percentages for the county, state, or United States. Census tracts within the project area were found to be below average for poverty level and below state levels for Hispanic, black, American Indian, Hawaiian native, Asian, and Alaskan native for several census tracts. None of the census tracts in Gloucester, Mathews, or Middlesex had above-average levels for these five categories according to the USCB census tract data. The seven census tracts have not met the criteria for environmental justice. With these considerations, the implementation of the preferred alternative should have no effect on environmental justice for the surrounding residential communities.

The 2020 mean personal (per capita) income for Gloucester County was $33,697. For Middlesex, the mean personal income is $31,502 and for Mathews County, it is $35,731. The mean personal income for the Commonwealth of Virginia is $39,278. The MISPPII would have some minor beneficial effects associated with the employment of construction personnel and transportation of goods and materials to the construction sites. There would be no permanent change in sales volume, income, employment, or population as a result of the MISPPII. There would be no effects on law enforcement, fire protection services, medical services, schools, family support services, shopping, or recreation facilities.

Consideration of environmental justice and the protection of children is done to ensure that no groups of people should bear a disproportionate share of the negative environmental consequences resulting from federal actions. The short-term economic benefits to the local economy would not disproportionately affect minority or low-income populations. The 2020 poverty level for Gloucester County, Virginia as a whole was 6.8 percent, for Middlesex County it was 13.8, significantly higher than the state level, and for Mathews, it was 8.8 (the Virginia poverty level was 9.9 percent) and the minority population for the three counties was 12.2, 19.9 percent, and 11.9 percent (Virginia minority level was 30.6 percent) (U.S. Census Bureau 2020). None of the three counties meet the U.S. Census Bureau definition of an environmental justice community area.

Children would not have access to construction sites. No effects on environmental justice would be expected, and the MISPPII would not result in disproportionate adverse environmental or health effects on low-income or minority populations. These effects would be minor and beneficial.

1.4.4 Transportation

The MISPPII is not expected to result in any appreciable changes in traffic or transportation resources. Traffic levels in the project areas would not increase substantially or degrade the level of service (LOS) on any nearby roadway or intersection. The construction and demolition activities would require the use of heavy equipment and worker commutes that would generate short-term increases in traffic. The local roadway infrastructure in all three counties would be sufficient to support these activities. Because most of the work would take place on-site, road closures or detours would not be expected. All construction vehicles would be equipped with backing alarms, two-way radios, and “Slow Moving Vehicle” signs when appropriate. Although these effects would be negligible, contractors would route and schedule construction vehicles to minimize conflicts with other traffic, and strategically locate staging areas to minimize these already limited effects. These effects would be negligible.

1.4.5 Land Use

The MISPPII is not expected to result in any appreciable effects on land use. The project area is agricultural and silvicultural with limited fisheries and with light industrial and residential use. Urbanized areas are within the town of Urbanna. Portions of the MISPPII cross the Piankatank River and Urbanna Creek. The MISPPII has been designed and sited to be compatible with current land use. These effects would be negligible.

1.4.6 Geological Resources

The MISPPII is not expected to result in any appreciable effects on geological resources. Ground-disturbing activities would be temporary and would occur on previously disturbed or developed land except for the construction of the proposed Urbanna pump station and the four proposed alternative Gloucester pump stations. In addition, standard erosion control measures implemented as part of the MISPPII would reduce or eliminate any potential impacts. The topography has approximately 60 ft. in elevational change from both the beginning of the project and the end of the project, not including the separate location of the proposed five alternatives in Gloucester County with a mean elevation of 30 to 70 ft. above mean sea level. Proposed activities would not alter the topography of the existing terrain nor would they be located near identified geological hazards such as sinkholes. These effects would be negligible.

1.5 Public and Agency Review of Environmental Assessment

The HRSD provides opportunities for the public to participate in the NEPA process to promote open communication and improve their decision-making process. All persons and organizations with an interest in the MISPPII and Alternatives are encouraged to participate in the process.

EO 12372, *Intergovernmental Review of Federal Programs*, requires intergovernmental notifications before making any detailed statement of environmental effects. Through the process of Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), the project proponent must notify concerning federal, state, and local agencies and allow them sufficient time to evaluate potential environmental effects of the MISPPII.

NEPA, 40 CFR §§1500-1508, and 32 CFR Part 989 require public review of the EA before approval of the SER and implementation of the MSIPPII. A Notice of Availability for public review of the Final EA will be published in the *Southside* Sentinel and the Daily *Press*. The Final EA will be made available for public review at the public libraries in Middlesex, Gloucester, and Mathews Counties. The HRSD will notify relevant federal, state, and local agencies and allowed them 30 days to make known their environmental concerns specific to the MSIPPII. Copies of all correspondence and agency letters received are provided in Appendix A.

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2.0 Description of HRSD Middlesex Interceptor System Program Phase II and Alternatives

This chapter presents a detailed description of the MISPPII. The details of the MISPPII form the basis for the analysis of potential environmental effects presented in Chapter 3 of this EA. This chapter includes a discussion of considerations used to identify reasonable alternatives and also discusses the No Action Alternative.

The HRSD could implement any projects or project alternatives assessed in this EA.

2.1 HRSD Middlesex Interceptor System Program Phase II (Preferred Alternative)

The action being evaluated is discussed in Section 1.2.

2.2 Alternatives Considered but Eliminated

The HRSD considered reasonable alternatives to the MISPPII to formulate alternatives for analysis. Some projects might not have any reasonable alternatives because they are identified as site-specific. This collaborative effort consolidates functions and efficiencies while providing flexibility for future sewage conveyance and treatment requirements and environmental protection.

2.2.1 Selection Criteria

During the Preliminary Engineering Report (PER) of the MISPPII, alternatives were evaluated against numerous screening criteria. Specifically, the MISPPII must:

- Meet the purpose of the MISPPII, to remedy deficiencies in the infrastructure.
- Address the need to provide and maintain the infrastructure that is adequate to support the HRSD and applicable State, and Federal requirements.
- Make as much use as possible of existing land and facilities, avoid creating or maintaining redundant space or infrastructure, avoid or minimize operational inefficiencies, and represent the most cost-effective and sustainable alternative.
- Be consistent with all zoning requirements, applicable installation architectural compatibility guides, and relevant legal and regulatory requirements, and must accommodate applicable, known, man-made, and natural development constraints.
- Maintain or improve the quality of life enjoyed by the greater community,
- Provide for construction without significant environmental effects or development constraints that would result in excessive costs or schedule delays.
- Include only individual components that meet the program's need.

The MISPPII meets all of the selection criteria outlined above and has been carried forward for detailed analysis in this EA. For an alternative to the MISPPII to be considered viable, it must meet all of these selection criteria as well.

2.3 No Action Alternative

The CEQ regulation 40 CFR Section 1502.14(d) specifically requires analysis of the "No Action" alternative in all NEPA documents. Under the No Action Alternative, the HRSD would not implement the MISPPII. The HRSD would maintain their existing facilities and would not construct new facilities, upgrade infrastructure, or demolish existing facilities. Under the No Action Alternative, the deficiencies identified in Chapter 2 would impair the HRSD's ability to serve the greater community. Although the No Action alternative does not meet any of the selection criteria or fulfill the purpose of and need for the action, it has been carried forward for detailed analysis in this EA as required under NEPA.

3.0 Affected Environment and Environmental Consequences

This section describes relevant and existing environmental conditions for resources potentially affected by the MISPPII and the environmental consequences of implementing the MISPPII and No Action alternatives.

A description of the affected environment and the detailed evaluation of environmental consequences on these resource areas are provided in the following sections.

3.1 Air Quality

3.1.1 Definition of Resource

Air pollution is the presence in the outdoor atmosphere of one or more contaminants (e.g., dust, fumes, gas, mist, odor, smoke, or vapor) in quantities and of characteristics and duration such as to be injurious to human, plant, or animal life. Air quality as a resource incorporates components that describe air pollution within a region, sources of air emissions, and regulations governing those emissions. The following sections include a discussion of the existing conditions, a regulatory overview, and a summary of GHGs and global warming and if they are relevant to the MISPPII.

3.1.2 Affected Environment

The USEPA Region 3 and VDEQ regulate air quality in Virginia. The CAA (42 U.S.C. 7401-7671q), as amended, assigns the USEPA responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) that specify acceptable concentration levels of six criteria pollutants: particulate matter (measured as both particulate matter less than 10 microns in diameter [PM_{10}] and particulate matter less than 2.5 microns in diameter [$PM_{2.5}$]), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and lead. Short-term NAAQS (1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, while long-term NAAQS (annual averages) have been established for pollutants contributing to chronic health effects. While each state has the authority to adopt standards stricter than those established under the Federal program, the State of Virginia has accepted the federal standards.

3.1.2.1 LOCAL AIR QUALITY

Federal regulations designate Air Quality Control Regions (AQCRs) in violation of the NAAQS as *nonattainment* areas. Federal regulations designate AQCRs with levels below the NAAQS as *attainment* areas. Those which were in nonattainment for ozone in previous years but now are considered *maintenance* are in an area that has formerly been designated nonattainment but is now recognized by EPA as meeting the NAAQS. A maintenance area must have an approved “maintenance plan” to meet and maintain air quality standards. Middlesex, Mathews, and Gloucester County (and therefore all areas associated with the MISPPII) are designated by the EPA as in maintenance for all criteria pollutants (USEPA 2016a). The USEPA monitors levels of criteria pollutants at representative sites in each region. For reference purposes, Table 3-1 shows the concentrations of criteria pollutants at the monitoring location in Hanover, Virginia, 7345 McClellan Road, at latitude 37.60613, longitude -77.2188 closest to

the MISPPII. Ozone is the sole atmospheric component/criteria pollutant measured. This data is updated hourly.

Historical Data Concentration

Table 3.1-1. Air Quality Standards and Monitored Data

Hour	AQI	Class	Responsible Pollutant	Activity Caution
11:00	24	Good	Ozone	None
10:00	8	Good	Ozone	None
09:00	13	Good	Ozone	None
08:00	12	Good	Ozone	None
07:00	11	Good	Ozone	None

3.1.2.2 CLIMATE AND GREENHOUSE GASES

Greenhouse gases are components of the atmosphere that trap heat relatively near the surface of the earth, and therefore, contribute to the greenhouse effect and climate change. Most occur naturally in the atmosphere but increases in their concentration result from human activities such as the burning of fossil fuels. Global temperatures are expected to continue to rise as human activities continue to add carbon dioxide (CO_2), methane, nitrous oxide, and other greenhouse (or heat-trapping) gases to the atmosphere. Whether or not rainfall will increase or decrease remains difficult to project for specific regions (USEPA 2016c and IPCC 2014).

The CEQ recently released its final guidance on when and how federal agencies should consider GHG emissions and climate change in NEPA analyses. The guidance is primarily focused on larger projects that have large air quality implications which will not apply to this project.

3.1.3 Environmental Consequences

3.1.3.1 SIGNIFICANCE CRITERIA

Effects would not exceed the significance criteria for air quality unless the emissions would exceed the general conformity rule *de minimis* (of minimal importance) threshold values, would exceed the greenhouse gases threshold, or would contribute to a violation of any federal, state, or local air regulation.

3.1.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

There would be short-term less-than-significant adverse, and long-term beneficial effects to air quality. Short-term effects would be from fugitive dust and the use of heavy equipment during construction, renovation, and demolition. Long-term effects would be from space optimization and consolidation of

facilities and operations. Emissions would not exceed the general conformity rule *de minimis* threshold values, would not exceed the greenhouse gas threshold in the draft CEQ guidance, and the MISPPII would not contribute to a violation of any federal, state, or local air regulation.

The MISPPII and Alternatives outlined in Chapter 2 consist of construction (including new construction, renovations, alterations, and additions), demolition of buildings and pavement, and directional drilling at the Piankatank River and Urbanna Creek. There would be some minor adverse effects to air quality from individual projects and project alternatives; however, each was reviewed on a case-by-case basis, and none in and of themselves would have appreciable adverse effects on air quality. A description of effects to air quality from the full implementation of the preferred alternative including all projects and project alternatives outlined is provided below. This is considered the reasonable upper bound of effects, and impacts would be less than those described herein.

Construction Effects

The MISPPII is within a region that the USEPA has designated as a maintenance area for the NAAQS and the general conformity rule does not apply since there will be no increase in emission in the maintenance area from the federal or state action that could cause new violations of the standards and/or no increase in the frequency or severity of previous violations. The proposed project will not result in either the increase or the decrease of emissions of Greenhouse gases. Standard equipment and standard emissions controls will be used during demolition and construction. The implementation of the proposed construction and demolition will not increase air emissions or exceed regulated standards. The Virginia Administrative Code (VAC) has outlined requirements with which the HRSD must comply. Controlled actions will include the control of fugitive dust emissions. "Fugitive dust emissions" means particulate matter that does not pass through a process stack or vent and that is generated within RIC property boundaries from activities such as unloading and loading areas, process areas, stockpiles, stockpile working, parking lots, and roads (including access roads and haul roads). Methods to minimize fugitive dust include: limiting dusty work on windy days, watering or sweeping roadways often to ensure that vehicle traffic is not spreading dust, reducing speed limits on unpaved surfaces within construction and demolition sites to ten miles per hour, and enclosing storage piles and handling areas if dusty materials are frequently loaded and unloaded. With the above considerations, the operations associated with construction and demolition are not expected to impact air quality, either locally or regionally.

Operational Effects

There would be no appreciable net change in new permanently heated areas or other emissions. There would be no changes in vehicle emissions from changes in commuting.

Sensitive receptors to odors generated by the MISPPII are schools, housing, and playground structures. The proposed improvements to the pump stations and new pump stations are all located at a sufficient distance from schools, housing and playground structures that odor is not likely to affect sensitive receptors.

The MISPPII does not include any new major stationary sources of air emissions but may include some small stationary sources such as stand-by generators. Any new stationary sources of air emissions could be subject to federal and state air permitting regulations. Any new stationary sources of air emissions

would be reviewed on a case-by-case basis and added to the installation's air operating permit as necessary. Both a new source construction permit and a modification to the existing operating permit could be required. By upgrading and consolidating facilities and using new and more efficient heating and cooling systems and backup generators, there would be a net decrease in emissions from these sources.

3.1.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects would not occur. The need to maintain existing facilities and not upgrade infrastructure deficiencies identified in Chapter 2 would not allow the HRSD to continue to deliver services efficiently. Existing conditions would remain unchanged and there would be no long-term beneficial effects to air quality.

3.2 Displacement of Residences and Businesses

3.2.1 Definition of Resource

For impacts that are assessed under NEPA, the level of impact is expressed in terms of whether it is not adverse, potentially adverse, or adverse. NEPA assessments often do not have specific impact criteria and documents typically do not specify whether impacts are significant. Under a general definition of significance, residences and businesses are considered displaced when they can no longer fulfill their intended purposes due to a portion of the parcels under consideration being cut off from egress or ingress or, for example, be unable to be farmed, rented, or made into an industrial or commercial property.

3.2.2 Affected Environment

A total of 93 parcels are anticipated to be impacted based on the recommended alternatives. This total is based on assumption that easements will be needed along Twiggs Ferry Road between General Puller Highway and the Piankatank River bridge where there is uncertainty as to whether the existing road is within a prescriptive right of way. Easements in this area may not be needed; however, this cannot be determined until the design phase when property research is conducted with the survey effort. Temporary easements total 3.89 acres, and permanent easements total 12.26. One parcel, parcel 25, will result in a significant portion of land acquired as a permanent easement. Four parcels, 22, 23, 24, and 25 belonging to this property owner will have some acreage reduced. Parcel 90 will have a significant portion of land acquired as a permanent easement. The residential property at 215 Linden Street in Urbanna has been purchased by HRSD.

3.2.3 Environmental Consequences

There are a small number of parcels that will have permanent easements that will result in a significant amount of land acquisition.

3.2.3.1 SIGNIFICANCE CRITERIA

The significance criteria applied is based upon total parcels acquired.

3.2.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

There would be short-term less-than-significant adverse, and long-term beneficial effects to existing land acquisition.

3.2.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects would not occur. The need to maintain existing facilities and not upgrade infrastructure deficiencies identified in Chapter 2 would continue to impair the HRSD's ability to meet the greater community's needs. Existing conditions would remain unchanged and there would be no long-term benefits or adverse impacts

3.3 Aesthetics

3.3.1 Definition of Resource

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government uses all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). Final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values. Defining aesthetics concerning planning takes into account color, surface, texture, slope, form (shape and size, particularly in respect to the existing landscape and architectural elements), pollution in the form of debris creation, changes in the color of soil or water, and integration with cultural resources. The Degradation of Aesthetics Beneficial Use Impairment (BUI) tool used in this document is more subjective than the other beneficial use impairments.

3.3.2 Affected Environment

The affected environment is the entirety of the MISPPII. The land use is currently agricultural, silvicultural, and light industrial, with some fisheries and rural residential. Portions of the project corridor involve crossing the Piankatank River and Urbanna Creek.

3.3.3 Environmental Consequences

The project will have short-term visual impacts during construction due to ground disturbance and the directional drilling beneath Piankatank River and Urbanna Creek, which will be visible from the bridge crossings of these two waterways. Changes to the color of the soil or water will be avoided due to the implementation of Best Management Practices. Long-term impacts will include the removal of some trees, particularly in the construction of the pump stations at Locust Hill, Urbanna, and for the Gloucester alternative selected at 8210 Waverly Lane. A wooded area within a former residential parcel, now the property of the HRSD is located at 215 Linden Street near Taber Park is the location of the Urbanna pump station preferred alternative. This property will have trees removed. The site is 0.365 acres in total area and is adjacent to Taber Park at the intersection of Rappahannock Road and Park Street in the town of Urbanna, zip code 23175. The site is adjacent to the western property line for Taber Park which features a parking area, a fenced swimming pool, a locker room and changing area, wooden bleachers behind the pool, mowed lawn, landscaped shrubs, a playground, and an electrical station. There are no other existing

parklands that surround the project. The Taber Park property is owned by the Middlesex County Department of Parks and Recreation. There will be right of way acquisition of private property at the 215 Linden Street site. No municipal park property is now anticipated to be required under the preferred alternative. The following activities take place on the Taber Park property: Pedestrian use, landscaped shrubs, children's playground, fenced swimming pool (currently closed to the public due to safety issues), locker room and changing area, bleachers (currently closed to the public), and mowed lawn. The swimming pool is to reopen in the future once necessary repairs are implemented by the County. No planned or organized activities, either educational or recreational, take place in the privately owned parcel acquired. The Taber Park property is accessed by pedestrian and vehicular traffic and has usage of over 2,000 users/visitors per year. There are no hiking or jogging trails and there are no improvements to the wooded area behind the Park. The only unusual characteristic of the wooded lot is a deeply incised stream with vegetated banks up to 11 ft. on one flank of the intermittent stream. The stream is partially culverted. On April 6, 2022 it was announced that The Urbanna Oyster Festival Foundation removed 2.5 acres of underbrush in a vacant lot it purchased on Rappahannock Avenue to the east of and adjacent to Taber Park. This property is designated recreational open space acquired in part via a grant from the Virginia Outdoors Foundation and is now converted to parkland.

James River Archaeology, Inc. reviewed reports in addition to archaeological site files and architectural survey files at the Virginia Department of Historic Resources (VDHR) in Richmond. The earliest detailed maps of those areas included within the project area consist of coastal surveys completed by cartographers of the U.S. Coast Survey in the 1850s and 1860s. According to the 1856 Map of a Portion of the Rappahannock River, the proposed Urbanna pump station and associated transmission force main corridor were well beyond the developed area of the town. The proposed location of the Urbanna Treatment Plant pump station (Alternative 2) and the associated transmission force main corridor within the limits of the Town of Urbanna are situated outside of the boundaries of the Urbanna Historic District (DHR ID# 316-0009), which is listed in the National Register and the Virginia Landmarks Register. The above survey is included as Attachment 7 of the Draft HRSD Middlesex Joint Permit Application in Appendix A: Agency Correspondence as well as in Attachment A of the Final Preliminary Engineering Report included as Appendix B of this Final EA. Recommendations made by the VDHR included in addition to this earlier survey a Phase I Cultural Resources study. This study, which included both archaeological and architectural survey, was performed in June and July 2022 for selected components of the MISPPII as requested by the VDHR on October 21, 2021. The surveys are included in Appendix A.

3.3.3.1 SIGNIFICANCE CRITERIA

Significance criteria are based upon the removal of elements such as historic districts, a form of architectural elements, slope, and removal of vegetation. It is also based upon additions of elements that are incompatible with existing architectural elements, recreational use, color, and slope used by the BUI tool.

3.3.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The project will have a less than significant impact on aesthetics. Fill material for land-based excavation, when brought in from an outside source, will be clean and non-erodible soil. The MISPPII would have short- and long-term less than significant effects on aesthetics resources.

3.3.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no effects on aesthetics.

3.4 Wild and Scenic Rivers

3.4.1 Definition of Resource

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government uses all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA), in its implementation of NEPA (23 USC 109[h]), directs that final decisions on projects are to be made in the best overall public interest. This includes impacts upon wild and scenic rivers.

3.4.2 Affected Environment

The affected environment is the entirety of the MISPPII. There are no designated wild and scenic rivers in the Commonwealth of Virginia.

3.4.3 Environmental Consequences

There will be no environmental consequences regarding wild and scenic rivers.

3.4.3.1 SIGNIFICANCE CRITERIA

Significance criteria and the threshold is based on the project's design and seating within proximity to designated wild and scenic rivers in the Commonwealth of Virginia.

3.4.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The project will have no impact upon wild and scenic rivers.

3.4.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no impacts to wild and scenic rivers as none exist within the Commonwealth.

3.5 Biological *Resources*

3.5.1 Definition of Resource

Biological resources include native or naturalized plants and animals and the habitats in which they occur. These include vegetation; wildlife; and threatened, endangered, or sensitive species in a given area.

Biological resources are integral to ecosystem integrity. The existence and preservation of biological resources are intrinsically valuable to society for aesthetic, recreational, and socioeconomic purposes.

3.5.2 Affected Environment

The project area is largely comprised of rural residential areas and agricultural operations with some silvicultural operations, limited industrial operations and fisheries, mostly recreational, and some small urban areas.

3.5.2.1 VEGETATION

Historically, maple (*Acer rubrum*), loblolly pine (*Pinus taeda*) sweetgum (*Liquidambar styraciflua*), mixed oak forest, and tidal wetlands consisting of saltmarsh cordgrass and black needle rush were the dominant vegetative communities present before the counties were mostly cleared for agricultural purposes in the 17th through the 20th centuries. Today the vegetative communities include disturbed grassland, deciduous forest, coniferous forest, agricultural species, and palustrine forested, emergent nontidal, and emergent and scrub-shrub tidal wetlands. Vegetation includes turf, manicured grasses, and ornamental species in landscaped areas.

The wetland delineation methods used are detailed in the United States Army Corps of Engineers' (USACE) *Wetland Delineation Manual* (*1987 Manual*; Environmental Laboratory 1987), as amended by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0* (*Regional Supplement*; USACE 2012). Wetlands within the project area and the 100-ft. buffer that was utilized during the 2021 wetland and stream survey are characterized as scrub-shrub, emergent, mixed, and forested wetland.

Ten separate streams were identified and surveyed. They include ephemeral, intermittent, and perennial streams. Seventeen separate wetland polygons were identified and surveyed. These include palustrine emergent wetlands within ditches parallel to the roadway corridors, palustrine forested slope wetlands classed as tributaries of drainages, depressional wetlands that were both isolated and non-isolated, palustrine emergent slope wetlands, one spring-fed wetland, palustrine scrub-shrub wetlands whose association with tributaries of the Piankatank or the Urbanna was not known. Identified stream reaches were mapped along their entire course within the study area by use of a Global Positioning System (GPS) receiver with sub-meter accuracy or better. The identified streams are shown on the Aquatic Resource Location Map in the report.

The USACE Nationwide Permit 58 (recently revised from Nationwide Permit 12) will potentially be required. For both temporary and permanent impacts to palustrine tributaries of drainages, isolated and non-isolated depressional wetlands, and palustrine scrub-sbrub wetlands. Please see Appendix A.

3.5.2.2 WILDLIFE, INCLUDING MARINE SPECIES

The MISPPII does not impact marine habitats.

Typical mammal species include eastern cottontail (*Sylvilagus flordianus*), white-tailed deer (*Odocoileus virginianus*) and northern short-tailed shrew (*Blarina brevicauda*). Bat species big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lastionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), and eastern pipistrelle (*Perimyotis subflavus*) (HRSDB 2019a). Typical bird species

include American robin (*Turdus migratorius*), Amphibian species observed include American toad (*Anaxyrus americanus*) and reptiles include the garter snake (*Thamnophis sirtalis*). The insects typical of the area include black swallowtail (*Papilio poluxenes*) and fine-lined emerald (*Somatochlora filosa*).

3.5.2.3 THREATENED, ENDANGERED, OR SENSITIVE SPECIES

Federal

Northern Long-eared Bat (*Myotis septentrionalis*). The northern long-eared bat is listed as threatened under the ESA anywhere it is found, and critical habitat is not established. White-nose syndrome is the main threat to this species causing significant losses to the population (USFWS 2021c). It is a medium-sized (3 to 3.7 inches body length) bat that is distinguished from other species in the genus by its long ears (USFWS 2020b). Caves and mines serve as winter habitats; in the summer they roost in colonies or singly under peeling bark or cavities in trees. At dusk, northern long-eared bats hunt for insects in the understory of forested areas (USFWS 2020b). There is limited roosting habitat for the species in the MISPPII corridor or alternative sites. In 2023 the status of *M. septentrionalis* will change from threatened to endangered. The impending change will potentially affect construction that involves tree clearing after 2023.

Monarch Butterfly (Danaus plexippus). The monarch butterfly is a candidate for Federal listing. It occurs where habitat suitable for milkweed (genus *Asclepias*), its primary food source, occurs. No milkweed has been documented within the MISPPII corridor or alternative sites.

Small whorled pogonia (*Isotria medeoloides*). The small whorled pogonia, an orchid, is listed as threatened under the ESA anywhere it is found. When in flower the individual plants are 10 inches tall and about 14 inches when bearing fruit. The plant is named for the whorl of five or six leaves near the top of the stem and beneath the flower. The leaves are grayish-green, somewhat oblong and 1 to 3.5 inches long. The single or paired greenish-yellow flowers are about 0.5 to 1 inch long and appear in May or June. The fruit, an upright ellipsoid capsule, appears later in the year. The favored habitat is small light gaps, or canopy breaks, and grows in areas with sparse to moderate ground cover. Too many other plants in an area can be harmful to this plant. This orchid typically grows under canopies that are relatively open or near features that create long-persisting breaks in the forest canopy such as a road or a stream. It grows in mixed-deciduous or mixed-deciduous/coniferous forests that are generally in second- or third-growth successional stages. The soils in which it lives are acidic and moist, and have very few nutrients. The small whorled pogonia requires certain species of soil and leaf detritus fungi that are commonly associated with beech species. Habitat alteration is the primary threat to this species. Secondary threats are pesticide use and physical trampling by humans or domestic livestock.

The canopy cover in wooded areas in the MISPPII are primarily oak species, tulip poplar, loblolly pine, box elder, and sweetgum. Appropriate habitat including beeches is absent.

Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*). The northeastern beach tiger beetle is listed as threatened under the ESA anywhere it is found. Critical habitat has been established, Consultation with the preeminent expert in the northeastern beach tiger beetle and related beach tiger beetles on the East Coast of the United States, Dr. C. Barry Knisley, disclosed all surveys he has conducted along the Western Shore of the Chesapeake Bay since 2017. There are no suitable beach dune habitats

for this species in Mathews or Middlesex Counties. They do not occur in these smaller tidal tributaries. Correspondence is included in Appendix A.

Table 3.5-1. Protected Species in Gloucester, Middlesex and Mathews Counties with Potential to Occur within the Project Area

Common Name	Scientific Name	Federal Status[1]	Occurrence in Project Area
Mammals			
Northern long-eared bat	*Myotis septentrionalis*	T	Unlikely, limited roosting habitat
Insects			
Monarch butterfly	*Danaus plexippus*	C	Unlikely, no milkweed habitat
Plants			
Small whorled pogonia	*Isotria medeoloides*	T	Unlikely, no habitat with favored tree species

[1] E: endangered; T: threatened. C: candidate [2] Source: USFWS 2021

Migratory Birds

There are twenty migratory bird species protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act that potentially occur in Gloucester, Middlesex, and Mathews Counties. The twenty species are bald eagle (*Haliaeetus leucocephalus*), Golden eagle (*Aquila chrysaetos*), cerulean warbler (*Setophaga (Dendroica) cerulea*), Canada warbler (*Cardinellina canadensis*), Kentucky warbler (*Opoornis formosus*), prairie warbler (*Dendroica discolor*), prothonotary warbler (*Protonotaria citrea*), blue winged warbler (*Vermivora pinus*), rusty blackbird (*Euphagus carolinus*), red headed woodpecker (*Malanerpes erythrocephalus*), American oystercatcher (*Haematopus palliatus*), willet (*Tringa semipalmata*), lesser yellowlegs (*Tringa flavipes*), glossy ibis (*Plegadis falcinellus*), ruddy turnstone (*Arenaria interpres morinella*), piping plover (*Charadrius melodus*), short-billed dowitcher (Limnodromus griseus), wood thrush (*Hylocichla mustelina*), bobolink (Dolichonyx oryzivorus), and migrant loggerhead shrike (*Lanius ludovicianus migrans*). The bald eagle is protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940. The Center for Conservation Biology has created an online map of surveyed bald and golden eagle nesting sites in Virginia. No bald or golden eagles nest within a mile or greater in the project corridor within the three counties of Gloucester, Middlesex, and Mathews.

State-Listed Species

The migrant loggerhead shrike (*Lanius ludovicanus migrans*) and the barking treefrog (*Hyla gratiosa*) have been listed by the Virginia Department of Game and Inland Fisheries as occurring within two miles of the MISPPII area. However, the appropriate habitat for these species of farm fields with tree firebreaks and undisturbed large, forested wetland tracts, respectively, do not occur within the MISPPII area.

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations. Within the Urbanna and the Saluda Quadrangles, the VDCR has furnished the following conclusions.

Alternative 1, Alternative 2, Alternative 3 and Alternative 5 (Gloucester County)

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-ft. buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitats for natural heritage resources.

Alternative 4 (Gloucester County)

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-ft. buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitats for natural heritage resources.

In addition, the proposed project will intersect Ecological Core C 5 as identified in the Virginia Landscape Assessment (https://www.dcr.virginia.gov/naturalheritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer (http://vanhde.org/content/map).

According to the information currently in Biotics, natural heritage resources have not been documented elsewhere within the submitted project boundary including a 100-ft. buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitats for natural heritage resources. Within the Wilton Quadrangle and the Ware Neck Quadrangle, according to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-ft. buffer. Please note, a predictive model identifying potential habitat for natural heritage resources intersects the project boundary. However, based on the DCR biologist's review of the proposed project a survey is not recommended for the resource. For all quadrangles, if tree clearing occurs, the proposed project may fragment Ecological Cores (C3, C4, C5) as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/naturalheritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer (http://vanhde.org/content/map). Ecological Cores are areas of unfragmented natural cover with at least 100 acres of the interior that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection

and erosion prevention), and air quality (including carbon sequestration and oxygen production), along with the many associated economic benefits of these functions. The cores are ranked from C1 to C5 (C5 being the least ecologically relevant) using many prioritization criteria, such as the proportions of sensitive habitats of natural heritage resources they contain. The Project Action is present in two of these Ecological Core rankings: C3 (high), C4 (moderate), and C5 (general). Fragmentation occurs when a large, contiguous block of natural cover is dissected by development, and other forms of permanent conversion, into one or more smaller patches. Habitat fragmentation results in biogeographic changes that disrupt species interactions and ecosystem processes, reducing biodiversity and habitat quality due to limited recolonization, increased predation, and egg parasitism, and increased invasion by weedy species.

Therefore, minimizing fragmentation is a key mitigation measure that will reduce deleterious effects and preserve the natural patterns and connectivity of habitats that are key components of biodiversity. DCR recommends efforts to minimize edge in remaining fragments, retain natural corridors that allow movement between fragments, and design the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns). Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on the state listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects. There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

3.5.3 Environmental Consequences

3.5.3.1 SIGNIFICANCE CRITERIA

Biological resources effects would be considered significant if construction or operation activities would reduce the distribution or viability of species or habitats of concern, including the taking of a listed species.

3.5.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The MISPPII would have short- and long-term less than significant effects on biological resources. Ecological cores, where present, are of the C4 and C5 rankings due to the already fragmented ecological structures. Short-term minor adverse effects would be due to site-specific temporary disturbance during construction. Long-term minor adverse effects would be due to ongoing maintenance activities of the pump stations and treatment plants. Proposed activities would not significantly affect native vegetation or aquatic and terrestrial wildlife resources, including threatened and endangered species. Effects on biological resources would not reduce the distribution or viability of species or habitats of concern or violate biological resources laws or regulations. There would be less than significant effects regarding loss, degradation, or fragmentation of wildlife habitat. The concurrence and consultation with the USFWS and VDCR are provided in Appendix A.

The projects and project alternatives outlined in Chapter 2 consist of construction (including new construction, renovations, repair, alterations, and additions); demolition of buildings, pavement, and a directional drilling crossing of the Piankatank River and Urbanna Creeks. There would be some minor adverse effects to biological resources from individual projects and project alternatives; however, each

was reviewed on a case-by-case basis, and none in and of themselves would have appreciable adverse effects on biological resources. A description of effects to biological resources including all projects and project alternatives is provided in this section. This is considered the reasonable upper bound of effects, and impacts would be less than those described herein.

Construction Effects

Construction and demolition activities would have site-specific temporary effects on biological resources. The proposed activities would require vegetation removal, but it would primarily be mowed and landscaped vegetation. Construction activities would displace locally common wildlife species that are adapted to high levels of human activity and disturbance. However, any wildlife disturbed by construction activities could theoretically temporarily or permanently relocate to similar habitat nearby. There are no natural heritage areas or conservation/managed areas on public or private lands. All ground disturbed would be reseeded or planted with appropriate vegetation. These effects would be less than significant.

The proposed construction projects also include directional drilling under the Piankatank River and Urbanna Creek. The process is designed to avoid and minimize impacts to surface areas of the sediment, including sand, silt, and clay, to the extent practicable. Since the proposed project areas are in previously developed areas and previously directionally drilled areas for the installation of other utilities there would be no appreciable loss of wildlife habitat from the proposed construction activities. These activities would have short- and long-term less than significant effects on biological resources. The proposed repair and renovation projects include modifications to existing facilities. Since the proposed project areas are in previously developed areas there would be no appreciable loss of wildlife habitat from the proposed construction activities. These activities would have short- and long-term less than significant effects on biological resources.

Operational Effects

There would be less than significant effects on biological resources due to the maintenance and operations associated with the MISPPII. The MISPPII would have few additional effects on vegetation, wildlife, or threatened and endangered species when compared to existing conditions. Therefore, long-term effects on biological resources would be negligible.

The co-location and consolidation of facilities and functions specified in the MISPPII would provide operational efficiencies. The efficiencies gained from construction, renovation, and demolition would reduce the maintenance and operational requirements of facilities and project areas; therefore, the operational effects on biological resources would be negligible. Short-term minor adverse effects would be due to site-specific temporary disturbance during construction. Long-term minor adverse effects would be due to ongoing activities at the facilities.

3.5.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation as proposed would be unmet. The HRSD would be unable to fulfill its responsibilities to the greater community. Existing conditions would remain unchanged and there would be no effects on biological resources. Construction, renovation, and demolition activities would have site-specific temporary effects on the biological

resources. No past, present, or reasonably foreseeable projects have been identified that, when combined with the MISPPII, would have substantial cumulative effects on biological resources. Therefore, cumulative effects on biological resources would be less than significant. The No Action Alternative would have no effects on biological resources.

3.6 Irretrievable Resources

3.6.1 Definition of Resource

43 U. S. Code §4332 states that Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered following the policies outlined in this chapter, and (2) all agencies of the Federal Government shall-

(A) utilize a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by subchapter II of this chapter, which will ensure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on-

(i) the environmental impact of the MISPPII,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the MISPPII,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources that would be involved in the MISPPII should it be implemented.

These irretrievable commitments of resources that are irreversible include paleontological resources such as fossils and geological resources such as minerals, oil, and gas which, if used, will not be recovered. These also include prime farmland which, if converted to non-agricultural use, will not be recovered. The resources also include Chesapeake Bay Preservation Area buffers (offset by BMPs). The corridor and the pump stations will occupy the Chesapeake Bay Preservation Area Buffers at the crossings of the Piankatank River and Urbanna Creek. Not more than approximately 0.20 acre of potential impact is anticipated.

3.6.2 Affected Environment

The geology of the landscape within the proposed MISPPII is Coastal Plain sediments and is represented by the late Tertiary Period and the early Quaternary Period of the Cenozoic Era. The deposits are mostly estuarine and marine in origin. They thickly overlay the older Cretaceous Period sand and clay. The western terminus of the MISPPII (the site of the proposed Central Middlesex pump station Alternative 2) is underlain by the Quaternary-Tertiary Period Windsor Formation, composed of gravel and sand. This Formation continues along State Route 227 until the crossing at Urbanna Creek. Thereafter the geologic unit exposed at or near the surface becomes the Quaternary-Tertiary Period Tabb Formation, Sedgefield member. Sand is the predominant mineral resource. The site of the proposed Urbanna pump station alternatives is also the Quaternary-Tertiary Tabb Formation, Sedgefield member, comprised of sand. Along State Route 3 south of the crossing of Twiggs Ferry Road and White Pine Lane the geologic unit is the Quaternary Period Shirley Formation, composed of sand. The Locust Hill pump station location is located within the Windsor Formation. Gravel and sand are the predominant mineral resources. At Wilton Point, it is the Quaternary Tabb Formation, Lynnhaven and Poquoson members, undifferentiated Quaternary sand, and silt. Immediately south of the northern abutment for the bridge over the Piankatank River, the geologic unit is the Quaternary Shirley Formation, comprised of gravel and sand. Just south of State Route 198 the geologic unit is the Quaternary Tabb Formation, Sedgefield member. It is Quaternary age sand. Following State Route 3 to John Clayton Memorial Highway (State Route 14) the unit is seen to be once more gravel and sand of the Quaternary-Tertiary Windsor Formation. This is the southernmost terminus of the main corridor. The five alternative sites for the proposed Gloucester pump stations, including the three alternatives near Waverley Lane and the site of the proposed Gloucester Pump Station Alternative 4 (not selected) include the Quaternary Tabb Formation, Lynnhaven and Poquoson members. The Formation is undifferentiated sand with a secondary silt component. Included also is the Tertiary Windsor Formation.

There are two active permitted mines permitted by Virginia Energy (formerly known as the Virginia Division of Mines, Minerals, and Energy) within five miles of the MISPPII: James Holmes Pit, permit number 90363AA C03243, owned by James and William Holmes, an open pit sand and gravel mine located one mile northwest of the town of Urbanna on State Route 602 (Old Virginia Street) in Middlesex County; and Mine # 1, permit number 13118AA C00594, owned by William H. Wright, an open pit sand mine located on State Route 3, three miles west of the unincorporated community of Topping on State Route 33 in Middlesex County.

A Pleistocene-epoch oyster fossil site is located on private property along the southern Piankatank River shoreline at Holland Point in Mathews County approximately 1.8 miles west of the State Route 3 bridge over the Piankatank River. A rich invertebrate fossil bed of Neogene-Pleistocene age is located at Mitchem Pit west of Ridge Road (State Route 626) in Mathews County approximately 8 miles from the MISPPII. Both sites are over one mile from the MISPPII area.

There are no Federal lands within five miles of the MISPPII area wherein disturbance of paleontological resources is prohibited. All paleontological resources are located on privately owned properties.

3.6.3 Prime Farmland

The project is located in a predominantly rural and rural residential area of the Commonwealth of Virginia with limited fisheries industry and one urban area. The MISPPII includes one semi-rural area in Saluda, Middlesex, and one urban area, Urbanna, also in Middlesex. The remainder of the MISPPII is located in an area of timber production, agriculture, small businesses, residences, public schools, nontidal streams and wetlands, and beaches and tidal waterbodies.

Prime farmland is identified by the U. S. Department of Agriculture/Natural Resources Conservation Service as land having the best combination of chemical and physical characteristics for producing food, fiber, and forage, permeable, with adequate water supply from precipitation or irrigation, favorable temperature, and levels of acidity or alkalinity and few or no rocks. Urban areas do not have prime farmland mapped. It does not occur in undrained areas or areas that flood frequently although it can be well-drained hydric soils.

The United States Department of Agriculture's Natural Resources Conservation Service publishes soil surveys of all counties and municipalities in Virginia. They have been evaluated according to morphology, physical composition, hue, chroma, and value at varying depths of the soil column to 60 inches, erodibility, and suitability for various crops or timber production. Associated soil mapping units that can occur with each unit are listed. Soils are identified as hydric soils and nonhydric soils, as well as their status as prime farmland, farmland of statewide importance, or neither of these. The following soil mapping units are documented within the Project Action.

Table 3.6-1. Soils Within the HRSD Middlesex Interceptor System Program Phase II

USDA Designated Soil Mapping Unit	Hydric (Yes/No)	Prime Farmland or Farmland of Statewide Importance (Yes/No)
3 Bethera and Daleville	Yes	No
3B Craven silt loam	No	Yes, Prime Farmland
4 Catpoint loamy sand	No	No
4A Dogue fine sandy loam, 0 to 2 percent slopes	No	Yes, Prime Farmland
4B Dogue fine sandy loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
5B Emporia sandy loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
6A Emporia loam, 0-2 percent slopes	No	Yes, Prime Farmland
6B Emporia loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
7D Emporia-Nevarc complex, 6 to 15 percent slopes	No	Yes Farmland of Statewide Importance
7F Emporia-Nevarc complex, 15 to 45 percent slopes	No	No
8 Eunola loam	No	Yes, Prime Farmland
9A Kempsville sandy loam, 0 to 2 percent slopes	No	Yes, Prime Farmland
9B Kempsville sandy loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
10 Kenansville fine sand	No	No
11 Kinston-Bibb complex	Yes	No
11 Johns variant loamy sand	No	No
13 Myatt loam	Yes	Yes, Prime Farmland if Drained
13B Kempsville fine sandy loam, 2 to 6 percent slopes	Yes	Yes, Prime Farmland
15 Ochlockonee silt loam	No	No

USDA Designated Soil Mapping Unit	Hydric (Yes/No)	Prime Farmland or Farmland of Statewide Importance (Yes/No)
16 Pactolus loamy fine sand	No	No
16 Lumbee sandy loam	Yes	Yes Prime Farmland if Drained
17 Pocaty muck	Yes	No
18 Meggett sandy loam	Yes	Yes, Prime farmland if drained
18B Rumford fine sandy loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
19A Slagle silt loam, 0 to 2 percent slopes	No	Yes, Prime Farmland
19B Slagle silt loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
20A Suffolk fine sandy loam, 0 to 2 percent slopes	No	Yes, Prime Farmland
20B Suffolk fine sandy loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
21D Suffolk-Remlik complex, 6 to 15 percent slopes	No	Yes, Farmland of Statewide Importance
21F Suffolk-Remlik complex, 15 to 45 percent slopes	No	No
22B Udorthents and Psamments, gently sloping	No	No
25 Pamlico and Portsmouth muck	Yes	No
29C Suffolk fine sandy loam, 6 to 10 percent slopes	No	Yes, Farmland of statewide importance
Dr. Dragston fine sandy loam	No	Yes, Prime Farmland if Drained
Fa Fallsington fine sandy loam	Yes	Yes, Prime Farmland if Drained
SaA Sassafras fine sandy loam 0 t0 2 percent slopes	Yes	Yes, Prime Farmland if Drained
SdA Sassafras loamy fine sand, 0 to 2 percent slopes	Yes	Yes, Prime Farmland if Drained
StE Steep sandy land	No	No
Wo Woodstown fine sandy loam	No	Yes, Prime Farmland if Drained

The above prime farmland and soils of statewide importance soil mapping units are present along the main transmission force main corridor except for the following. Present at the location of the proposed pump stations at 8210 Waverly Lane, Tax Map number 26-109, 9375 John Clayton Memorial Highway, 9316 John Clayton Memorial Highway and Tax Map number 26-22 John Clayton Memorial Highway, are these prime farmland and soils of statewide importance soil mapping units: 7D, Emporia-Nevarc complex, 6 to 15 percent slopes, 13B, Kempsville fine sandy loam, 16, Lumbee sandy loam, 18, Maggett sandy loam, 18B, Rumford fine sandy loam, 19A, Slagle silt loam. 0 to 2 percent slopes, and 29C, Suffolk fine sandy loam. At 9375 John Clayton Memorial Highway, most surrounding lots are now devoted to solar farm use and removed from agricultural production permanently. Only 400 feet by 350 feet of this parcel are planned as a location for the pump station and access road. The 5 acres at 9316 John Clayton Memorial Highway (Alternative 4) are in timber production and have not been used for agricultural production for many decades. It is conceivable that they could be returned to agricultural production but not likely since the current property owner is expanding a residential area to the west. The 8.5 acres at Tax Map number 26-22 are in timber production and have not been used for agricultural production for many decades. It is conceivable that the acreage could be returned to agricultural production, but not likely since they are mostly surrounded by residential areas. It is present at the location of one of the alternative sites for a proposed new pump station, proposed Gloucester Pump Station Alternative. This location is unlikely to be farmed in the future as it has been in timber for many decades. The following prime farmland and farmland of statewide importance soil mapping units are present at the location of 26-22, within the proposed pump station at 215 Linden Street in Urbanna in Middlesex County: 6A, Emporia loam, 0 to 2 percent slopes, 7D, Emporia-Nevarc complex, 6 to 15 percent slopes, 8, Eunola loam, 9A, Kempsville sandy loam, 19A, Slagle silt loam, 20A, and Suffolk fine sandy loam, 0 to 2 percent slopes. The property at 215 Linden Street is within the town limits and is zoned Residential-Medium Density, It has thus been removed from potential agricultural production permanently.

The prime farmland soil mapping units along the main transmission force main corridor are within disturbed soils already present within the Virginia Department of Transmission right of way.

The USDA Chesapeake Service Area office responded to a request for a Farmland Conversion Impact Rating on October 28, 2021. The project would require a rating if it received Federal funding or assistance. However, as the project receives no Federal funding or assistance. a Farmland Conversion Impact Rating is not required.

3.6.4 Environmental Consequences

The soils present along the main transmission force main corridor will not be used for the cultivation of food, fiber, and forage in the foreseeable future as they have been removed from agricultural production permanently. The MISPPII will not affect the availability of prime farmland for cultivation, as three of the alternatives along John Clayton Memorial Highway in Gloucester County are planned for future residential and solar farm land use and one is currently in timber and has been in timber for many decades

The resources also include Chesapeake Bay Preservation Area buffers (offset by BMPs). The corridor will occupy the Chesapeake Bay Preservation Area Buffers at the crossings of the Piankatank River and Urbanna Creek. Not more than approximately 0.20 acre of potential impact is anticipated.

Significance Criteria

43 U. S. Code §4332 makes limited provisions for the determination of significance in a short- or long-term impact. An impact may be beneficial or adverse or be of no impact. An adverse impact on geological resources or formations, or prime farmland, might be due to grading or otherwise modifying existing topography in such a manner that access to these resources is permanently removed. Other adverse impacts include the removal of the resource. In the case of prime farmland, the addition of soil for grading, or extensive excavation, removes the soil mapping unit and converts it permanently to a mapping unit commonly considered urban land.

3.6.4.1 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The project will not impact fossil shell beds or other paleontological resources via filling or excavation of said resources and there will be no impact on oil and gas resources or mineral resources. Fill material for land-based excavation, when brought in from an outside source, will be clean and non-erodible soil. The MISPPII would have short- and long-term less than significant effects on irretrievable resources. The MISPPII would not affect known minerals, gas, oil, or paleontological resources. As discussed in Section 3.6.4., the MISPPII will not affect the availability of prime farmland for cultivation, as the four alternatives along John Clayton Memorial Highway in Gloucester County are planned for future residential and solar farm land use. There is a low probability that the MISPPII could affect the availability of prime farmland if the proposed pump station is built at the proposed site at Gloucester Pump Station Alternative 4 along the John Clayton Memorial Highway. The land, currently in timber, could be converted to cultivated land as it is currently not under cultivation and has not been cultivated for decades.

Resources also include Chesapeake Bay Preservation Area buffers (offset by BMPs). The MISPPII will occupy the Chesapeake Bay Preservation Area Buffers at the crossings of the Piankatank River and Urbanna Creek. Not more than approximately 0.20 acre of potential impact is anticipated.

3.6.4.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no effects on irretrievable resources.

3.7 Cultural Resources

3.7.1 Definition of Resource

Cultural resources are defined as prehistoric or historic districts, sites, buildings, structures, or objects considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. They include archaeological, architectural, and traditional resources. Archaeological resources contain artifacts, features, or other archaeological indications of past human life or activities from which archaeologists interpret information about history or prehistory. Architectural resources include buildings, structures, landscapes, and objects that document the history of an area and possibly the history that predates the area. These could include underwater resources.

Sections 106 and 110 of the NHPA of 1966, as amended, require federal agencies to identify whether any historic or architectural resources that are listed or eligible for listing, on the NRHP could potentially be affected by the MISPPII. Generally, historic properties must be more than 50 years old to be considered for inclusion in the NRHP but may also include the Cold War era (resources constructed before 1990), and Native American cultural properties.

3.7.2 Affected Environment

A total of 14.2 acres of the MISPPII, where proposed construction activities will result in subsurface disturbance, were surveyed during the Phase I archaeological investigation conducted in June 2022, DHR File No. 2020-5020. The Area of Potential Effect (APE) was divided in 45 discrete Survey Units . A total of 222 shovel tests were dug during this survey. Three survey units, SU 006, SU 025 and SU 038. yielded artifacts. Eleven historic period artifacts, mainly bottle glass, were identified in three shovel tests throughout SU 006. These artifacts are interpreted as isolated finds. One prehistoric artifact, a non-diagnostic quartz biface was found in a ST within SU 025. Radial STs placed around the find did not reveal any additional cultural material. The artifact is interpreted as an isolated find. In SU 038, Site 44MT0185, a historic period artifact scatter, was identified. The site assemblage includes ceramics such as whiteware and stoneware, bottle glass, nails, window glass, and brick. The site is interpreted as a secondary artifact scatter. Tetra Tech recommends that the site does not possess qualities that meet the criteria to be eligible to the NRHP. Tetra Tech recommends no further archaeological investigation within SU 038.

Additionally, in the survey unit identified as SU 020, a cemetery was purported to be located in the APE. Pedestrian reconnaissance and subsequent shovel testing found no indication of graves within the APE. Tetra Tech recommends no further work within the area that comprises SU 020. For this survey unit Tetra Tech recommends development of an Unanticipated Discoveries Plan for the Project. This plan would outline steps to be taken in the event that human remains or a cultural site is revealed during construction. The survey recommends a finding by the Virginia DHR of “No Adverse Effect” to archaeological resources with the inclusion of this Unanticipated Discoveries Plan in construction documents. A Phase I Reconnaissance Level Historic Architectural Survey Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main Project, Middlesex, Mathews, and Gloucester Counties, Virginia VDHR File # 2020-5020, was conducted. The APE for historic architectural resources (including historic structures, districts, landscapes and cemeteries) consists of geographical areas where the pipeline may have direct or indirect effects. Direct effects may occur where the pipeline crosses the boundary of a National Register of Historic Places (NRHP) listed or eligible property. Indirect effects may occur outside NRHP boundaries but still have the potential to affect historic resources. Indirect effects include the introduction of visual, audible, or atmospheric elements that are incompatible with a resource’s historic character. In the case of MISPPII indirect effects would primarily be visual ones, where the pipeline or cleared easement would be visible from a listed or eligible property and diminish the special qualities that qualify the resource for the NRHP. The APE for historic architectural resources for the project comprised those areas that would have a direct line-of-sight to the project.

During a meeting held on March 22, 2022 to discuss the project, Tetra Tech and VDHR agreed that the historic architecture survey would inventory properties within a 0.25- mile radius (the “Study Area” comprising approximately 55.5 acres) of each proposed pump station, although the actual APE could well

be far smaller in size than implied by the defined Study Area. The APE for new easements along VDOT rights-of-way encompassed properties immediately adjacent to the project alignment. Each of the surveyed properties was evaluated for their eligibility for listing on the NHRP. Cultural resources are evaluated based on criteria for NRHP eligibility specified in the Department of Interior Regulations 36 CFR Part 60: National Register of Historic Places. Cultural resources can be defined as significant if they "possess integrity of location, design, setting, materials, workmanship, feeling, and association," and if they are 50 years of age or older and: A) are associated with events that have made a significant contribution to the broad patterns of our history (history); or B) are associated with the lives of persons significant in our past (person); or C) embody the distinctive characteristic of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that components may lack individual distinction (architecture); or D) have yielded, or may be likely to yield, information important in prehistory or history (archaeology).

Tetra Tech documented 56 historic resources 50 years of age or older that may have views of the MISPPII in proximity to the five proposed pump stations and along sections of the proposed force main that represent new Virginia Department of Transportation (VDOT) easements. Tetra Tech documented 29 newly identified historic architectural resources plus 27 historic architectural resources already recorded in the Virginia Cultural Resources. Based on analysis of resource characteristics and criteria of eligibility, Tetra Tech recommends two previously recorded resources for further research to determine whether they possess qualities of significance to be eligible for listing in the NRHP: a circa 1860 Greek Revival house in Locust Hill (VDHR Nos. 059-0042), and the City of Refuge Church in Hartfield (059-5061) Five resources already have been listed or determined eligible for listing in the NRHP, and no change is recommended in the NRHP status of these resources: Saluda Historic District (059-5124), Urbanna Historic District (316-0009), Rosegill Plantation (059-0009), Wilton Plantation (059-0010), and Middlesex Training School-Bus Garage (059-0078). Four resources previously have been recommended as contributing resources to historic districts and have not been individually evaluated for eligibility. Tetra Tech recommends that these four resources retain their present status: Antioch Baptist Church, cemetery, and elementary school (059-5124-0003), and Rappahannock Avenue Cemetery (316-0009-0095).

The remaining 45 documented resources are recommended not eligible for listing in the NRHP and are pending VDHR numbers.

Previous cultural resources surveys, inventories, and assessments performed by James River Archaeology, Incorporated for the MISPPII had identified NRHP eligible, or potentially eligible, archeological sites and NRHP-historic architectural resources that are not within or near the MISPPII. The undertakings within the MISPPII consist of interior renovation, addition or alteration of the buildings, and demolition of buildings. Phase I investigation and subsequent review indicate that the project will have no adverse effect upon any of the 56 documented resources detailed during the analysis. These structures are included in the 2022 Phase I Reconnaissance Level survey. The surveys are included as Attachment 7 in the Draft HRSD Middlesex Joint Permit Application in Appendix A, Agency Correspondence, as well as Appendix A of the Final Preliminary Engineering Report in Appendix B of this Final EA.

3.7.3 Environmental Consequences

3.7.3.1 SIGNIFICANCE CRITERIA

Effects would be considered significant if the HRSD did not conduct and complete proper coordination with the Virginia SHPO before physically altering, damaging, or destroying all or part of a cultural resource or introducing visual or audible elements that are out of character with a historically sensitive property.

Under Section 106 of the NHPA, an action might have no effects on historic properties (no historic properties finding), no adverse effects on historic properties, or adverse effects on historic properties. An adverse effect under Section 106 of the NHPA would not necessarily be significant under NEPA if effects were not considered substantial and could be mitigated. Measures developed to minimize or mitigate adverse effects on historic properties under Section 106 of the NHPA could result in an action having no significant impacts on cultural resources under NEPA. Mitigation consists of the inclusion of an Unanticipated Discoveries Plan in construction documents.

3.7.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The MISPPII is expected to have no adverse effects on cultural resources. A Phase I Cultural Resources Survey was performed per the recommendation of the Virginia DHR in their letter dated October 21, 2021 and provided data on any additional archaeological/architectural resources not yet identified in previous studies to ensure no significant impacts to these resources.

The projects and project alternatives outlined in Chapter 2 consist of construction (including new construction, renovations, alterations, and additions), demolition of buildings and pavement, and directional drilling. There would be some minor adverse effects to cultural resources from individual projects and project alternatives; however, each was reviewed on a case-by-case basis, and none of the projects would have potential effects on cultural resources. This is considered the reasonable upper bound of effects, and impacts would be less than those described herein.

Archaeological Resources

The Phase I Archaeological Investigation recommended by the Virginia DHR in their letter dated October 21, 2021 was conducted in June 2022. A desktop review of the Virginia Cultural Resource Information System (VCRIS) archaeological site files for the Project and surrounding one mile area was conducted to assemble a list of known archaeological, historic, and cultural properties that might be affected by the proposed transmission force main and pump stations and reviewed the extent of prior surveys performed in the Area of Potential Effect (APE). The results of the desktop assessment informed the strategy for the Phase I field survey. Tetra Tech sent VDHR a letter dated March 17, 2022, to begin discussions on the survey strategies for the Project. On March 22, 2022, Tetra Tech had a virtual meeting with Roger Kirchen and Marc Holma from VDHR to discuss the Project, APEs for archaeology and historic architecture, and to discuss Tetra Tech's approach to the surveys. VDHR approved of Tetra Tech's approach to survey. The Phase I field survey was initiated on June 15, 2022 and was completed on June 28, 2022. A Phase I archaeological survey was conducted between June 15, 2022 and June 28, 2022 on the portions of the project area that are previously undisturbed adjacent to the Force Main right-of-way (ROW) of Route 227, Route 33, and Route 3, as well as the areas of proposed pump stations Urbanna,

Locust Hill, Hartsfield, and Gloucester. Survey was not conducted in areas where the Force Main ROW is within a paved road or within extant pump stations Central Middlesex and Beaver Dam.

The MSIPPII would not affect known archaeological resources because there are no known archaeological resources that are within the proposed project areas, surveys across the base indicate the probability of undiscovered resources is low, and if resources are uncovered during construction, the HRSD has guidelines for stopping construction to allow professional archaeologists to survey the area. Although no subsurface cultural resources have been identified, if such resources were uncovered during construction, renovation, or demolition, activities would be suspended until a qualified archeologist could determine the significance of the resources. These effects would be less than significant.

Architectural Resources

The MISPPII includes the demolition of structures. The HRSD will be assessing all of the structures that are 50 years old and older during the Phase I Cultural Resources Survey to be performed in 2022.

The HRSD consulted with the Virginia SHPO under Section 106 of the NHPA, providing them with information on the undertaking. The SHPO correspondence is provided in Appendix A. The Virginia DHR recommended a Phase I Cultural Resources study for selected components of the MISPPII in their letter dated October 21, 2021. A Phase I reconnaissance level architectural survey and a Phase I archaeological survey were performed in June and July 2022. The results were forwarded to the SHPO and included in this Final EA.

Traditional Cultural Resources

The MSIPPII is not expected to affect known traditional cultural resources because there are no known traditional cultural resources within the proposed project areas. There are no Federally recognized tribes in the area of the MISPPII as confirmed during the Phase I cultural resources survey.

3.7.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects would not occur and the need to meet current and future HRSD objectives would not be possible. Existing conditions would remain unchanged and there would be no effects on cultural resources.

3.8 Noise

3.8.1 Definition of Resource

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government uses all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA), in its implementation of NEPA (23 USC 109[h]), directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, noise.

The primary measure of noise impacts on people and land uses is the Federal standard cumulative metric. It is a measure of the overall noise experienced in an area during a full 24-hour day. The metric factors in the increase of duration of noise events, the number of noise events in the 24 hour day, takes into account the increased sensitivity to noise occurring at night, allows a composite measurement of all sources of noise both within and outside an airport and allows quantitative comparisons of noise from various sources. Decibel Scale is used as the Federal standard. Sound is measured in units called decibels (dB). The higher the decibel level, the louder the noise. On the decibel scale, the level increase of 10 means that a sound is 10 times more intense, or powerful. The 65 decibels (dB) contour is the lower limit for defining significant noise impact on the human ear. The exposure of 1.5 dB or greater to the human ear is considered a significant addition of noise. The problem to be addressed is if the project increases noise by 1.5 dB or more for a noise-sensitive area that is exposed to noise at or above the 65 dB noise exposure level, or that will be exposed at or above the 65 dB level due to a 1.5 dB or greater increase when compared to the no-action alternative for the same timeframe. Noise-sensitive areas include schools, cemeteries, churches, and hospitals.

3.8.2 Affected Environment

The affected environment is the entirety of the MISPPII project area. The land use is currently agricultural, silvicultural, and light industrial, with some fisheries and rural residential. Portions of the project corridor involve crossing the Piankatank River and Urbanna Creek. There are five noise-sensitive areas within the Project Action: Calvary Baptist Church, at 3971 General Puller Highway, Harmony Grove Baptist Church at 7722 General Puller Highway, Apostolic Faith Church at 7320 General Puller Highway, Christchurch School at 49 Seahorse Lane, and Grafton Church at 425 Grafton Church Road.

3.8.3 Environmental Consequences

Noise impacts during the construction of the proposed projects are associated with an increase in ambient noise levels from the construction equipment. Grading and scraping operations are the noisiest activities with equipment generating noise levels as high as 70 to 95 A-weighted in decibels (dBA) within 50 feet of their operation. Distance would rapidly attenuate noise, and it is not anticipated that construction will occur close enough to existing noise-sensitive areas to cause disturbances. In addition, construction would occur during daytime hours when residents are away from their homes and would be less disturbed than nighttime hours when most church activities would also take place; therefore, those living and worshipping in the vicinity are not likely to be affected by construction noise. Noise impacts are generally localized in the vicinity of the construction and demolition sites. Earthmoving equipment, tree removal equipment, asphalt pavers, drilling, and other construction machinery and vehicles will create localized increases in noise levels. These temporary noise impacts should not disrupt normal church or school operations. Noise levels generally dissipate as the distance from their origin increases. Distance from the construction sites must be considered when evaluating potential noise impacts to land uses adjacent to or near the construction.

3.8.3.1 SIGNIFICANCE CRITERIA

The Federal Highway Administration (FHWA), in its implementation of NEPA (23 USC 109[h]), developed the significance criteria for the evaluation of noise impacts. Adverse effects or no effects are the criteria categories. The Noise Control Act of 1972 and EO 12088 require that federal agencies assess the impact

of noise on the environment by assessing the duration, the number of events and sensitivity of certain groups and times of day, and noise receptors. An effect is considered adverse when all three factors are significantly impacted.

3.8.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The project will have a less than significant impact on noise. The MSIPPII would have short- and long-term less than significant effects on aesthetics resources.

3.8.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no effects on noise levels.

3.9 Traffic Circulation and Traffic Pattern Disruptions

3.9.1 Definition of Resource

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government uses all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA), in its implementation of NEPA (23 USC 109[h]), directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, changes to traffic patterns, and alteration in surface traffic patterns, or a noticeable increase in surface traffic congestion or decrease in Level of Sound (LOS).

3.9.2 Affected Environment

The affected environment is the entirety of the MSIPPII. The land use is currently agricultural, silvicultural, and light industrial, with some fisheries and rural residential. Portions of the project corridor involve crossing the Piankatank River and Urbanna Creek. Those roadways identified by the Virginia Department of Transportation (VDOT) as being within the project corridor are Route 227, Route 14 at John Clayton Memorial Highway near its intersection with Waverley Lane (Route 694) Route 33, Route 3 from Route 33 to the crossing of the Piankatank River, and Route 3 from the Middlesex County line to the Route 3/198 intersection. All of these would be impacted by the proposed construction. The Commonwealth of Virginia Annual Average Daily Traffic Volumes data for 2019 lists Annual Average Daily Traffic. At Waverley Lane, Ware Neck Road and SR 14, the nearest intersections to the proposed Gloucester Pump Station Alternatives 1, 2, 3 and, and the existing Beaver Dam Pump Station which will receive upgrades, the AADT is 21,000. At the intersection of 3 and 33, the AADT is 7,300. The AADT for Route 3 from Route 33 to the crossing of the Piankatank River (the Mathews County line) is 7,300 AADT, Route 3 at its intersection with SR 14 has an AADT of 12,000,and the main corridor Route 3 to the Route 31/Route 98 intersection is 2,500 AADT.

In its comments to the HRSD dated September 28, 2021, VDOT stated that there are no known or proposed programmed improvements at these above routes at the present time.

3.9.3 Environmental Consequences

The traffic volumes will have little impact from construction activities. Traffic levels in the project areas are light and would not increase substantially or degrade the LOS on any nearby roadway or intersection. The construction and demolition activities would require the use of heavy equipment and worker commutes that would generate short-term increases in traffic. The local roadway infrastructure in all three counties would be sufficient to support these activities. Because most of the work would take place on-site, road closures or detours would not be expected. All construction vehicles would be equipped with backing alarms, two-way radios, and "Slow Moving Vehicle" signs when appropriate. Although these effects would be negligible, contractors would route and schedule construction vehicles to minimize conflicts with other traffic, and strategically locate staging areas to minimize these already limited effects. These effects would be negligible.

3.9.3.1 SIGNIFICANCE CRITERIA

Effects would be considered significant if the proposed project produced a permanent increase in traffic or resulted in a decrease in LOS.

3.9.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The project will have a less than significant impact on traffic. The MSIPPII would have short- and long-term less than significant effects on traffic. The criteria for which significance is evaluated are twofold. One is a cumulative increase in traffic, and the second is whether roadways leading to and from the state roadways listed in Section 3.9.2 exhibit short- and long-term decreases in LOS. There are no proposed or programmed improvements planned along the routes within the MISPPII at the present time.

3.9.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no effects on traffic in the area.

3.10 Socio-Economic Changes

3.10.1 Definition of Resource

EO 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was enacted in 1994 to focus the Federal agency's attention on the environmental and human health conditions in minority communities and low-income communities to achieve environmental protection for all communities. Under this EO, Federal agencies must identify and address the human health or environmental effects of its actions on disproportionately minority and low-income populations.

Based on guidance from the CEQ, several definitions must be clarified to understand what an environmental justice community is. Minority populations should be identified where either (a) the minority population of the area exceeds 50 percent (%), or (b) the minority population percentage of the

affected area is meaningfully greater than the minority population percentage in the general population or other appropriate units of geographic analysis (CEQ 1997). Hispanic or Latino populations are defined not as a racial designation, but rather an ethnic population. Hispanics or Latinos may be white, black, or any race. Low-income populations are defined as those below the Federal poverty thresholds ($12,880 U. S. dollars per capita per year) identified using statistical poverty thresholds from the U.S. Census. EPA guidance states, "The composition of the population should be compared to the characteristics of the population, e.g., percentage of minority populations residing near a proposed project versus the percentage of minority populations located within a single or multiple-county area surrounding the proposed project" (EPA 1998). Applying this methodology, the percentage of low-income and minority populations within the Census Tracts where the project area is located is compared to the percentage of low-income and minority populations located within the Commonwealth of Virginia. Specifically, a low-income or minority population is identified when an area has a poverty rate or minority population percentage that is significantly greater than the state. 2020 USCB data were examined to determine minority and low-income population percentages in the project area to facilitate the qualitative assessment of potential environmental justice impacts.

3.10.2 Affected Environment

The data used in this analysis is obtained from the USCB Census 2020. The Gloucester County component of the project area is in both Census Tract 1002.03, zip code 23061, and Census Tract 1002.01, zip code 23061. (USCB, 2021). For Census Tract 1002.03 the population is 37,348, approximately 87.8% of which is Caucasian or white. Approximately 8.0% is black, 0.6% is Native American, 0.9% is Asian, 0.1% is Native Hawaiian, approximately 2.7% is two or more races, and 3.8% is Hispanic or Latino. The data indicate in Census Tract 1002.03, 8.6% of the individuals live below the Federal poverty level, a lower percentage of the low-income population than either Gloucester County or the state. Census Tract 1002.3 has a lower percentage of minority population than the state, at 69.4%. The mean per capita income according to July 2017 Census data for Census Tract 1002.03 is $33,697. For the state of Virginia, the mean per capita income is $39,278, significantly more than the mean per capita income for the Census Tract.

The median home price in the Census Tract is $230,000. The Census Tract median home price is significantly less than the state median home price of $273,100. A statistical testing tool is available from the USCB. This testing tool was applied to Census Tract rankings for home prices to ascertain the statistical significance of variations in-home prices.

Census Tract 1002.03 does not have a higher percentage of children under the age of 18 living in poverty compared to that of the state (8.6% as compared with 9.9% for the state) or a higher percentage of adults aged 65 and over living in poverty (2.1% as compared with 9.9% for the state). Census Tract 1002.03 is not classed as a Housing and Urban Development Qualified Census Tract, which bases its evaluations on environmental justice community criteria. Based upon the small percentage of children and seniors living in poverty and the lower percentages of minority populations in the Census Tract as compared to Commonwealth of Virginia data, the criteria for an environmental justice community are not met in Census Tract 1002.03.

For Census Tract 1002.01 the population is 6,078, approximately 81.5% of which is Caucasian or white. Approximately 9.2% is black, 0.1% is Native American, 0.6% is Asian, 0.4% is Native Hawaiian,

approximately 7.3% is two or more races, and 3.7% is Hispanic or Latino. The data indicate in Census Tract 1002.01, 6.1% of the individuals live below the Federal poverty level, a lower percentage of the low-income population than either Gloucester County or the state. Census Tract 1002.1 has a lower percentage of minority population than the state, at 69.4%. The mean per capita income according to July 2017 Census data for Census Tract 1002.01 is $35,211. For the state of Virginia, the mean per capita income is $39,278, significantly more than the mean per capita income for the Census Tract.

The median home price in the Census Tract is $208,100. The Census Tract median home price is significantly less than the state median home price of $273,100. A statistical testing tool is available from the USCB. This testing tool was applied to Census Tract rankings for home prices to ascertain the statistical significance of variations in-home prices.

Census Tract 1002.01 does not have a higher percentage of children under the age of 18 living in poverty compared to that of the state (8.7% as compared with 9.9% for the state) or a higher percentage of adults aged 65 and over living in poverty (3.9% as compared with 9.9% for the state). Census Tract 1002.01 is not classed as a Housing and Urban Development Qualified Census Tract, which bases its evaluations on environmental justice community criteria. Based upon the small percentage of children and seniors living in poverty and the lower percentages of minority populations in the Census Tract as compared to Commonwealth of Virginia data, the criteria for an environmental justice community are not met in Census Tract 1002.01.

The Middlesex County component of the project area is in Census Tracts 9509, 9510, 9511, and 9512, zip codes 23071, 23169, 23149, and 23175. (USCB, 2021). The population is 10,582, approximately 80.1% of which is Caucasian or white. Approximately 16.6% is black, 0.5% is Native American, 0.5% is Asian, 0.1% is Native Hawaiian, approximately 2.2% is two or more races, and 2.9% is Hispanic or Latino. Taking a mean percentage in these four Census Tracts, we see that 13.8% of the individuals live below the Federal poverty level, a higher percentage of the low-income population than the state. Census Tracts 9509, 9510, 9511, and 9512 have a lower percentage of the minority population. The mean per capita income according to July 2017 Census data for these census tracts is $31,592. For the state of Virginia, the mean per capita income is $39,278, significantly more than the mean per capita income for these four census tracts.

The median home price in the census tracts studies is $261,900. The Census Tract median home price is not significantly less than the state median home price of $273,100. A statistical testing tool is available from the U.S. Census Bureau. This testing tool was applied to Census Tract rankings for home prices to ascertain the statistical significance of variations in-home prices.

These four Middlesex County census tracts do have a higher percentage of children under the age of 18 living in poverty compared to that of the state (10.9% average as compared with 9.9% for the state) and have a higher percentage of adults aged 65 and over living in poverty (13.9% average as compared with 9.9 % for the state). These census tracts are not, however, classed as Housing and Urban Development Qualified Census Tracts, which bases its evaluations on environmental justice community criteria. Based upon the percentage of children and seniors living in poverty and the lower percentages of minority populations in the Census Tract as compared to Commonwealth of Virginia data, the criteria for an environmental justice community are not met in Census Tracts 9509, 9510, 9511, and 9512.

The Mathews County component of the project area is in Census Tract 9513.01, zip code 23035. (USCB, 2021). The population is 8,834, approximately 88.1% of which is Caucasian or white. Approximately 8.5% is black, 0.3% is Native American, 0.9% is Asian, 0.1% is Native Hawaiian, approximately 2.1% is two or more races, and 2.7% is Hispanic or Latino. The data indicate in Census Tract 9513.01, 8.8% of the individuals live below the Federal poverty level, a lower percentage of the low-income population than the state. Census Tract 9513.01 has a lower percentage of minority population than the state, and a lower population of minorities compared with the state. The mean per capita income according to July 2017 Census data for Census Tract 9513.01 is $35,731. For the state of Virginia, the mean per capita income is $39,278, not significantly more than the mean per capita income for the Census Tract.

The median home price in the Census Tract is $230,000. The Census Tract median home price is significantly less than the state median home price of $273,100. A statistical testing tool is available from the U.S. Census Bureau. This testing tool was applied to Census Tract rankings for home prices to ascertain the statistical significance of variations in-home prices.

Census Tract 9513.01 does not have a higher percentage of children under the age of 18 living in poverty compared to that of the state (8.6% as compared with 9.9% for the state) or a higher percentage of adults aged 65 and over living in poverty (2.1% as compared with 14.1% for the state). Census Tract 9513.01 is not classed as a Housing and Urban Development Qualified Census Tract, which bases its evaluations on environmental justice community criteria. Based upon the small percentage of children and seniors living in poverty and the lower percentages of minority populations in the Census Tract as compared to Commonwealth of Virginia data, the criteria for an environmental justice community are not met in Census Tract 9513.01.

3.10.3 Environmental Consequences

No impacts to vehicular, bicycle, or foot traffic access to medical facilities, school, or employment are anticipated, nor are access to food and fiber production or firewood (fuel) to be impacted. No disproportionately high adverse impacts to human health or the environment of a minority or low-income populations are expected. No conflicts with known (documented) residential communities are anticipated.

3.10.3.1 SIGNIFICANCE CRITERIA

Effects would be considered significant if the HRSD did not conduct and complete proper coordination with the USCB before public involvement.

3.10.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

According to EQ12898, an action might have no effect, no adverse effects on environmental justice communities or adverse effects on environmental justice communities. An adverse effect would not necessarily be significant under NEPA if effects were not considered substantial and could be mitigated. Measures developed to minimize or mitigate adverse effects could result in an action having no impact on environmental justice communities under NEPA.

3.10.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no effects on communities.

3.11 Hazardous materials and Wastes

3.11.1 Definition of Resource

Hazardous materials are defined by 49 CFR 171.8 as a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in Part 173 of subchapter C. Transportation of hazardous materials is regulated by the USDOT regulations within 49 CFR Parts 105 to 108.

Hazardous wastes are defined by Resource Conservation and Recovery Act (RCRA) at 42 USC §6903(5), as amended by the Hazardous and Solid Waste Amendments, as solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material, polychlorinated biphenyls, and lead-based paint. The USEPA is given authority to regulate these special hazard substances by the Toxic Substances Control Act Title 15 USC Chapter 53.

3.11.2 Affected Environment

The United States Environmental Protec EPA Envirofacts database and an Environmental Data Resources Incorporated report have listed the following eleven registered facilities: Western Fiberglass Incorporated facility at 7519 Ware Neck Road, Gloucester, Virginia 23061, VA 000000510730001 for volatile organic compounds, complies and is more than one mile from the project site. The Ginney Point Marina, at 222 Ginney Point Lane, VA R051216, ICIS and NPDES, VAR051216 is in a significant category of noncompliance and is more than one mile from the project site. The HRSD Central Middlesex STP at 170 Oak Landing Road, Saluda Virginia 23149 is at the project site. The Facility Registry ID is 110009116599, National Pollutant Discharge Elimination System (NPDES) registration VA0073318 for sewerage systems. The facility is currently in compliance as of January 1, 2020, and has a previous three-year compliance history of identified violations, from July 9, 2009, to December 31, 2019. No formal or informal enforcement actions are recorded.

The Middle Peninsula Regional Security facility at the TY Center, Middlesex, Virginia 23149 is approximately 0.23 miles from the project site and downgradient. The VPDES permit VA0073318 for a sludge pipe expired December 31, 2016.

The HRSD Urbanna STP at 110 Laurel Hill Road, Urbanna, Virginia 23175 is at the project site. The Facility Registry ID is 110009768493, National Pollutant Discharge Elimination System (NPDES) registration VA0026263 and VAN020034 for sewerage systems. The facility is currently in compliance as of March 31, 2021, and has a previous three-year compliance history of no violations.

J. T. and C. A. Thrift, Incorporated, at 2742 General Puller Highway, Saluda, Plant I. D. 110007319543 is within one-tenth of a mile of the project site and upgradient. It complies.

Middle Peninsula Cremation Services, LLC, at 15 C. F. Edwards Lane, Saluda, Virginia 23149 is within one-third of a mile of the project site and complies.

Middlesex County High School, at 458 General Puller Highway, Saluda, Virginia 23149 is within 0.12 miles of the project site and is upgradient. It has an active air permit, I. D. 5111900007. AIRS/ATS. The data source is ICUS October 17, 2014. It is an RCRA handler of ignitable waste, ethene, 1. 1'-OXTBIS-0) or ethyl ether (1). The handler I. D, for the facility, is VA 0000902254. It complies and no violations were noted.

Christchurch School, at 49 Seahorse Lane, Christchurch, Virginia 23031 is 0.19 miles north of the project site and is upgradient. An ICIS-air facility permit number VA000000511900012, is regulated by the Safe Drinking Water Information System. The relevant permit number is VA4119400 and is an RCRA registered facility, VAR000007430, for an unspecified generation. It is in compliance. No violations were noted.

Meherrin AG & Chemical, at 5730 General Puller Highway, Locust Hill, Virginia 23092 is 0.10 miles south of the project site and upgradient. It is an RCRA Generator of hazardous waste and has a Handler I. D. number of VAP 508201512. No violations were noted. The former Parvins Super Market, 5041 General Puller Highway, Locust Hill, Virginia 23092 is 0.021-mile north-northeast and upgradient. Three registered gasoline underground storage tanks, one registered and one unregistered diesel underground storage tank and one unregistered kerosene underground storage tank were removed from the ground. No releases were reported.

Those sites which have ongoing noncompliance issues are at a minimum of one mile from the proposed project area.

The U.S. EPA National Radon Database lists the counties of Middlesex, Mathews, and Gloucester as being in Zone 2 for radon potential, with average predicted indoor screening levels less than 2 picoCuries per liter (pCi/L), which is below the EPA action level of 4 pCi/L. The EPA recommends that indoor radon levels be measured to determine actual concentrations in a particular building. Radon assessments were not part of the scope or purpose of this Environmental Assessment.

There are no landfills, mines, or quarries located within one mile of the project site. There are no military facilities, Indian reservations, or Department of Homeland Security sites within one mile of the project site.

3.11.3 Environmental Consequences

3.11.3.1 SIGNIFICANCE CRITERIA

Effects would be considered significant if the MSIPPII would substantially increase the quantity or toxicity of hazardous substances, substantially increase the risk to human health or the environment, or generate solid waste in amounts that would appreciably decrease capacity or life span at receiving landfills.

3.11.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The MSIPPII would have short- and long-term less than significant adverse effects concerning hazardous materials and wastes. Short-term minor adverse effects would be due to the use of hazardous materials and the generation of wastes during construction, renovation, and demolition activities. The MSIPPII would not include acquiring, using, or generating any additional hazardous materials or wastes, or changing the disposal of any wastes when compared to existing conditions; therefore, long-term effects would be negligible. The proposed activities would not require subsurface soil excavation to depths that could impact groundwater. The MSIPPII would not substantially increase the quantity or toxicity of hazardous materials, substantially increase the risk to human health or the environment, or generate solid waste in amounts that would appreciably decrease capacity or life span at receiving landfills. Implementation of these plans would ensure the safe handling of hazardous materials and wastes.

The projects and project alternatives outlined in the Description of MSIPPII consist of construction (including new construction, renovations, alterations, and additions), demolition of buildings and pavement, and installation of the force main. There would be some minor adverse effects to hazardous materials and wastes from individual project components and project alternatives; however, each was reviewed on a case-by-case basis, and none in and of themselves would have appreciable adverse effects to hazardous materials and wastes.

Construction Effects

The use of hazardous materials and the generation of wastes at the construction, renovation, and demolition areas would occur; however, the increase in hazardous materials and wastes would be limited and temporary. The safe handling, storage, and use procedures managed under the Hazardous Waste Management Plan, following all federal, state, and local regulations, would be implemented. Any effects would be less than significant.

The proposed construction projects include both new construction and demolition of existing structures and pavement. Demolition and construction activities would be performed following state and federal regulations and policies. These activities would have short- and long-term less than significant effects on hazardous materials and wastes.

The proposed repair and renovation projects include modifications to existing facilities. Buildings would be surveyed for asbestos and lead-based paint by a certified inspector to ensure appropriate measures were taken to reduce potential exposure and release of asbestos and lead following federal, state, and local regulations.

Operational Effects

The use, generation, or disposal of hazardous materials and wastes after implementation of the MISPPII would be similar to the levels under the existing conditions. Long-term, negligible, beneficial impacts on hazardous materials and petroleum product management could occur concerning storage conditions because the older buildings would be replaced with new facilities that have modern hazardous material and petroleum product storage areas. The proposed activities would not result in substantially different operational activities; therefore, the MSIPPII would result in less than significant adverse effects concerning hazardous materials and wastes.

3.11.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation necessary for the project would not occur. The need to meet current and future requirements for sanitary sewer operations would be unmet. Existing conditions would remain unchanged and there would be no effects on hazardous materials and wastes.

3.12 Water Resources

3.12.1 Definition of Resource

Water resources include groundwater, surface water, wetlands, floodplains, and waters of the U.S. Hydrology concerns the distribution of water through the processes of evapotranspiration, atmospheric transport, precipitation, surface runoff and flow, and subsurface flow.

Groundwater. Groundwater is water that exists in the saturated zone beneath the earth's surface and includes underground streams and aquifers. It is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial processes. Groundwater features include depth from the surface, aquifer or well capacity, quality, recharge rate, and surrounding geologic formations.

Surface Water. Surface water generally consists of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. Waters of the U.S. are defined within the CWA, as amended, and jurisdiction is addressed by the USEPA and the USACE (33 CFR Part 328). Section 401 of the CWA requires that any applicant for a federal license or permit to conduct an activity that could result in a discharge into waters of the U.S. provide the permitting agency a certification from the state in which the discharge originates certifying that the license or permit complies with CWA requirements, including applicable state water quality standards.

Wetlands. Wetlands are identified as those areas that are inundated or saturated by surface or groundwater 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. The USACE regulates the discharge of dredged or fill material into waters and wetlands of the U.S. according to Section 404 of the CWA. Notably, Section 401 of the CWA also applies to wetlands. A Request for the Corps Preliminary Jurisdictional Determination has been filed on behalf of the HRSD for impacts to wetlands and streams within the 100-ft. buffer.

Floodplains. Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters subject to periodic or infrequent inundation due to rain or melting snow. The risk of flooding typically depends on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines flood hazard areas as the area that will be inundated by the flood event having a 1 percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. The 500-year flood zone is characterized as a 0.2 percent annual chance flood hazard. Federal, state, and local regulations often limit floodplain development to passive uses such as recreational and preservation activities to reduce the risks to human health and safety.

3.12.2 Affected Environment

The project area has more than one acre (0.40 hectares) that have been delineated as jurisdictional wetlands and waters of the United States. Open boundary wetlands continue beyond the delineated wetland boundary shown in Figures 4A to 4J of the Draft Aquatic Resources Delineation Report for the HRSD Middlesex Interceptor System Program Phase II; therefore, the total wetland size of open boundary wetlands may be larger than the size provided in the report. The MISPPII is still in the preliminary design phase, and it is anticipated that any unavoidable impacts to wetlands will be less than one acre (0.40 hectares). Similarly, there may be more than one acre (0.40 hectares) of the 100-year floodplain that will be determined in more detail before the MSIPPII's Joint Permit Application submission. Two pump station alternatives that were considered at the time of the first Draft EA and eliminated from consideration have brought the total acreage of temporary and permanent impacts to waters of the U.S. to a lower quantity. At the time of this Final EA, the Preliminary Jurisdictional Request was being reviewed by the HRSD in anticipation of submittal to the USACE. The Virginia Marine Resources Commission (VMRC) has deemed that it has jurisdiction in some waters and wetlands within the MSIPPII. Specifically, VMRC regulates impacts and encroachments to activities in, on, or under State-owned submerged lands, tidal wetlands, and dunes/beaches under Code of Virginia Title 28.2, Chapters 12, 13, and 14. When issuing permits, VMRC considers effects on other reasonable and permissible uses of state waters and state-owned bottomlands, marine and fisheries resources of the Commonwealth, tidal wetlands, adjacent and nearby properties, water quality, and submerged aquatic vegetation.

The Piankatank River and Urbanna Creek crossings proposed for this project will require the submission of a JPA which is used by the USACE, VMRC, VDEQ, and the LWB(s) for permitting purposes. Submarine crossings are normally permitted by VMRC as long as reasonable measures are taken to protect aquatic resources and other uses of the waterway.

VMRC regulated private oyster ground leases occur within the project area at the Piankatank River and Urbanna Creek crossings. Per the VMRC subaqueous guidelines, any alteration of submerged aquatic vegetation (in Virginia, the species *Ruppia martima*, widgeon grass, and *Zostera marina*, eelgrass, are the predominant species), shellfish beds, and wetlands should be minimized wherever possible in the planning and location of submerged structures. In general, HDD methodologies are preferred by VMRC over trenching.

The VMRC provided comments on January 6, 2022 with regard to the draft EA for the HRSD MISPPII project, and found that the proposed project is within the jurisdictional areas of the Virginia Marine Resources Commission (VMRC) and will require a permit from this agency. The VMRC advised that, pursuant to Chapters 12, 13 and 14 of Title 28.2 of the Code of Virginia, administers permits required for submerged lands, tidal wetlands, and beaches and dunes. Any jurisdictional impacts will be reviewed by the VMRC during the Joint Permit Application process. Should the proposed project change, a new review by this agency may be required relative to these jurisdictional areas.

The Virginia Institute of Marine Science (VIMS), an advisory agency with the College of William and Mary, furnished comments on the MISPPII on December 17, 2021. As proposed, the force main is proposed to be installed via either horizontal directional drilling (HDD) or mini-HDD methods. In order to minimize impacts, we recommend that all tidal wetlands and streams also be crossed via HDD or mini-HDD rather than open cut methods. Doing so should avoid direct impacts to these areas. With any HDD/mini-HDD project there is the potential for an inadvertent release of drilling fluids (i.e. frac-out), so we recommend development of an inadvertent release/frac-out plan. In wetlands, this should include restoring elevations and plants to pre-construction states. VIMS has mapped submerged aquatic vegetation (SAV) within 2 of the 5 years that currently define an SAV bed (2016–2020) within the Limits of Disturbance (LOD) for the Piankatank River. SAV is vulnerable to sedimentation, so those beds are areas of particular concern should a frac-out (or other turbidity plume) occur. (SAV mapping data can be accessed here: https://www.vims.edu/research/units/programs/sav/access/index.php

The 2022 VIMS mapping does not depict beds of SAV in the vicinity of the Route 3 crossing of the Piankatank River or the Route 227 crossing of Urbanna Creek.

HRSD will assure that a frac-out plan is provided by the contractor in all bid documents.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for Middlesex County and Mathews County (Panels 51115C0045E, 51115C0010E, 51119C0220E, 51119C0215E, 51119C05E, 51119C0185E, 51119C0180E, and 51119C0114E), portions of the project area lie within Zone AE (EL 6 Feet) at Urbanna Creek, and portions of the project area lie within Zone VE (EL 7 and 11 Feet), AE (EL 6 Feet), and X-shaded (0.2 Percent Annual Chance Flood Hazard) at the Piankatank River. The remainder of the project are lies in the Zone X Area of Minimal Flood Hazard.

These floodplain mapping units are located at the crossings of the Piankatank River and Urbanna Creek.

3.12.3 Environmental Consequences

3.12.3.1 SIGNIFICANCE CRITERIA

Water resources effects would be considered significant if the proposed activities would reduce water availability or supply, exceed the safe annual yield of water supplies, increase flooding potential, adversely affect water quality, threaten or damage hydrology, or violate water resources laws or regulations.

3.12.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The projects and project alternatives consist of construction (including new construction, renovations, alterations, and additions), demolition of buildings and pavement, and crossing of two tidal waterways.

The MSIPPII will have short- and long-term less than significant adverse effects on water resources. Short-term minor adverse effects would be due to site-specific temporary changes in surface hydrology, and the potential for soil erosion and transport during construction, renovation, and demolition activities. Long-term minor adverse effects would be due to an incremental increase in impervious surfaces from new construction. Effects to water resources would not reduce water availability or supply, exceed the safe annual yield of water supplies, adversely affect water quality, threaten or damage hydrology, or violate water resources laws or regulations. If uncontrolled, construction activities have the potential to cause erosion and sedimentation that can impact water quality. The project will result in some new, impervious surface area. Potential impacts to water quality associated with construction will be avoided by employing Best Management Practices (BMPs). Specifically, erosion control measures as required by Middlesex, Mathews, and Gloucester Counties will be implemented. Contractors will be required to provide an erosion and sediment control plan that complies with the latest version of the Virginia Erosion and Sediment Control Law and General Criteria, including the Virginia Erosion and Sediment Control Handbook. A Stormwater Pollution Prevention Plan (SWPPP) for construction activities will be required.

Construction Effects

Construction, renovation, and demolition activities would have site-specific temporary effects on water resources. Temporary effects could cause soil erosion and sedimentation. There are surface waters and wetlands in the MSIPPII. Only directional drilling for the force main would occur within the floodplain. Construction activities, including grading and clearing, would result in ground surface disturbance and could cause soil erosion and subsequent transport of sediment via stormwater. However, potential effects would be minimized through proper implementation of environmental protection measures such as silt fencing, following policies and procedures as detailed in erosion-and-sediment control plans, and regulatory agency coordination for required permits before ground-breaking activities. The depth of excavation during construction would generally not reach the depth of groundwater. There would be negligible effects to surface waters.. As a mitigative measure HRSD will assure that a frac-out plan is provided by the contractor in all bid documents.

A variety of stormwater management practices would be incorporated, to the maximum extent technically feasible, in the proposed development and redevelopment projects to maintain or restore predevelopment site hydrology. Therefore, the MSIPPII would have less than significant effects on water resources.

The MSIPPII would result in short- or long-term effects on wetlands and streams that are less than significant. The MSIPPII lies partially within a 100-year floodplain.

Per review of all construction activities, in consideration of the aforementioned specific impacts, the project would have short- and long-term less than significant effects on water resources.

Operational Effects

There would be less than significant effects on water resources due to the maintenance and operations associated with the MSIPPII. The efficiencies gained from construction, renovation, and demolition would reduce the maintenance and operational requirements of facilities and project areas; therefore, the operational effects on water resources would be minor.

3.12.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functionality and future needs would be unmet. Existing conditions would remain unchanged and there would be no effects on water resources.

4.0 Cumulative Effects

Cumulative effects on environmental resources result from the incremental effects of action when combined with other past, present, and reasonably foreseeable future projects in the area (40 CFR § 1508.7). Cumulative effects can result from individually minor but collectively substantial actions taken over some time. Following NEPA, a discussion of cumulative effects is required (CEQ 1997). This section describes past, present, and reasonably foreseeable actions in the area, and evaluation of potential cumulative effects.

4.1 Cumulative Effects Analysis

4.1.1 Air Quality

The State of Virginia takes into account the effects of all past, present, and reasonably foreseeable emissions during the development of the State Implementation Plan. The state accounts for all significant stationery, area, and mobile emission sources in the development of this plan. Estimated emissions generated by the MSIPPII would be *de minimis* and it is understood that activities of this limited size and nature would not contribute significantly to adverse cumulative effects on air quality. No past, present, or reasonably foreseeable projects have been identified that, when combined with the MSIPPII, would have substantial cumulative effects on air quality. All new air permits will be obtained for new facilities. Therefore, cumulative effects on air quality would be less than significant.

4.1.2 Biological Resources

Construction, renovation, and demolition activities would have site-specific temporary effects on the biological resources within the MSIPPII. There are no records of rare species, significant natural heritage areas, or conservation/managed areas. The USFWS coordination and other coordination are provided in Appendix A. No past, present, or reasonably foreseeable projects have been identified that, when combined with the MSIPPII area, would have substantial cumulative effects on biological resources. Therefore, cumulative effects on biological resources would be less than significant.

4.1.3 Cultural Resources

It is not anticipated that the proposed construction, renovation, or demolition projects would have potential effects on cultural resources. The HRSD consulted with the Virginia SHPO under Section 106 of the NHPA, providing them with information on the undertaking and arranged for a Phase I field cultural resources survey for potentially affected components, recommending a finding of “no adverse effect” upon cultural resources. The SHPO concurrence will be provided in Appendix A once the 30 day comment period for the Final EA is completed. No past, present, or reasonably foreseeable projects have been identified that, when combined with the MSIPPII area, would have substantial cumulative effects on cultural resources. Therefore, no cumulative effects will occur to cultural resources..

4.1.4 Hazardous Materials and Wastes

Minor cumulative effects to hazardous materials and wastes could occur within the MSIPPII area as a result of a temporary increase in the storage, use, or generation of hazardous materials and wastes

during construction, renovation, and demolition activities. Spill Prevention, Control, and Countermeasure Plans; Asbestos Management Plan; and Lead-Based Paint Management Plans will be implemented. Past projects have been identified that, when combined with the MSIPPII, would have less than significant cumulative effects on hazardous materials and wastes.

4.1.5 Water Resources

Minor cumulative effects on water resources could occur from the incremental increase in impermeable surfaces. All planned construction would be required to obtain air permits, develop, and implement project-specific plans (e.g., Stormwater Pollution Prevention Plan), and adhere to all applicable permitting regulations and BMPs to minimize potential effects to water resources. No past, present, or reasonably foreseeable projects have been identified that, when combined with the MSIPPII, would have substantial cumulative effects on water resources. Therefore, cumulative effects on water resources would be less than significant.

5.0 Management Actions / Special Procedures

This section summarizes special operating procedures associated with this EA. Evaluations contained in this EA have determined that no significant environmental effects would result from the implementation of the MSIPPII. *Special operating procedures* are defined as measures that would be implemented to address minor potential environmental effects associated with the implementation of the MSIPPII. The environmental protection measures described in this EA include standard BMPs such as the implementation of control measures for reducing fugitive dust emissions, engineering, and site development to account for soil constraints, conforming to all federal, state, and local requirements related to stormwater pollution prevention during construction activities, and safe removal of potentially hazardous materials would be applied. Environmental protection measures are those actions that are used to minimize impacts that are not required as a part of statutes, regulations, or to fulfill permitting requirements, but are typically taken during the design and construction phases of a project to reduce impacts on the environment. BMPs are actions required by statutes or regulations, or to fulfil permitting requirements, that reduce potential impacts. None of the environmental protection measures or BMPs are needed to bring an effect below the threshold of significance. Since the implementation of the preferred alternative would result in less than significant effects on the resources evaluated, recommendations for special procedures are unnecessary.

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7.0 List of Preparers

James Cook, Environmental Scientist, Tetra Tech, Inc.
Land Use and Biological Resources
M.S., Environmental Science
B.S., Biology
Years of Experience: 13

Deborah R. Painter, Senior Environmental Scientist, Tetra Tech Inc,
NEPA Project Manager
M. S., Biology and Education
B. S., Biology and Geophysical Sciences
Years of Experience: 29

Melissa Cushing, Environmental Scientist III, Tetra Tech, Inc.
GIS/Geologic and Socioeconomic Resources
M.S., Environmental Health
B.S., Geology
Years of Experience: 13

Emily Foster, Environmental Scientist, Tetra Tech, Inc.
Water Resources and Biological Resources
M.S., Environmental Science
B.S., Biology
Years of Experience: 12

Beverly Keys, Administrative Assistant, Tetra Tech Inc.
Administrative Record
B.A.S, Business Administration
Years of Experience: 17

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Appendix A: Agency Correspondence

Ann Jennings
Secretary of Natural and Historic Resources and Chief Resilience Officer

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Rochelle Altholz
Deputy Director of Administration and Finance

Nathan Burrell
Deputy Director of Government and Community Relations

Darryl M. Glover
Deputy Director of Dam Safety & Floodplain Management and Soil & Water Conservation

Thomas L. Smith
Deputy Director of Operations

November 17, 2021

Deborah Painter
Tetra Tech, Inc.
5700 Lake Wright Drive, Suite 102
Norfolk, VA 23505

Re: HRSD Middlesex Interceptor System Program Phase II

Dear Ms. Painter:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Urbanna Quadrangle, Saluda Quadrangle,
According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

Wilton Quadrangle, Ware Neck Quadrangle
According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-foot buffer. Please note, a predictive model identifying potential habitat for natural heritage resources intersects the project boundary. However, based on DCR biologist's review of the proposed project a survey is not recommended for the resource.

All Quads
In addition, if tree clearing occurs, the proposed project may fragment Ecological Cores **(C3, C4, C5)** as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

Ecological Cores are areas of unfragmented natural cover with at least 100 acres of interior that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection and erosion prevention), and air quality (including carbon

sequestration and oxygen production), along with the many associated economic benefits of these functions. The cores are ranked from C1 to C5 (C5 being the least ecologically relevant) using many prioritization criteria, such as the proportions of sensitive habitats of natural heritage resources they contain.

Fragmentation occurs when a large, contiguous block of natural cover is dissected by development, and other forms of permanent conversion, into one or more smaller patches. Habitat fragmentation results in biogeographic changes that disrupt species interactions and ecosystem processes, reducing biodiversity and habitat quality due to limited recolonization, increased predation and egg parasitism, and increased invasion by weedy species.

Therefore minimizing fragmentation is a key mitigation measure that will reduce deleterious effects and preserve the natural patterns and connectivity of habitats that are key components of biodiversity. DCR recommends efforts to minimize edge in remaining fragments, retain natural corridors that allow movement between fragments and designing the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns).

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of $30.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

The Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Amy Martin at (804-367-2211) or amy.martin@dwr.virginia.gov.

Should you have any questions or concerns, please contact me at 804-225-2429. Thank you for the opportunity to comment on this project.

Sincerely,

Tyler Meader

Tyler Meader
Natural Heritage Locality Liaison

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To: May 10, 2020
Consultation Code: 05E2VA00-2020-TA-3693
Event Code: 05E2VA00-2020-E-10395
Project Name: HRSD Middlesex Interceptor Phase 2

Subject: Verification letter for the 'HRSD Middlesex Interceptor Phase 2' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Emily Foster:

The U.S. Fish and Wildlife Service (Service) received on May 10, 2020 your effects determination for the 'HRSD Middlesex Interceptor Phase 2' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

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[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

HRSD Middlesex Interceptor Phase 2

2. Description

The following description was provided for the project 'HRSD Middlesex Interceptor Phase 2':

> Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes the design of approximately 3.2 miles of force main from Urbanna to Cook's Corner in addition to approximately 13 miles of force main along Route 33 between Cook's Corner and the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The new force main will convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The new system will consist of a transmission force main, pump stations, and potential off-line storage tanks. The project will also provide for future connections of the Topping Service Area near the Route 3/ Route 33 intersection and the Deltaville Service Area near Hartfield along General Puller Highway. New pump stations are proposed at the two treatment plants that will be decommissioned in addition to new booster pump stations along the force main alignment.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.564988186246154N76.4732604043296W

Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")

   No

3. Will your activity purposefully **Take** northern long-eared bats?

   No

4. Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

5. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

   Yes

6. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

7. Will the action involve Tree Removal?

   Yes

8. Will the action only remove hazardous trees for the protection of human life or property?

   No

9. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

   No

10. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

    No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

0

2. If known, estimated acres of forest conversion from April 1 to October 31

0

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?
0

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

HRSD Alternatives for Gloucester Pump Stations (Middlesex Interceptor System Program Phase II)

LOCATION

Gloucester County, Virginia

DESCRIPTION

Some(Three alternatives for the Gloucester County component of the project have been identified. They are 9375 John Clayton Memorial Highway, 9316 John Clayton Memorial Highway, and Tax Map number 26-22, John Clayton Memorial Highway.)

Local office

Virginia Ecological Services Field Office

(804) 693-6694
(804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Small Whorled Pogonia Isotria medeoloides No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public

have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Blue-winged Warbler *Vermivora pinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 1 to Jun 30
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31

Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cerulean Warbler Dendroica cerulea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 29 to Jul 20
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere
Kentucky Warbler Oporornis formosus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler Protonotaria citrea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31

Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Ruddy Turnstone Arenaria interpres morinella This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Willet Tringa semipalmata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

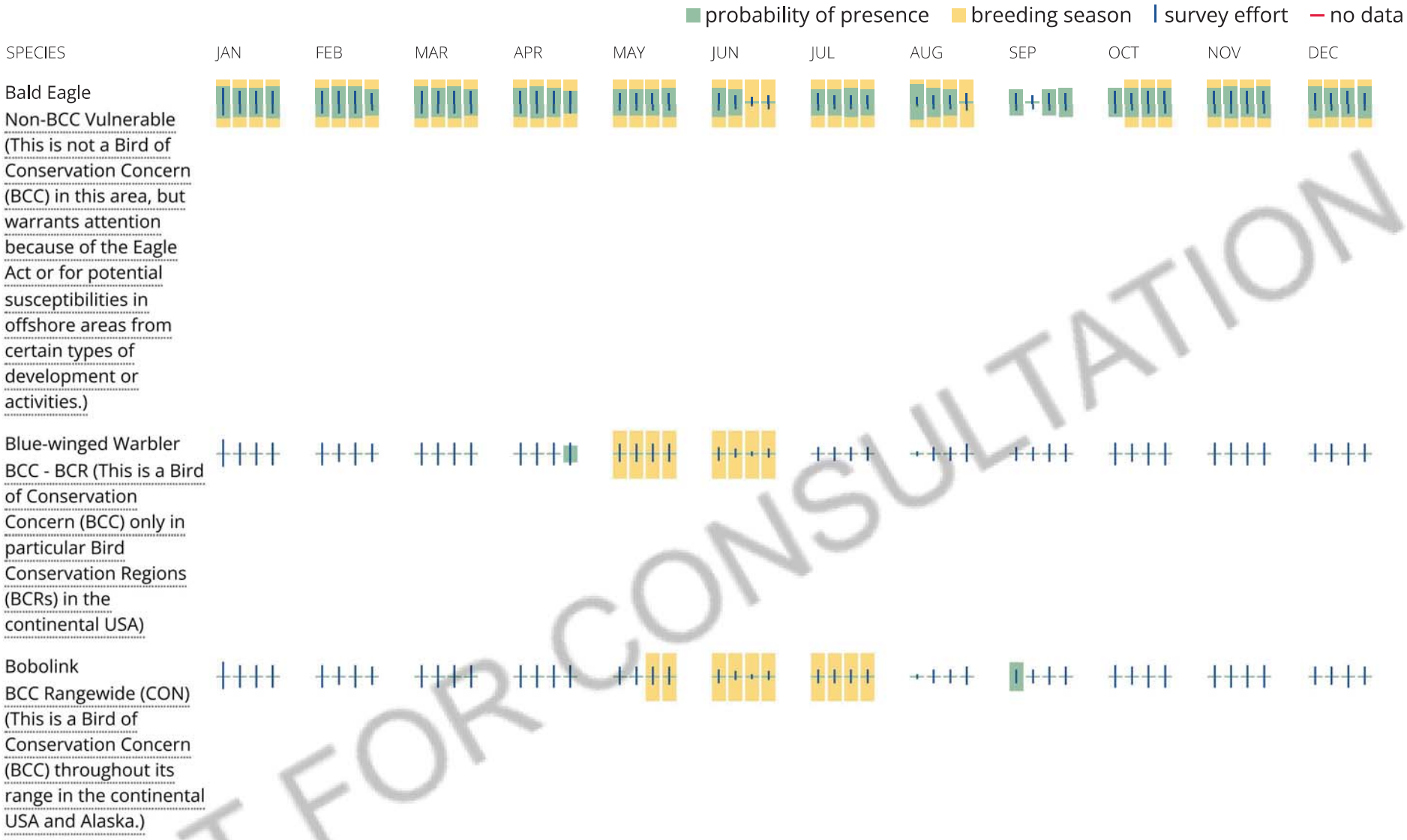
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

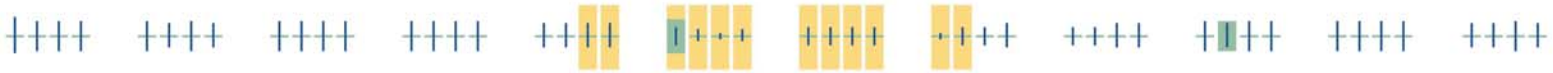
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

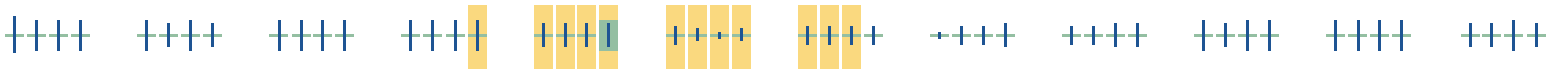
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Canada Warbler
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

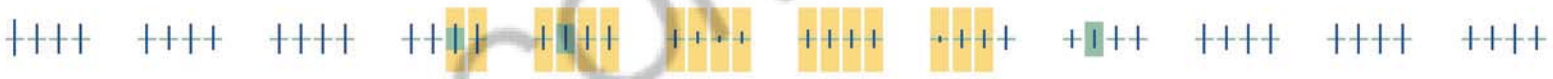


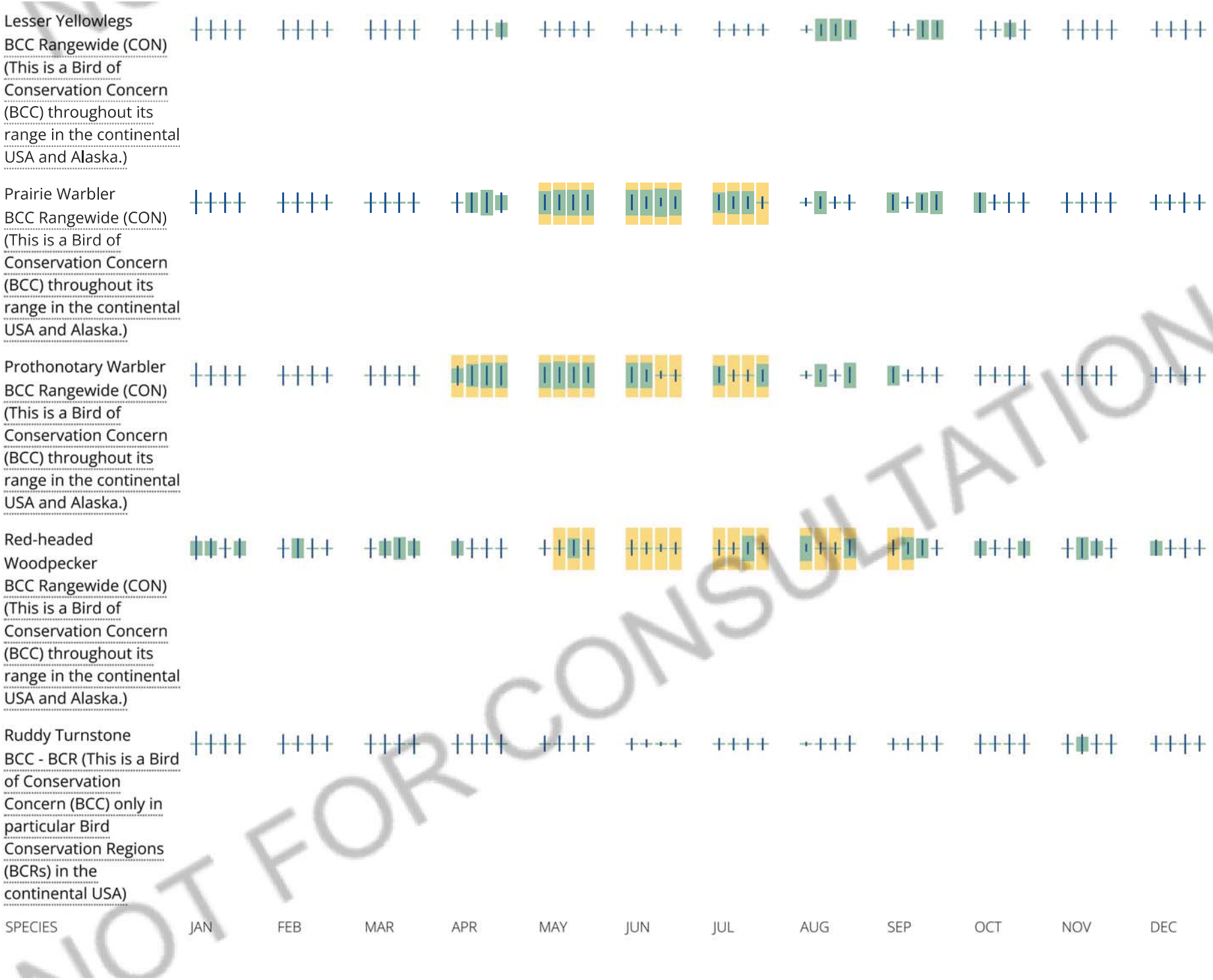
Cerulean Warbler
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

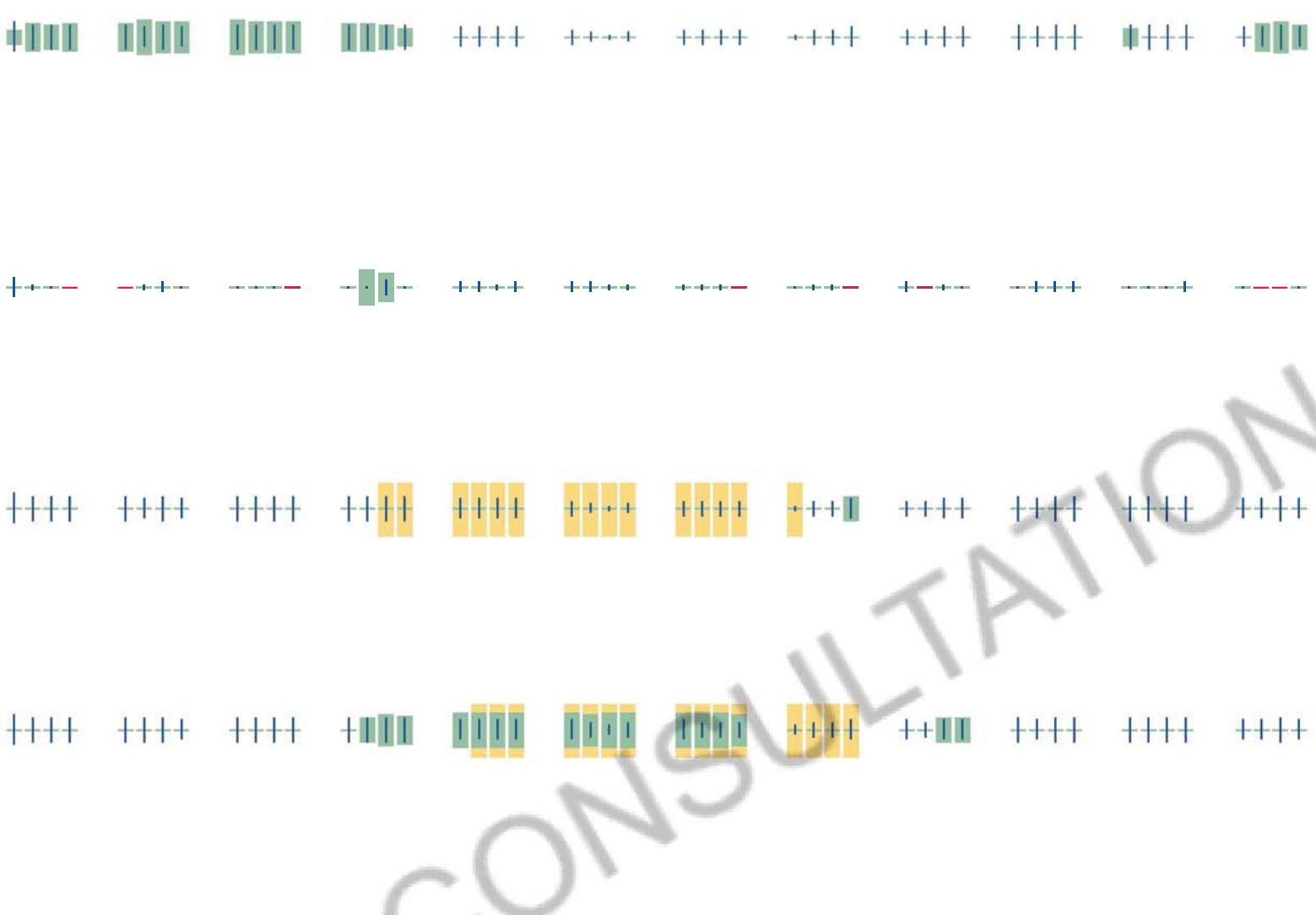


Golden Eagle
Non-BCC Vulnerable
(This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Kentucky Warbler
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)







Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

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Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

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To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
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Details about birds that are potentially affected by offshore projects

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Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and

helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

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Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Alternative Urbanna Pump Station Urbanna, Virginia

LOCATION

Middlesex County, Virginia

DESCRIPTION

Some(Alternative Pump Station at 215 Linden Avenue, Urbanna, Virginia and immediate environs)

Local office

Virginia Ecological Services Field Office

(804) 693-6694
(804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Prairie Warbler *Dendroica discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or

attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
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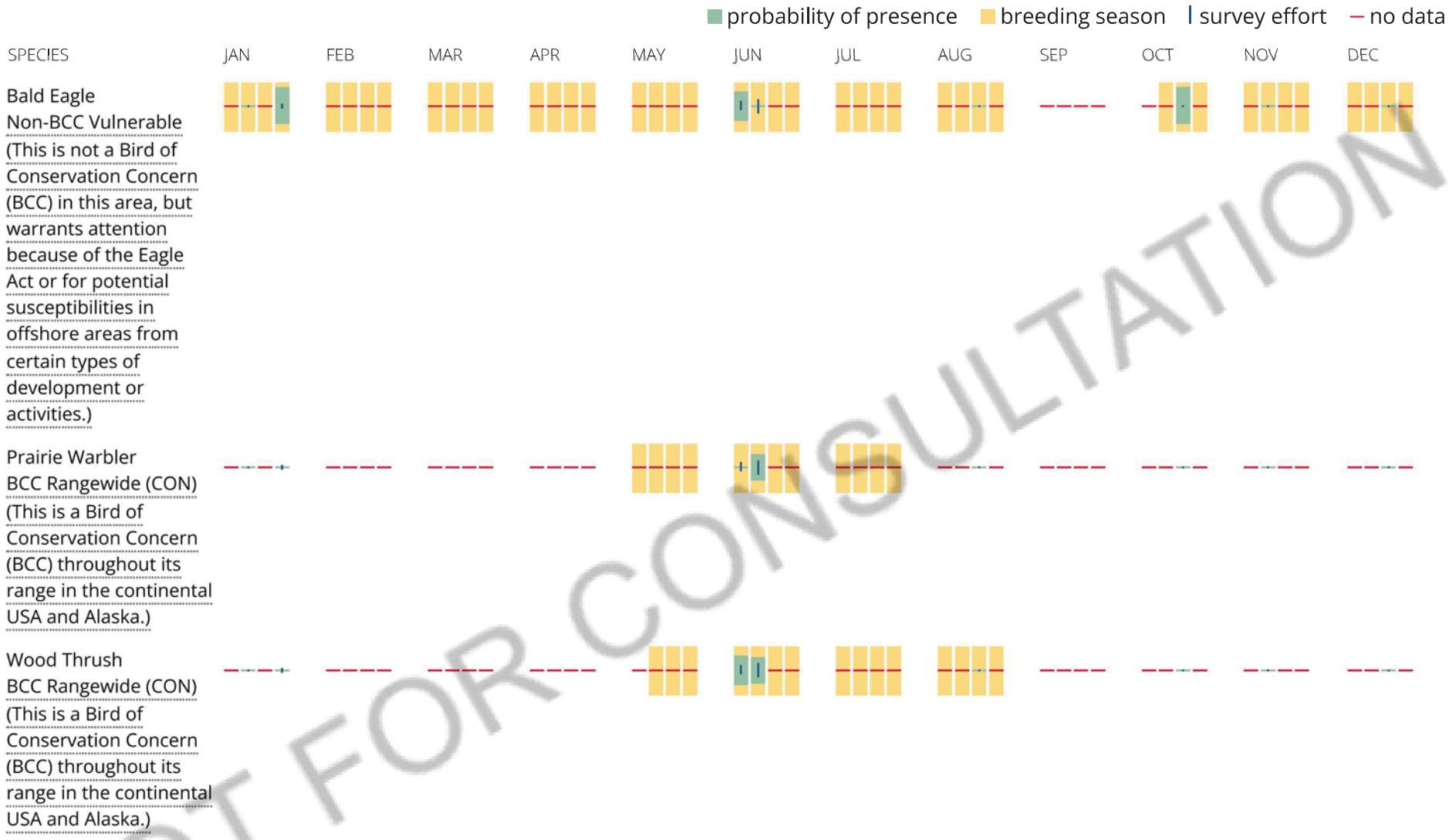

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Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To: January 14, 2022
Consultation Code: 05E2VA00-2022-SLI-1736
Event Code: 05E2VA00-2022-E-05626
Project Name: Alternative Urbanna Pump Station Urbanna, Virginia

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2022-SLI-1736
Event Code: Some(05E2VA00-2022-E-05626)
Project Name: Alternative Urbanna Pump Station Urbanna, Virginia
Project Type: WASTEWATER PIPELINE
Project Description: Alternative Pump Station at 215 Linden Avenue, Urbanna, Virginia and immediate environs

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.6390884,-76.57899196620288,14z

Counties: Middlesex County, Virginia

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

United States Department of the Interior

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In Reply Refer To: November 30, 2021
Consultation Code: 05E2VA00-2022-SLI-0936
Event Code: 05E2VA00-2022-E-03182
Project Name: HRSD Beaver Dam Pump Station

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2022-SLI-0936
Event Code: Some(05E2VA00-2022-E-03182)
Project Name: HRSD Beaver Dam Pump Station
Project Type: WASTEWATER FACILITY
Project Description: Construction of new pump station and access road.
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.45501245,-76.46750235439337,14z

Counties: Gloucester County, Virginia

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

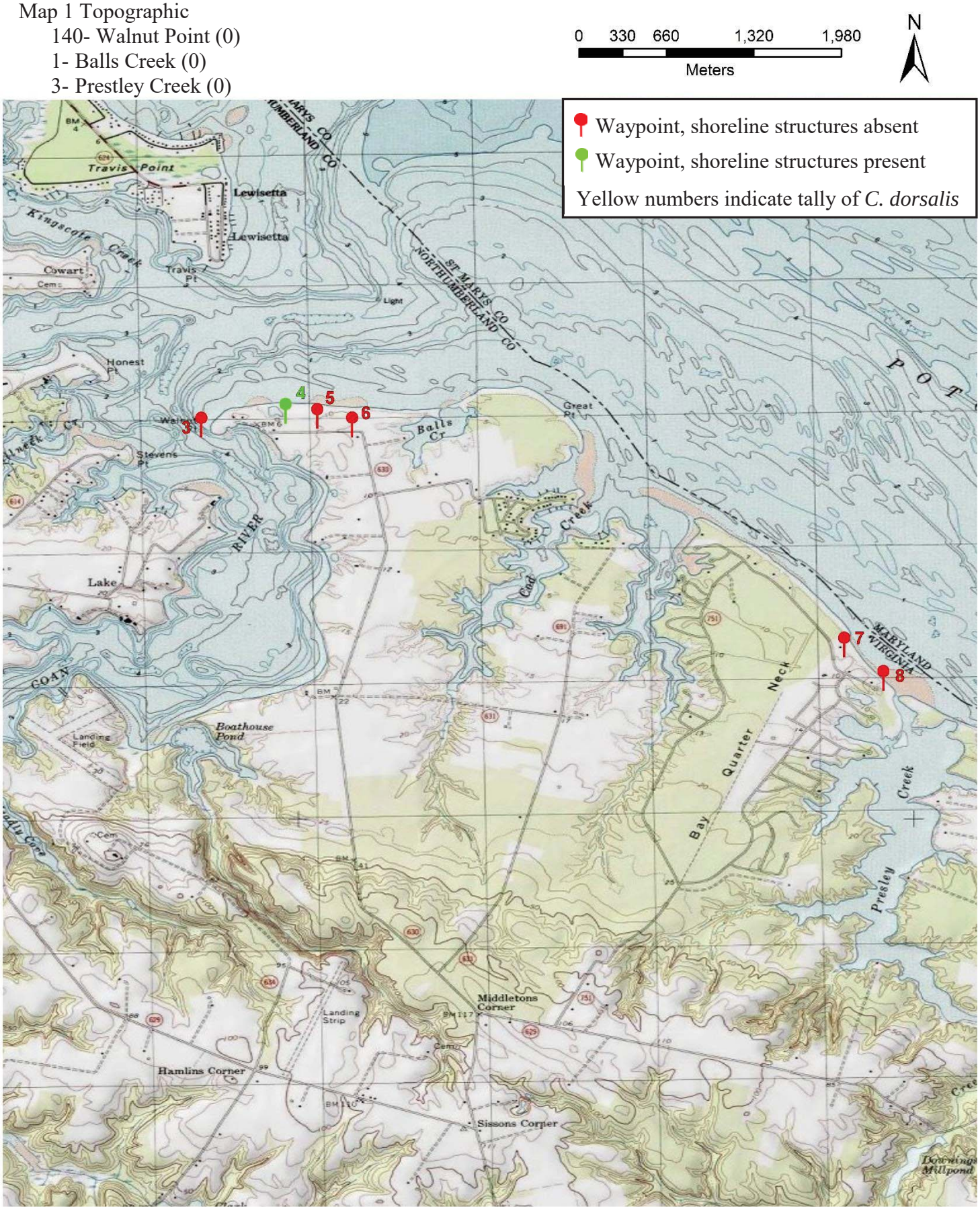
THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Map 1 Topographic
140- Walnut Point (0)
1- Balls Creek (0)
3- Prestley Creek (0)



Map 1 Aerial

140- Walnut Point (0)

1- Balls Creek (0)

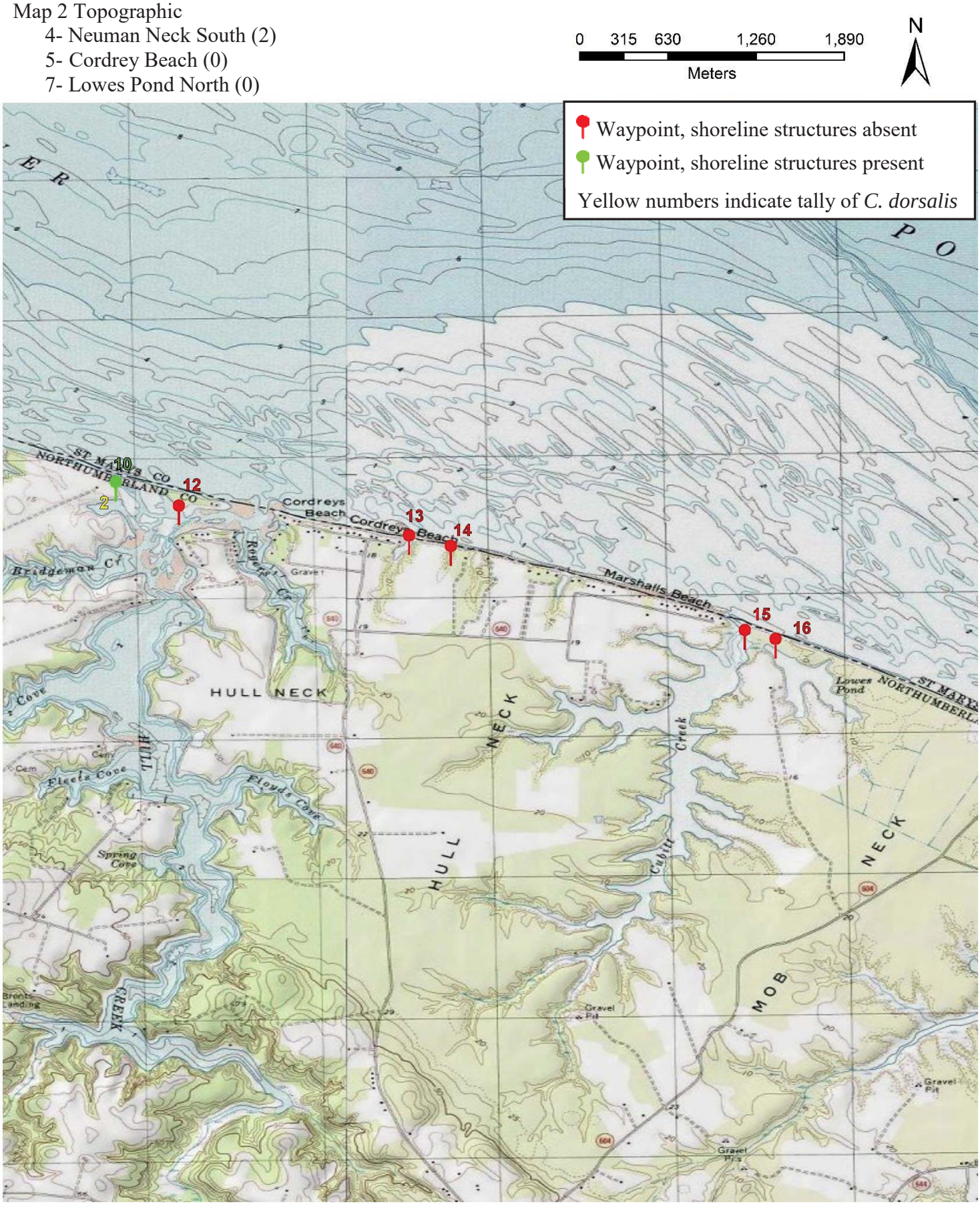
3- Prestley Creek (0)

Map 2 Topographic

4- Neuman Neck South (2)

5- Cordrey Beach (0)

7- Lowes Pond North (0)

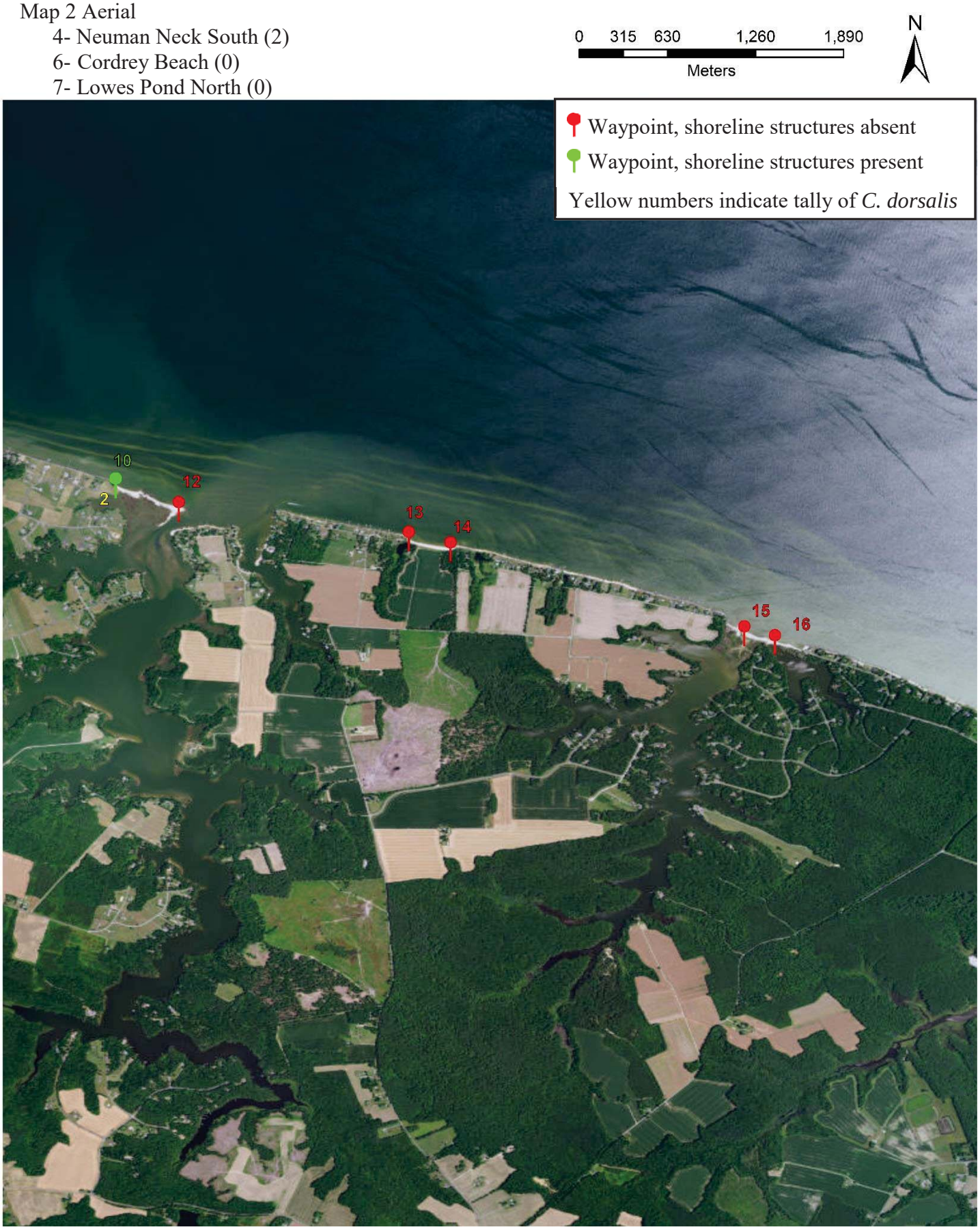


Map 2 Aerial

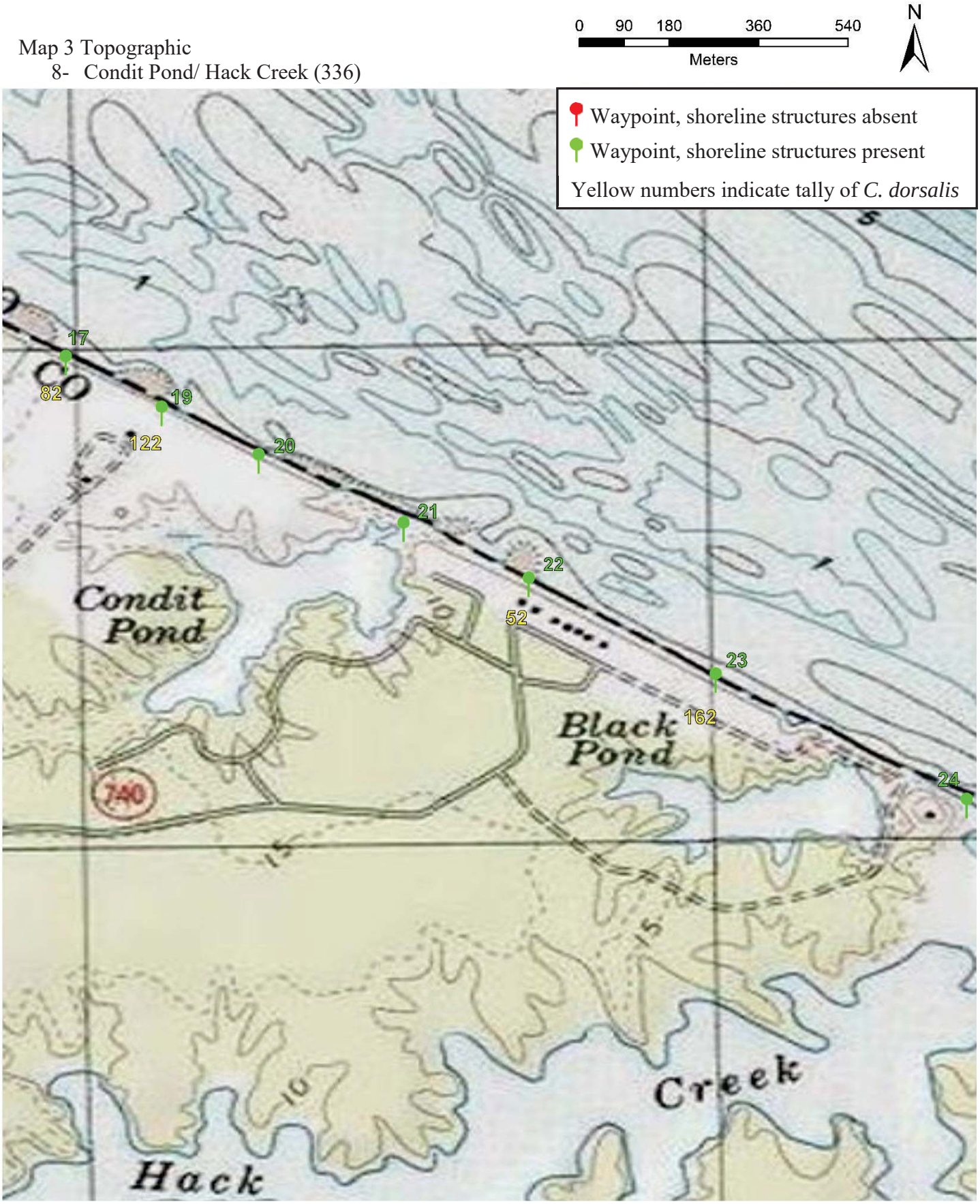
4- Neuman Neck South (2)

6- Cordrey Beach (0)

7- Lowes Pond North (0)



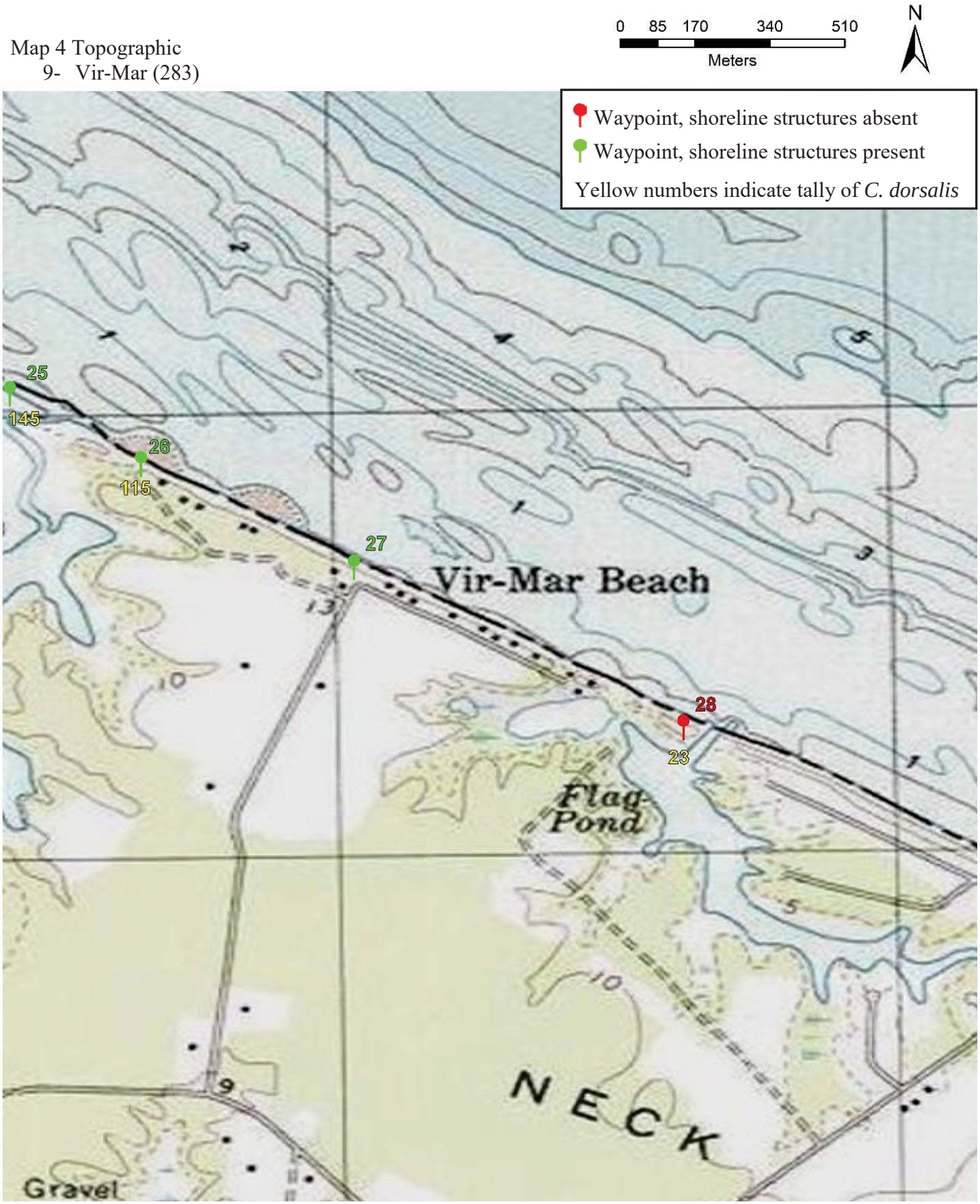
Map 3 Topographic
8- Condit Pond/ Hack Creek (336)



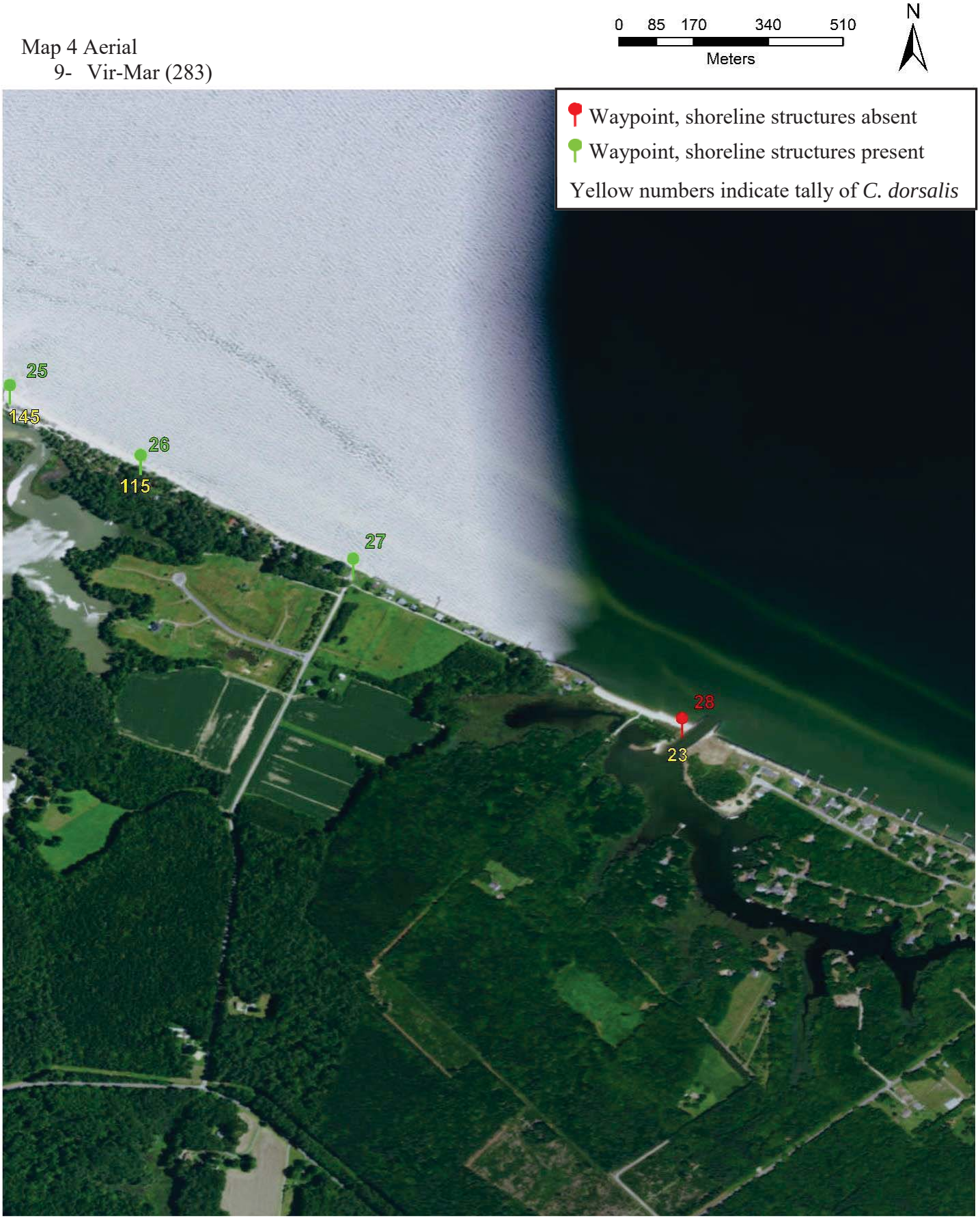
Map 3 Aerial

8- Condit Pond/ Hack Creek (336)

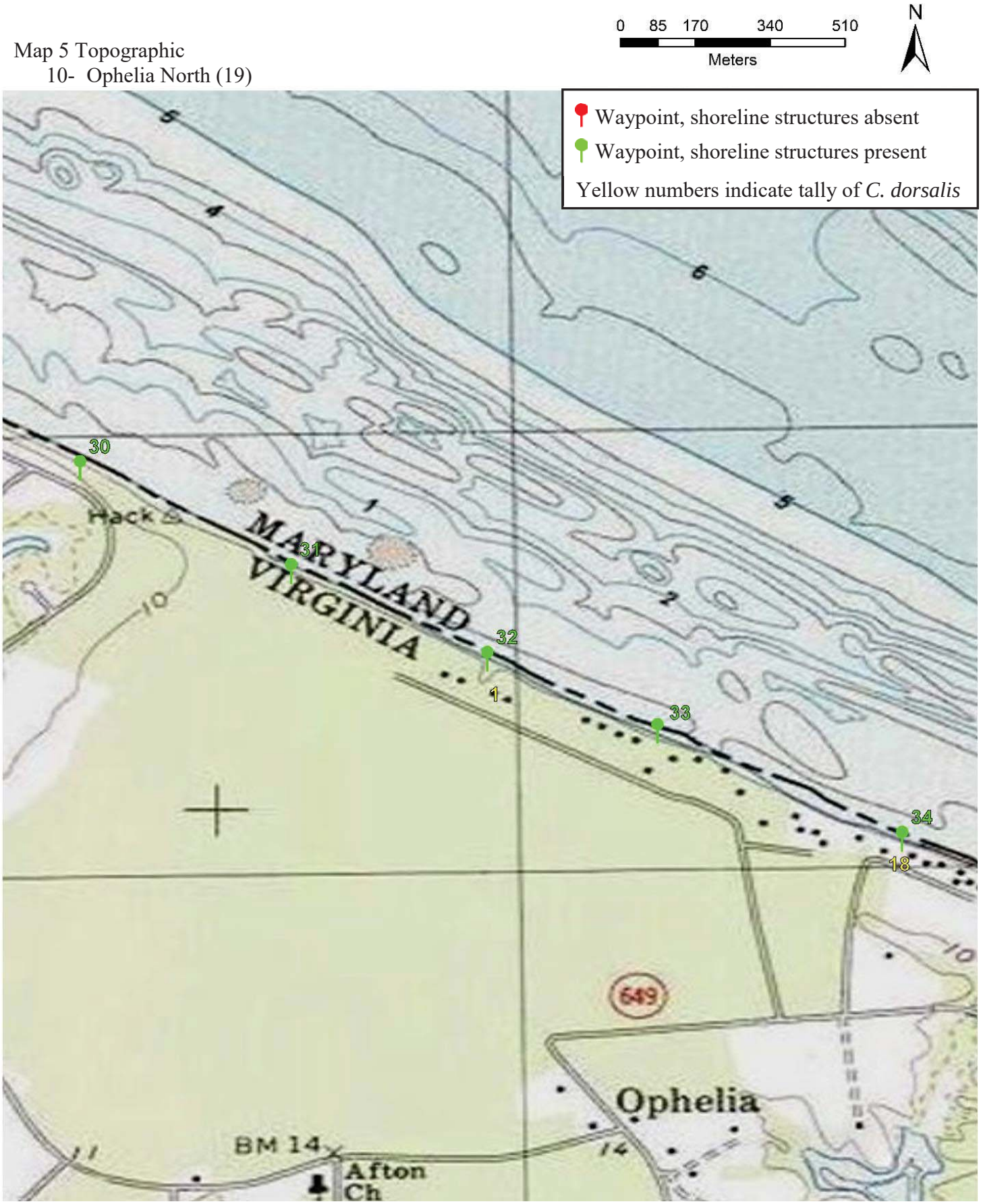
Map 4 Topographic
9- Vir-Mar (283)



Map 4 Aerial
9- Vir-Mar (283)

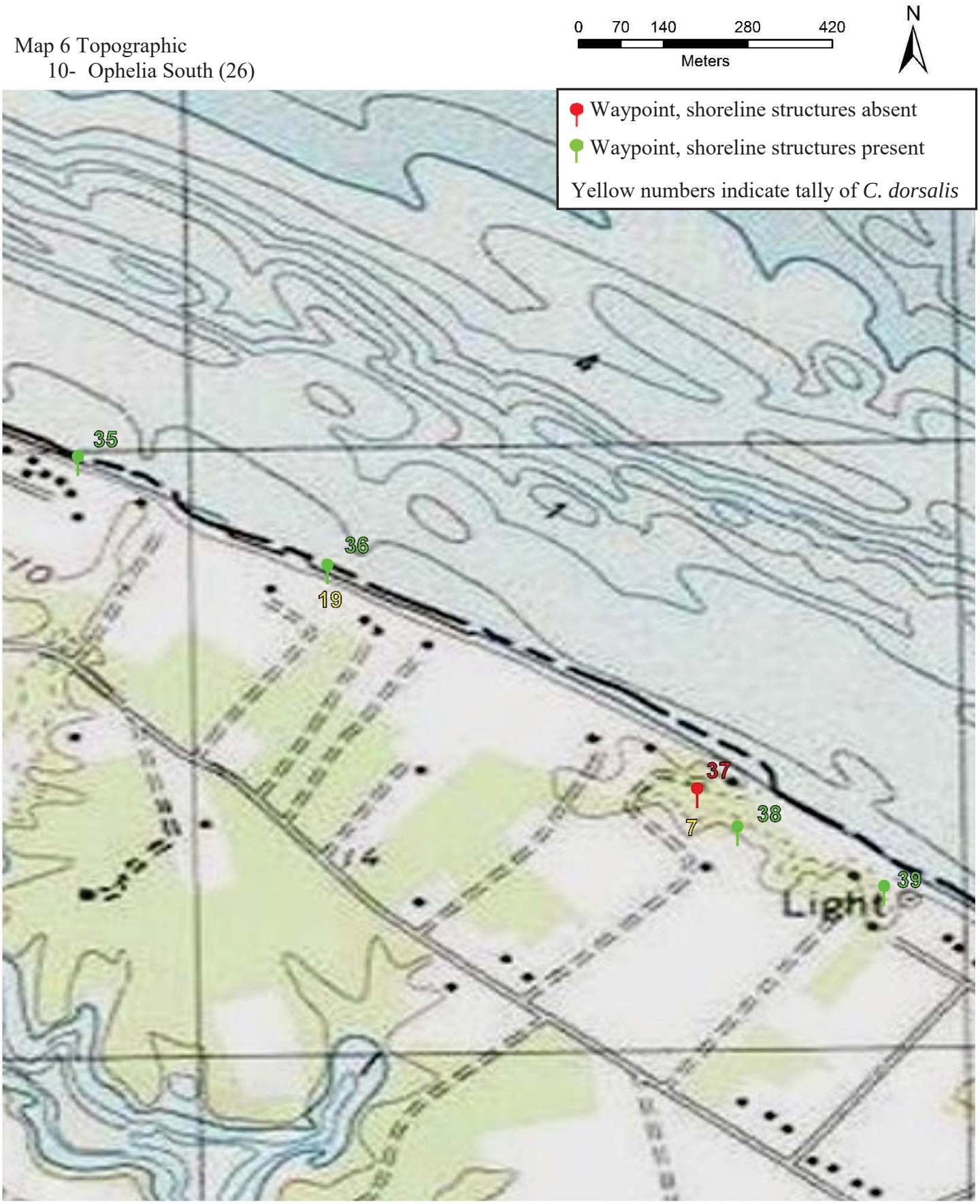


Map 5 Topographic
10- Ophelia North (19)



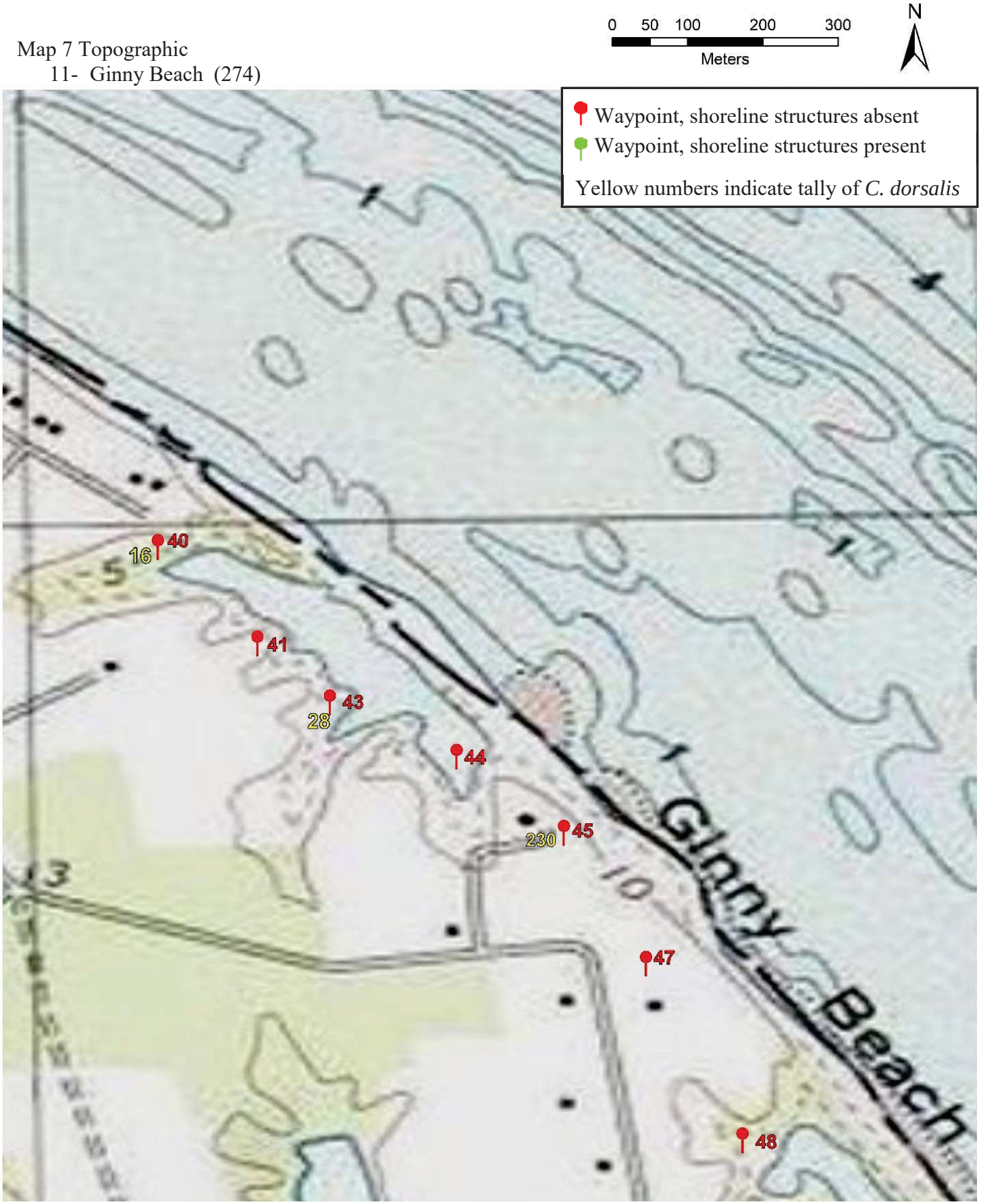
Map 5 Aerial
10- Ophelia North (19)

Map 6 Topographic
10- Ophelia South (26)



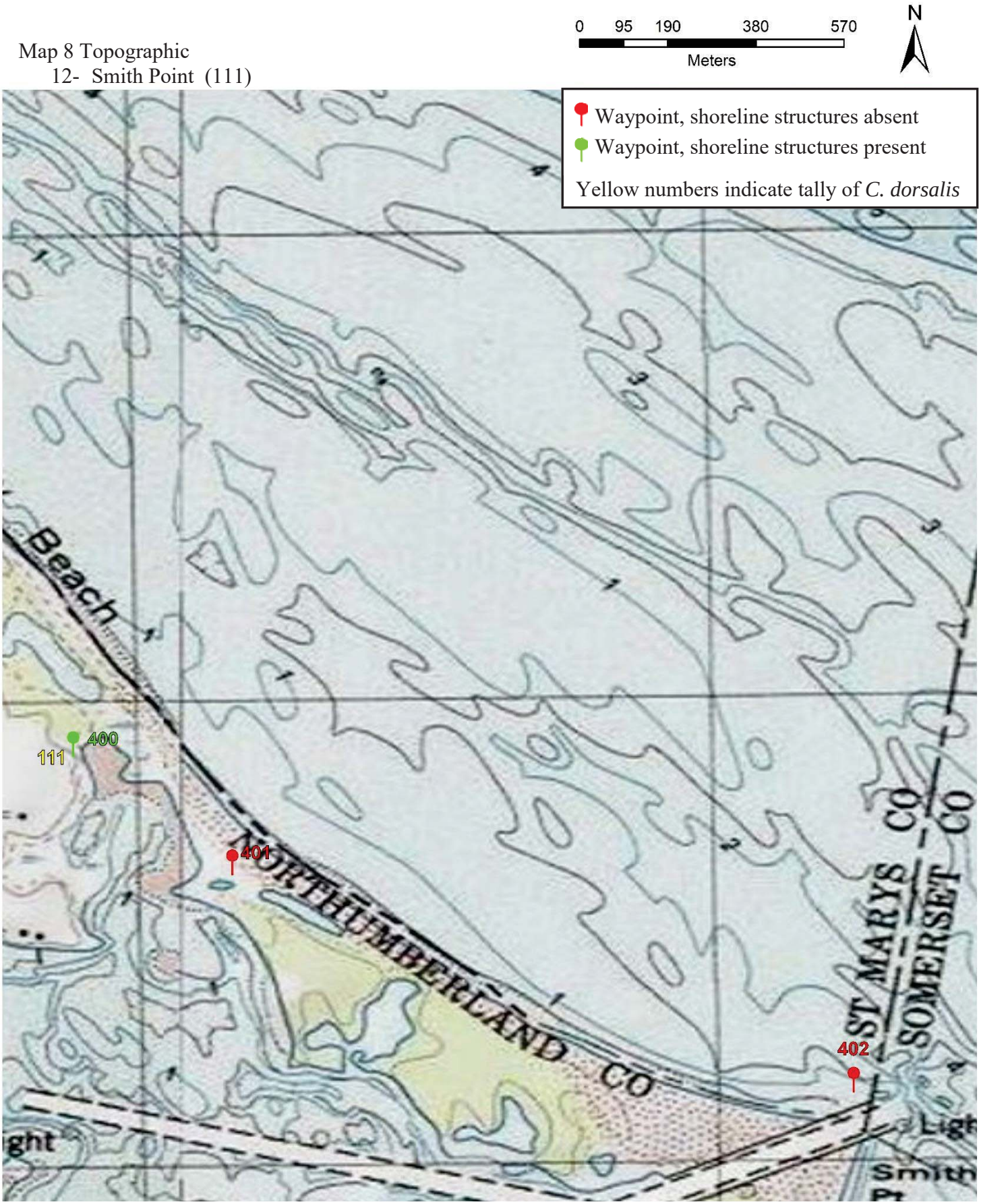
Map 6 Aerial
10- Ophelia South (26)

Map 7 Topographic
11- Ginny Beach (274)



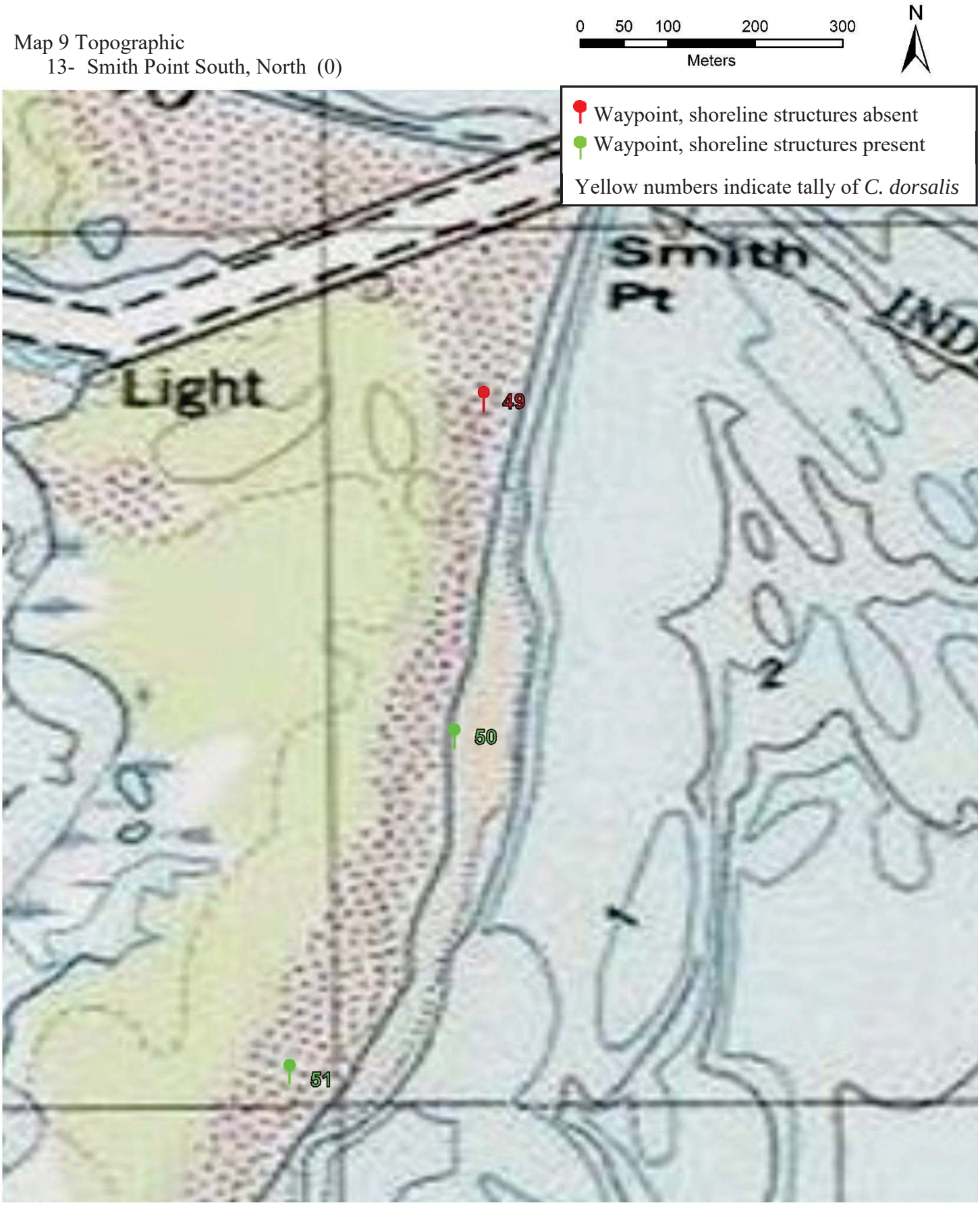
Map 7 Aerial
11- Ginny Beach (274)

Map 8 Topographic
12- Smith Point (111)



Map 8 Aerial
12- Smith Point (111)

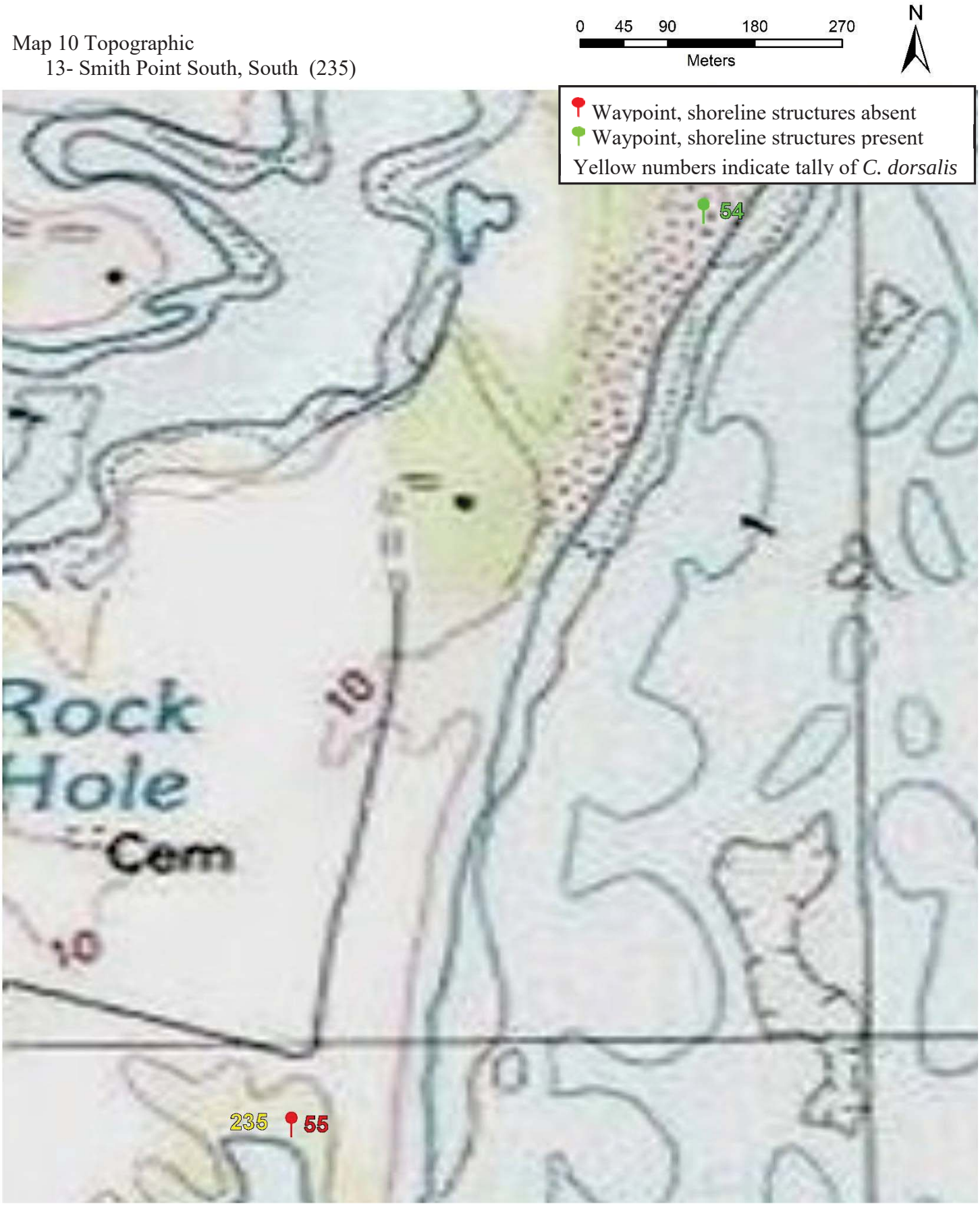
Map 9 Topographic
13- Smith Point South, North (0)



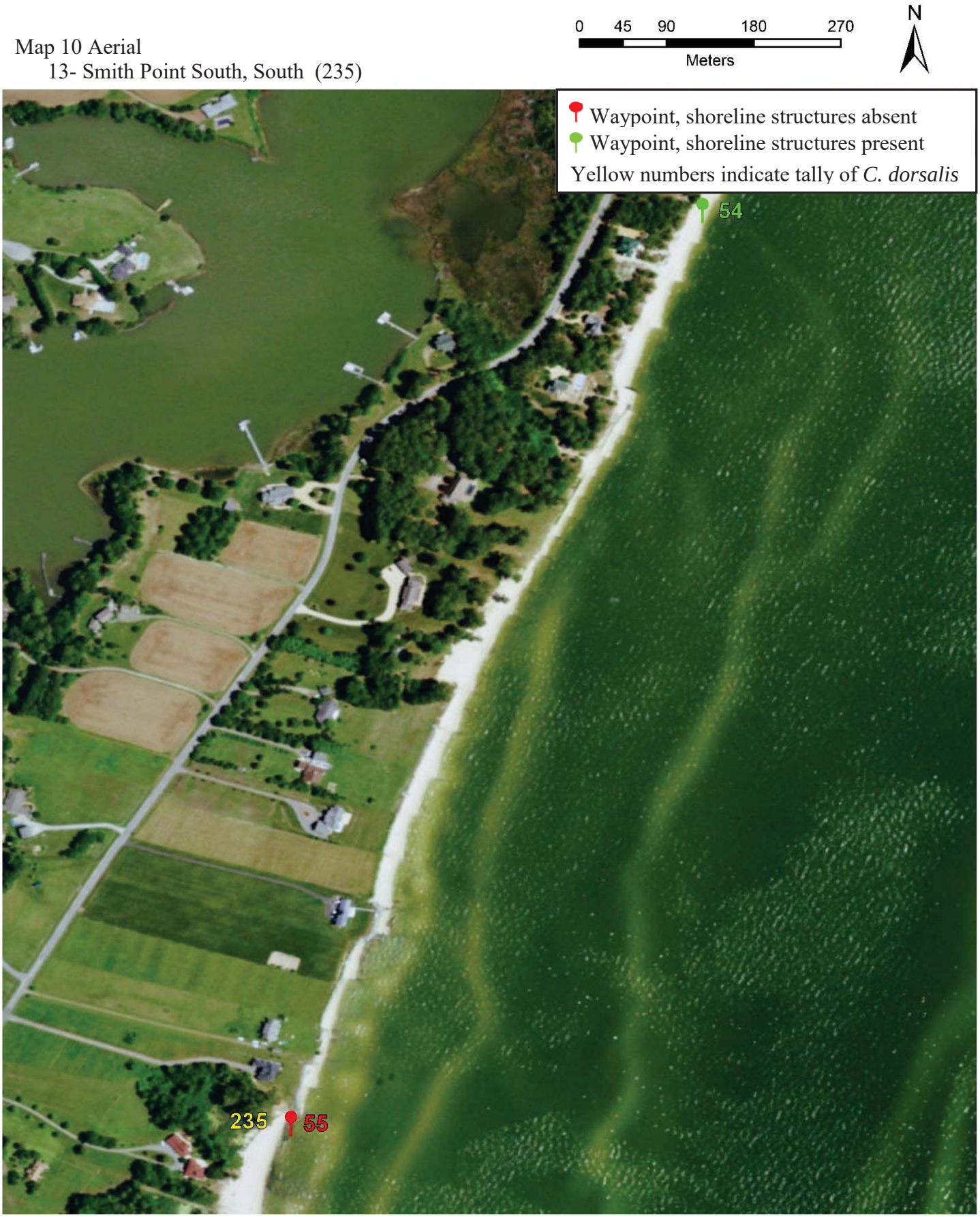
Map 9 Aerial

13- Smith Point South, North (0)

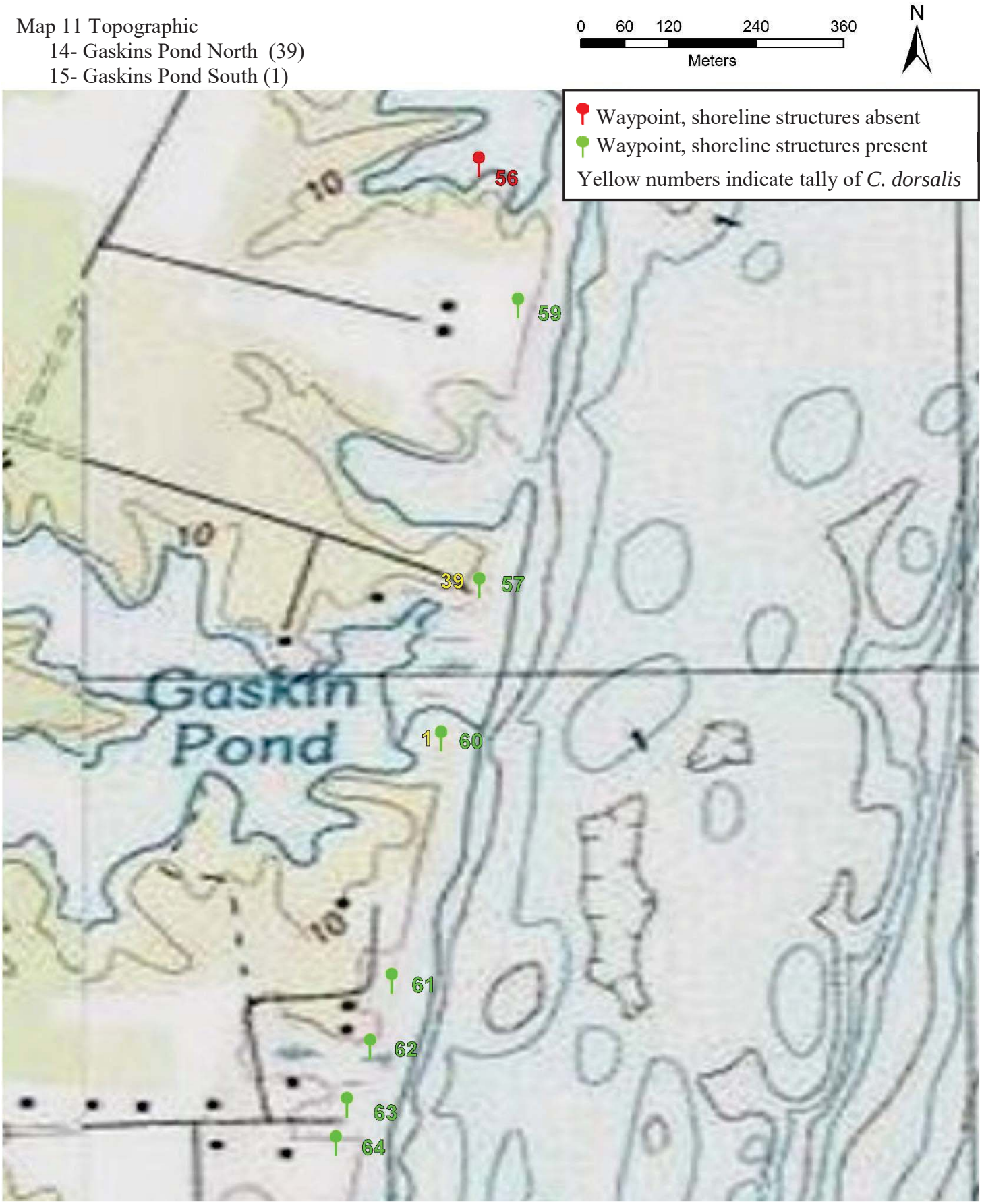
Map 10 Topographic
13- Smith Point South, South (235)



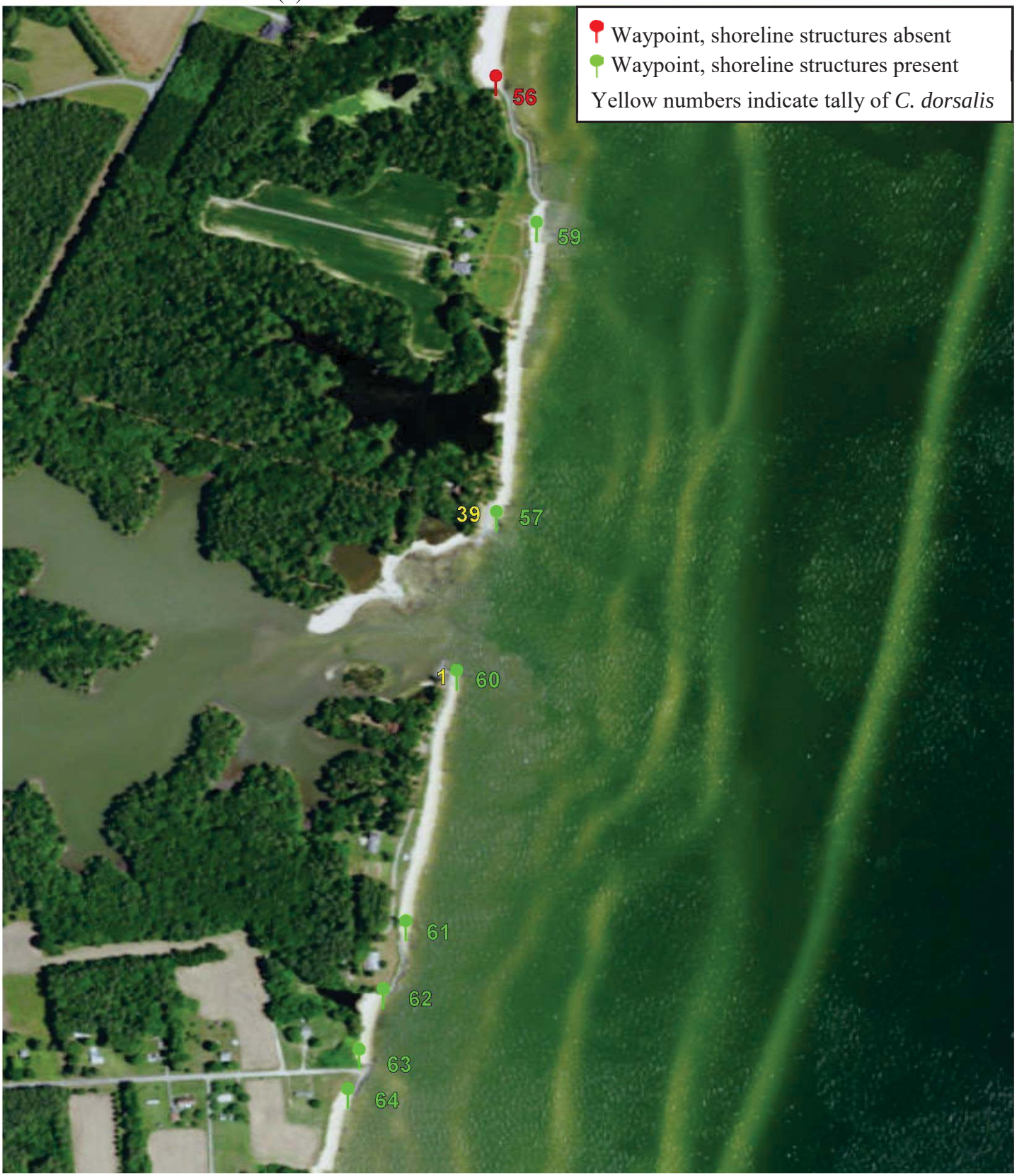
Map 10 Aerial
13- Smith Point South, South (235)



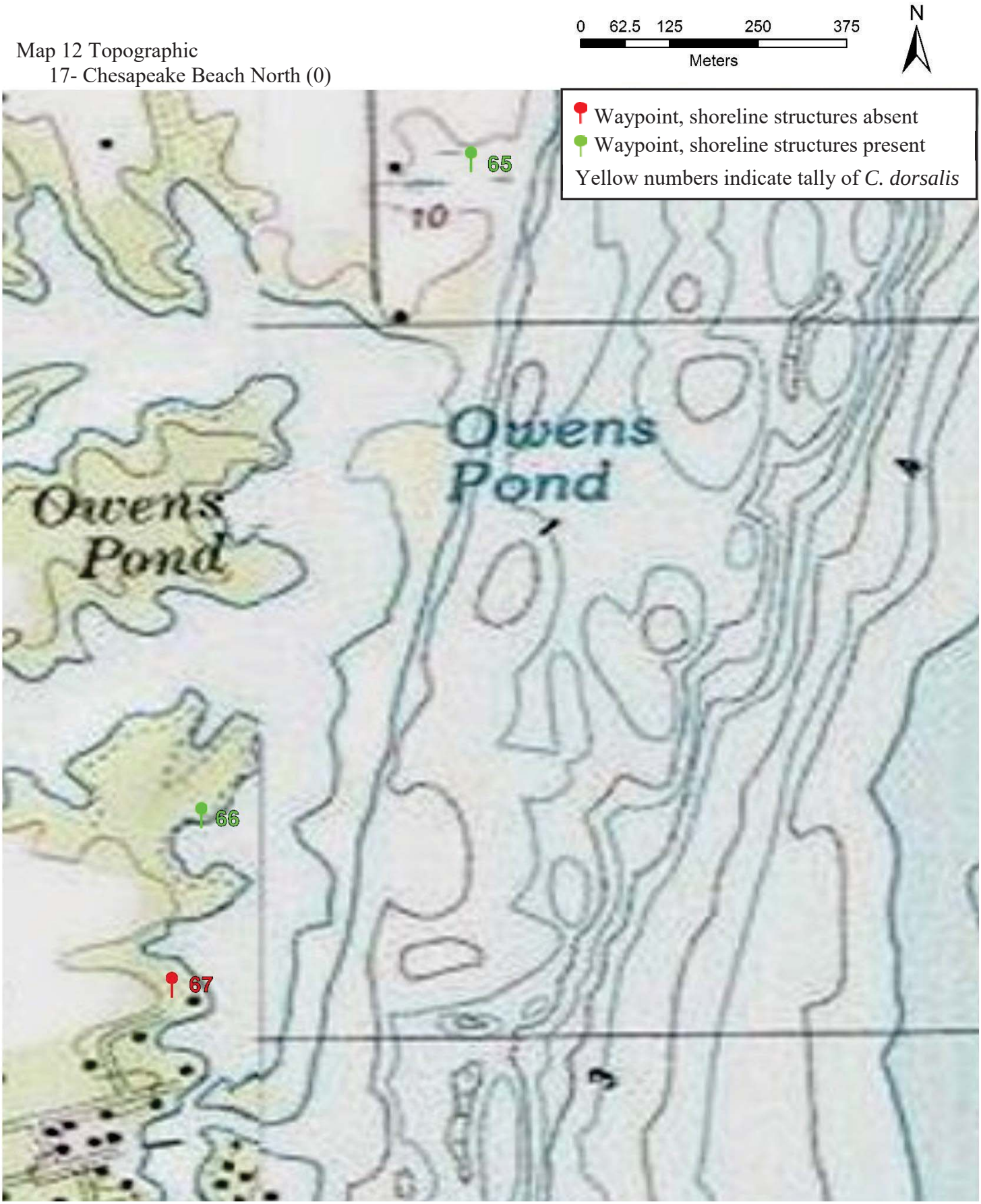
Map 11 Topographic
14- Gaskins Pond North (39)
15- Gaskins Pond South (1)



Map 11 Aerial
14- Gaskins Pond North (39)
15- Gaskins Pond South (1)

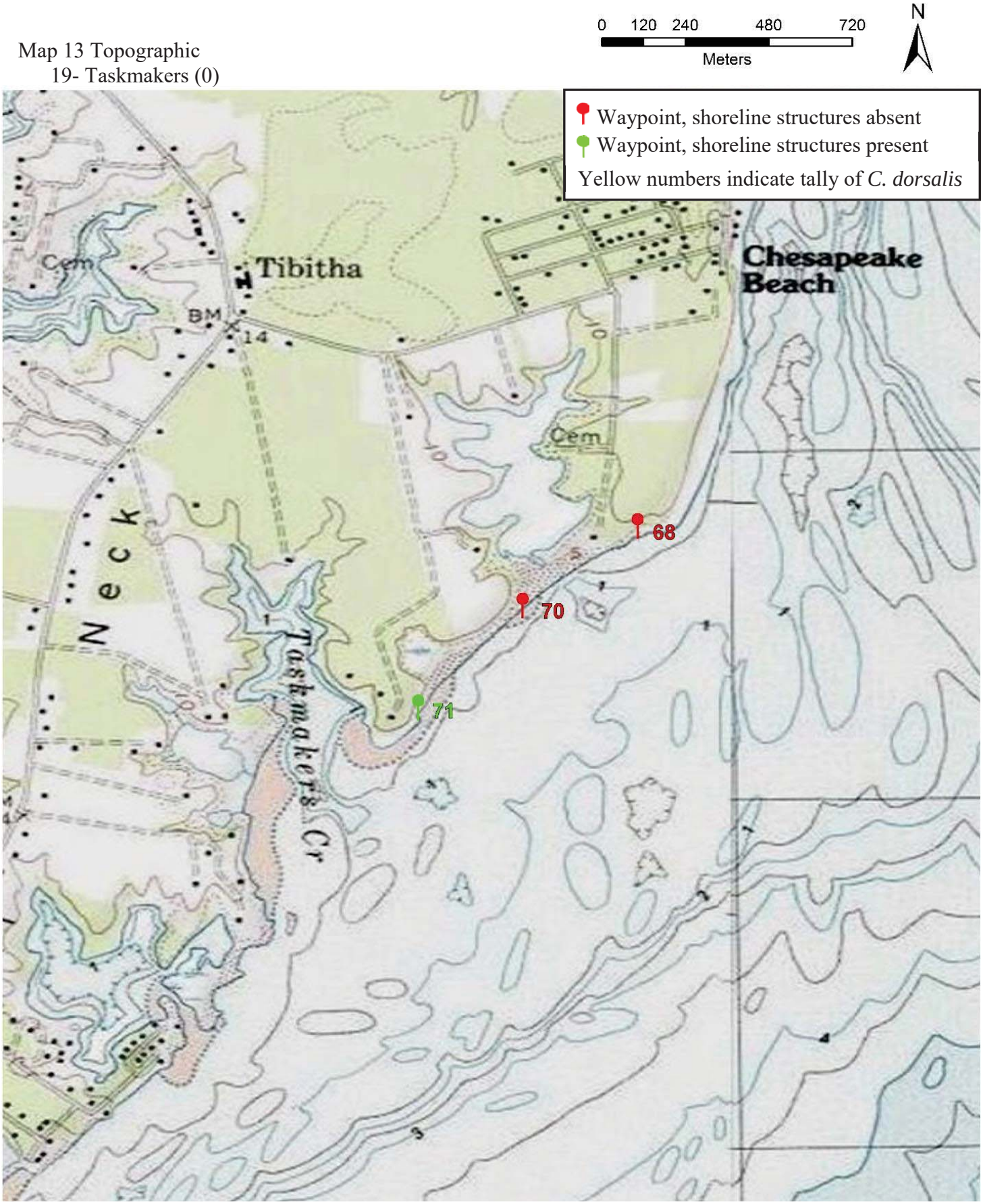


Map 12 Topographic
17- Chesapeake Beach North (0)



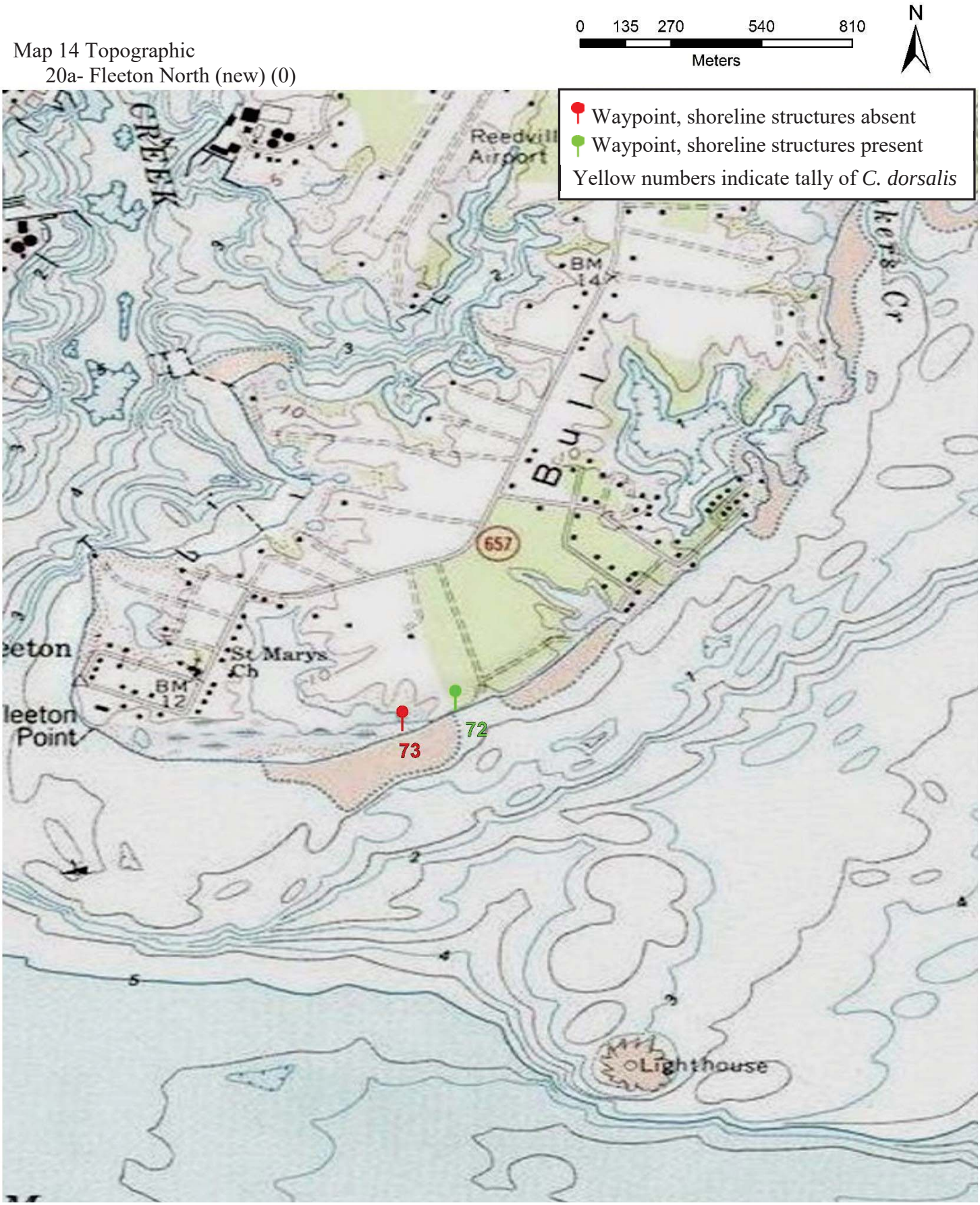
Map 12 Aerial
17- Chesapeake Beach North (0)

Map 13 Topographic
19- Taskmakers (0)



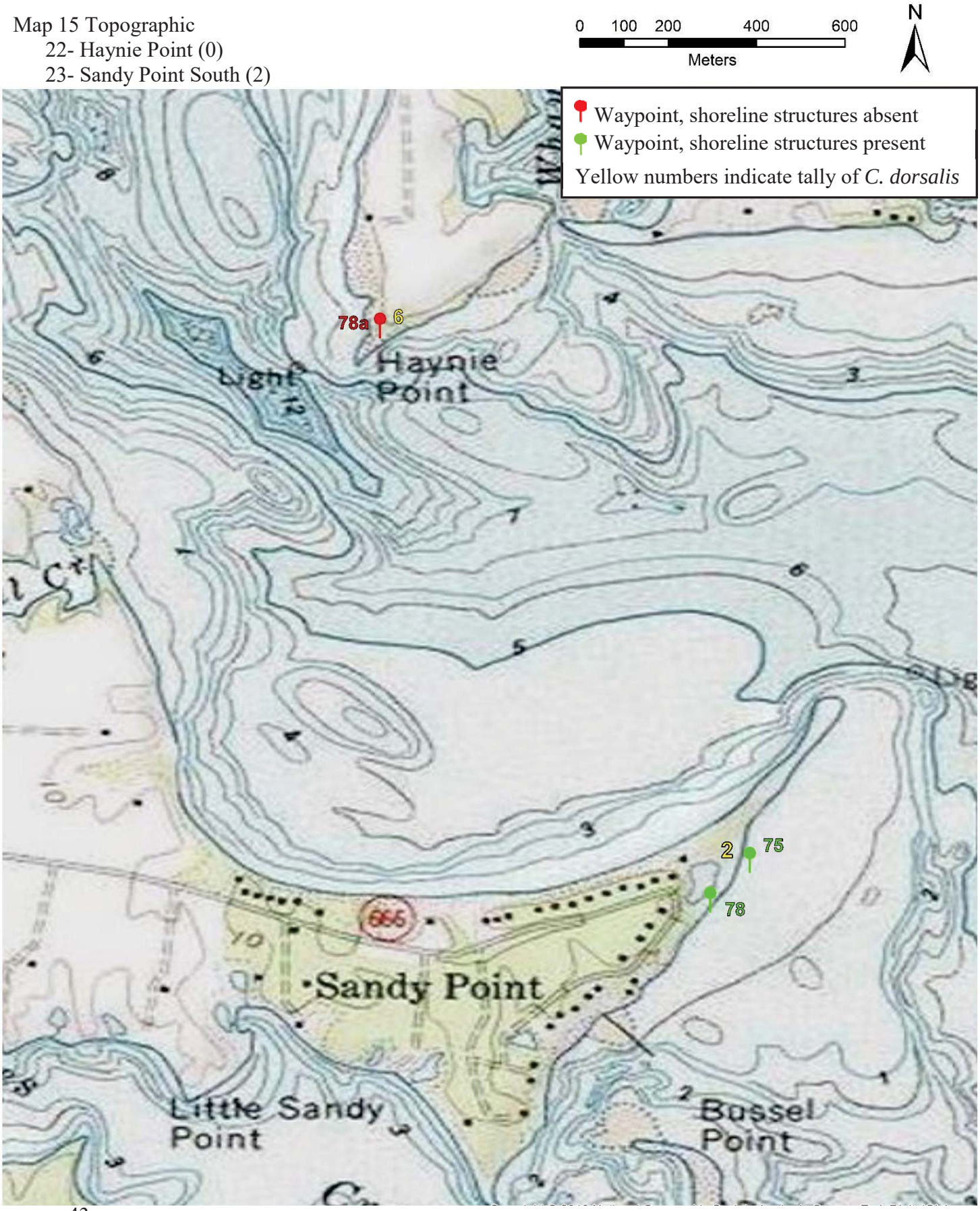
Map 13 Aerial
19- Taskmakers (0)

Map 14 Topographic
20a- Fleeton North (new) (0)



Map 14 Aerial
20a- Fleeton North (new) (0)

Map 15 Topographic
22- Haynie Point (0)
23- Sandy Point South (2)

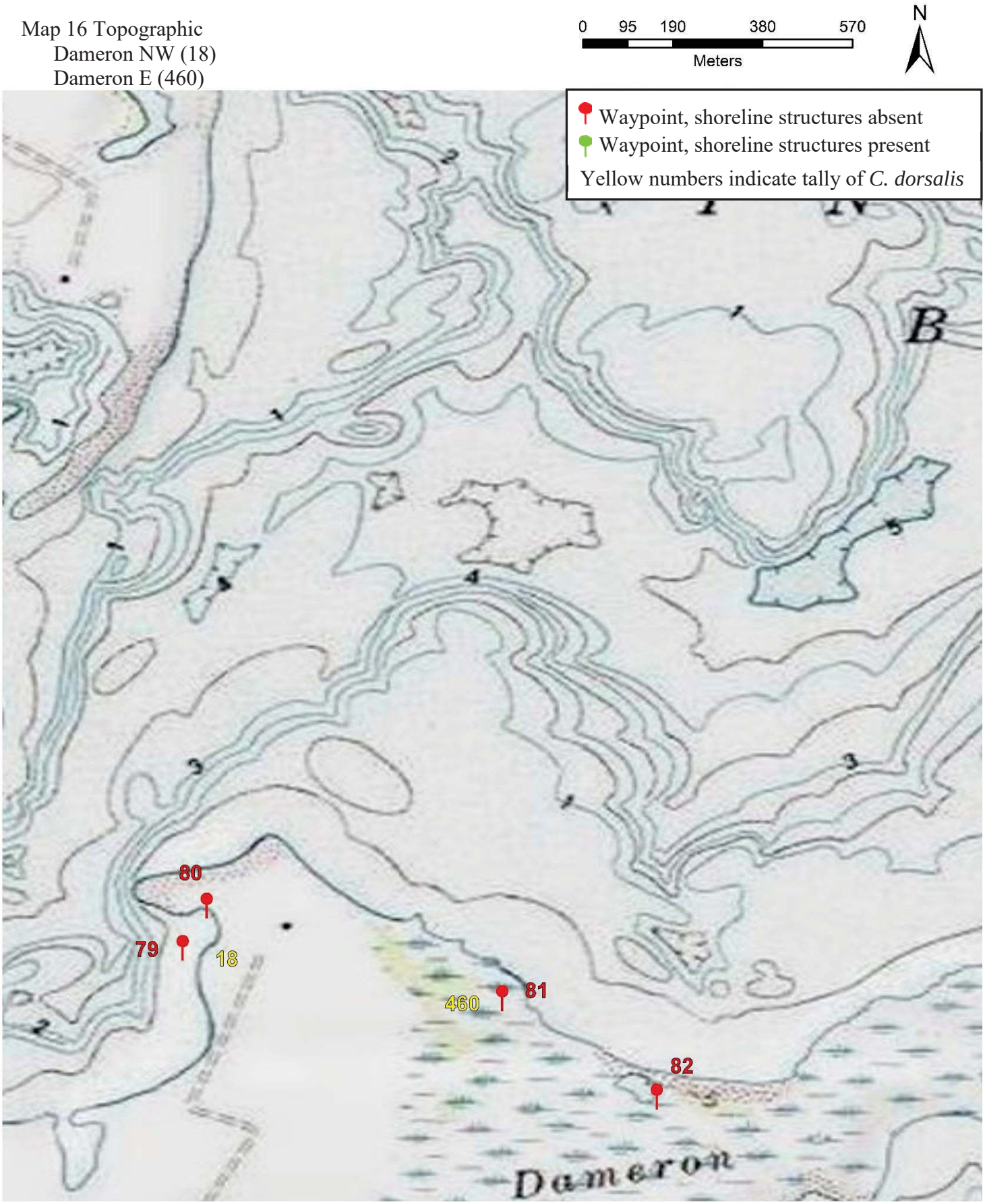


Map 15 Aerial

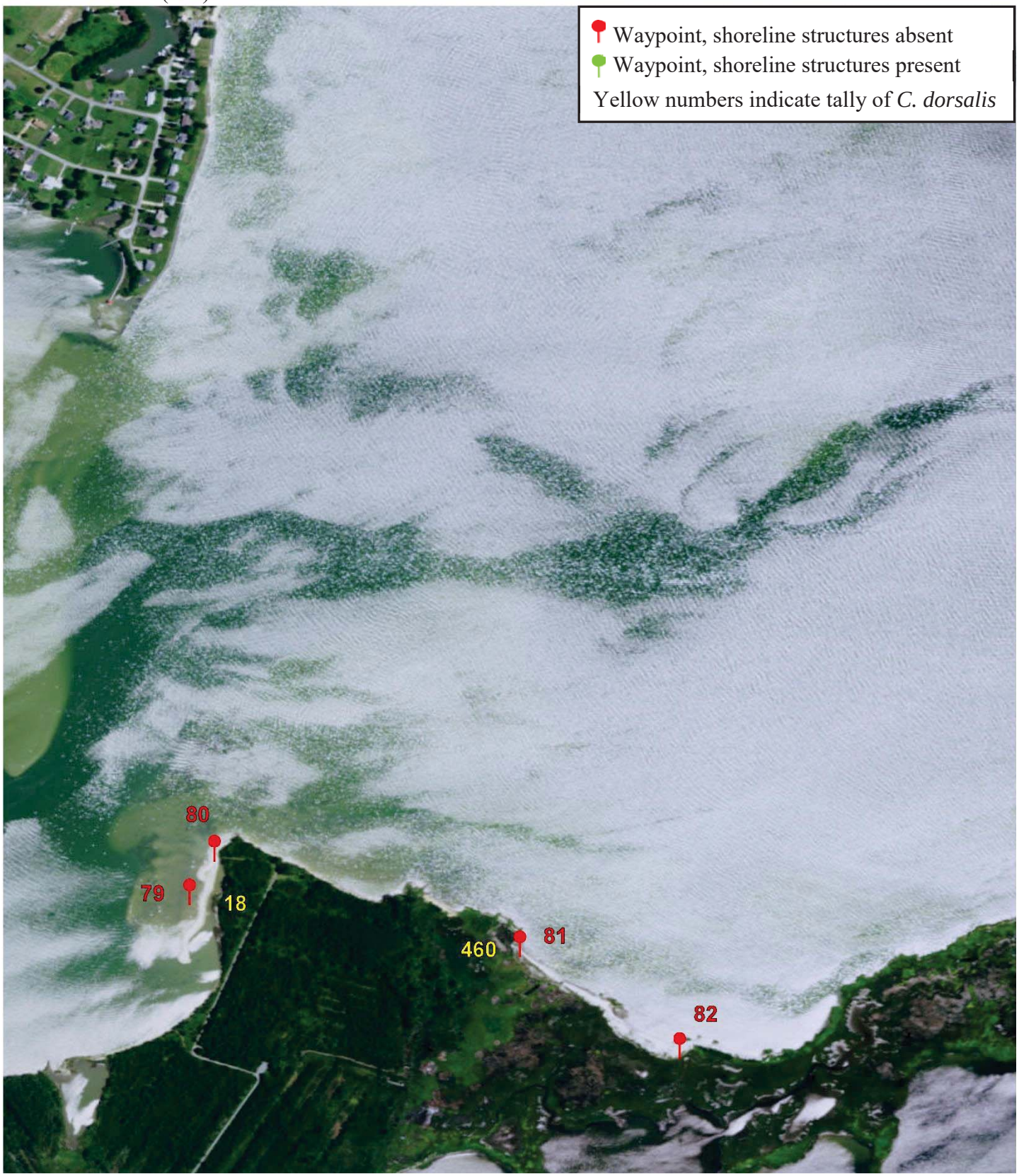
22- Haynie Point (0)

23- Sandy Point South (2)

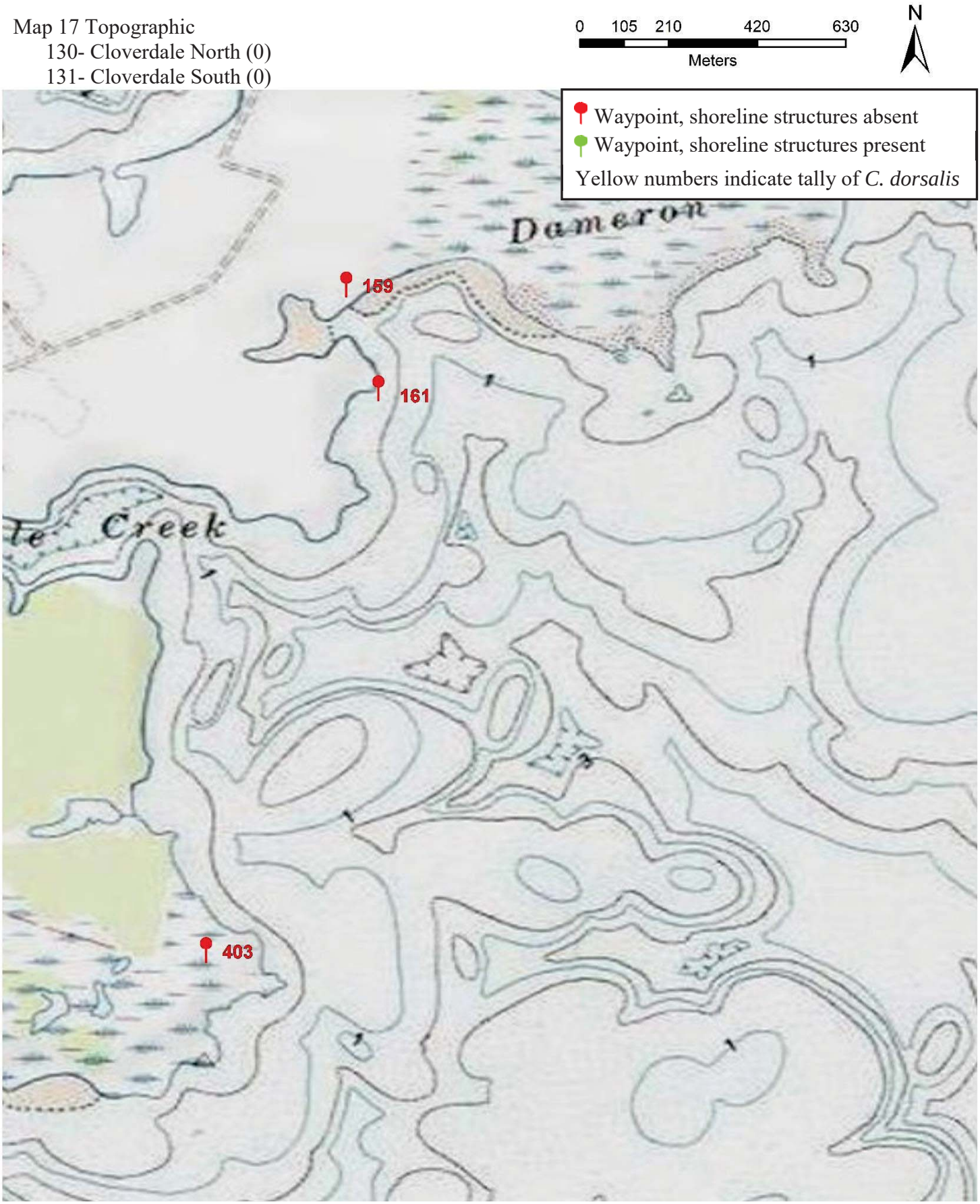
Map 16 Topographic
Dameron NW (18)
Dameron E (460)



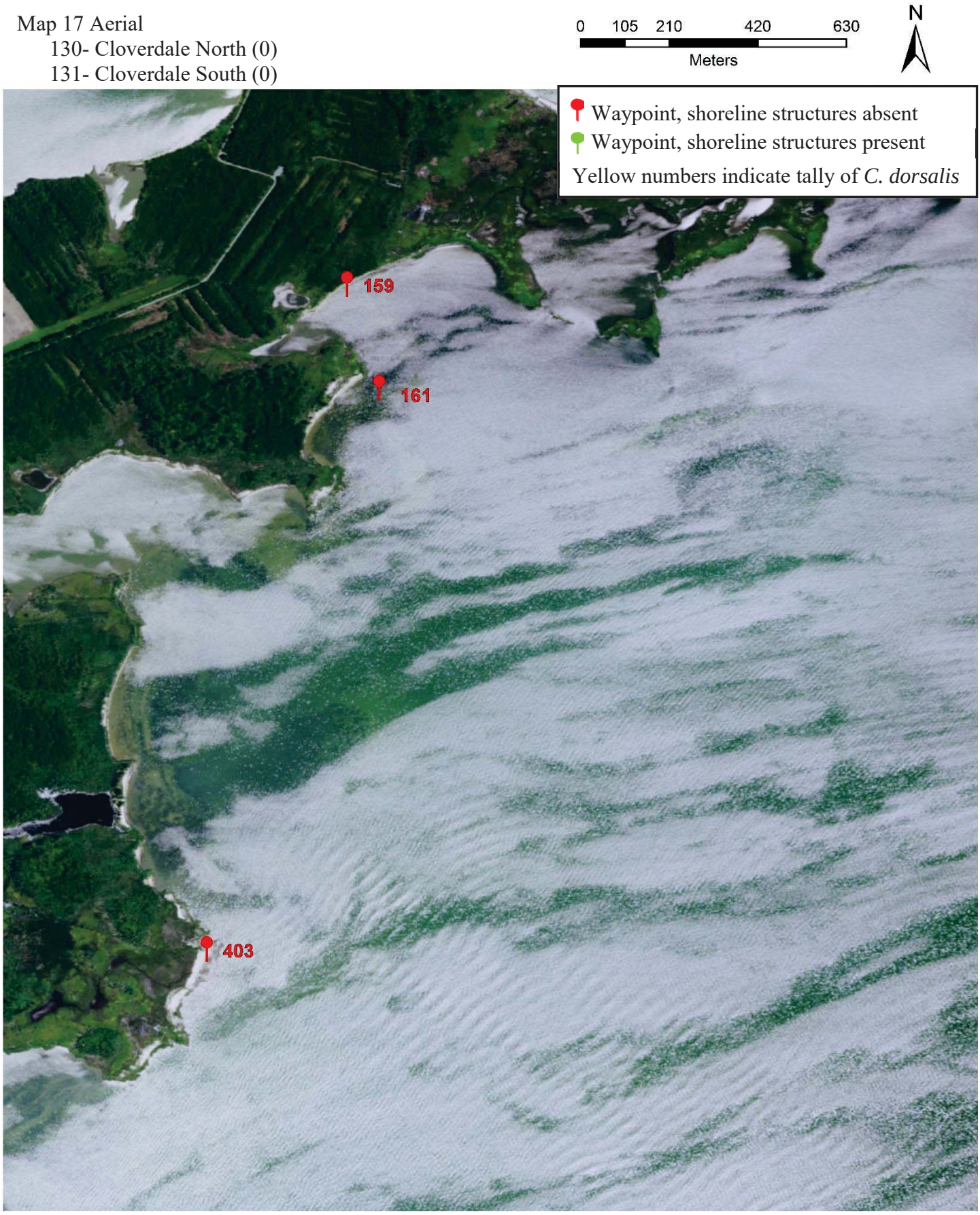
Map 16 Aerial
Dameron NW (18)
Dameron E (460)



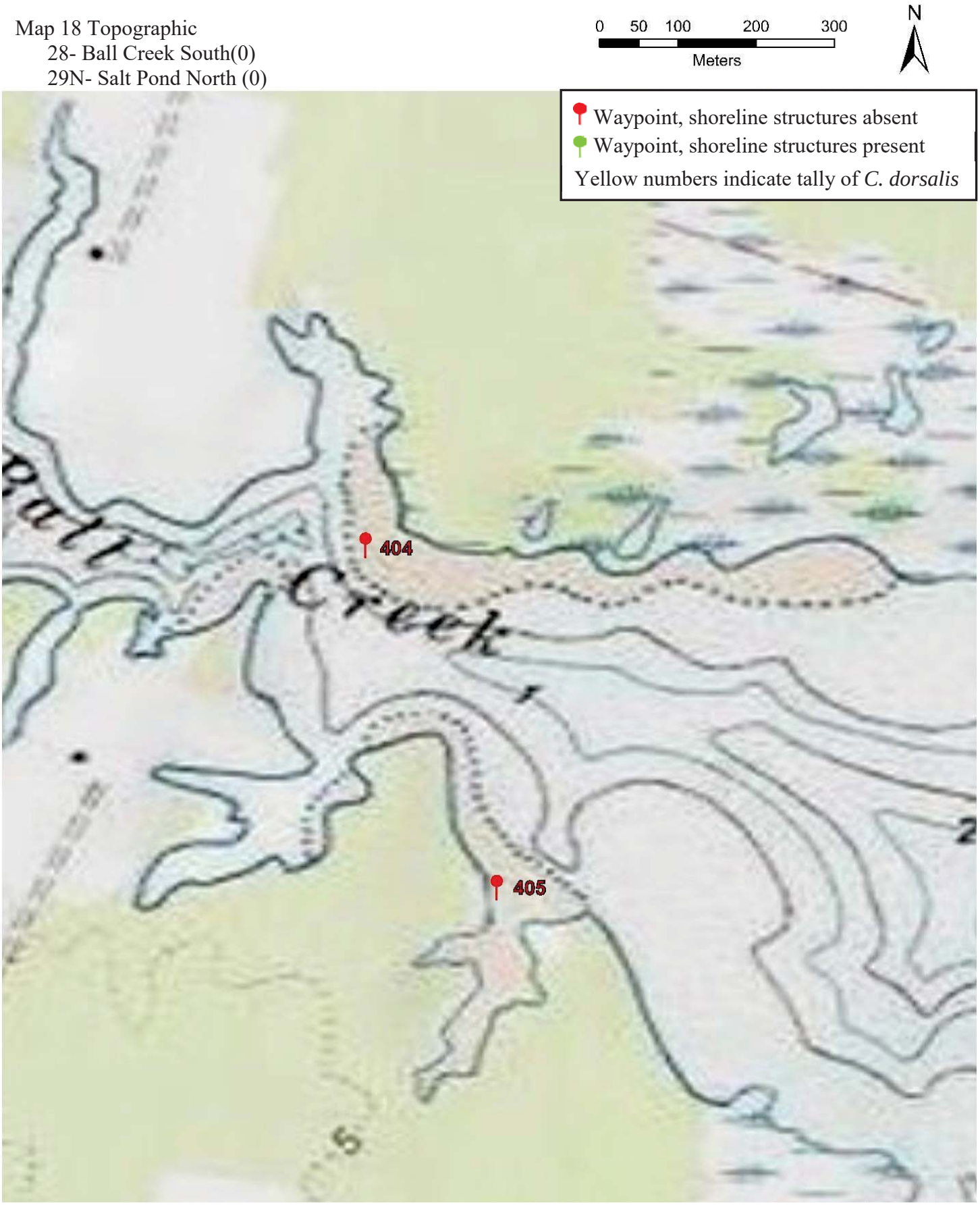
Map 17 Topographic
130- Cloverdale North (0)
131- Cloverdale South (0)



Map 17 Aerial
130- Cloverdale North (0)
131- Cloverdale South (0)



Map 18 Topographic
28- Ball Creek South(0)
29N- Salt Pond North (0)

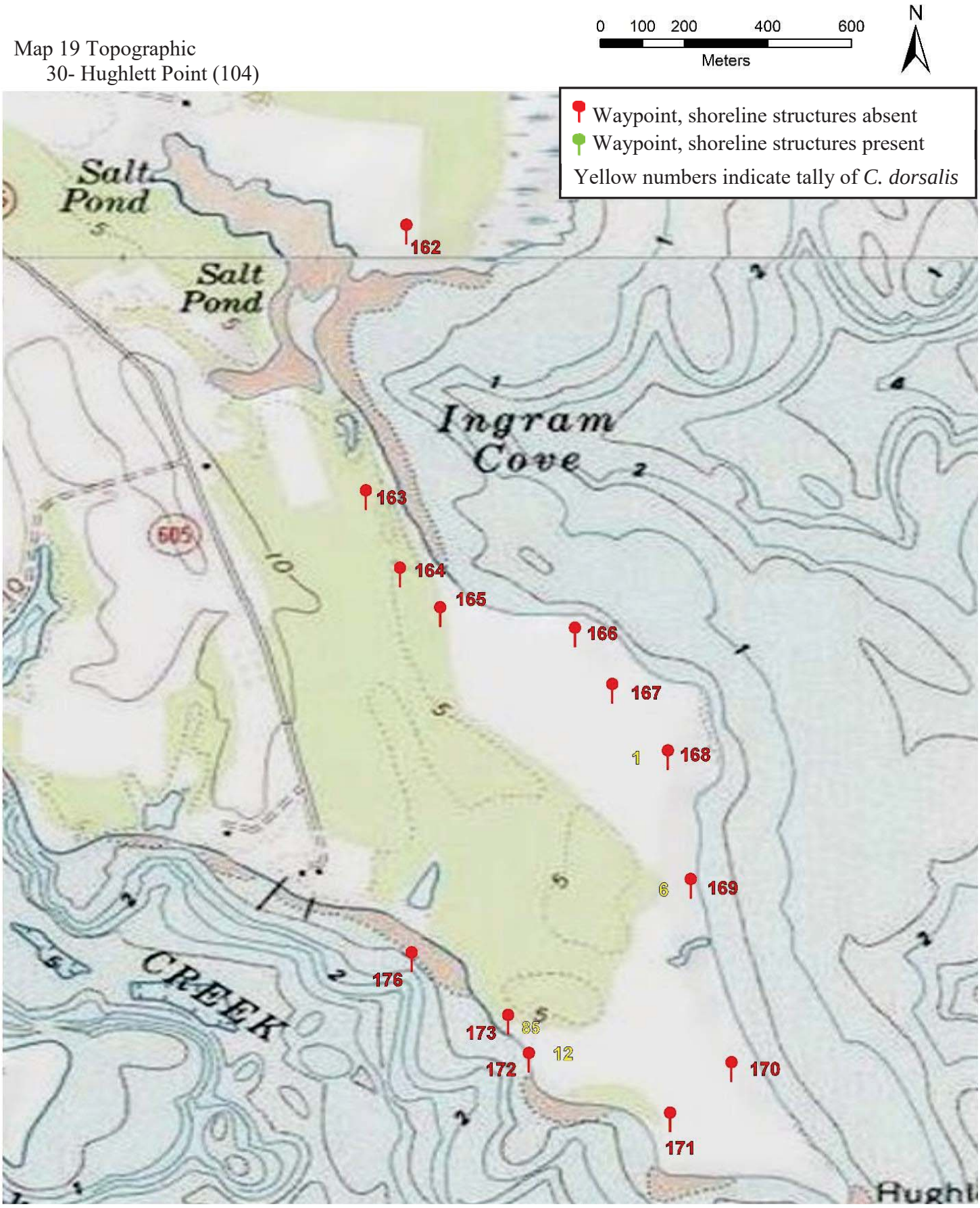


Map 18 Aerial

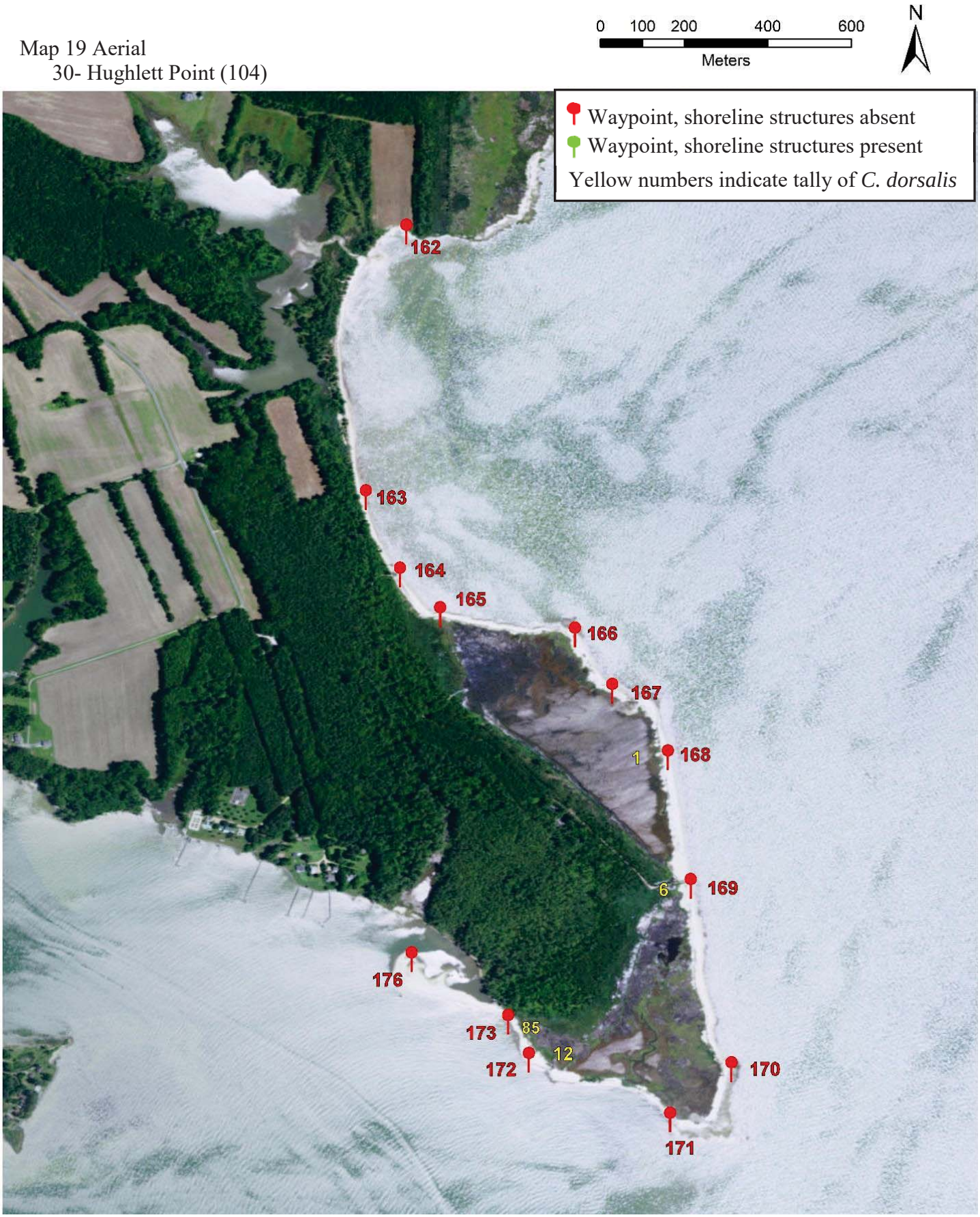
28- Ball Creek South(0)

29N- Salt Pond North (0)

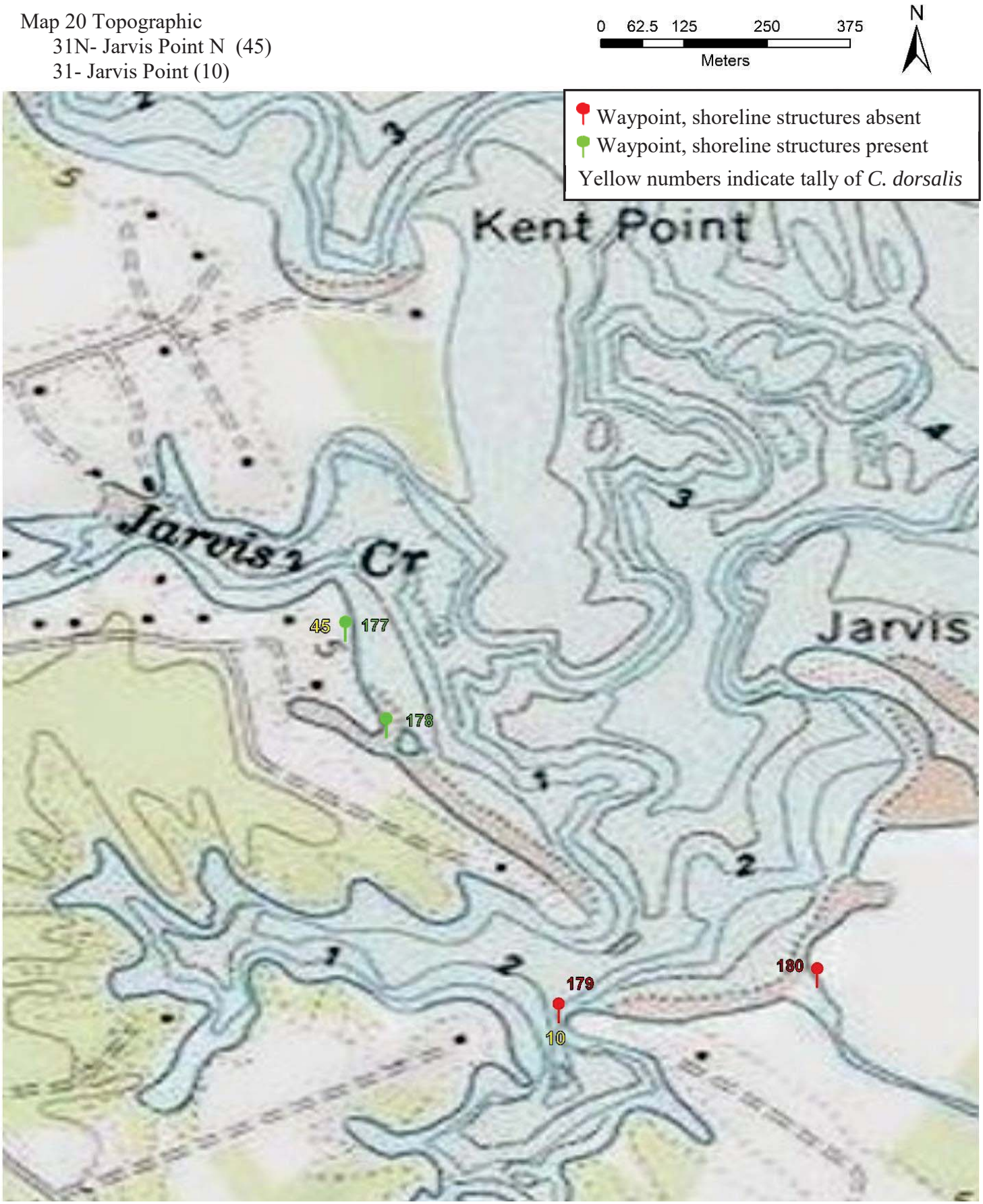
Map 19 Topographic
30- Hughlett Point (104)



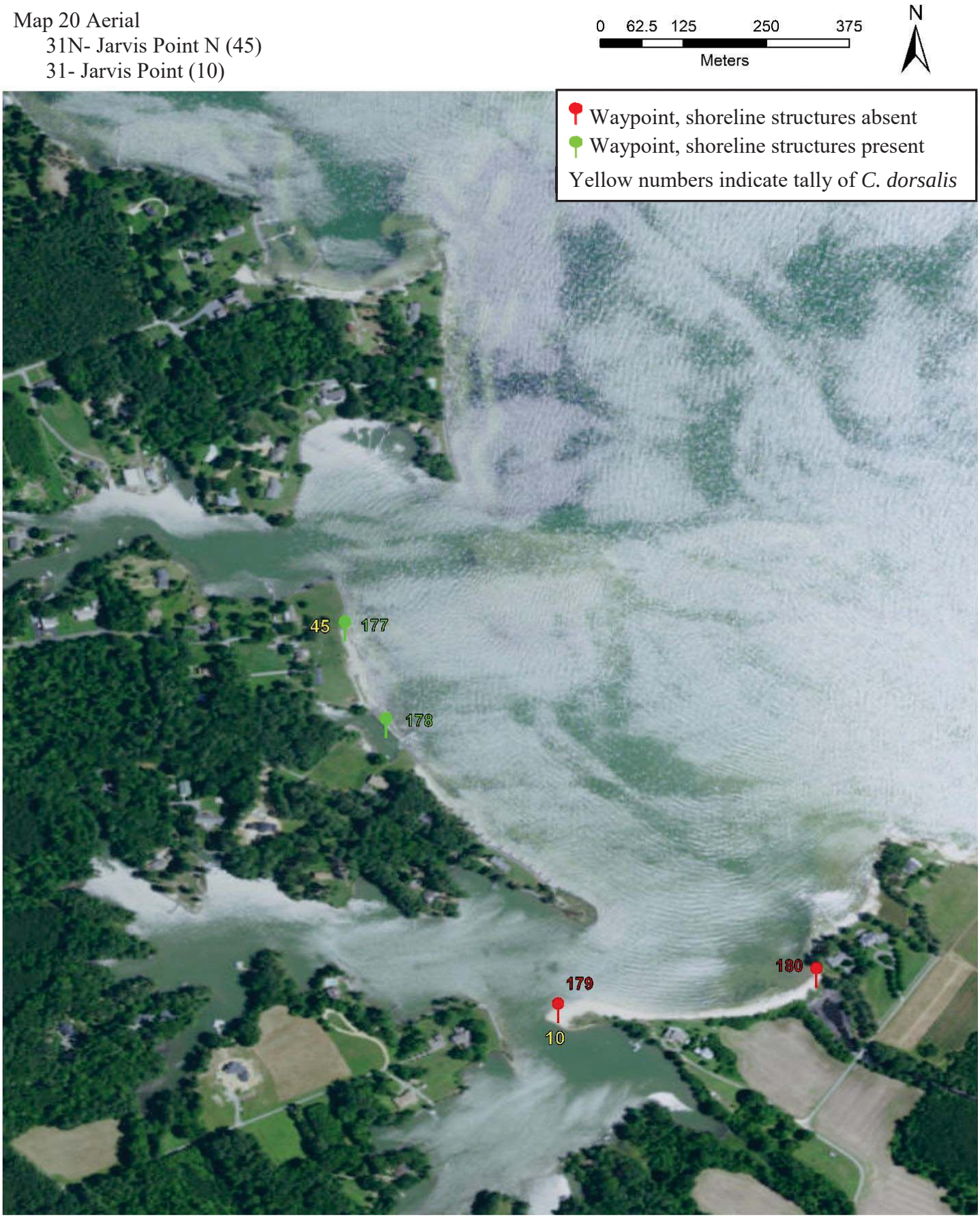
Map 19 Aerial
30- Hughlett Point (104)



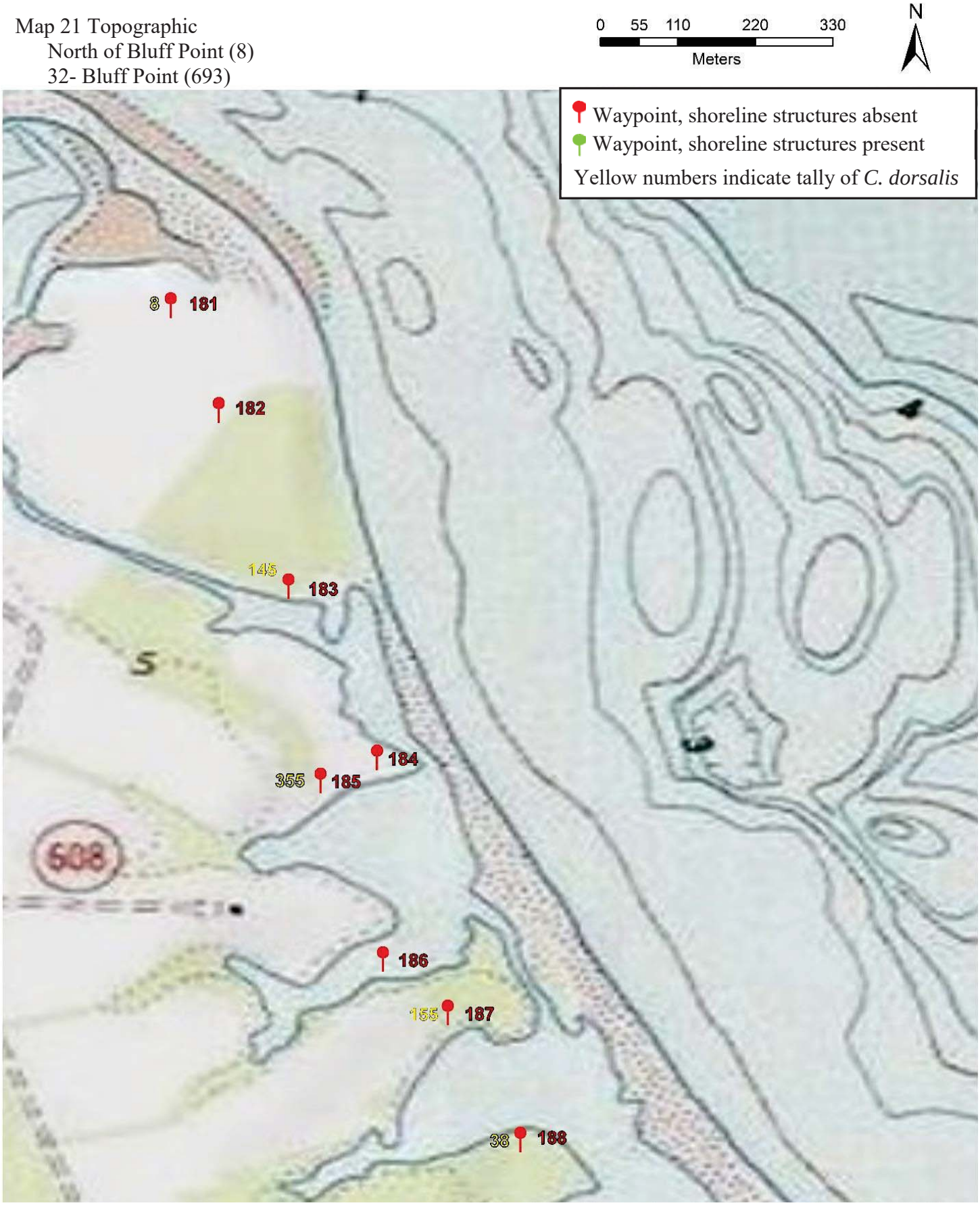
Map 20 Topographic
31N- Jarvis Point N (45)
31- Jarvis Point (10)



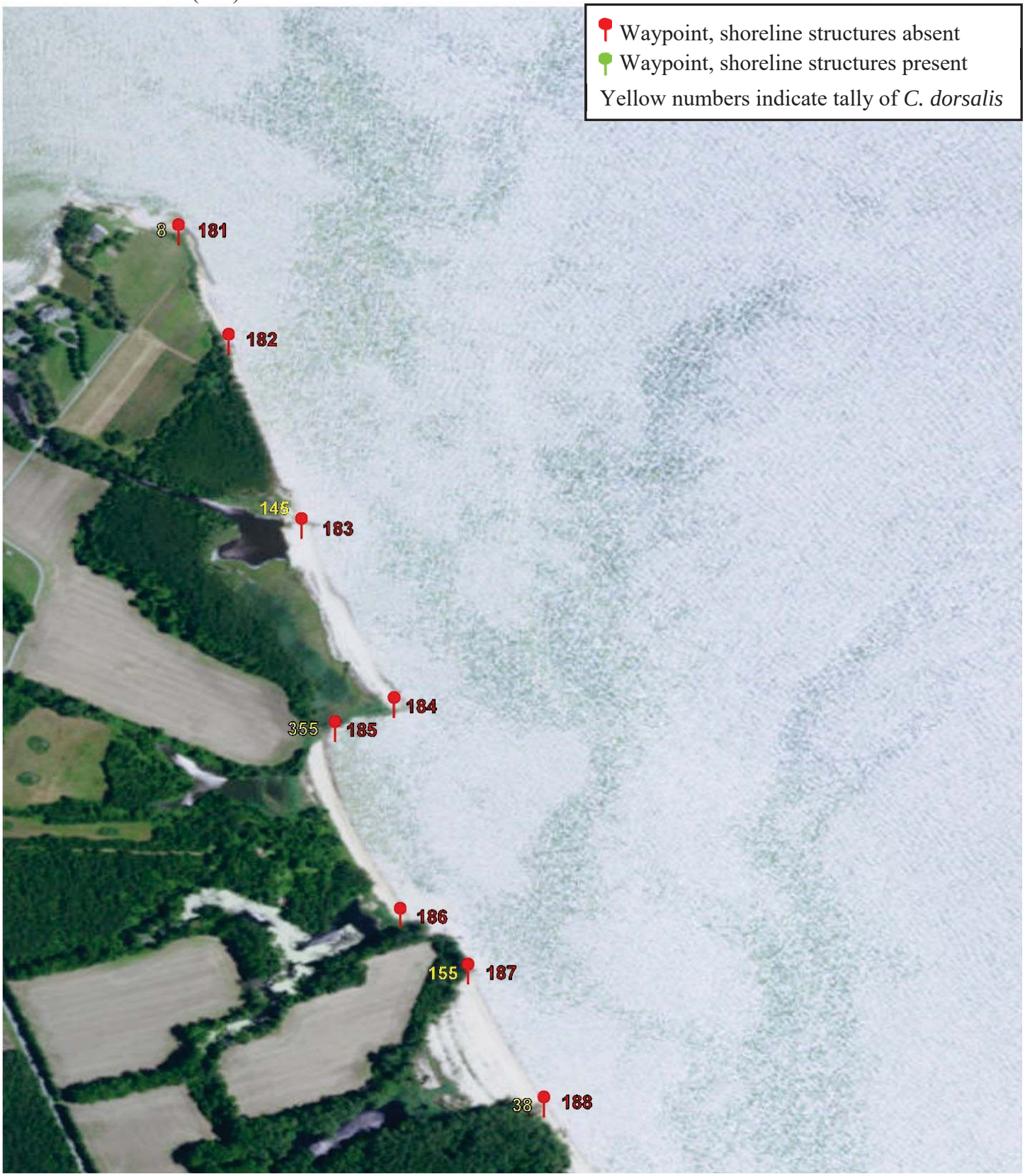
Map 20 Aerial
31N- Jarvis Point N (45)
31- Jarvis Point (10)



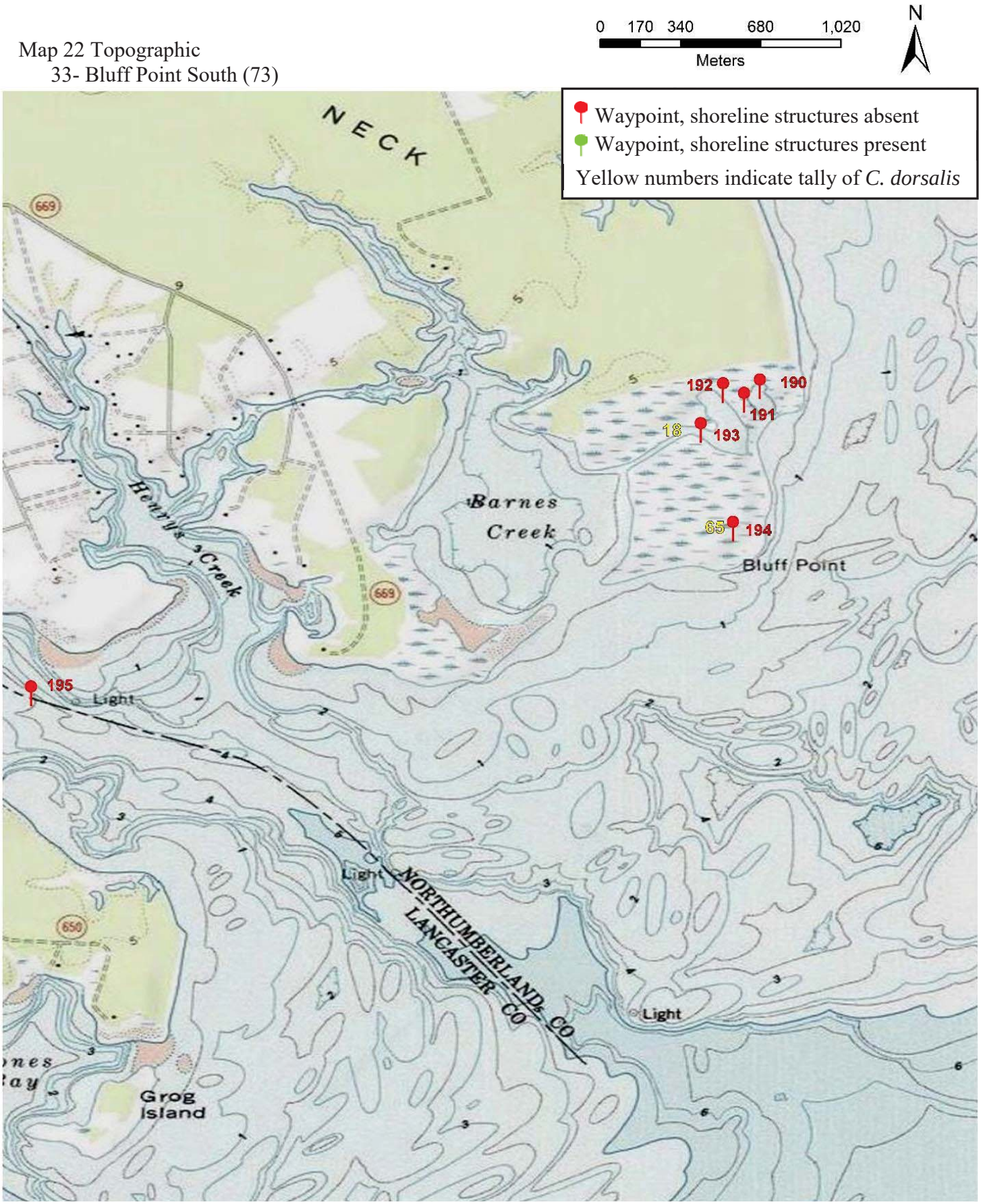
Map 21 Topographic
North of Bluff Point (8)
32- Bluff Point (693)



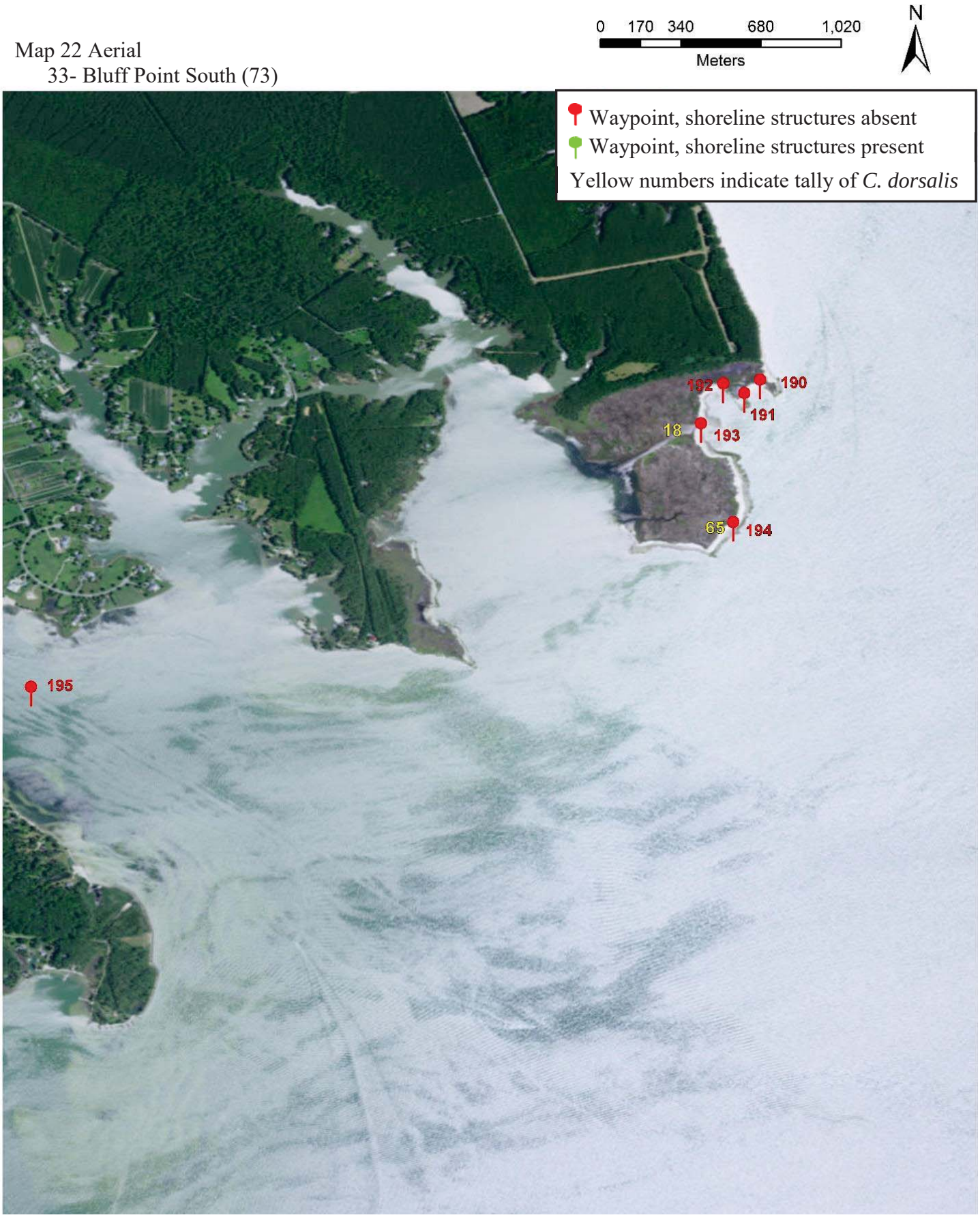
Map 21 Aerial
North of Bluff Point (8)
32- Bluff Point (693)



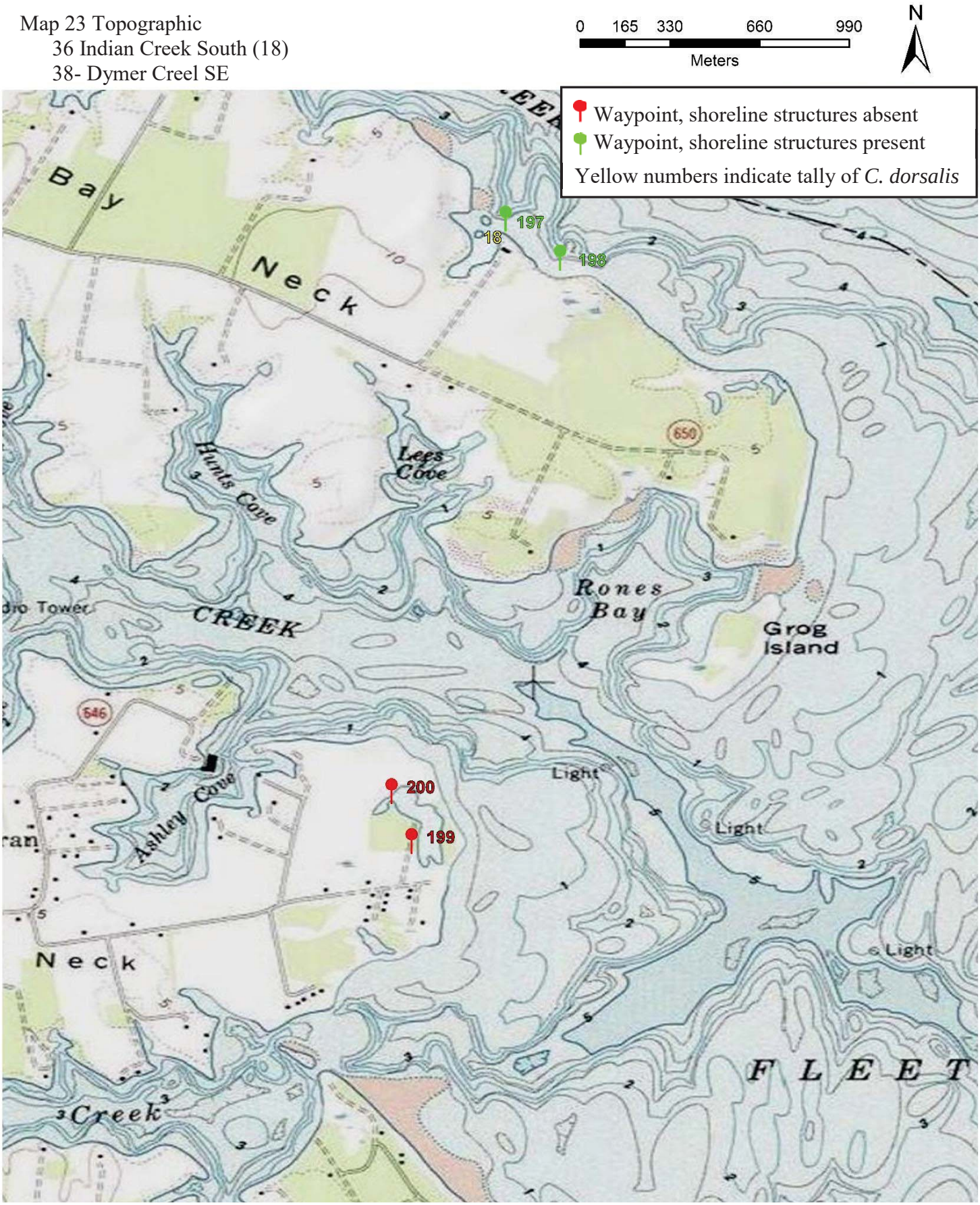
Map 22 Topographic
33- Bluff Point South (73)



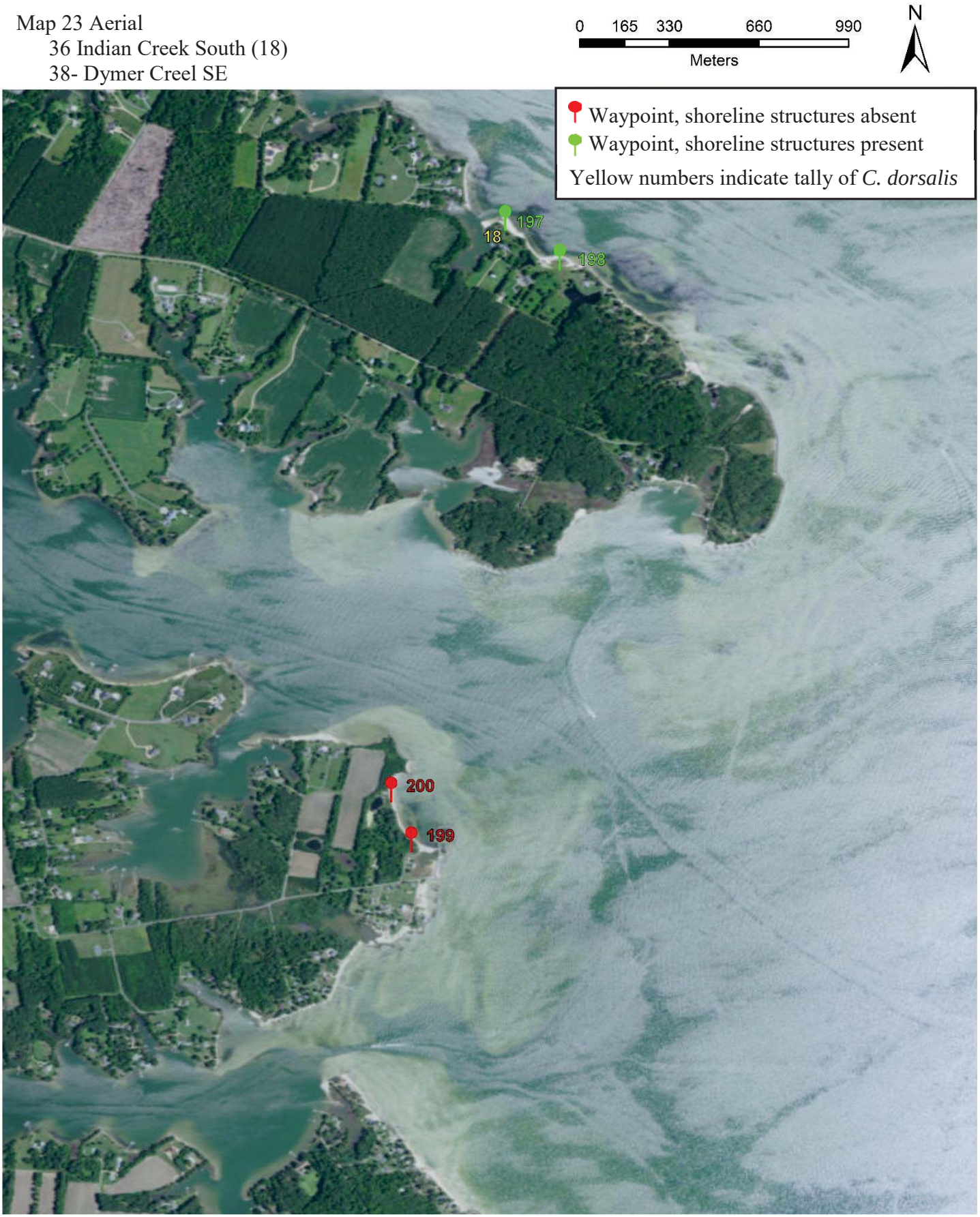
Map 22 Aerial
33- Bluff Point South (73)



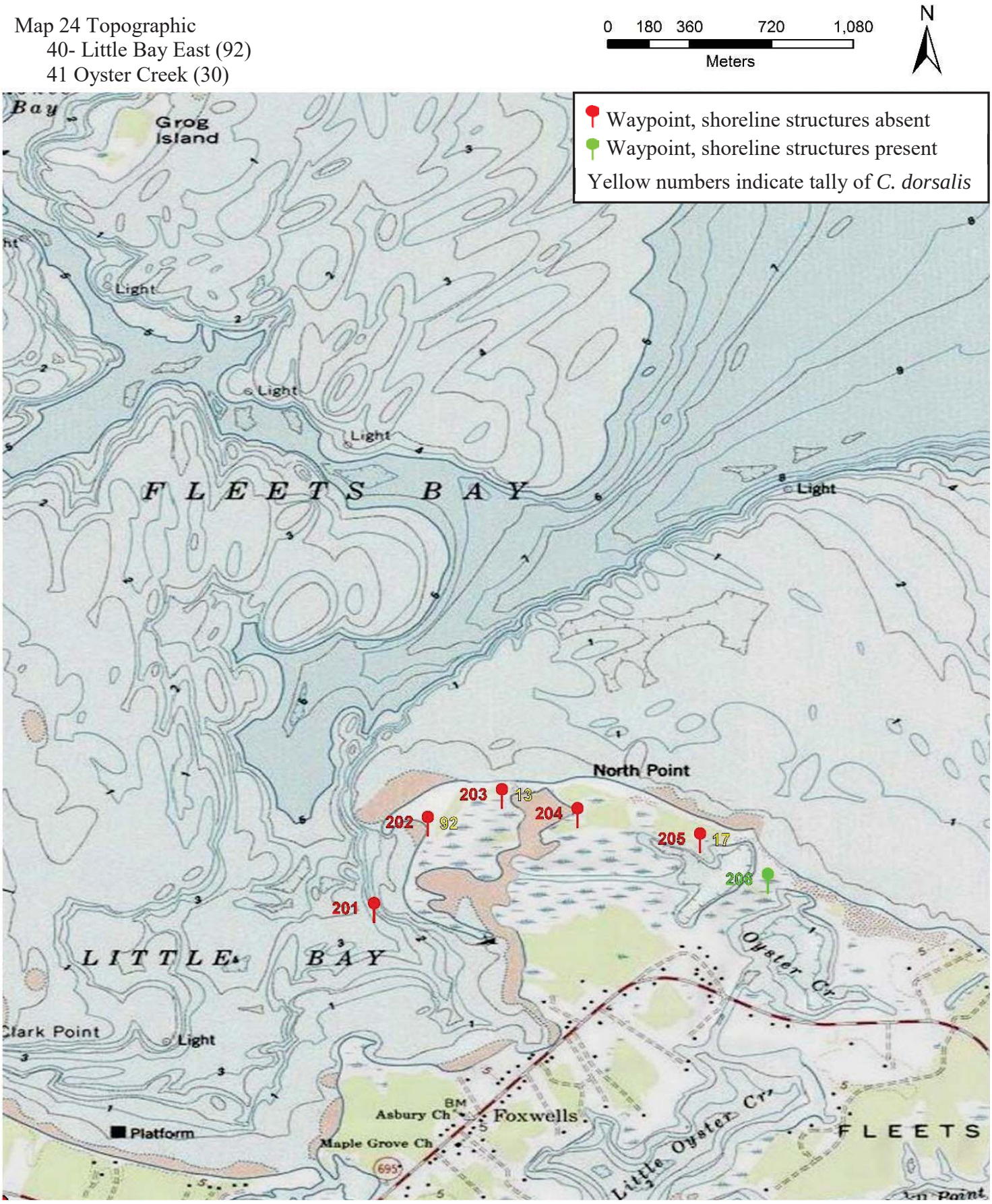
Map 23 Topographic
36 Indian Creek South (18)
38- Dymer Creel SE



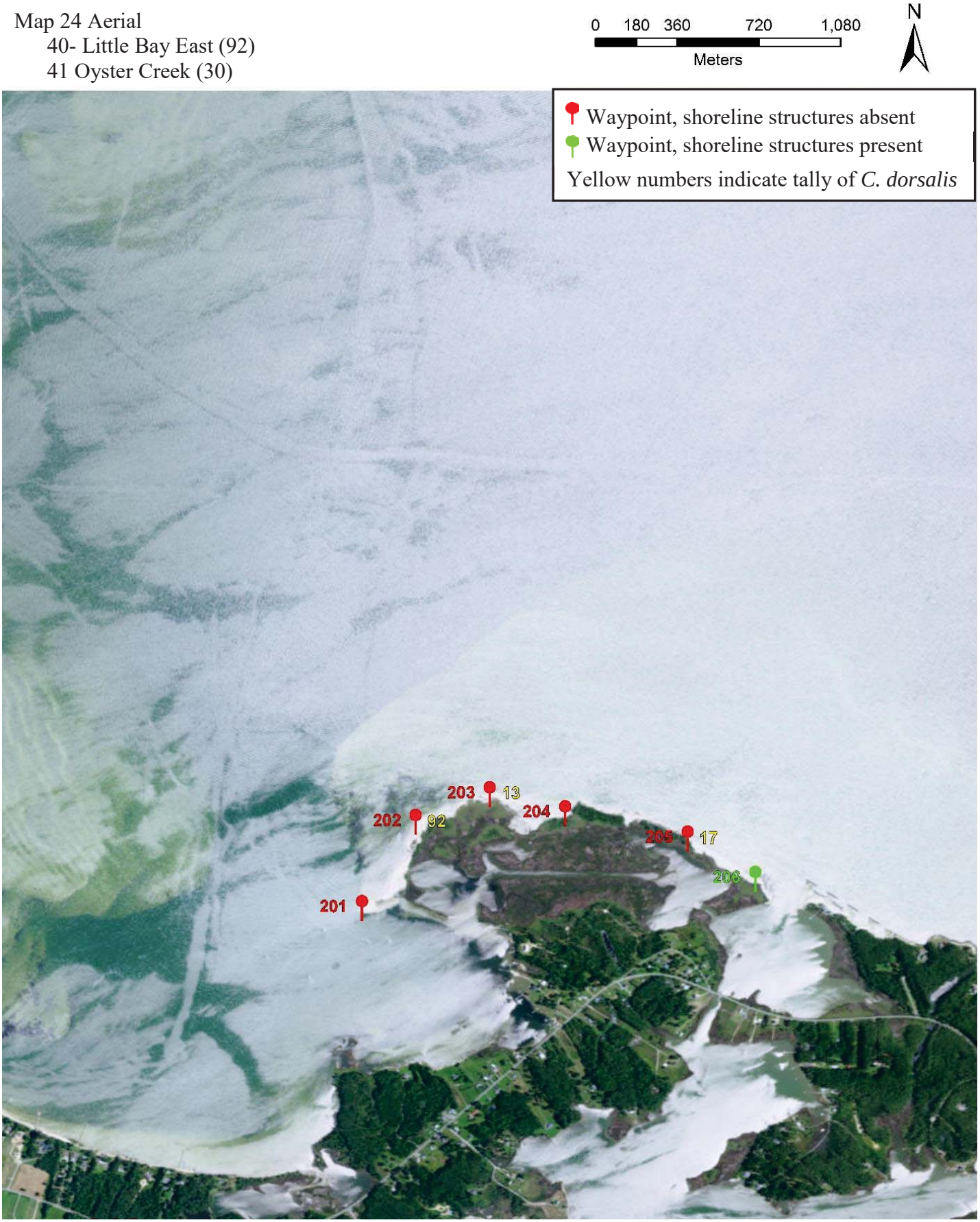
Map 23 Aerial
36 Indian Creek South (18)
38- Dymer Creel SE



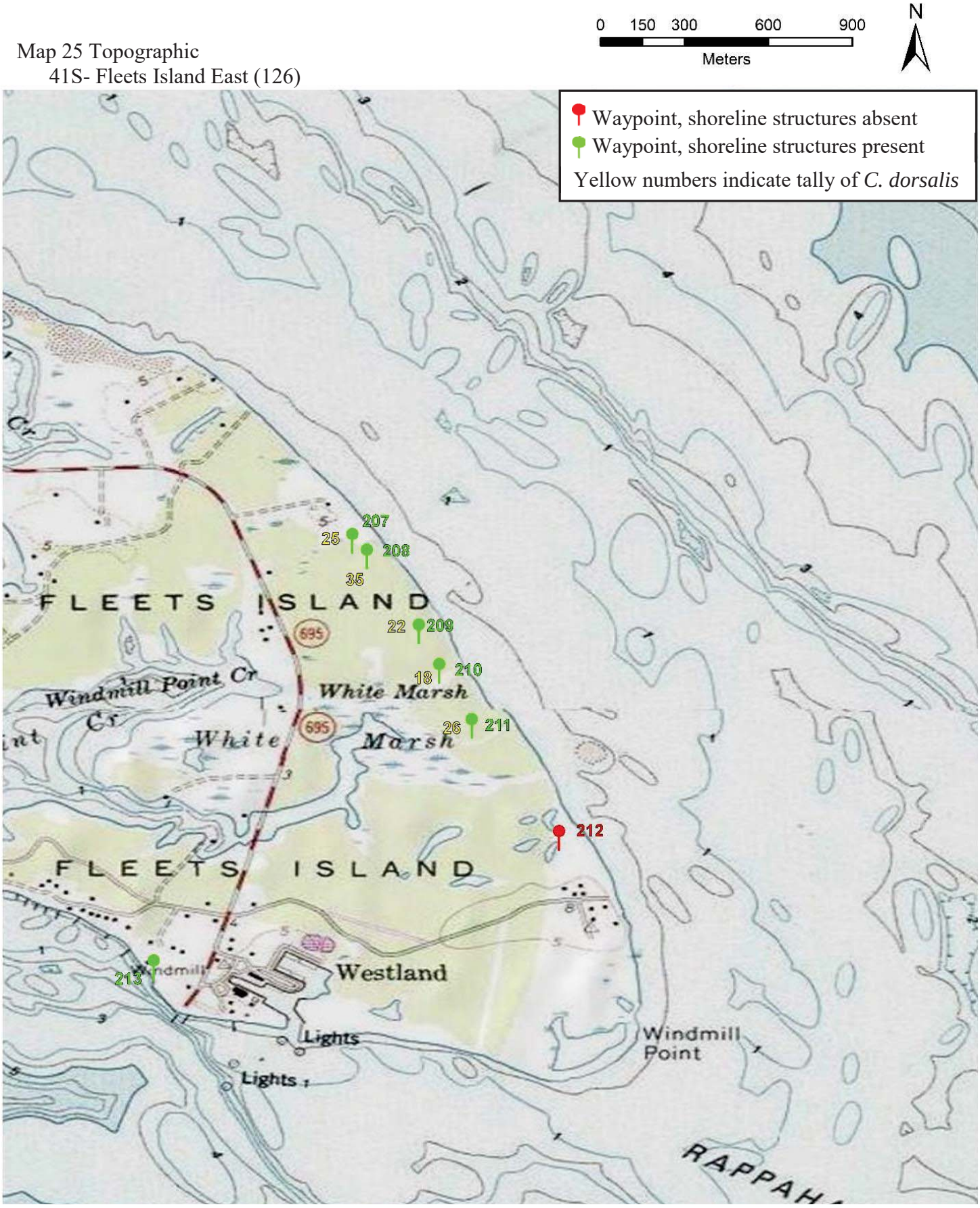
Map 24 Topographic
40- Little Bay East (92)
41 Oyster Creek (30)



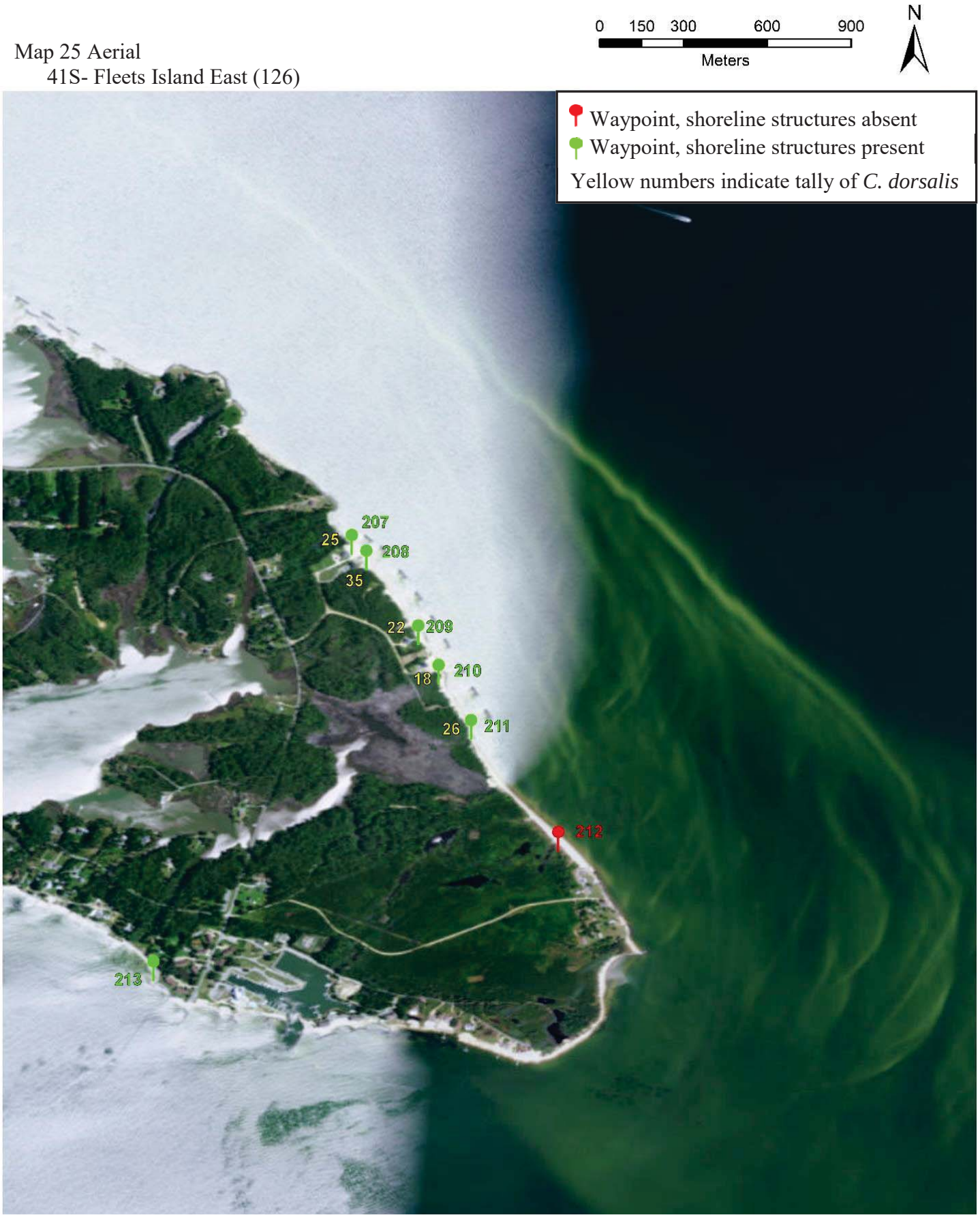
Map 24 Aerial
40- Little Bay East (92)
41 Oyster Creek (30)



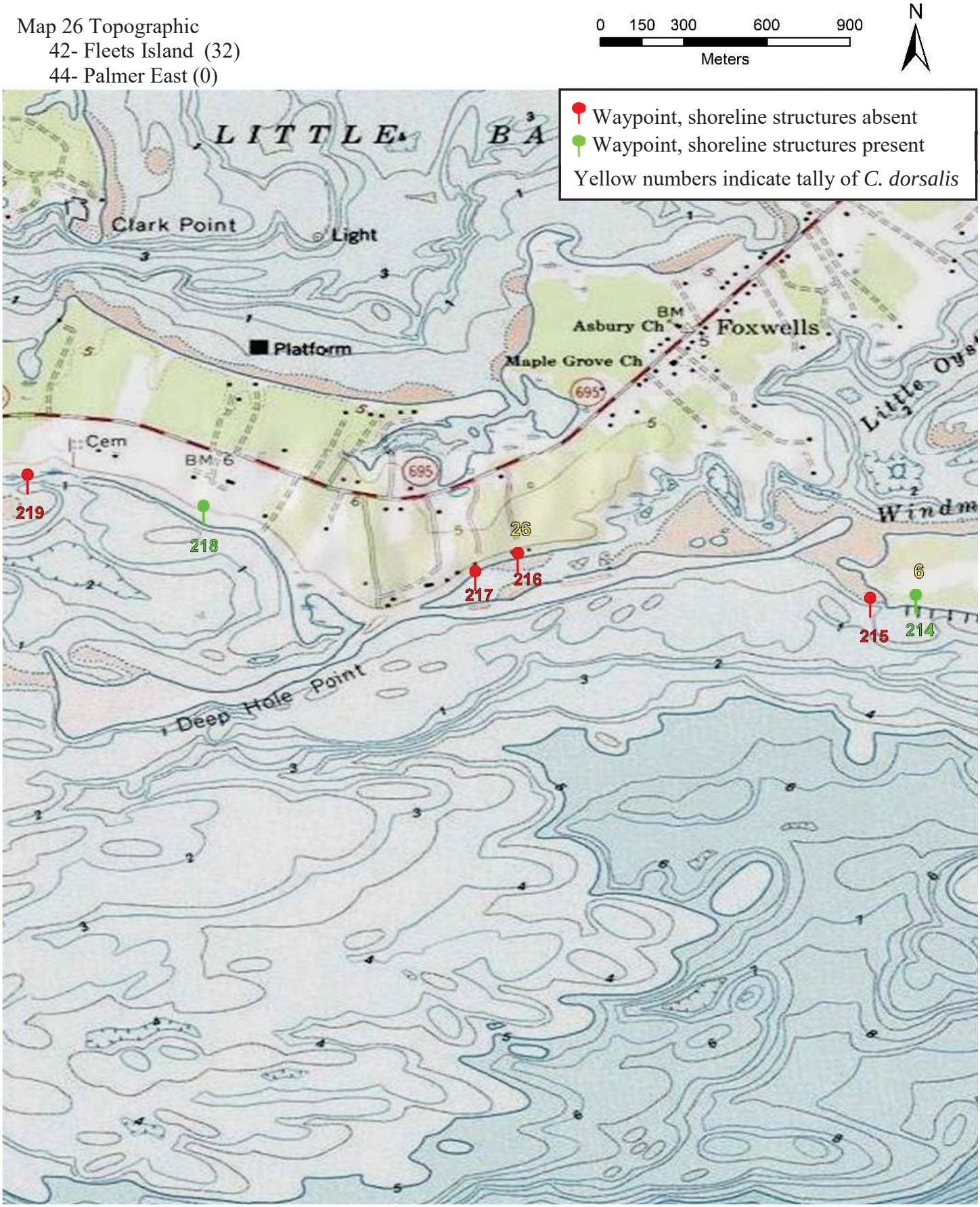
Map 25 Topographic
41S- Fleets Island East (126)



Map 25 Aerial
41S- Fleets Island East (126)



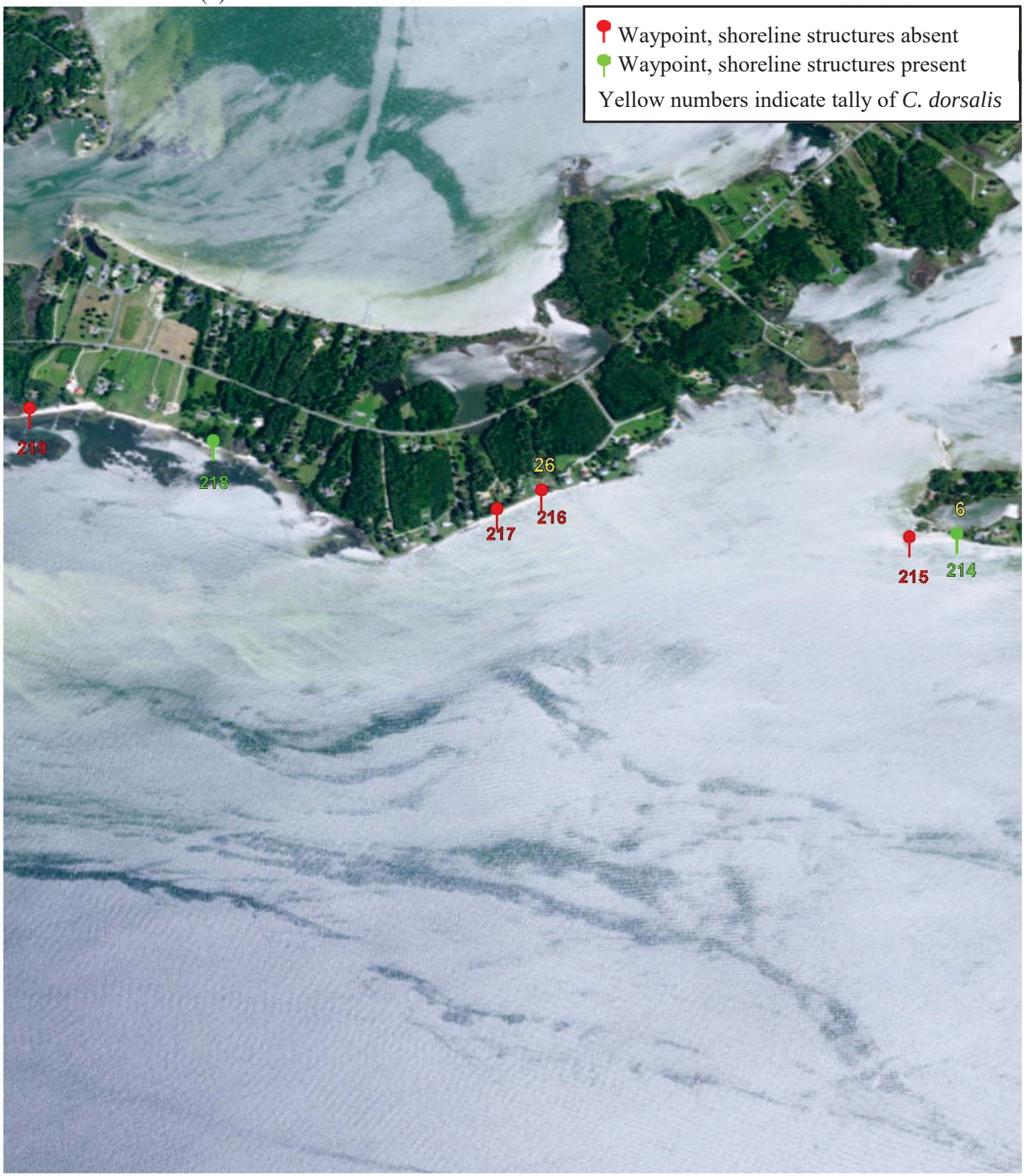
Map 26 Topographic
42- Fleets Island (32)
44- Palmer East (0)



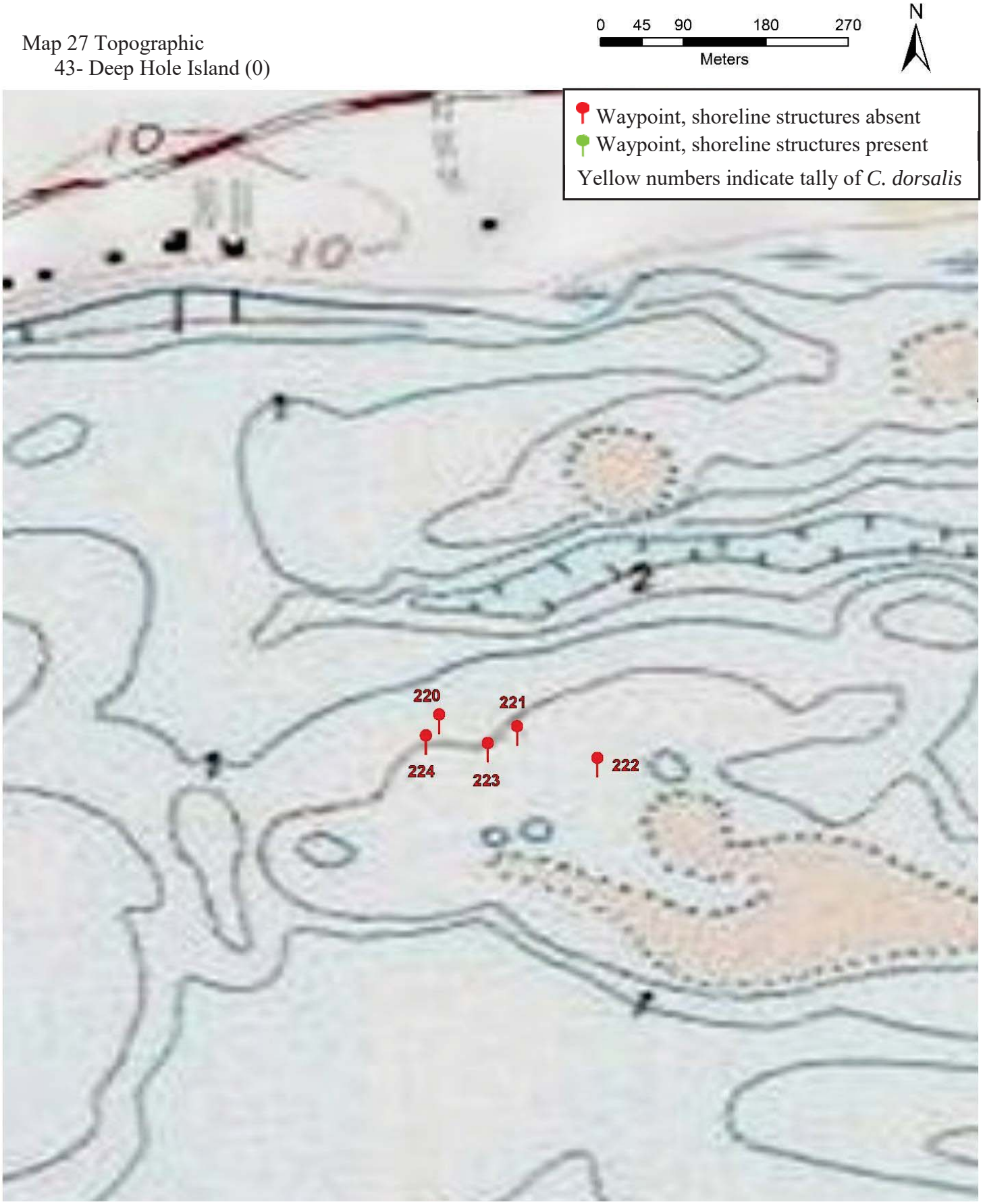
Map 26 Aerial

42- Fleets Island (32)

44- Palmer East (0)

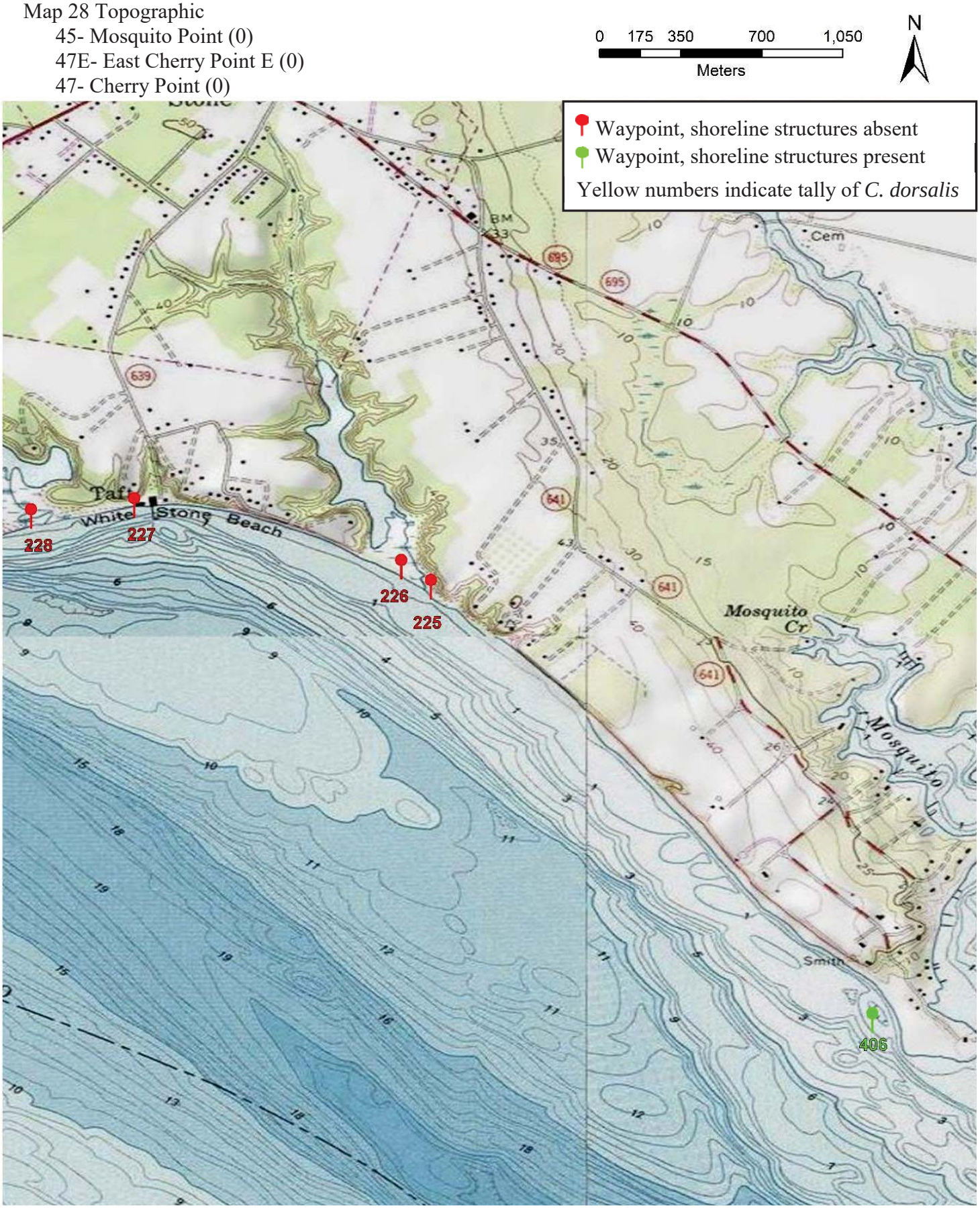


Map 27 Topographic
43- Deep Hole Island (0)



Map 27 Aerial
43- Deep Hole Island (0)

Map 28 Topographic
45- Mosquito Point (0)
47E- East Cherry Point E (0)
47- Cherry Point (0)



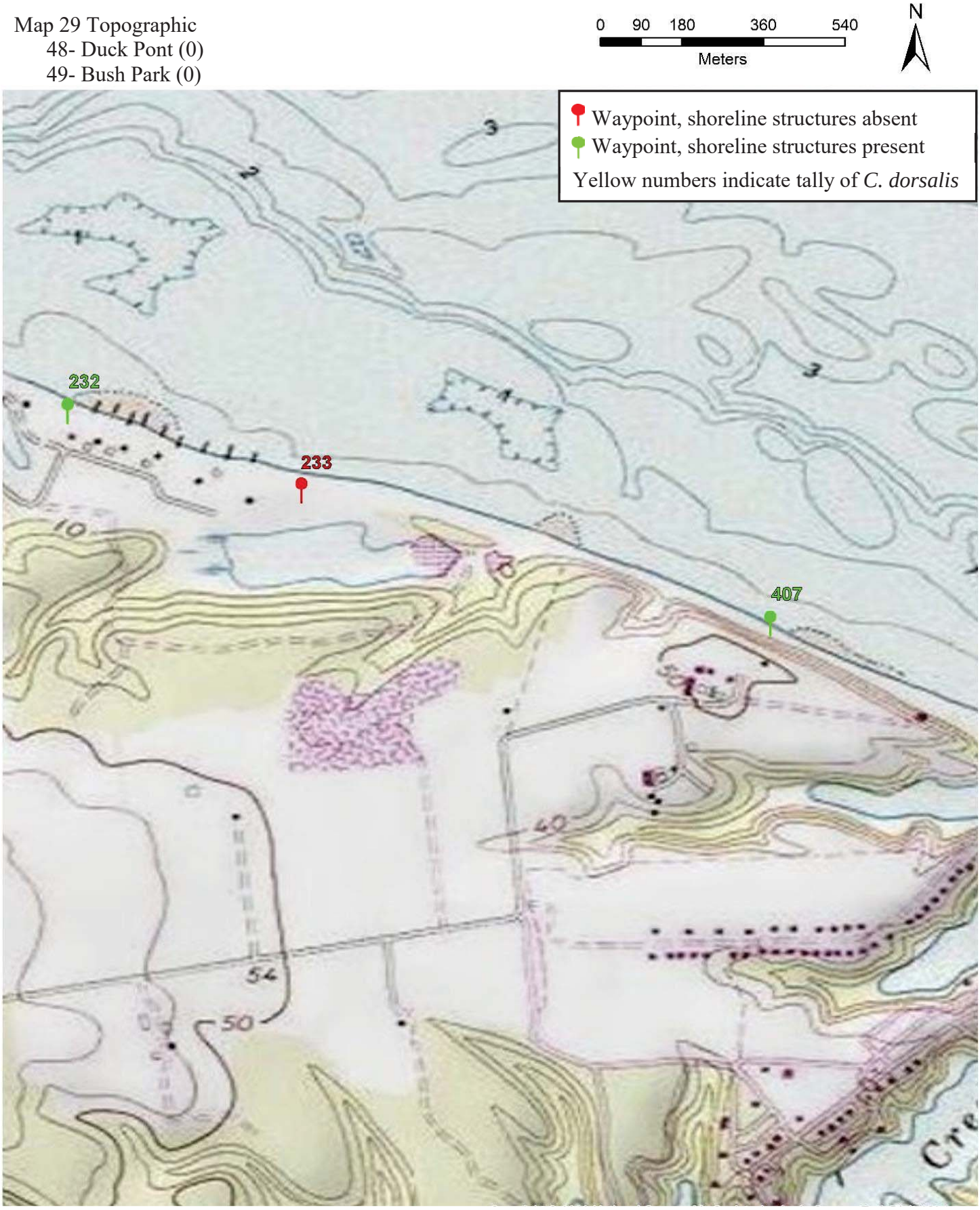
Map 28 Aerial

45- Mosquito Point (0)

47E- East Cherry Point E (0)

47- Cherry Point (0)

Map 29 Topographic
48- Duck Pont (0)
49- Bush Park (0)

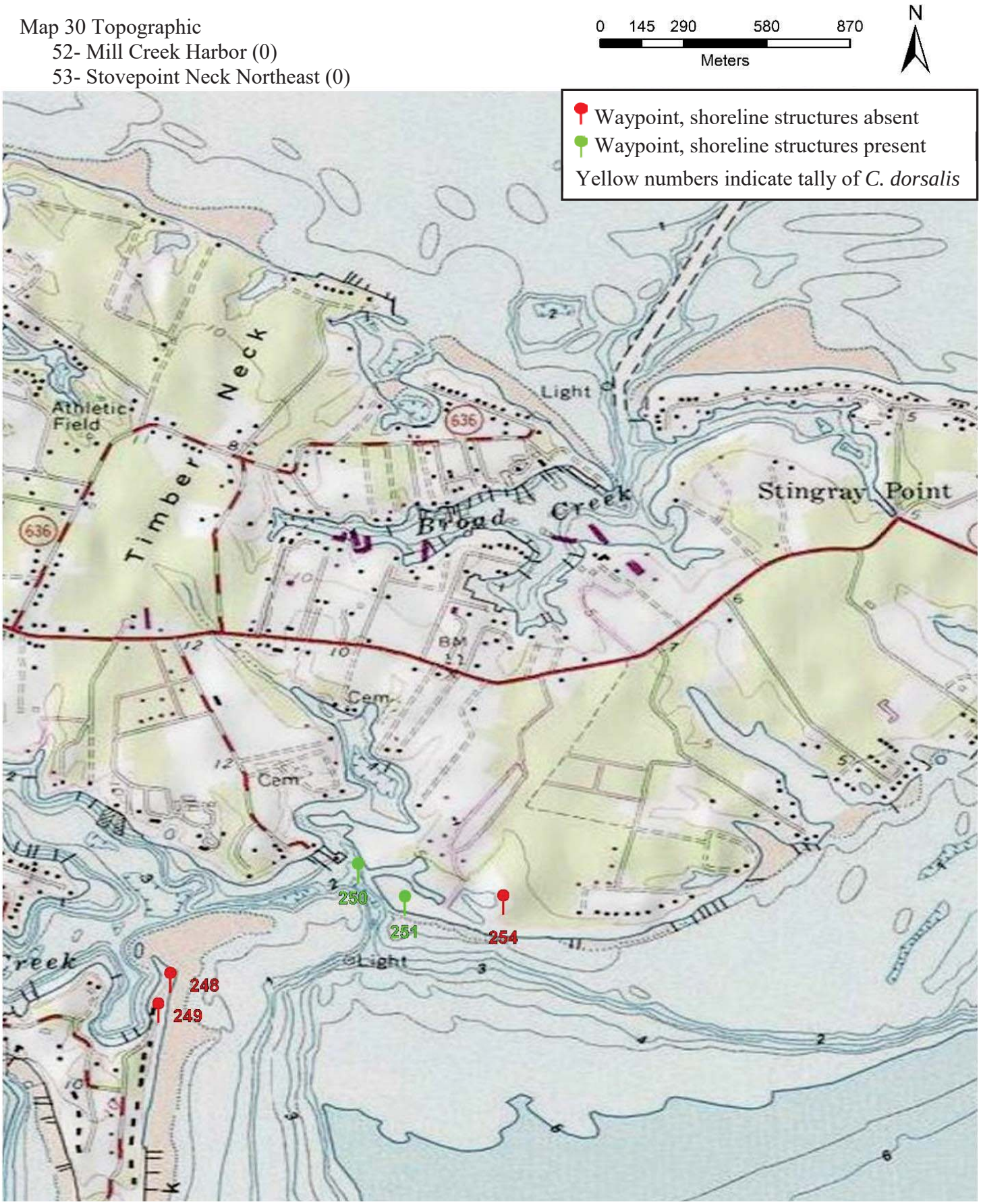


Map 29 Aerial

48- Duck Pont (0)

49- Bush Park (0)

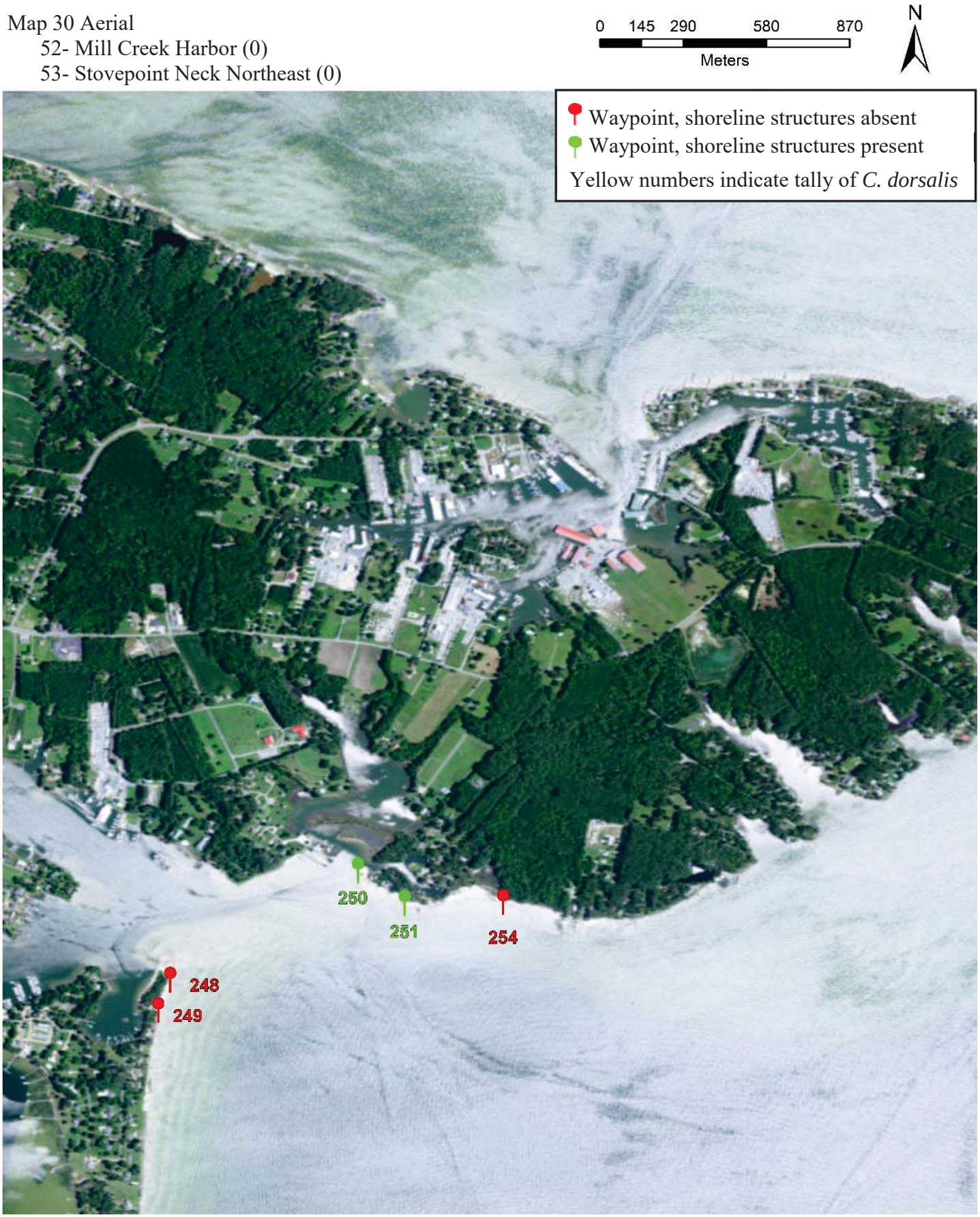
Map 30 Topographic
52- Mill Creek Harbor (0)
53- Stovepoint Neck Northeast (0)



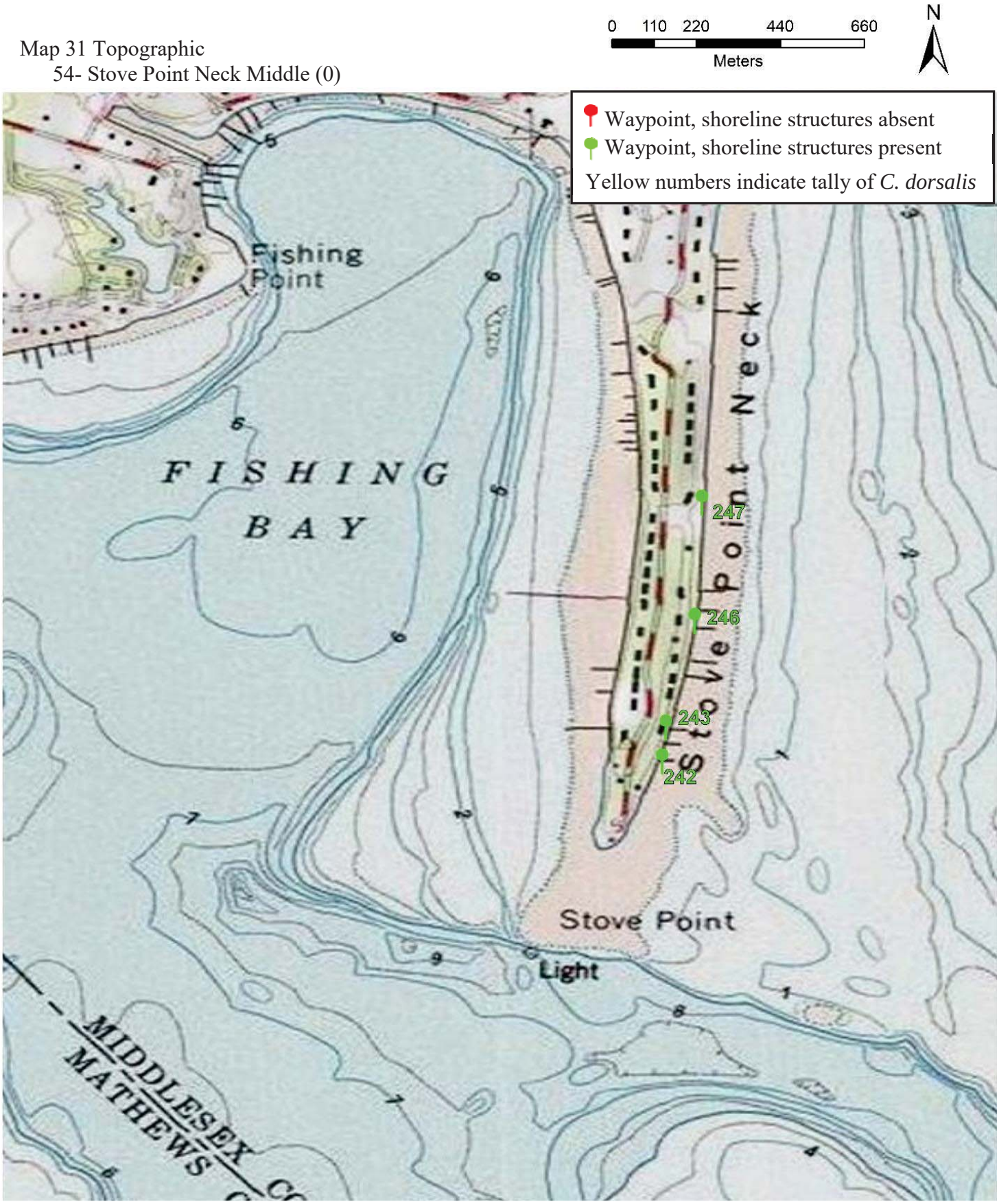
Map 30 Aerial

52- Mill Creek Harbor (0)

53- Stovepoint Neck Northeast (0)

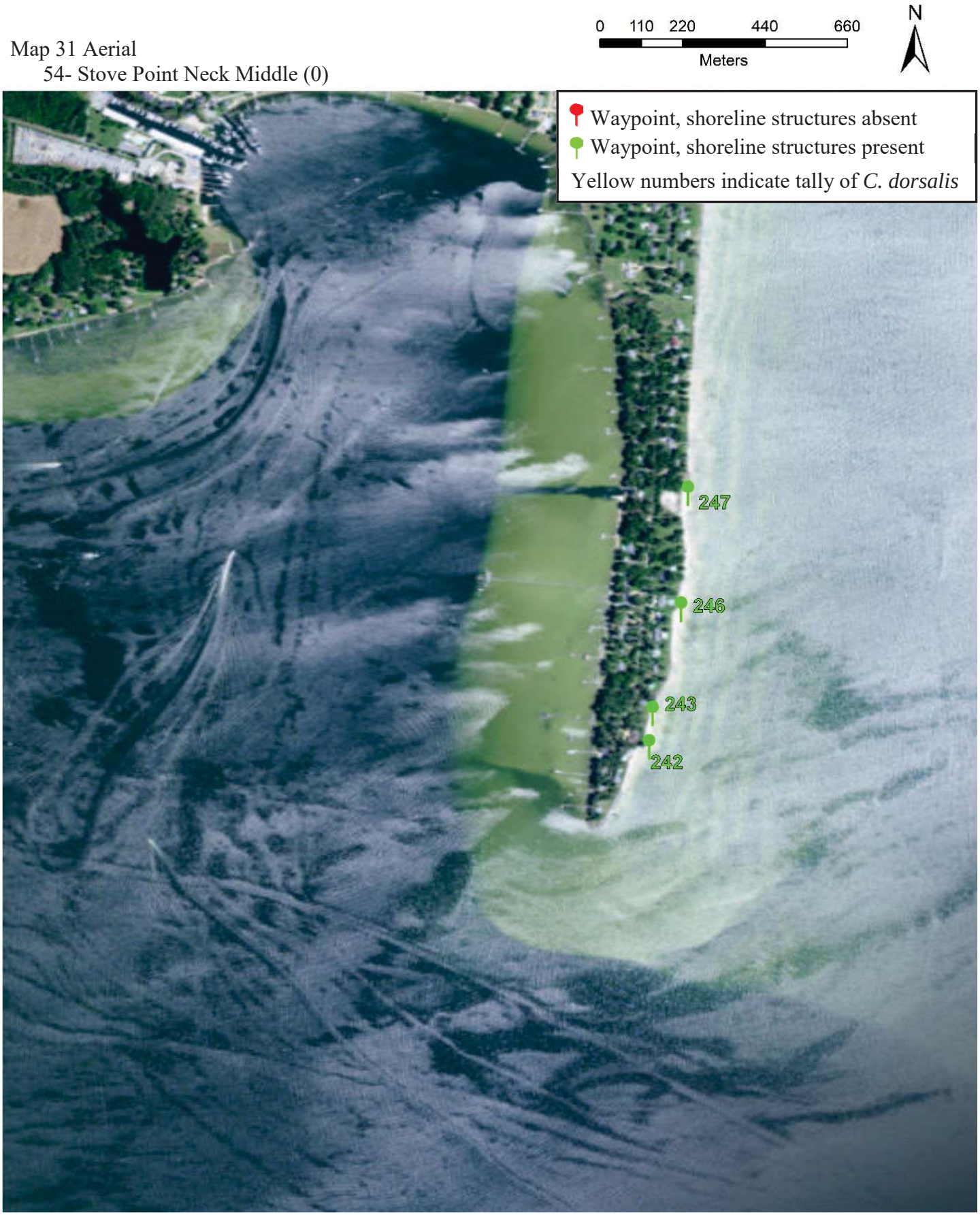


Map 31 Topographic
54- Stove Point Neck Middle (0)

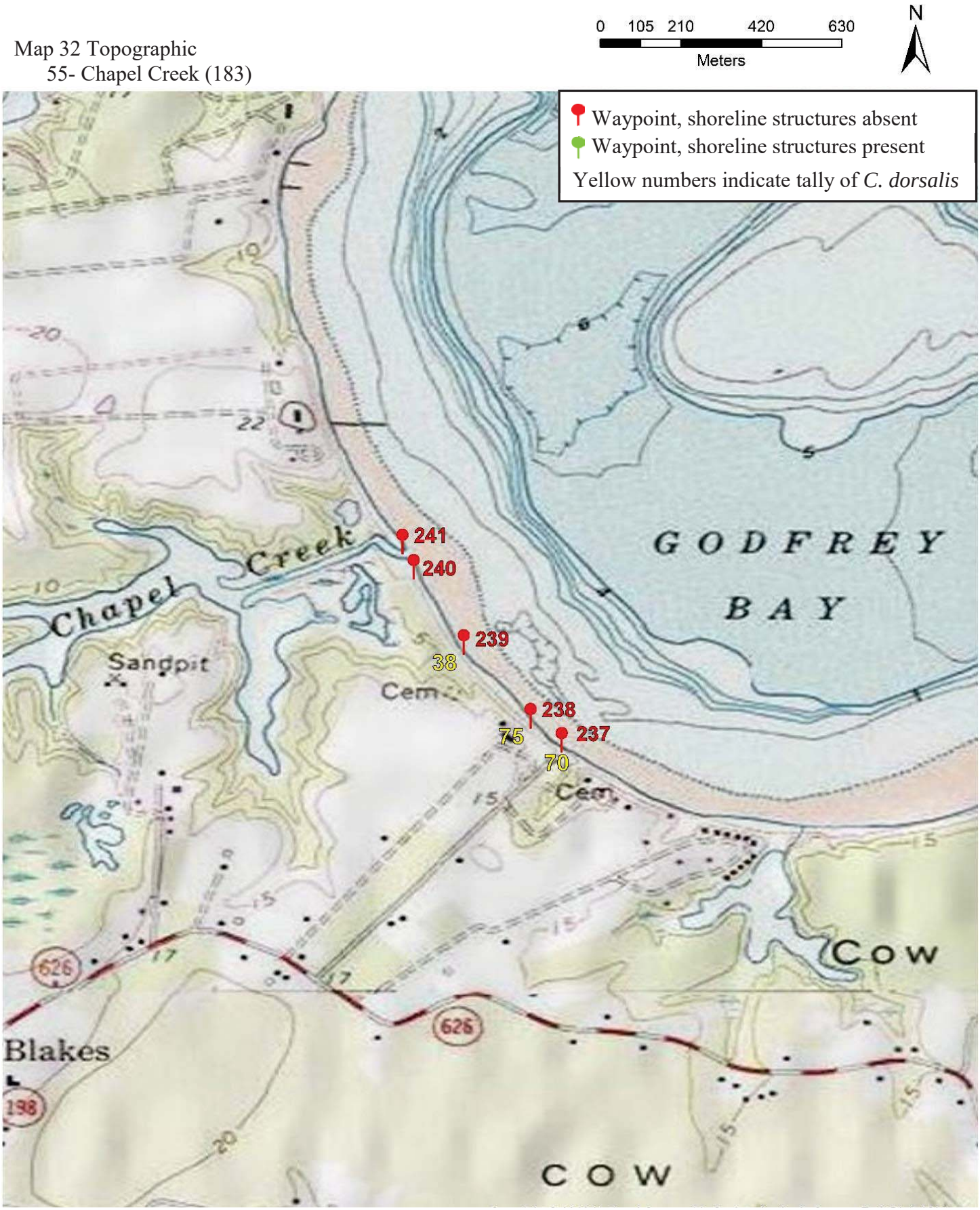


Map 31 Aerial

54- Stove Point Neck Middle (0)

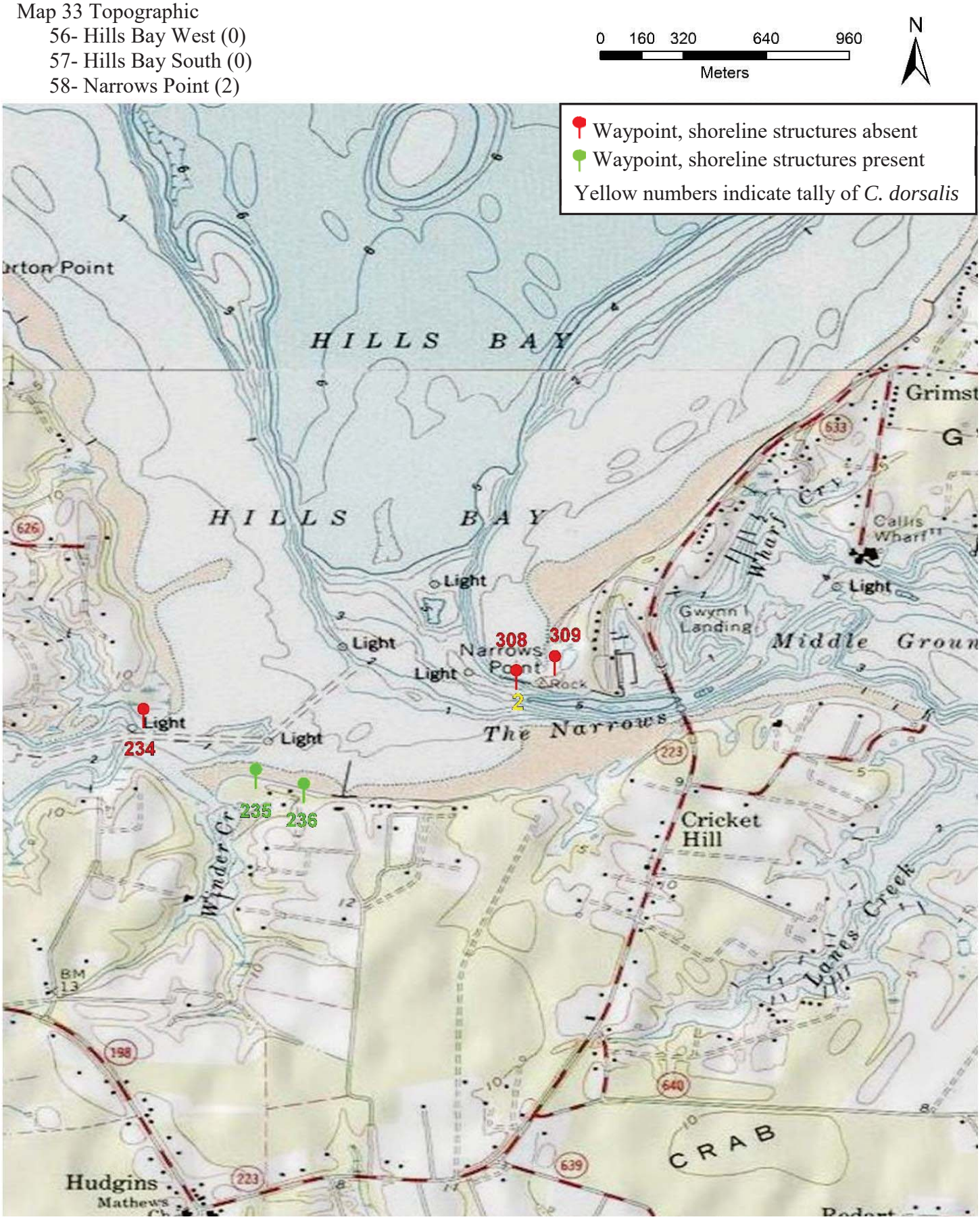


Map 32 Topographic
55- Chapel Creek (183)



Map 32 Aerial
55- Chapel Creek (183)

Map 33 Topographic
56- Hills Bay West (0)
57- Hills Bay South (0)
58- Narrows Point (2)



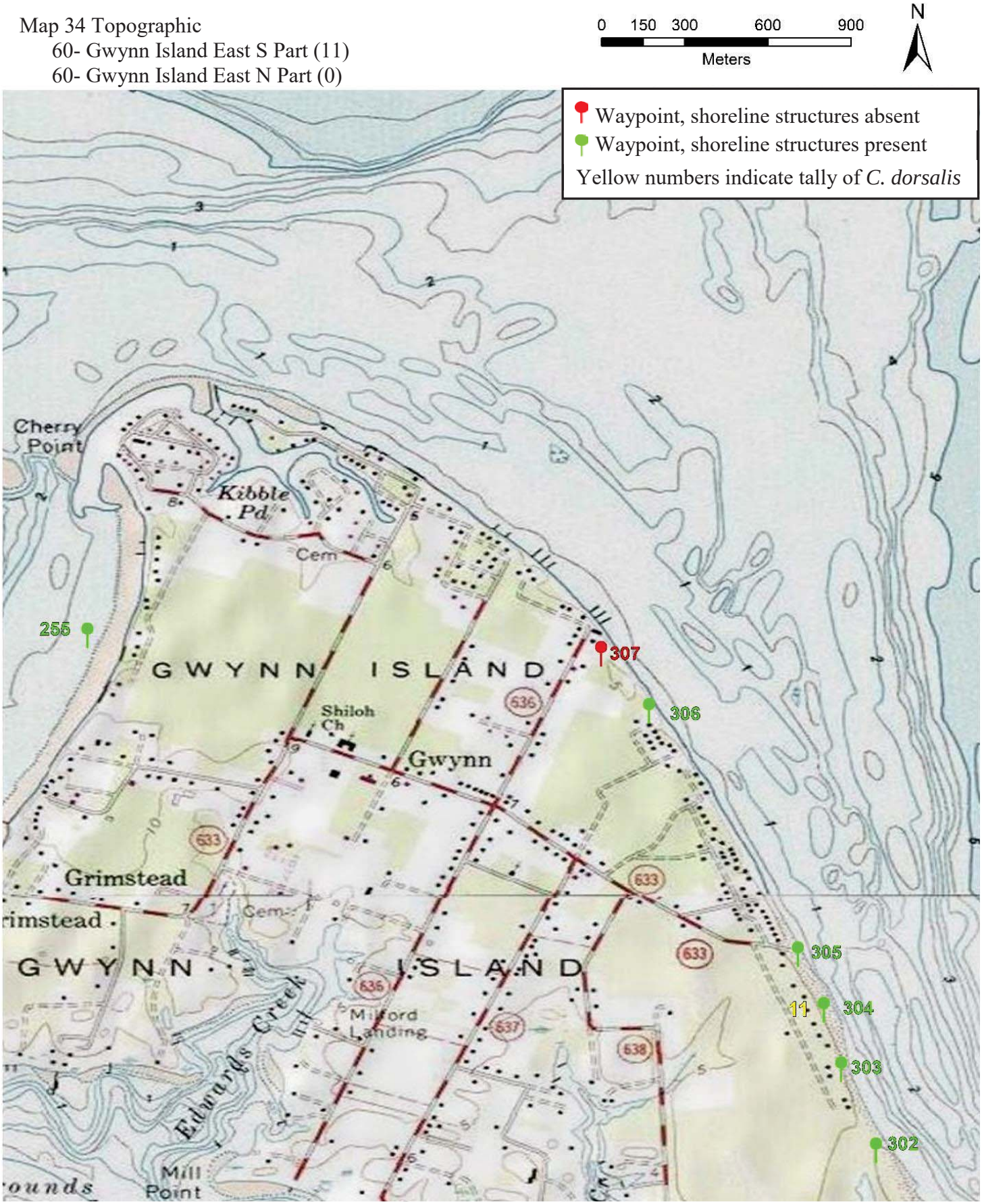
Map 33 Aerial

56- Hills Bay West (0)

57- Hills Bay South (0)

58- Narrows Point (2)

Map 34 Topographic
60- Gwynn Island East S Part (11)
60- Gwynn Island East N Part (0)

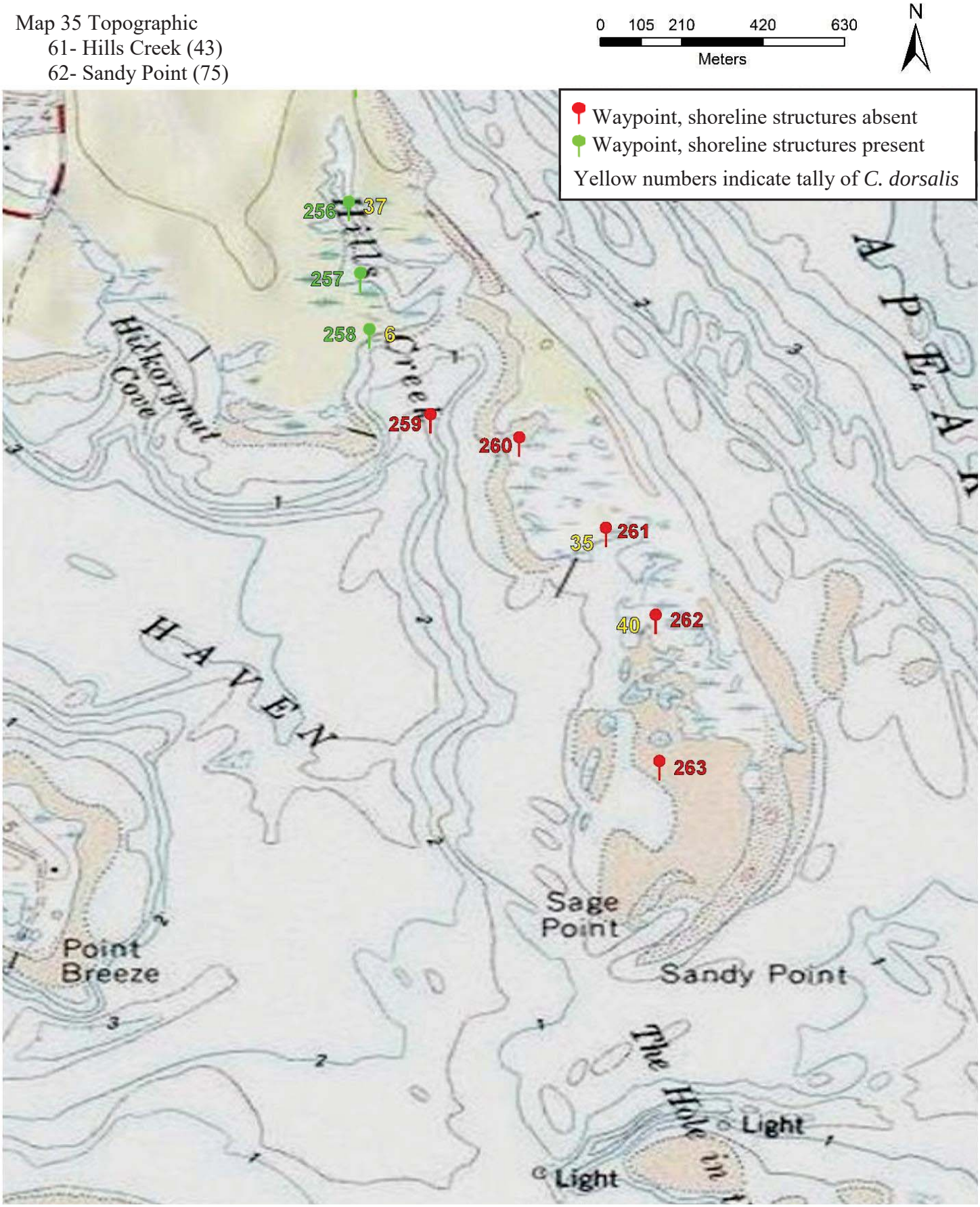


Map 34 Aerial

60- Gwynn Island East S Part (11)

60- Gwynn Island East N Part (0)

Map 35 Topographic
61- Hills Creek (43)
62- Sandy Point (75)

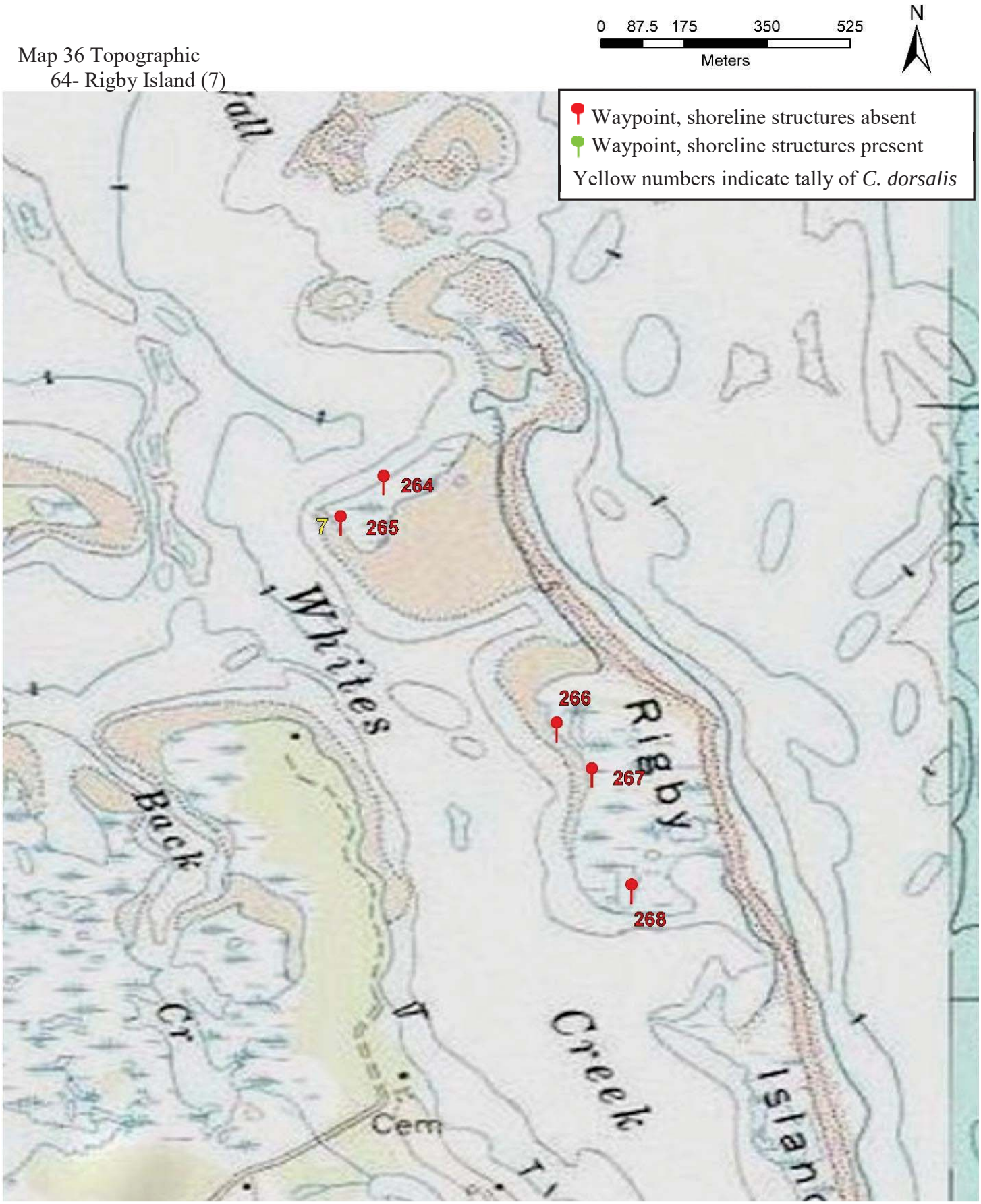


Map 35 Aerial

61- Hills Creek (43)

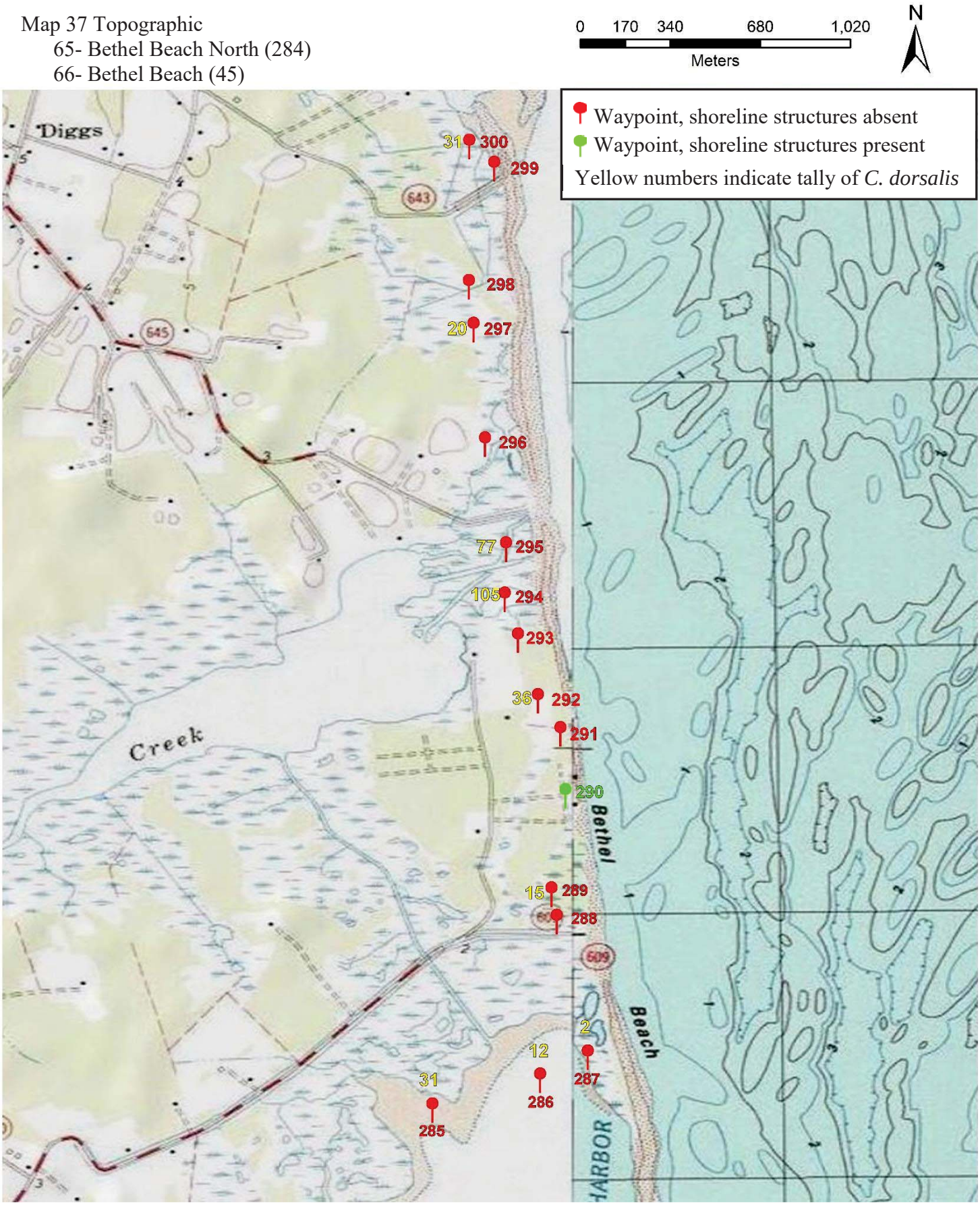
62- Sandy Point (75)

Map 36 Topographic
64- Rigby Island (7)



Map 36 Aerial
64- Rigby Island (7)

Map 37 Topographic
65- Bethel Beach North (284)
66- Bethel Beach (45)

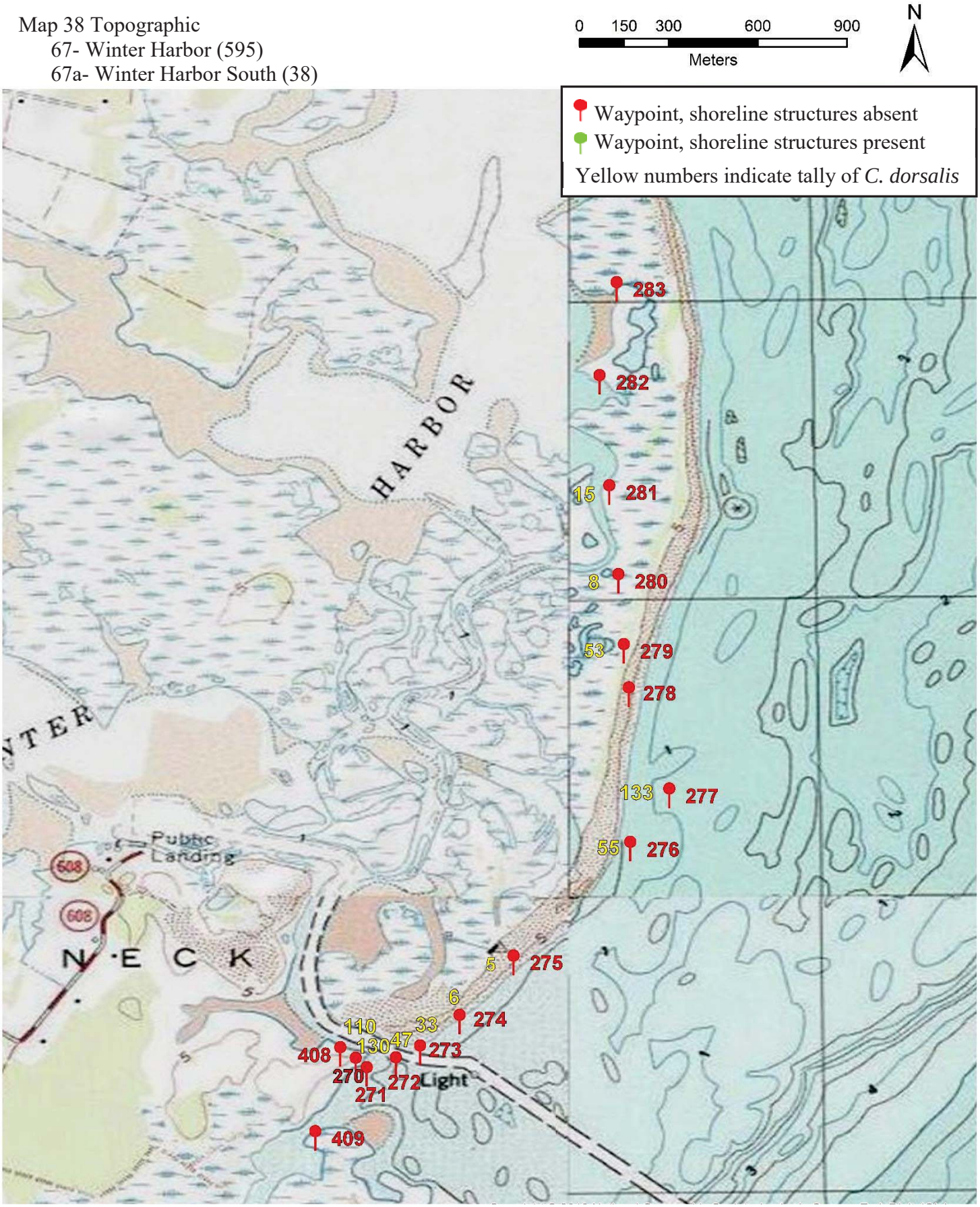


Map 37 Aerial

65- Bethel Beach North (284)

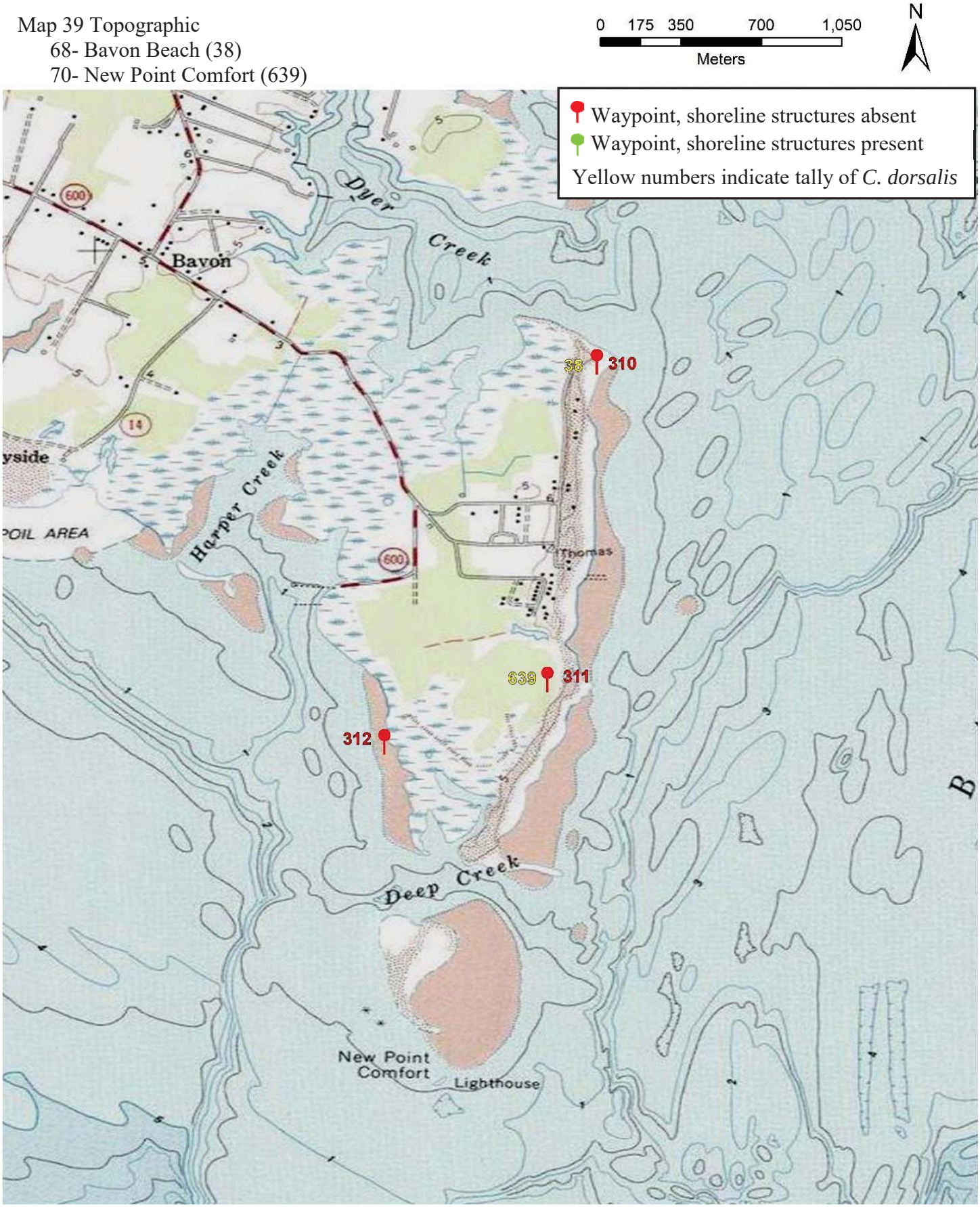
66- Bethel Beach (45)

Map 38 Topographic
67- Winter Harbor (595)
67a- Winter Harbor South (38)



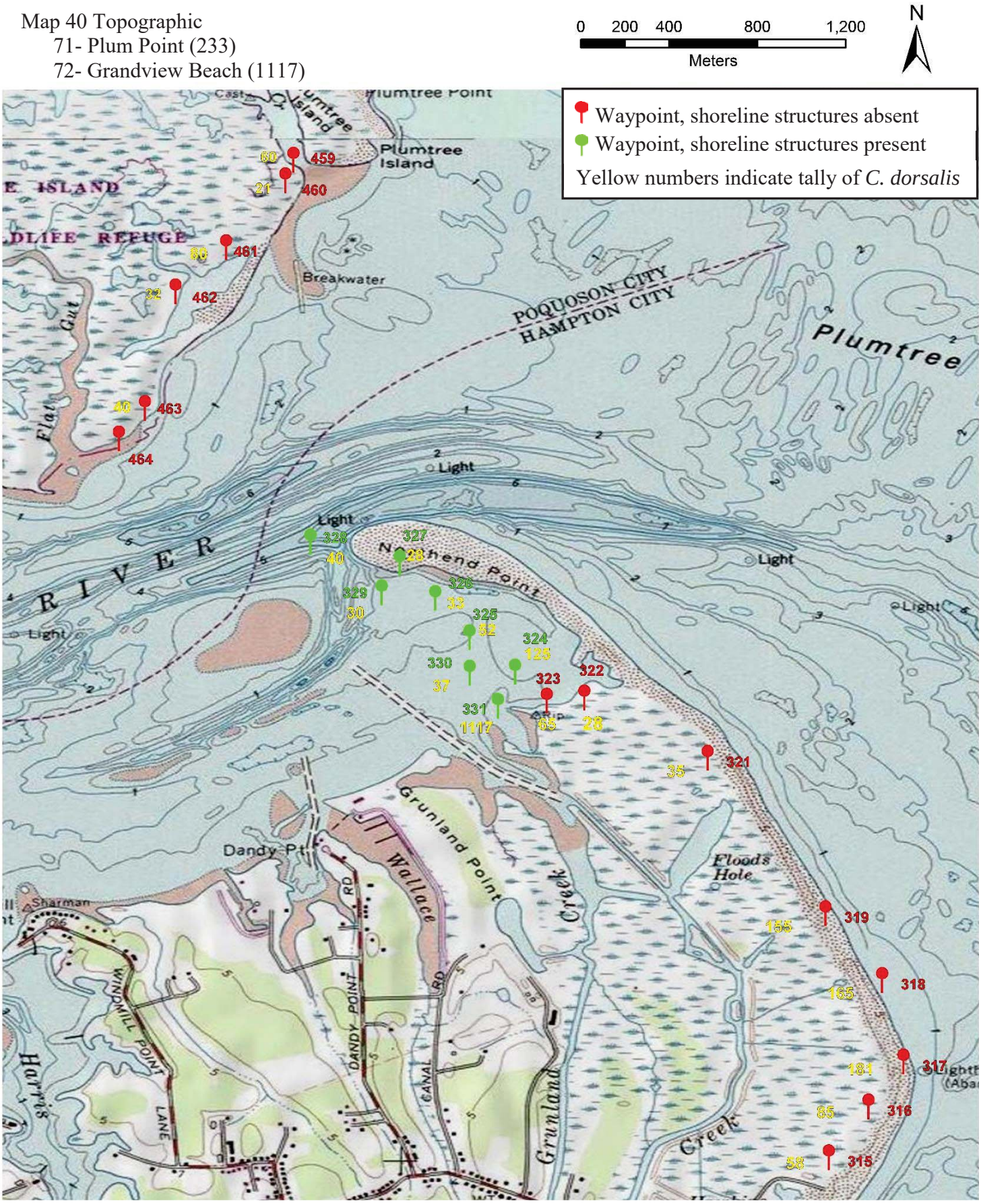
Map 38 Aerial
67- Winter Harbor (595)
67a- Winter Harbor South (38)

Map 39 Topographic
68- Bavon Beach (38)
70- New Point Comfort (639)



Map 39 Topographic
68- Bavon Beach (38)
70- New Point Comfort (639)

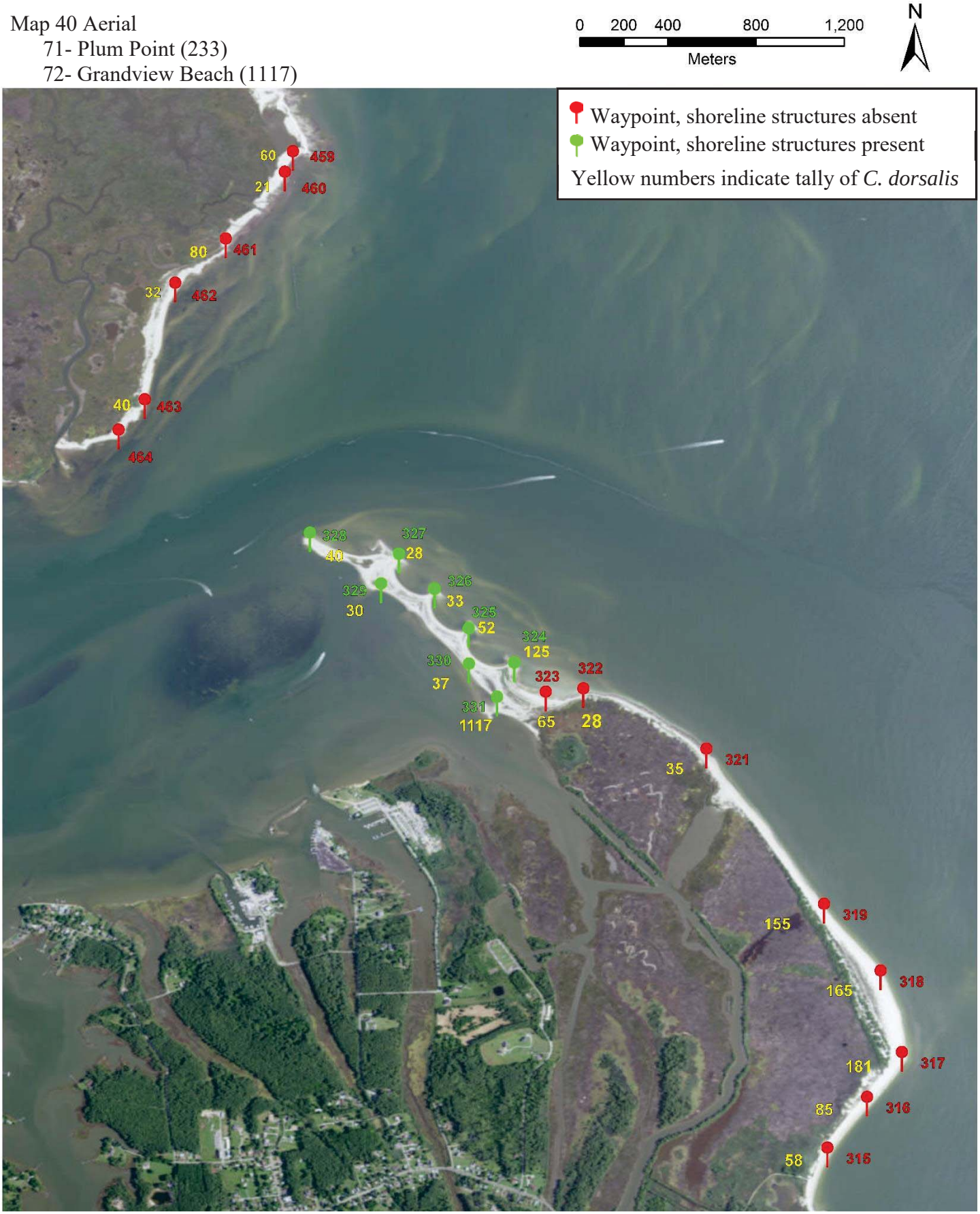
Map 40 Topographic
71- Plum Point (233)
72- Grandview Beach (1117)



Map 40 Aerial

71- Plum Point (233)

72- Grandview Beach (1117)



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To: May 10, 2020
Consultation Code: 05E2VA00-2020-TA-3693
Event Code: 05E2VA00-2020-E-10395
Project Name: HRSD Middlesex Interceptor Phase 2

Subject: Verification letter for the 'HRSD Middlesex Interceptor Phase 2' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Emily Foster:

The U.S. Fish and Wildlife Service (Service) received on May 10, 2020 your effects determination for the 'HRSD Middlesex Interceptor Phase 2' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

---

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

HRSD Middlesex Interceptor Phase 2

2. Description

The following description was provided for the project 'HRSD Middlesex Interceptor Phase 2':

> Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes the design of approximately 3.2 miles of force main from Urbanna to Cook's Corner in addition to approximately 13 miles of force main along Route 33 between Cook's Corner and the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The new force main will convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The new system will consist of a transmission force main, pump stations, and potential off-line storage tanks. The project will also provide for future connections of the Topping Service Area near the Route 3/ Route 33 intersection and the Deltaville Service Area near Hartfield along General Puller Highway. New pump stations are proposed at the two treatment plants that will be decommissioned in addition to new booster pump stations along the force main alignment.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.564988186246154N76.4732604043296W

Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")

   No

3. Will your activity purposefully **Take** northern long-eared bats?

   No

4. Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

5. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

   Yes

6. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

7. Will the action involve Tree Removal?

   Yes

8. Will the action only remove hazardous trees for the protection of human life or property?

   No

9. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

   No

10. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

    No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

0

2. If known, estimated acres of forest conversion from April 1 to October 31

0

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?
0

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To: May 10, 2020
Consultation Code: 05E2VA00-2020-SLI-3693
Event Code: 05E2VA00-2020-E-10394
Project Name: HRSD Middlesex Interceptor Phase 2

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2020-SLI-3693

Event Code: 05E2VA00-2020-E-10394

Project Name: HRSD Middlesex Interceptor Phase 2

Project Type: WASTEWATER PIPELINE

Project Description: Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes the design of approximately 3.2 miles of force main from Urbanna to Cook's Corner in addition to approximately 13 miles of force main along Route 33 between Cook's Corner and the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The new force main will convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The new system will consist of a transmission force main, pump stations, and potential off-line storage tanks. The project will also provide for future connections of the Topping Service Area near the Route 3/Route 33 intersection and the Deltaville Service Area near Hartfield along General Puller Highway. New pump stations are proposed at the two treatment plants that will be decommissioned in addition to new booster pump stations along the force main alignment.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.564988186246154N76.4732604043296W

Counties: Mathews, VA | Middlesex, VA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To: September 22, 2021
Consultation Code: 05E2VA00-2021-SLI-5910
Event Code: 05E2VA00-2021-E-17349
Project Name: HRSD Middlesex Interceptor System Program Phase II - Proposed pump station in the Town of Urbanna

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2021-SLI-5910
Event Code: Some(05E2VA00-2021-E-17349)
Project Name: HRSD Middlesex Interceptor System Program Phase II - Proposed pump station in the Town of Urbanna
Project Type: WASTEWATER PIPELINE
Project Description: The project will consist of a new sewage conveyance system that includes a small diameter transmission force main that extends 3.2 miles from Urbanna to Cook's Corner and approximately 13 miles along Route 33 (General Puller Highway) from Cook's Corner to the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The polygon depicts the location of the Urbanna Wastewater Treatment Plant component of the project.

The Urbana Wastewater Treatment Plant will be decommissioned and replaced with a gravity sewer system and pump station located adjacent to Tabor Park off of Bonner Street in the Town of Urbanna. The proposed locations of the new pump stations are: Locust Hill which is to be located off of General Puller Highway east of Clare Walker Middle School; Hartfield which is to be located off of Wood Brothers Road; and Gloucester, which is to be located on the eastern side of the intersection of John Clayton Memorial Highway and Rangtang Road.

The vertical footprint for the proposed construction is 25 feet in total depth for the wet well, and a total depth of 11 feet for the manhole. Construction is scheduled for early 2023.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.639502300000004,-76.57805845672965,14z

Counties: Middlesex County, Virginia

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Matthew S. Wells
Director

Frank N. Stovall
Deputy Director for Operations

Darryl Glover
Deputy Director for Dam Safety, Floodplain Management and Soil and Water Conservation

Laura Ellis
Interim Deputy Director for Administration and Finance

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

April 8, 2022

Deborah Painter
Tetra Tech, Inc.
5700 Lake Wright Drive, Suite 102
Norfolk, VA 23505

Re: HRSD Middlesex Interceptor System Program Phase II

Dear Ms. Painter:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Alternative 1, Alternative 2, Alternative 3
According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

Alternative 4
According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

In addition, the proposed project will impact an Ecological Core **(C5)** as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla). Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

Ecological Cores are areas of at least 100 acres of continuous interior, natural cover that provides habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Interior core areas begin 100 meters inside the nearest core edges and continue to the deepest parts of cores. Cores also provide natural and economic benefits of open space, recreation, water quality (including drinking water recharge and protection, and erosion prevention), and air quality (including

carbon sequestration and oxygen production). Cores are ranked from C1 to C5 (C5 being the least significant) using nine prioritization criteria, including the habitats of natural heritage resources they contain.

Impacts to cores occur when their natural cover is partially or completely converted permanently to developed land uses. Habitat conversion to development results in changes that reduce ecosystem processes, biodiversity, population viability and habitat quality due to limited recolonization, increased predation, and increased introduction and establishment of invasive species.

Therefore, avoiding or minimizing core impacts is a key mitigation measure that will reduce deleterious effects and preserve the area and connectivity of habitats that are key components of biodiversity. DCR recommends efforts to minimize edge in remaining habitat fragments, retain natural corridors that allow movement between fragments and design the intervening landscape to support native wildlife (natural cover versus lawns).

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of $270.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

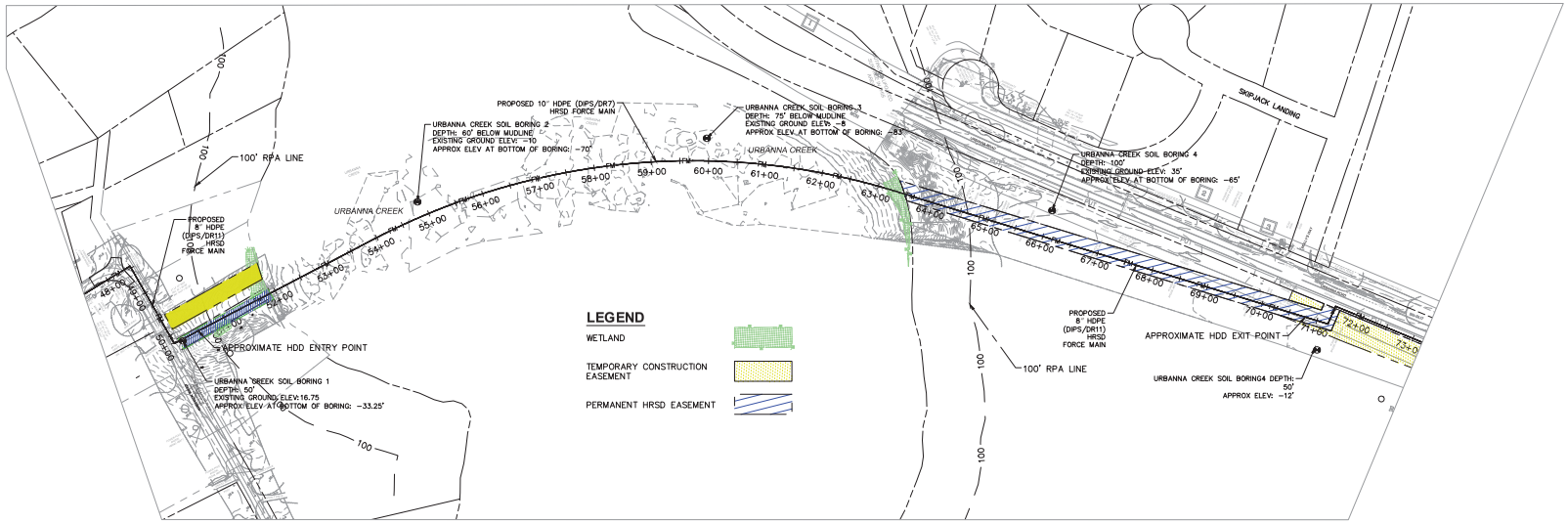
The Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Amy Martin at (804-367-2211) or amy.martin@dwr.virginia.gov.

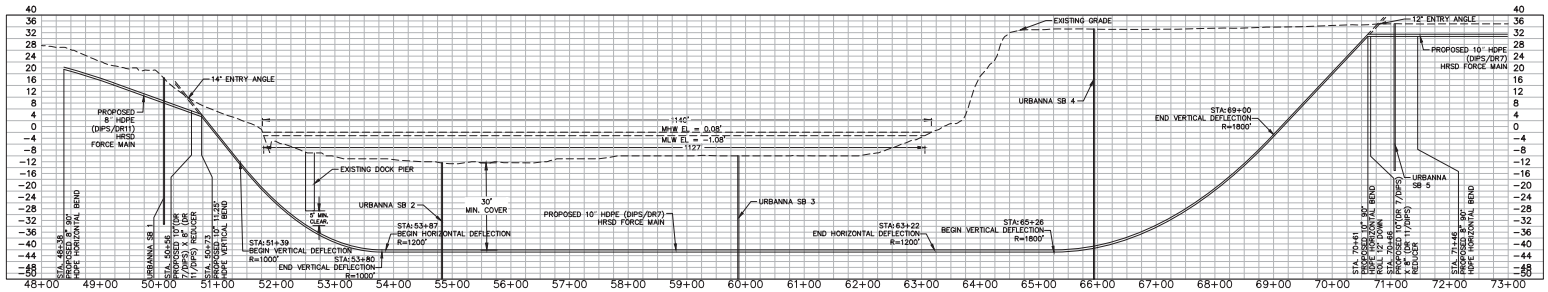
Should you have any questions or concerns, please contact me at 804-225-2429. Thank you for the opportunity to comment on this project.

Sincerely,

Tyler Meader

Tyler Meader
Natural Heritage Locality Liaison





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Kimley»Horn
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4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
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NO.	DATE	BY	REVISION

PROPOSED FORCE MAIN CROSSING OF URBANNA CREEK

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	JDV	DATE:	SEPTEMBER 2021
DRAWN BY:	JDV	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	
SCALE:	AS NOTED	SHEET NO.:	1

From: Emily A. Hein
Sent: Friday, December 17, 2021 2:47 PM
To: Painter, Debbie
Cc: Sweeney, Brad; Cook, James; scott.funk@kimley-horn.com; Moore, Tim O; tiffany.birge@mrc.virginia.gov; Advisory
Subject: RE: Tetra Tech MFT: Draft Environmental Assessment Coordination for the HRSD Middlesex Interceptor System Program Phase II

Good afternoon, Debbie,

We have reviewed the draft EA for the HRSD MISPPII project which includes installing a force main under the Piankatank River and Urbanna Creek and tributaries as well as vegetated and nonvegetated tidal wetlands. As proposed, the force main is proposed to be installed via either horizontal directional drilling (HDD) or mini-HDD methods. In order to minimize impacts, we recommend that all tidal wetlands and streams also be crossed via HDD or mini-HDD rather than open cut methods. Doing so should avoid direct impacts to these areas. With any HDD/mini-HDD project there is the potential for an inadvertent release of drilling fluids (i.e. frac-out), so we recommend development of an inadvertent release/frac-out plan. In wetlands, this should include restoring elevations and plants to pre-construction states. We have mapped submerged aquatic vegetation (SAV) within 2 of the 5 years that currently define an SAV bed (2016–2020) within the LOD for the Piankatank River. SAV is vulnerable to sedimentation, so those beds are areas of particular concern should a frac-out (or other turbidity plume) occur. (SAV mapping data can be accessed here: https://www.vims.edu/research/units/programs/sav/access/index.php.)

Please let me know if you have questions.

Happy holidays,

–Emily

Upcoming out of office dates:
December 20 – January 3

Emily Hein
Pronouns: she/her
Assistant Director for Advisory Services
VIMS Research and Advisory Services
eahein@vims.edu, 804-684-7482

From: Painter, Debbie <donotreply@tetratech.com>
Sent: Friday, December 3, 2021 2:32 PM
To: keith.tignor@vdacs.virginia.gov; robbie.rhur@dcr.virginia.gov; terry.lasher@dof.virginia.gov;

projectreview@dgif.virginia.gov; odwreview-vdh@cov.virginia.gov; roger.kirchen@dhr.virginia.gov; david.spears@dmme.virginia.gov; Emily A. Hein <eahein@vims.edu>; tiffany.birge@mrc.virginia.gov; eir.coordination@vdot.virginia.gov
Cc: brad.sweeney@tetratech.com; james.cook@tetratech.com; scott.funk@kimley-horn.com; tim.moore2@tetratech.com
Subject: Tetra Tech MFT: Draft Environmental Assessment Coordination for the HRSD Middlesex Interceptor System Program Phase II

Tetra Tech Managed File Transfer

New Secure File Package is Available to Download until Saturday, 18 December

December 3, 2021

Re: Draft
Environmental Assessment (NEPA) Coordination for the HRSD Middlesex Interceptor System Program Phase II

Dear Reviewer:

On behalf of the Hampton Roads Sanitation District, Kimley-Horn and Tetra Tech are providing engineering services for the Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project, which includes the design and construction of a sewage conveyance system to serve Middlesex and Mathews Counties.

In accordance with the provisions of the Virginia Clean Water Revolving Loan Fund, a Draft National Environmental Policy Act (NEPA) Environmental Assessment is submitted for your review and comments.

Please furnish comments within 30 days to Deborah Painter at Debbie.Painter@tetratech.com or respond by mail to me at Tetra Tech, 5700 Lake Wright Drive Suite 102, Norfolk, Virginia 23502. If you have questions, please contact me using the contact information above or contact the Project Manager at Brad.Sweeney@tetratech.com.
His telephone number is (757) 278-4072.

Yours very truly,
Tetra Tech, Inc.

Deborah Painter

Senior Environmental Scientist

c: Brad Sweeney, Scott Funk, Tim Moore, James Cook

This link will not work for anyone else. The secure file package is available until: **Saturday, 18 December.** After this date contact the sender.

Files attached to this message

Filename	Size
HRSD Draft Environmental Assessment_2021Dec3.pdf	392 MB

Download Files

You will need to logon to download this package. If you don't have an account on amermft.tetratech.com, you will receive a separate email with a unique **Access Pass/Code** which you will use to authenticate yourself. If you have recently received a **Access Pass/Code** from a previous package, you can re-use the code to logon.

Logon to reply to this message

Aquatic Resources Delineation Report for the HRSD Middlesex Interceptor System Program Phase II

Hampton Roads Sanitation District

Mathews and Middlesex Counties, Virginia

January 2022

Prepared for:

Hampton Roads Sanitation District (HRSD)
1434 Air Rail Avenue
Virginia Beach, VA 23455

Prepared by:

Tetra Tech, Inc.
5700 Lake Wright Drive
Norfolk, VA 23502
Phone: (757) 461-4148

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FIGURES

Figure 1: USGS Project Location Map
Figure 2: NWI Wetlands and NHD Streams Map
Figure 3: Aquatic Resource Location

TABLES

Table 1: Identified Streams
Table 2: Identified Wetlands

APPENDICES

Appendix A: Stream Data Forms
Appendix B: Wetland Data Forms
Appendix C: NRCS Soils Report

ACRONYMS AND ABBREVIATIONS

Acronyms/Abbreviations	Definition
1987 Manual	Corps of Engineers Wetland Delineation Manual
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GIS	Geographic Information Systems
GPS	Global Positioning System
HGM	Hydrogeomorphic
HUC	Hydrologic Unit Code
NHD	National Hydrography Dataset
NJD	Non-Jurisdictional
NRCS	Natural Resources Conservation Service
NRPW	Non-Relatively Permanent Waters
NRPWW	Wetlands adjacent to Non-Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	Ordinary High-Water Mark
PEM	Palustrine Emergent
PFO	Palustrine Forested
MISPPII	Middlesex Interceptor System Program Phase II
PSS	Palustrine Scrub-Shrub
PUB	Palustrine Unconsolidated Bottom
Regional Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region Version 2.0 (2010)
RPW	Relatively Permanent Waters
RPWWD	Wetlands directly abutting Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
RPWWN	Wetlands adjacent to but not directly abutting Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
Tetra Tech	Tetra Tech, Inc.
TNW	Traditionally Navigable Water
TNWW	Wetlands Adjacent to Traditionally Navigable Waters
UNT	Unnamed Tributary
UPL	Upland

Acronyms/Abbreviations	Definition
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION

Hampton Roads Sanitation District (HRSD) proposes to design and construct a sewage conveyance system to serve Middlesex County, referred to as the Middlesex Interceptor System Program Phase II; Urbanna to Mathews Transmission Force Main Project (MISPPII Project). The MISPPII Project is located in Middlesex and Mathews Counties in Virginia (VA), as shown on the United States Geological Survey (USGS) Project Location Map (Figure 1). The Project is in the Great Wicomico-Piankatank and the Lower Rappahannock (Hydrologic Unit Code [HUC] 02080102, 02080104) Watersheds (USGS 2019).

Tetra Tech, Inc. (Tetra Tech), on behalf of HRSD, prepared this Aquatic Resource Report summarizing the results of a field survey of the Project study area for the presence of wetlands and surface water features. Tetra Tech applied the methods detailed in the United States Army Corps of Engineers' (USACE) *Wetland Delineation Manual* (*1987 Manual*; Environmental Laboratory 1987), as amended by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0* (*Regional Supplement*; USACE 2012).

2.0 METHODS

The primary objective of the aquatic resource field survey is to identify and map potentially jurisdictional streams and wetlands for avoidance and MISPPII Project permitting.

2.1 FIELD SURVEY

Prior to the start of field surveys, an initial desktop analysis of the Project study area is conducted through a review of available Geographic Information Systems (GIS) resources. Information reviewed includes the following:

- USGS topographic mapping (Figure 1; National Geographic Society, i-cubed 2013).
- Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2017) mapping and data.
- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (Figure 2; USFWS 2018).
- National Hydrography Dataset (NHD) Streams mapping (Figure 2; USGS 2021).

All features identified in the field, including stream reaches, wetlands, and wetland upland points, are given unique identification names (i.e. S-ID, W-ID, and W-ID-UPL, respectively). In addition, the NHD stream name (USGS 2021) for field identified streams is recorded on the stream data form (Appendix A) and listed in Table 1. Identified streams without an NHD stream name are named, “Unnamed Tributary (UNT)” of the first named receiving waterbody.

Identified stream reaches are mapped along their entire course within the study area by use of a Global Positioning System (GPS) receiver with sub-meter accuracy or better. The identified streams are shown on the Aquatic Resource Location Map (Figures 3A to 3J). Stream data forms detailing stream characteristics are provided in Appendix A. Photographs and photograph location maps of each identified stream reach are included immediately following each features’ respective stream data form.

Wetland delineation involves the establishment of the wetland/upland boundary based on the identification of hydrophytic vegetation, hydric soils, and wetland hydrology indicators. This delineated wetland boundary is mapped in the field by use of a GPS receiver. Delineated wetlands are identified as closed or open boundary systems on the Identified Streams Table (Table 1). Wetlands that continue beyond the delineated boundary shown on the Aquatic Resource Location Map are identified as open boundary wetland systems. Wetlands that do not continue beyond the delineated boundary shown on the Aquatic Resource Location Map are identified as closed boundary wetland systems. Data collected on vegetation, soils, and hydrology for identified wetlands and their associated upland points are recorded on USACE Wetland Determination Data Forms (Appendix B). Photographs and photograph location maps of each identified wetland are included immediately following each features’ respective USACE Wetland Determination Data Form.

2.2 STREAM IDENTIFICATION

Potentially jurisdictional streams are identified in the field by the presence of a continuous channel that exhibits evidence of frequent or reoccurring water flow such as a defined bed, bank, and an ordinary high-water mark (OHWM; USACE and United States Environmental Protection Agency [USEPA] 2007).

Physical and biological characteristics of the identified streams are evaluated to determine Flow Regime (82 FR 1860, January 6, 2017), USACE Waters Type (USACE and USEPA 2007), and Cowardin classifications (Cowardin et al. 1979). Physical characteristics evaluated include, but are not limited to: channel morphology, substrate size and type, and base flow conditions. Biological characteristics evaluated include, but are not limited to: the presence of fish, aquatic macroinvertebrates, and vegetation rooted within the OHWM. USACE Water Types (USACE and USEPA 2007) include:

- *Traditional Navigable Water (TNW)* – All "navigable waters of the U.S.," defined in 33 CFR Part 329 and by numerous decisions of the federal courts, plus all other waters that are navigable-in-fact.
- *Relatively Permanent Waters (RPW)* – Streams that flow directly or indirectly into TNWs and where the flow of water is continuous year-round or at least seasonally.
- *Non-RPW (NRPW)* – Streams that flow directly or indirectly into TNWs where the flow of water is not continuous at least seasonally.

Flow Regimes (82 FR 1860, January 6, 2017) include:

- *Perennial* – Streams that typically have flow year-round. Most of the hydrology for perennial streams is derived from smaller upstream waters and/or groundwater sources with precipitation as a supplemental hydrologic contributor. Perennial streams are classified as RPW or TNW USACE Waters Types (USACE and USEPA 2007).
- *Intermittent* – Streams with seasonal flow, typically during the wet season (winter through spring). At least a portion of the hydrology for intermittent streams is derived from groundwater sources with precipitation as a supplemental hydrologic contributor. Intermittent streams are classified as an RPW USACE Waters Type (USACE and USEPA 2007).
- *Ephemeral* – Rain-dependent streams flowing only after precipitation event. Precipitation driven run-off from the localized surrounding landscape is the primary source of hydrology. Ephemeral streams are different from non-jurisdictional ditches and drainages due to the presence of an observable OHWM. Ephemeral streams are classified as an NRPW USACE Waters Type (USACE and USEPA 2007).

2.3 WETLAND DELINEATION

Wetland delineations are conducted in accordance with the procedures specified in the *1987 Manual* (Environmental Laboratory 1987) and the *Regional Supplement* (USACE 2012). According to the *1987 Manual* (Environmental Laboratory 1987), an area is defined as a wetland if, under normal circumstances, it meets all three of the following criteria: predominance of hydrophytic vegetation (plants adapted for life in saturated soil conditions); hydric soils (soils formed under water, or in saturated conditions); and wetland hydrology (current or recent inundation or saturated soils at some time during the growing season).

2.3.1 Hydrophytic Vegetation

Hydrophytic vegetation is identified in the field based on protocol outlined in the *Regional Supplement* (USACE 2012). Plant species representative of the habitats within the Project study area are identified to the species taxonomic level and the indicator status for each plant species is identified using *The National Wetland Plant List: 2020 Wetland Ratings* (USACE 2020). Wetland indicator statuses are described below (Reed 1988):

- *Obligate (OBL)* – almost always occurs in wetlands; estimated probability of occurrence in a wetland is greater than 99 percent.
- *Facultative Wetland (FACW)* – usually occurs in wetlands but may occur in non-wetlands; estimated probability of occurrence in a wetland is 67 to 99 percent.
- *Facultative (FAC)* – equally likely to occur in wetlands and non-wetlands; estimated probability of occurrence in a wetland is 34 to 66 percent.
- *Facultative Upland (FACU)* – usually occurs in non-wetlands but may occur in wetlands; estimated probability of occurrence in a wetland is 1 to 33 percent.
- *Upland (UPL)* – rarely occurs in wetlands; estimated probability of occurrence in a wetland is less than 1 percent.

Hydrophytic vegetation includes species with an indicator status of OBL, FACW, or FAC. Hydrophytic vegetation decisions are based on the plant community typically present during the wet portion of the growing season during a normal rainfall year. In areas where human practices or natural events have influenced vegetation, procedures for difficult or problematic situations outlined in the *Regional Supplement* (USACE 2012) are followed.

Wetlands habitat types are based on vegetation strata composition and are classified in accordance with the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979):

- *Palustrine emergent (PEM)* – contain emergent, herbaceous (non-woody) plants which are the tallest life form with at least 30 percent aerial coverage.
- *Palustrine scrub-shrub (PSS)* – contain woody plants less than six meters (20 feet) in height which are the tallest life form with at least 30 percent aerial coverage, or, when trees or shrubs alone cover less than 30 percent of an area but in combination cover 30 percent or more. Trees are defined as woody plants at least six meters (20 feet) in height, and shrubs are defined as woody plants less than six meters (20 feet) in height.
- *Palustrine forested (PFO)* – contain woody plants at least six meters (20 feet) in height which are the tallest life form with at least 30 percent aerial coverage.
- *Palustrine unconsolidated bottom (PUB)* – contain all wetland and deepwater habitats with at least 25 percent cover of particles smaller than stones, and a vegetative cover of less than 30 percent.

2.3.2 Hydric Soils

Hydric soils are identified in the field based on protocol outlined in the *1987 Manual (*Environmental Laboratory 1987*)*, *Regional Supplement* (USACE 2012), and *Field Indicators of Hydric Soils in the United States* (United States Department of Agriculture [USDA] 2010). Based on prior experience, the presence of field-identified hydric soils does not always align with NRCS mapped hydric soils units. The NRCS soil units represent a large geographic area and are based on broad geologic and historic conditions. The methods used in the *Field Indicators of Hydric Soils in the United States* (USDA 2010) are used to determine hydric soil conditions on a localized scale. A review of the NRCS mapped hydric soils units is used to initially identify areas that have the potential to contain wetlands (See Section 3.2); however, the wetland delineation boundaries are based on the presence of field identified hydric soils. In cases where soils are found to be disturbed or problematic, determinations may rely on the NRCS mapped hydric soil units (USACE 2012).

2.3.3 Wetland Hydrology

Wetland hydrology indicators are identified in the field based on protocol outlined in the *1987 Manual* (Environmental Laboratory 1987) and *Regional Supplement* (USACE 2012). Hydrogeomorphic (HGM) and Water Type classifications are assigned to wetlands based on their hydrologic source and connectivity to streams. HGM classifications are based on *A Hydrogeomorphic Classification for Wetlands* (Brinson 1993); a summary of HGM classifications commonly used in the Project region is described below:

- *Riverine* – Wetlands occur in floodplains and riparian corridors in association with stream channels.
- *Depressional* – Wetlands occur in topographic depressions. Dominant water sources are precipitation ground water discharge, and both interflow and overland flow from adjacent uplands.
- *Slope* – Wetlands normally are found where there is a discharge of ground water to the land surface. They normally occur on sloping land; elevation gradients may range from steep hillsides to slight slopes.

Wetland USACE Water Types (USACE and USEPA 2007) include:

- *TNWW* – Wetlands adjacent to TNWs.

- *RPWWD* – Wetlands directly abutting RPWs that flow directly or indirectly into TNWs.
- *RPWWN* – Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs.
- *NRPWW* – Wetlands adjacent to NRPWs that flow directly or indirectly into TNWs.
- *Isolate* – Isolated (interstate or intrastate) waters, including isolated wetlands.

Current wetland hydrology indicators, inundation/saturation visible on aerial imagery, and estimates of the effects of ditches and subsurface drainage systems are all considered when making decisions regarding wetland hydrology in areas where human practices or natural events may have altered wetland hydrology.

3.0 RESULTS

Tetra Tech performed field surveys for the MISPPII Project between March 2021 and January 2022. Surveys were limited to the Project study area illustrated on Figures 1 through 3. The field surveys identified 10 stream reaches and 19 wetlands within the Project study area. The Aquatic Resource Location Map (Figures 3A to 3J) illustrates the wetland and stream feature locations in relation to the Project study area. Tables 1 and 2 summarize stream and wetland information for all identified streams reaches and wetlands. Stream data forms are included in Appendix A and Wetland Determination Data Forms for wetlands and their associated upland points are included in Appendix B.

This Aquatic Resource Report represents our best professional judgment and is based on site conditions at the time of the field survey. However, final authority over determinations made during these surveys rests with the Virginia Department of Environmental Quality (VADEQ) and USACE.

3.1 STREAM IDENTIFICATION

Ten stream reaches were identified in the Project study area based on our review of available GIS mapping data, evidence collected during field surveys, and best professional judgment. A summary of the data for each identified stream reach is provided in Table 1. Table 1 shows the stream reach field identification name, the NHD stream name, stream location, Flow Regime classification, Water Type classification, Cowardin classification, flow direction, top of bank width, and Figure 3 sheet location. Stream data forms are provided for each stream reach in Appendix A. Photographs and photograph location maps of each identified stream reach are included immediately following each features' respective stream data form.

3.2 WETLAND DELINEATION

NRCS and USFWS NWI mapping were reviewed for the initial desktop analysis of the Project study area to identify areas that may have the potential to contain wetlands. Appendix C provides the NRCS web soil survey for Middlesex and Mathews Counties. The NRCS soil survey mapping units are shown on Figure 2. A review of the USFWS NWI mapping indicates that 18 NWI wetlands are mapped in the Project study area (Figure 3 Index). One wetland, W5, is correlated with an NWI listed wetland as shown in Figure 2-A.

Nineteen wetlands are located within the Project study area based on our review of available GIS mapping data, evidence collected during field surveys, and best professional judgment.

A summary of each wetland identified and delineated within the Project study area is provided in Table 2. Table 2 shows the wetland identification name, location, Cowardin classification, HGM classification, Waters Type classification, the identity of any associated (i.e. abutting or adjacent) waterbodies, wetland size within the Project study area (in acres and square feet), and whether the wetland boundary is open or closed (see Section 2.1) and Figure 3 sheet location. Wetlands with multiple Cowardin types (e.g. PEM and PSS) are considered a single wetland system and are counted as one wetland. The wetland size provided in Table 2 represents the size of the delineated wetland boundary shown on Figures 3A to 3J. Open boundary wetlands continue beyond the delineated wetland boundary shown on Figures 3A to 3J; therefore, the total wetland size of open boundary wetlands may be larger than the size provided in Table 2.

USACE Wetland Determination Data Forms detailing the existing vegetation, soil characteristics, and hydrology for each wetland and its associated upland point are provided in Appendix B. Photographs and photograph location maps of each identified wetland are included immediately following each features' respective USACE Wetland Determination Data Form.

4.0 CONCLUSION

During the field survey of the MISPPII Project, 10 stream reaches, and 19 wetlands were identified within the Project study area. A summary of the identified stream reach and wetland data is provided in Tables 1 and 2, respectively, and locations of all streams and wetlands are shown on the Aquatic Resource Location Map (Figures 3A to 3J).

This Aquatic Resource Report represents our best professional judgment and is based on site conditions at the time of the field survey. However, final authority over the determinations made during this survey rests with the VADEQ and the USACE.

5.0 REFERENCES

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FIGURES

Figure 1: USGS Project Location Map

Figure 2-Index: NWI Wetlands and NHD Streams Map

Figures 2A-2C: NWI Wetlands and NHD Streams Map

Figure 3-Index: Aquatic Resource Location Index Map

Figures 3A-3J: Aquatic Resource Location Map

Figure 1
Project Location Map
Map produced by M. Solano, 01-26-2022
NAD 1983 HARN StatePlane Virginia South

Document Path: G:\GIS_files\HRSD\MXD\Middlesex\Aquatic_Resources\USGS_ProjLoc_111021.mxd

Figure 2-Index
NWI Wetlands and
NHD Waterbodies and Streams
Map produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

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Figure 2A
NWI Wetlands and
NHD Waterbodies and Streams
Map produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

Document Path: G:\GIS_files\HRSD\MXD\MiddlesexAquatic_Resources\NWI_Wetlands_A_111021.mxd

Figure 2B
NWI Wetlands and
NHD Waterbodies and Streams
Map produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

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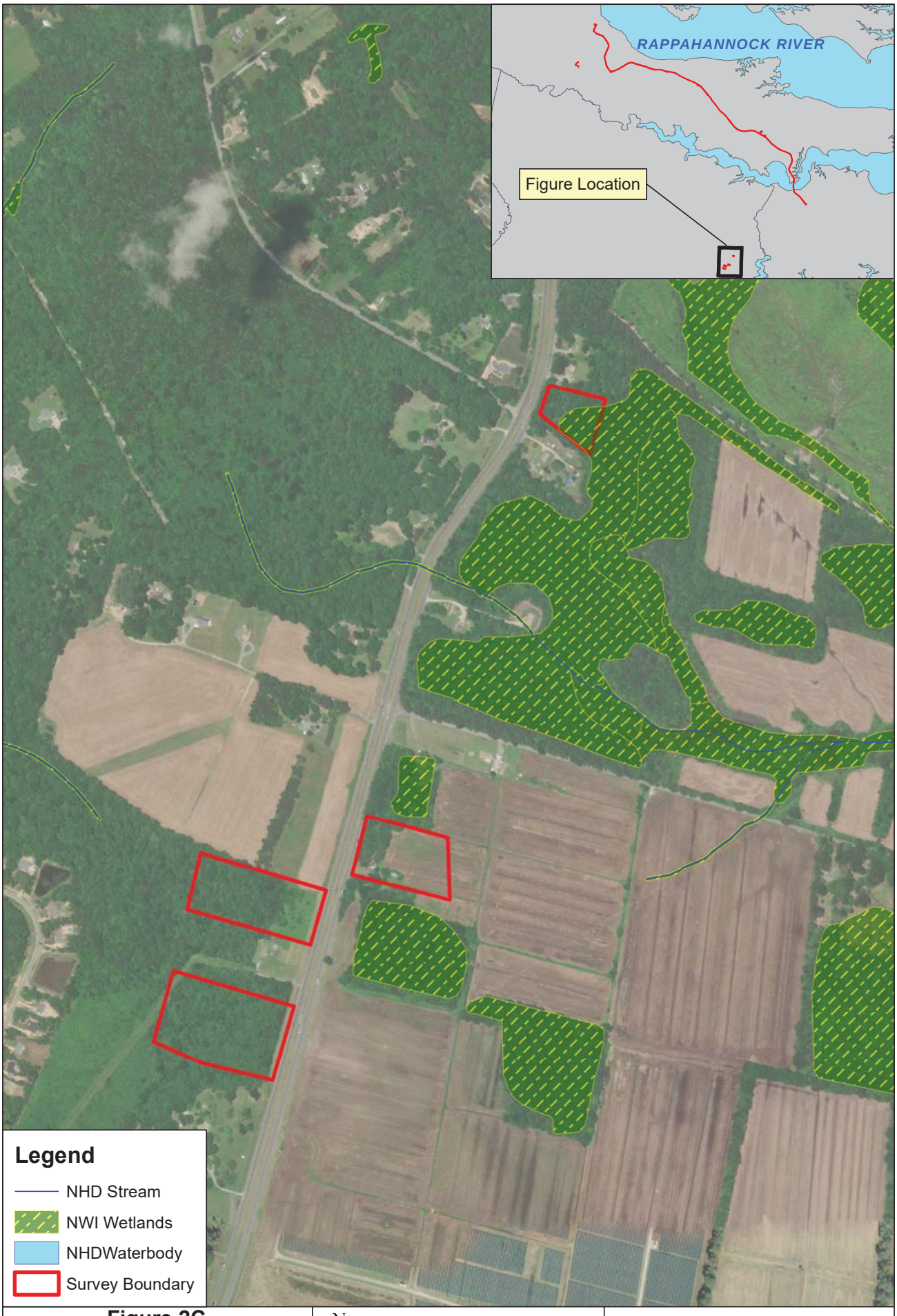

Figure 2C
NWI Wetlands and
NHD Waterbodies and Streams
Map produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

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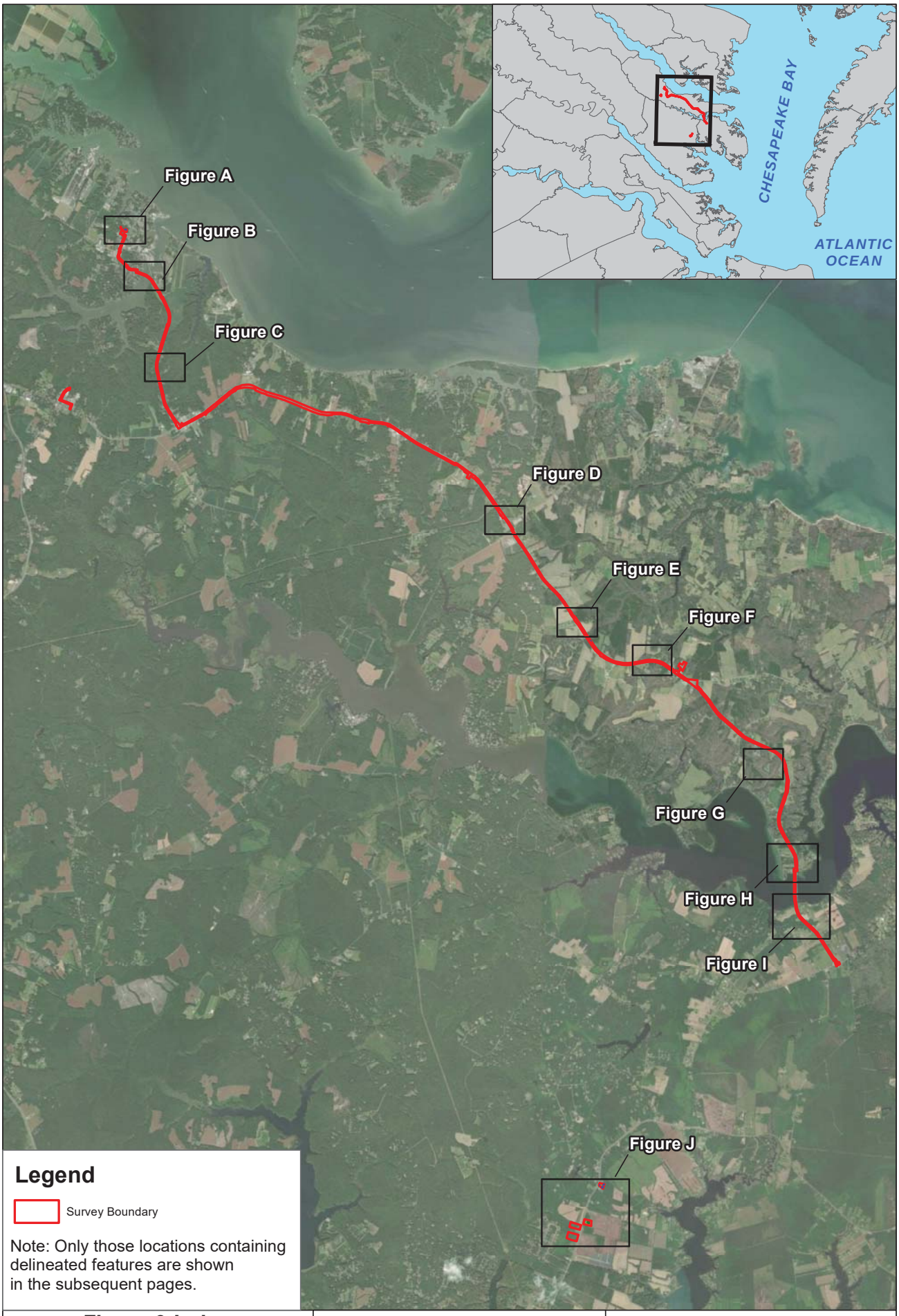

Figure 3-Index
Map of Aquatic Resources Figure Locations
Map produced by M. Solano, 01-27-2022
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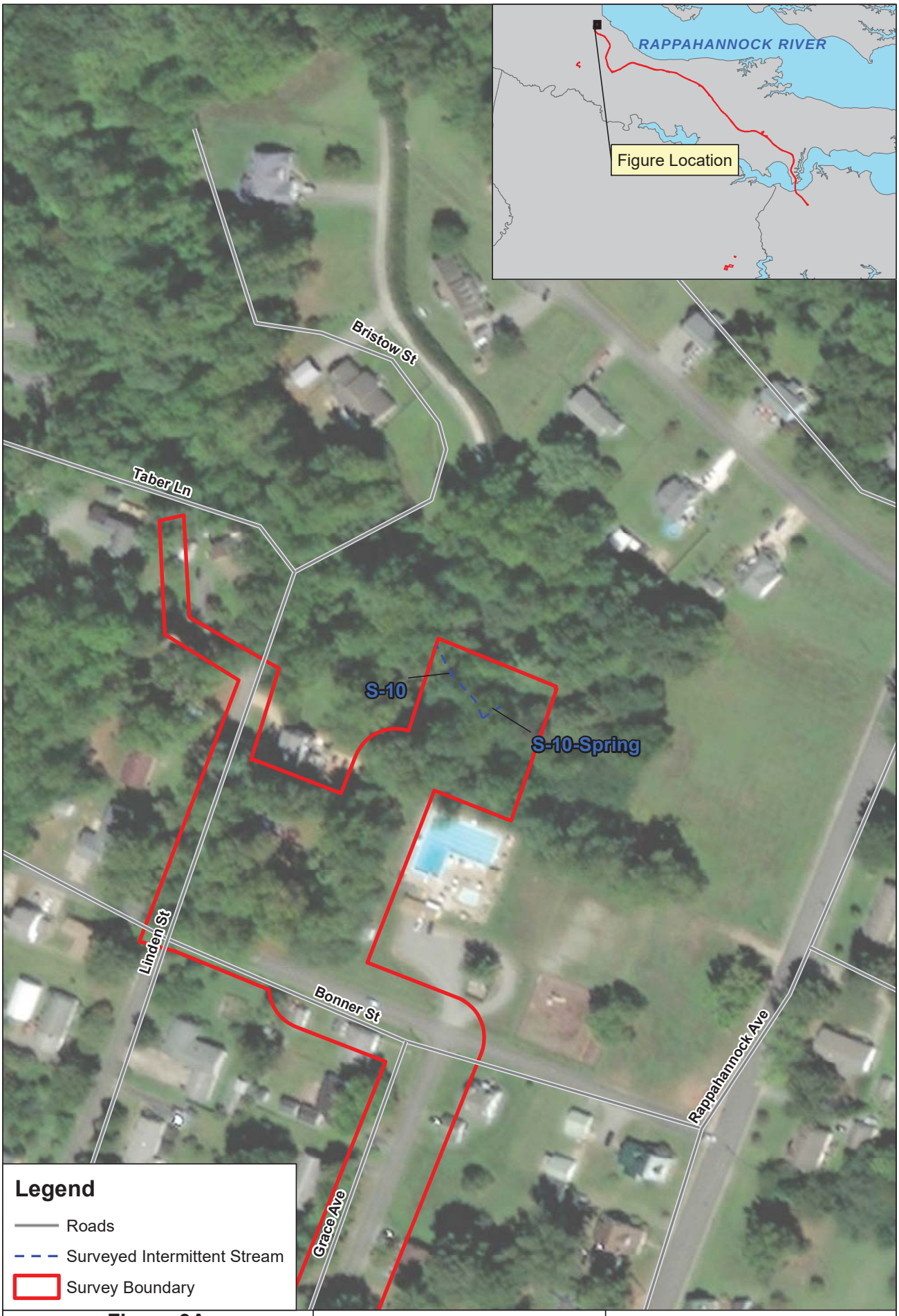

Figure 3A
Surveyed Wetlands and Streams

Map produced by M. Solano, 01-27-2022
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TETRA TECH

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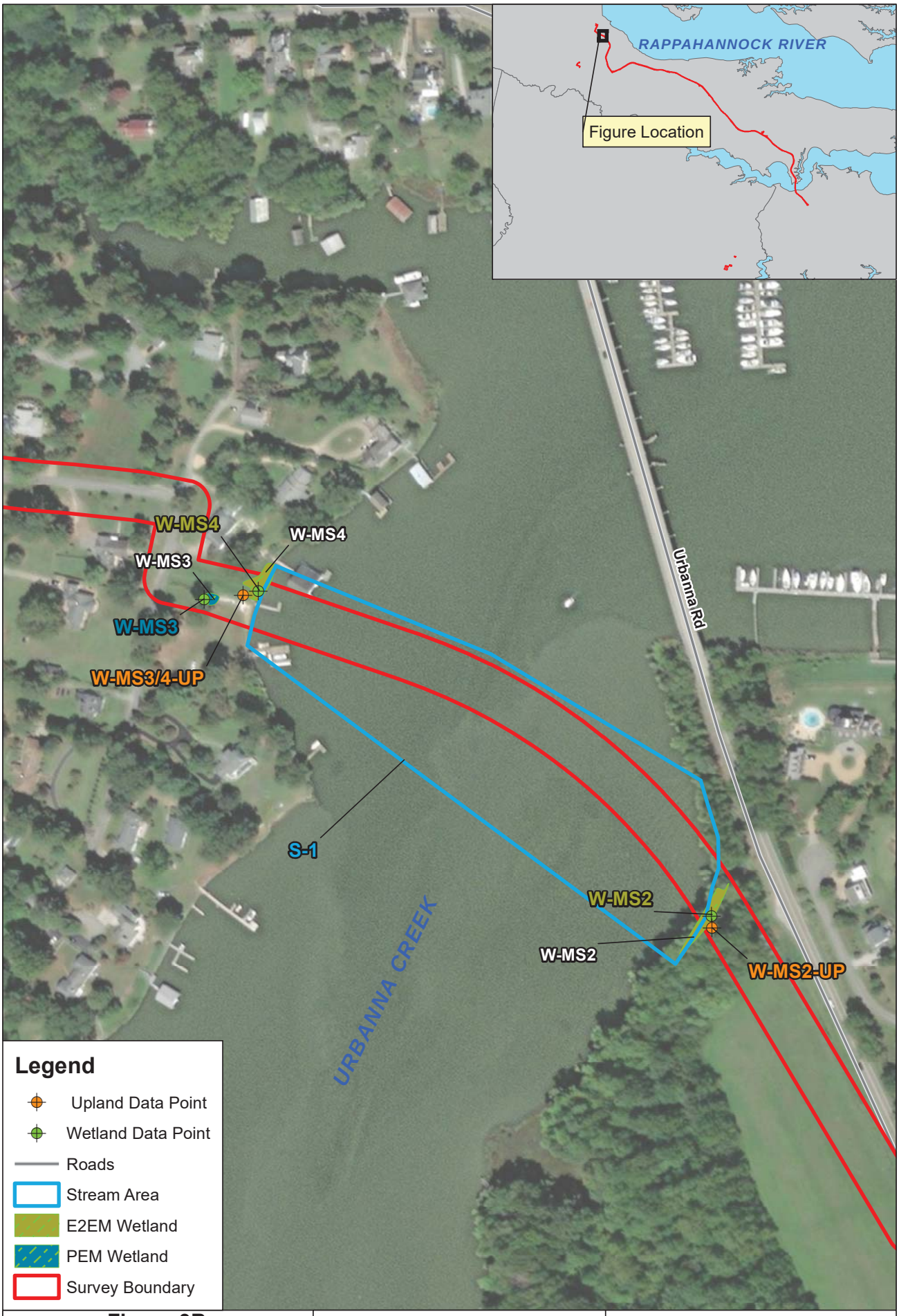

Figure 3B
Surveyed Wetlands and Streams

Map produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

N

0 87.5 175 350 Feet

0 0.0175 0.035 0.07 Miles

TETRA TECH

Document Path: G:\GIS_files\HRSD\MXD\Middlesex\Aquatic_Resources\AquaResources_B_111021.mxd

Figure 3C
Surveyed Wetlands and Streams

Map produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

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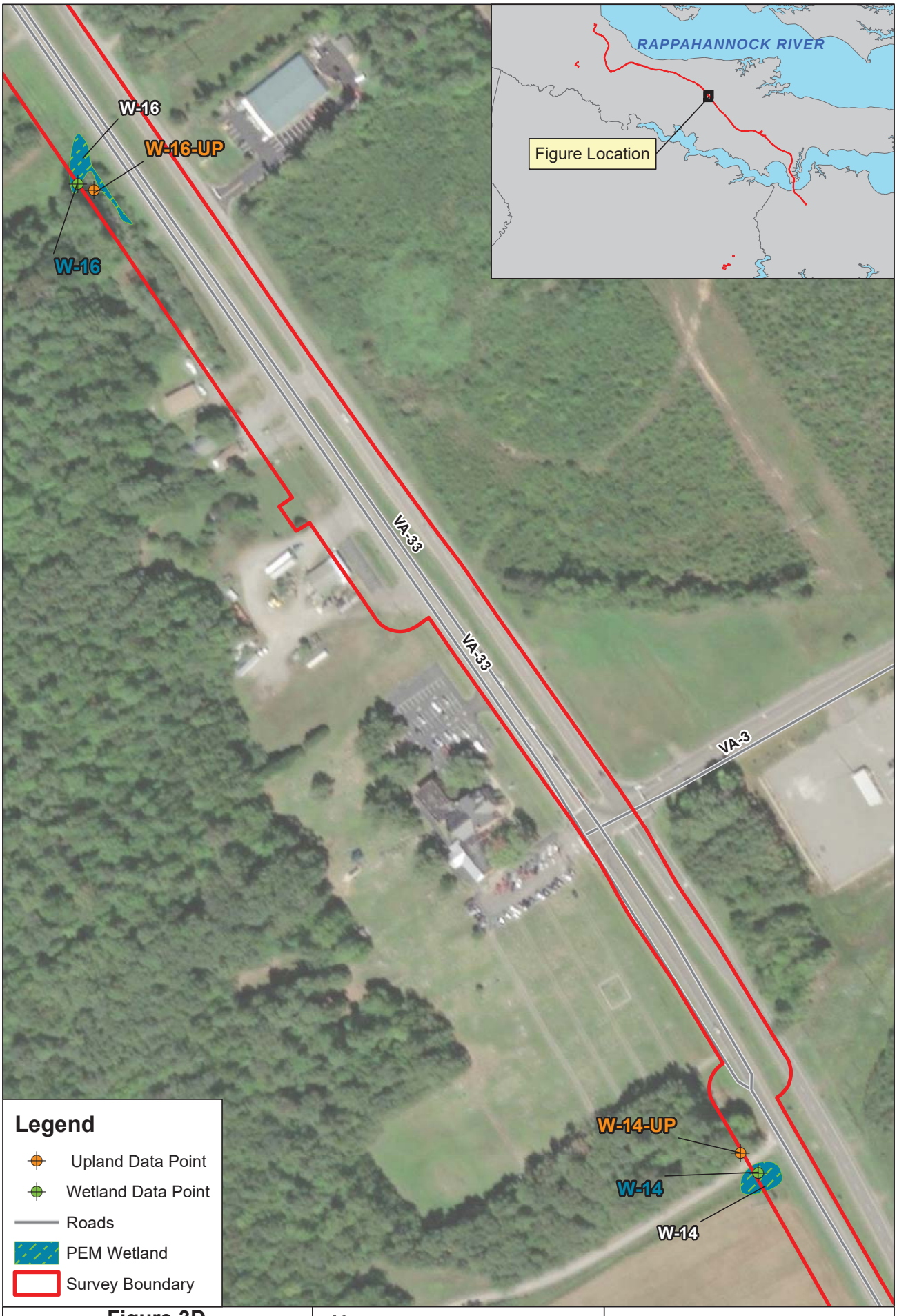

Figure 3D
Surveyed Wetlands and Streams

Map produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

N

0 75 150 300 Feet

0 0.015 0.03 0.06 Miles

TETRA TECH

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Figure 3E
Surveyed Wetlands and Streams

Map produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

N

0 100 200 400 Feet

0 0.02 0.04 0.08 Miles

TETRA TECH

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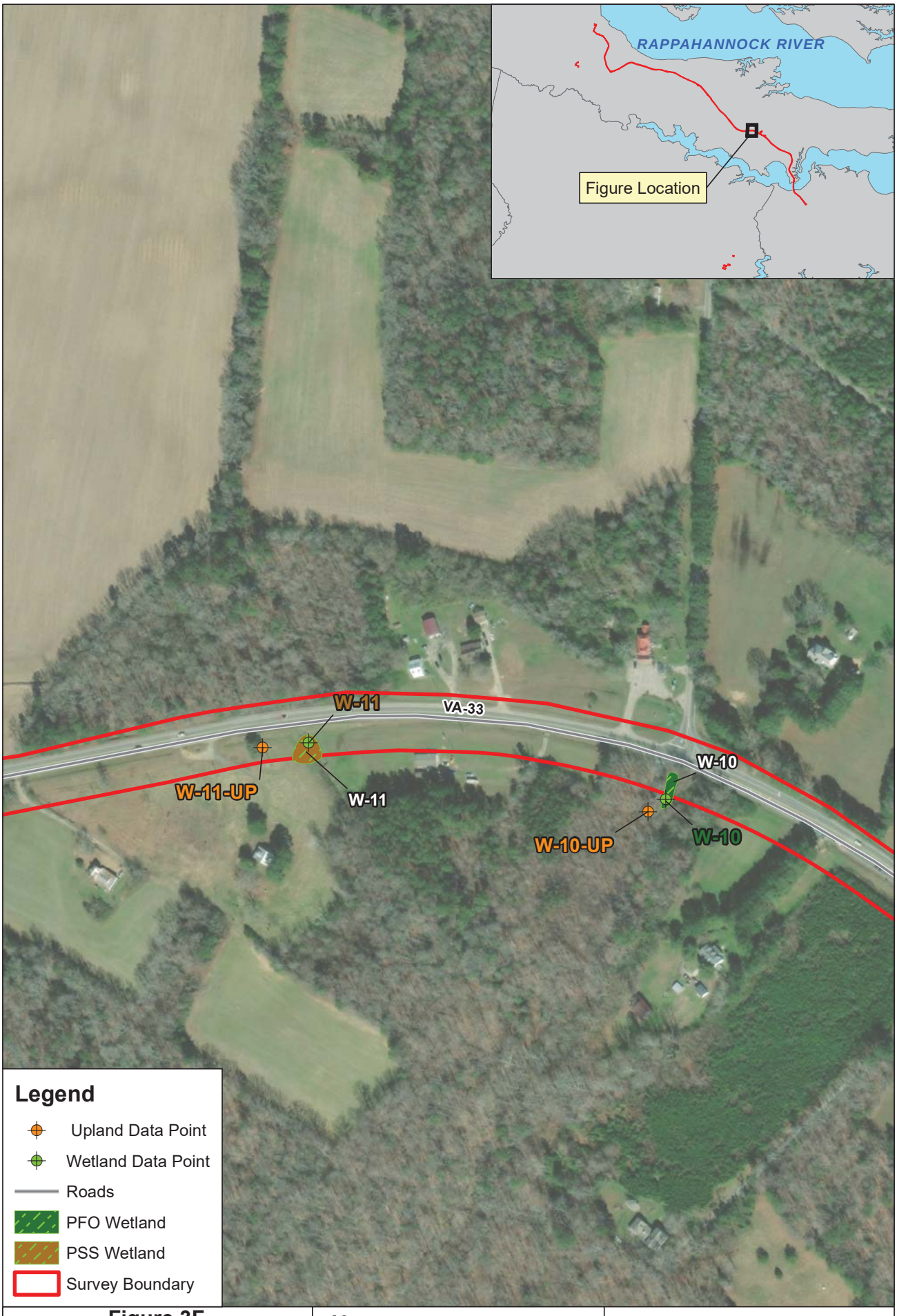

Figure 3F
Surveyed Wetlands and Streams

Map produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

N

0 100 200 400 Feet

0 0.02 0.04 0.08 Miles

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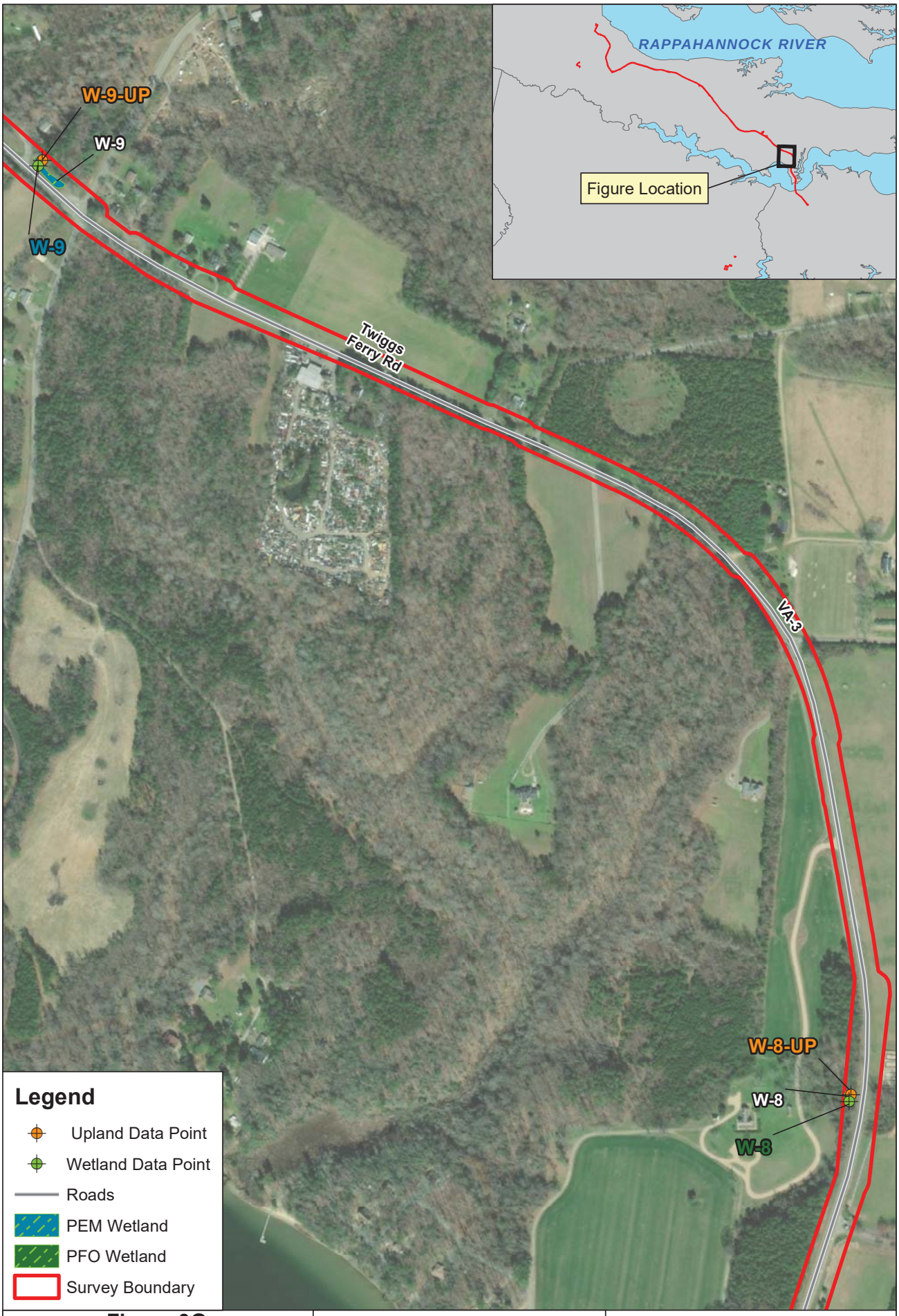

Figure 3G
Surveyed Wetlands and Streams
Map produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

N

0 175 350 700 Feet

0 0.035 0.07 0.14 Miles

TETRA TECH

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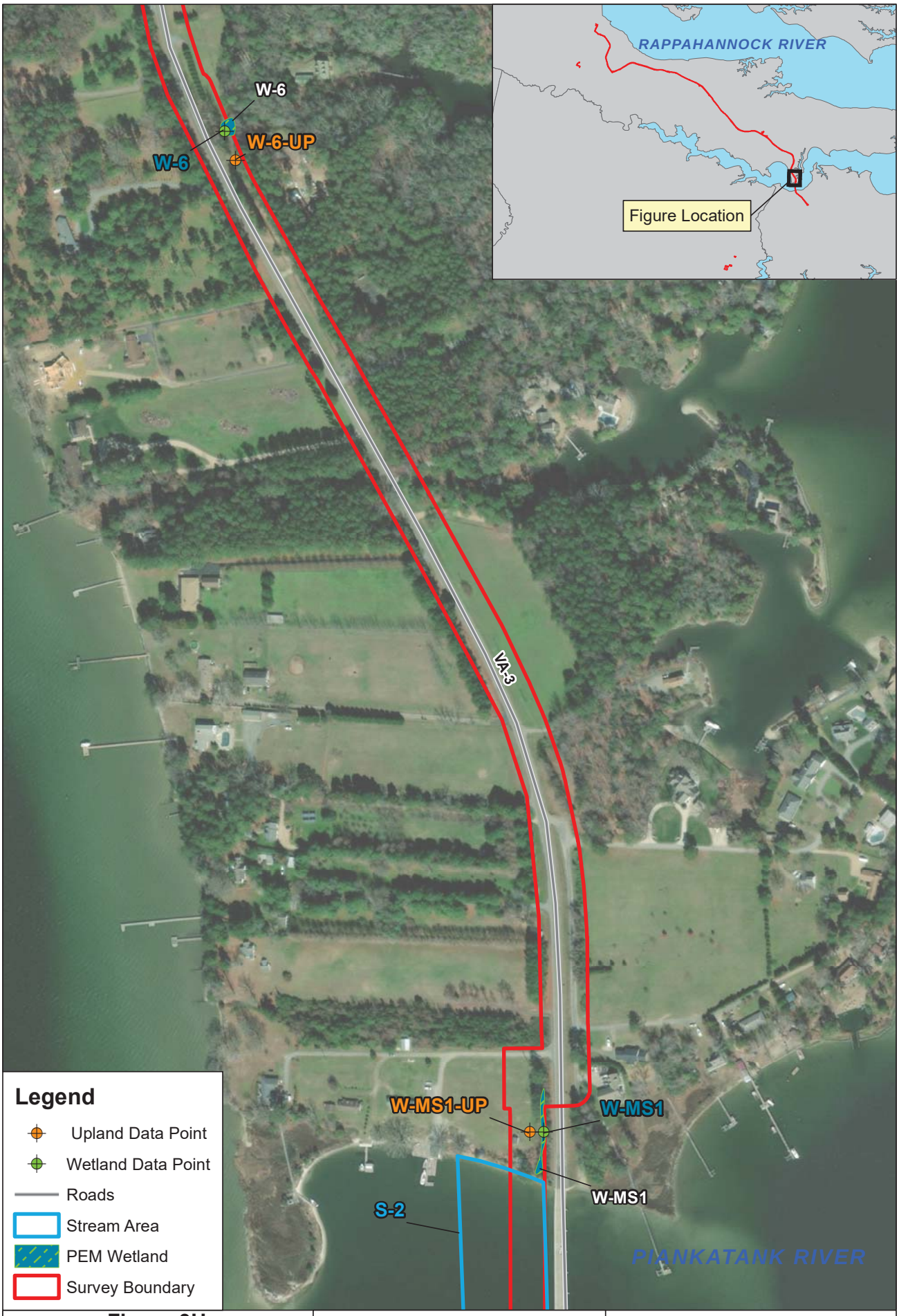

Figure 3H
Surveyed Wetlands and Streams

Map produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

N

0 125 250 500 Feet

0 0.025 0.05 0.1 Miles

TETRA TECH

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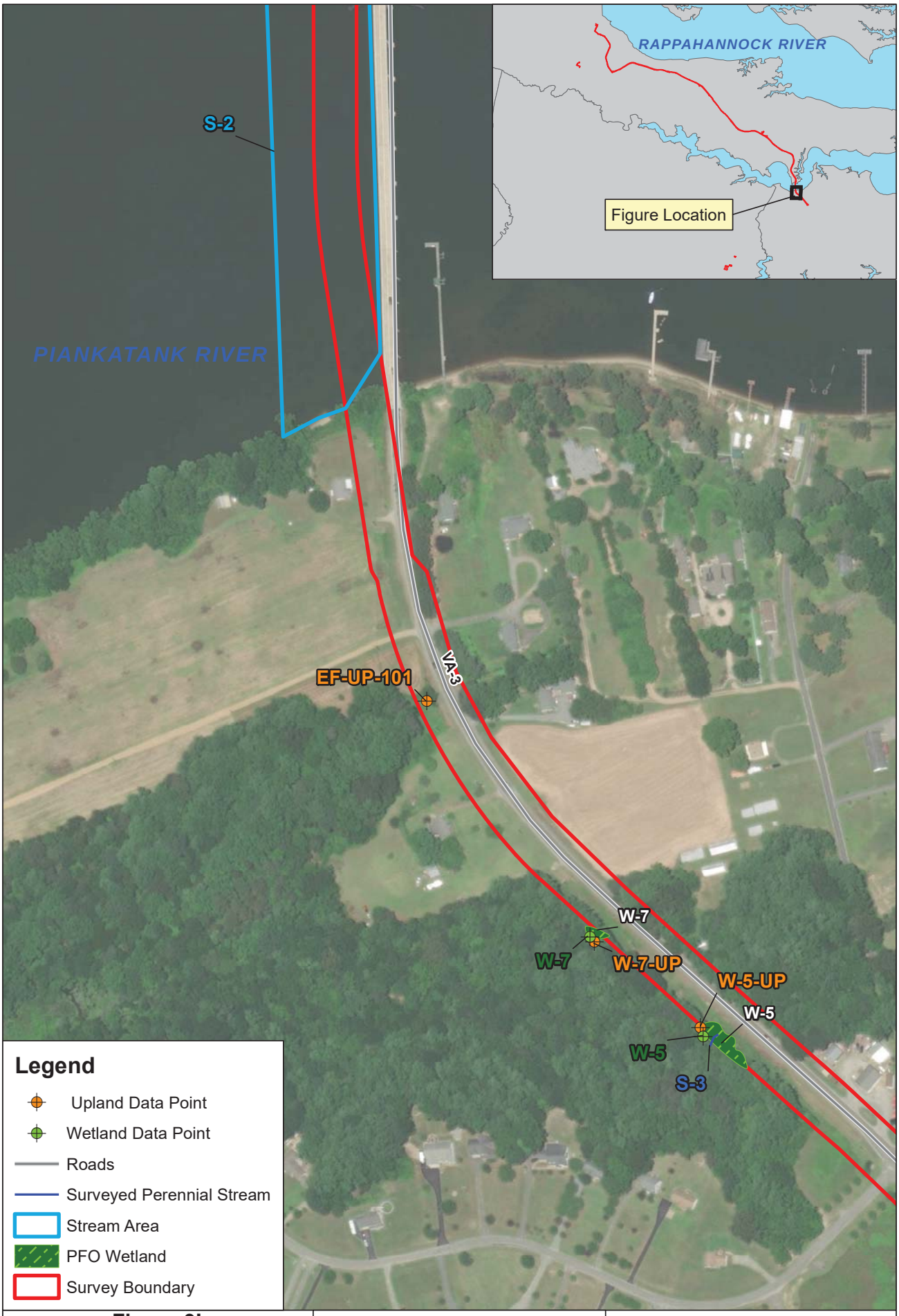

Figure 3I
Surveyed Wetlands and Streams

Figure I: Produced by M. Solano, 01-27-2022
NAD 1983 HARN StatePlane Virginia South

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Figure 3J
Surveyed Wetlands and Streams

Figure J: Produced by M. Solano, 01-26-2022
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

Document Path: G:\GIS_files\HRSD\MXD\Middlesex\Aquatic_Resources\AquaResources_J_111021.mxd

TABLES

Table 1: Identified Streams

Table 2: Identified Wetlands

Table 1.
Identified Streams

Stream Number[1]	Stream Reach ID	NHD Stream Name[2]	County	Latitude[3]	Longitude[3]	Flow Regime	Water Type[4]	Cowardin Class[5]	Flow Direction	Top of Bank Width (feet)	Linear Feet in Survey Area	Geographic Authority	Figure
1	S1	Piankatank River	Middlesex	37.513154	-76.419896	Perennial	TNW	R3	Northeast	2050.00	110.00	Section 10/404	3B
2	S2	Urbanna Creek	Middlesex	37.629513	-76.572037	Perennial	TNW	R3	Northeast	1230.00	138.00	Section 10/404	3H
3	S3	UNT to Wadinger Creek	Matthews	37.503280	-76.417500	Perennial	RPW	R3	South	4.00	12.60	Section 404	3I
4	S4	UNT to Mill Creek	Middlesex	37.558893	-76.468024	Intermittent	RPW	R4	Northeast	5.00	9.00	Section 404	3E
5	S5	UNT to Rosegill Lake	Middlesex	37.618307	-76.569336	Ephemeral	NRPW	R6	East	10.00	24.00	Section 404	3C
6	S6	UNT to Urbanna Creek	Middlesex	37.609903	-76.570838	Ephemeral	NRPW	R6	West	12.00	22.00	Section 404	3C
7	S7	UNT to North River	Gloucester	37.454353	-76.468993	Intermittent	RPW	R4	Southeast	4.00	54.00	Section 404	3J
8	S8	UNT to North River	Gloucester	37.453852	-76.468088	Ephemeral	NRPW	R6	Southeast	4.50	147.00	Section 404	3J
9	S9	UNT to North River	Gloucester	37.454461	-76.467861	Intermittent	RPW	R4	Southwest	10.00	108.00	Section 404	3J
10	S10	UNT to Perkins Creek	Middlesex	37.639412	-76.578079	Intermittent	RPW	R4	West	13.00	126.00	Section 404	3A

Notes:

1 - Streams with braided channels, streams that have different flow regimes (e.g. ephemeral and intermittent) within the surveyed reach, and NHD named streams with different field stream reach identification names are counted as single streams.

2 - From NHD (USGS 2021); see References. For identified streams without an NHD stream name, the identified stream was given the name, “Unnamed Tributary (UNT)”, of the first named receiving waterbody.

3 - In decimal degrees.

4 - RPW = Relatively Permanent Waters
- NRPW = Non-Relatively Permanent Waters
- TNW = Traditional Navigable Waters

5 - From Cowardin et al. 1979; see References.

Table 2.
Identified Wetlands

Wetland Number[1]	Wetland ID	County	Latitude[2]	Longitude[2]	Cowardin Class[3]	HGM[4]	Water Type[5]	Associated Waterbodies	Size (Acres)[6]	Size (square feet)[6]	Open/Closed Boundary	**Figure**
1	W-MS1	Middlesex	37.513581	-76.420069	PEM	Riverine	RPWWD	Piankatank river	0.05780	2,518	Closed	3H
2	W-MS2	Middlesex	37.629363	-76.571996	PEM	Riverine	RPWWD	Urbanna Creek	0.06564	2,859	Closed	3B
3	W-MS3	Middlesex	37.631185	-76.575514	PEM	Slope	RPWWD	Urbanna Creek	0.01655	721	Closed	3B
4	W-MS4	Middlesex	37.507359	-76.419963	PEM	Slope	RPWWD	Urbanna Creek	0.05758	2,508	Closed	3B
5	W5-PFO	Mathews	37.503319	-76.417549	PFO	Slope	RPWWD	UNT to Wadinger Creek	0.10369	4,517	Open	3I
6	W6-PEM	Middlesex	37.521623	-76.423043	PEM	Slope	RPWWN	Piankatank River	0.04142	1,804	Open	3H
7	W7-PFO	Middlesex	37.503972	-76.418445	PFO	Slope	RPWWD	UNT to Wadinger Creek	0.02501	1,090	Open	3I
8	W8-PEM	Middlesex	37.529907	-76.421768	PEM	Slope	RPWWD	Wilton Creek	0.02277	992	Open	3G
9	W9-PEM	Middlesex	37.540568	-76.432867	PEM	Depressional	ISOLATE	N/A	0.08941	3,895	Closed	3G
10	W10-PFO	Middlesex	37.554191	-76.451741	PFO	Slope	RPWWD	UNT to Scoggin Creek	0.04350	1,895	Open	3F
11	W11-PSS	Middlesex	37.554596	-76.454609	PSS	Slope	RPWWN	Scoggin Creek	0.07185	3,130	Open	3F
12	W12-PEM	Middlesex	37.560321	-76.471869	PEM	Depressional	ISOLATE	N/A	0.08936	3,892	Closed	3E
13	W13-PEM	Middlesex	37.566080	-76.474214	PEM	Depressional	ISOLATE	N/A	0.10993	4,789	Closed	3E
14	W14-PEM	Middlesex	37.579991	-76.486446	PEM	Slope	RPWWD	UNT to North River	0.07384	3,216	Open	3D
15	W15-PFO	Gloucester	37.454564	-76.468726	PFO	Slope	RPWWD	UNT to North River	0.41918	18,259	Closed	3J
16	W16-PEM	Middlesex	37.584816	-76.490421	PEM	Slope	RPWWD	UNT to North River	0.08461	3,686	Open	3D
17	GSA1-1	Gloucester	37.447841	-76.472188	PUB	Slope	RPWWN	UNT to North River	0.09000	4,023	Open	3J
18	GSA1-2	Gloucester	37.446857	-76.471293	PSS	Slope	RPWWN	UNT to North River	1.92000	83,805	Open	3J
19	GSA2-1	Gloucester	37.446056	-76.473862	PEM	Slope	RPWWN	UNT to North River	0.13000	5,734	Open	3J

Notes:

1 - Wetlands with multiple contiguous Cowardin types (e.g. PEM and PSS) are considered a single wetland system and are counted as one wetland.

2 - In decimal degrees. Coordinates show wetland test pit locations.

3 - PEM = Palustrine Emergent
- PFO = Palustrine Forested
- PSS = Palustrine Scrub-Shrub
- PUB = Palustrine Unconsolidated Bottom

4 - HGM = Hydrogeomorphic

5 - RPWWD = Wetlands directly abutting Relatively Permanent Waters (RPWs) that flow directly or indirectly into Traditional Navigable Waterways (TNWs)
- RPWWN = Wetlands adjacent but not directly abutting RPWs that flow directly or indirectly into TNWs
- NRPWW = Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Isolate = Isolated (interstate or intrastate) waters, including isolated wetlands

6 - Size of wetlands with open boundaries may be larger than shown in this table. Wetland size shown is the size of the wetland delineated and illustrated on Aquatic Resource Location Map.

APPENDIX A: STREAM DATA FORMS

STREAM ID S1	**STREAM NAME** Piankatank River		
CLIENT HRSD	**PROJECT NAME** Middlesex HRD TFM		
LAT 37.513154 **LONG** -76.419896	**STATE** Virginia	**COUNTY** Middlesex	
INVESTIGATORS Emily Foster, James Cook		**DATE** 07/09/2021	
WATER TYPE TNW ☑ RPW ☐ NRPW ☐	**FLOW REGIME** Perennial ☑ Intermittent ☐ Ephemeral ☐		

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 2,050 ft
Top of Bank Height:
LB 2.0 ft RB 3.0 ft
Water Depth: _____ ft
Water Width:_____ ft
Ordinary High Water Mark (Width): 2,050 ft
Ordinary High Water Mark (Height): _____ in
Flow Direction: East

Sinuosity ✓ Low ___ Medium ___ High

Gradient ✓ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
___ None ✓ Moderate ___ Heavy

Artificial, Modified or Channelized
✓ Yes ___ No

Within Roadside Ditch
___ Yes ✓ No

Culvert Present ___ Yes ___ No
Culvert Material:_____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✓ Flowing water

Velocity
___ Fast ✓ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle % Run 100 %
Pool %

Turbidity
___ Clear ✓ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	5
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	90
Silt	0.004-0.06 mm	5
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	10
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest ___ Commercial
✓ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
✓ Wide > 30ft ___ Moderate 15-30ft
___ Narrow <15ft

Canopy Cover
✓ Open ___ Partly shaded
___ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Estimated using photos/online data

Photograph Page

Stream ID S1 Date 07/09/2021

Photograph Number 1

Photograph Direction North

Comments:

Photograph Number 2

Photograph Direction SE

Comments:

Photograph Number 3

Photograph Direction _____

Comments:

Photograph Number 4

Photograph Direction _____

Comments:

STREAM ID S2	**STREAM NAME** Urbanna Creek		
CLIENT HRSD	**PROJECT NAME** Middlesex HRD TFM		
LAT 37.629513 **LONG** -76.572037	**STATE** Virginia	**COUNTY** Middlesex	
INVESTIGATORS Emily Foster, James Cook		**DATE** 07/09/2021	
WATER TYPE TNW ☑ RPW ☐ NRPW ☐	**FLOW REGIME** Perennial ☑ Intermittent ☐ Ephemeral ☐		

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 1,230 ft
Top of Bank Height:
LB _____ ft RB _____ ft
Water Depth: _____ ft
Water Width: 1,200. ft
Ordinary High Water Mark (Width): 1200 ft
Ordinary High Water Mark (Height): _____ in
Flow Direction: Northeast

Sinuosity ✓ Low ___ Medium ___ High

Gradient ✓ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
___ None ✓ Moderate ___ Heavy

Artificial, Modified or Channelized
✓ Yes ___ No

Within Roadside Ditch
___ Yes ✓ No

Culvert Present ___ Yes ___ No
Culvert Material:_____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✓ Flowing water

Velocity
___ Fast ✓ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle % Run 100 %
Pool %

Turbidity
___ Clear ✓ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	90
Silt	0.004-0.06 mm	10
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	10
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest ✓ Commercial
✓ Field/Pasture ___ Industrial
___ Agricultural ✓ Residential
___ ROW ___ Other:

Canopy Cover
✓ Open ___ Partly shaded
___ Shaded

Floodplain Width
✓ Wide > 30ft ___ Moderate 15-30ft
___ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Estimated using photos/online data

Photograph Page

Stream ID S2 Date 07/09/2021

Photograph Number 1

Photograph Direction NE

Comments: Southeast bank

Photograph Number 2

Photograph Direction SW

Comments: Southeast bank

Photograph Number 3

Photograph Direction North

Comments: Northwest bank

Photograph Number 4

Photograph Direction South

Comments: Northwest bank

STREAM ID S3	**STREAM NAME**		
CLIENT HRSD	**PROJECT NAME** Middlesex HRD TFM		
LAT **LONG**	**STATE** Virginia	**COUNTY** Mathews	
INVESTIGATORS Emily Foster, James Cook		**DATE** 7/9/21	
WATER TYPE TNW ☐ RPW ☑ NRPW ☐	**FLOW REGIME** Perennial ☑ Intermittent ☐ Ephemeral ☐		

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 4.5 ft
Top of Bank Height:
LB 1 ft RB 1 ft
Water Depth: 2 in
Water Width: 3 ft
Ordinary High Water Mark (Width): 4 ft
Ordinary High Water Mark (Height): 4 in
Flow Direction: _____

Sinuosity ___ Low ✓ Medium ___ High

Gradient ___ Flat (0.5/100 ft) ✓ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
✓ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✓ No

Within Roadside Ditch
___ Yes ✓ No

Culvert Present ✓ Yes ___ No
Culvert Material: concrete box cuvert
Culvert Size: 24 in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✓ Flowing water

Velocity
___ Fast ✓ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 45 % Run 50 %
Pool 5 %

Turbidity
✓ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	100
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
___ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Flows approx. south southwest. Small minnows and macroinverts.

Photograph Page

Stream ID S3 Date 7/9/21

Photograph Number 1

Photograph Direction NE

Comments: Photograph facing into culvert.

Photograph Number 2

Photograph Direction _____

Comments:

Photograph Number 3

Photograph Direction _____

Comments:

Photograph Number 4

Photograph Direction _____

Comments:

STREAM ID S4	**STREAM NAME** UNT to Mill Creek		
CLIENT HRSD	**PROJECT NAME** HRSD Middlesex TFM		
LAT 37.558893 **LONG** -76.468024	**STATE** Virginia	**COUNTY** Middlesex	
INVESTIGATORS Emily Foster, Katelyn Hoisington		**DATE** 7/15/21	
WATER TYPE TNW ☐ RPW ☑ NRPW ☐	**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐		

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 5 ft
Top of Bank Height:
LB 3 ft RB 3 ft
Water Depth: 2 in
Water Width: 2 ft
Ordinary High Water Mark (Width): 2.5 ft
Ordinary High Water Mark (Height): 6 in
Flow Direction: Northeast

Sinuosity ✓ Low ___ Medium ___ High

Gradient ✓ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
✓ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
✓ Yes ___ No

Within Roadside Ditch
___ Yes ✓ No

Culvert Present ✓ Yes ___ No
Culvert Material: concrete
Culvert Size: 18 in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
✓ Standing water
___ Flowing water

Velocity
___ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle % Run %
Pool 100 %

Turbidity
___ Clear ___ Slightly turbid ✓ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	90
Silt	0.004-0.06 mm	10
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
✓ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
___ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Recent timber harvest adjacent to roadside, stream bed disturbed from heavy machinery.

Photograph Page

Stream ID S4 Date 7/15/21

Photograph Number 1

Photograph Direction North

Comments:

Photograph Number 2

Photograph Direction South

Comments:

Photograph Number 3

Photograph Direction East

Comments:

Photograph Number 4

Photograph Direction West

Comments:

STREAM ID S5	**STREAM NAME** UNT to Rosegill Lake		
CLIENT HRSD	**PROJECT NAME** MISPII		
LAT 37.618307 **LONG** -76.569336	**STATE** Virginia	**COUNTY** Middlesex	
INVESTIGATORS Emily Foster		**DATE** 07/29/2021	
WATER TYPE TNW ☐ RPW ☐ NRPW ☑	**FLOW REGIME** Perennial ☐ Intermittent ☐ Ephemeral ☑		

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 10.0 ft
Top of Bank Height:
LB 5.0 ft RB 5.0 ft
Water Depth: 0.00 in
Water Width: 0.0 ft
Ordinary High Water Mark (Width): 1.0 ft
Ordinary High Water Mark (Height): 6.0 in
Flow Direction: East

Sinuosity ✓ Low ___ Medium ___ High

Gradient ___ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ✓ Severe (10 ft/100 ft)

Stream Erosion
___ None ✓ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✓ No

Within Roadside Ditch
___ Yes ✓ No

Culvert Present ✓ Yes ___ No
Culvert Material: Concrete
Culvert Size: 12 in

FLOW CHARACTERISTICS

Water Present
✓ No water, stream bed dry
___ Stream bed moist
___ Standing water
___ Flowing water

Velocity
___ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle % Run %
Pool %

Turbidity
___ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 0

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✓ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Photograph Page

Stream ID S5 Date 07/29/2021

Photograph Number 1

Photograph Direction East

Comments:

Photograph Number 2

Photograph Direction West

Comments:

Photograph Number 3

Photograph Direction _____

Comments:

Photograph Number 4

Photograph Direction _____

Comments:

STREAM ID S6	**STREAM NAME** UNT to Urbanna Creek		
CLIENT HRSD	**PROJECT NAME**		
LAT 37.609903 **LONG** -76.570838	**STATE** Virginia	**COUNTY** Middledex	
INVESTIGATORS Emily Foster, Kristen Walls		**DATE** 7/29/21	
WATER TYPE TNW ☐ RPW ☐ NRPW ☑	**FLOW REGIME** Perennial ☐ Intermittent ☐ Ephemeral ☑		

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 12 ft
Top of Bank Height:
LB 7 ft RB 7 ft
Water Depth: 0 in
Water Width: 0 ft
Ordinary High Water Mark (Width): 1 ft
Ordinary High Water Mark (Height): 12 in
Flow Direction: West

Sinuosity ✓ Low ___ Medium ___ High

Gradient ✓ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
___ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ___ No

Within Roadside Ditch
___ Yes ___ No

Culvert Present ___ Yes ___ No
Culvert Material:_____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
✓ No water, stream bed dry
___ Stream bed moist
___ Standing water
___ Flowing water

Velocity
___ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle % Run %
Pool %

Turbidity
___ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	5
Sand	0.06-2mm (gritty)	75
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	20

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
___ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Photograph Page

Stream ID S6 Date 7/29/21

Photograph Number 1

Photograph Direction East

Comments:

Photograph Number 2

Photograph Direction West

Comments:

Photograph Number 3

Photograph Direction _____

Comments:

Photograph Number 4

Photograph Direction _____

Comments:

STREAM ID S7		**STREAM NAME** UNT to North River	
CLIENT HRSD		**PROJECT NAME** Middlesex Interconnector Phase II	
LAT 37.454353	**LONG** -76.468993	**STATE** Virginia	**COUNTY** Gloucester
INVESTIGATORS K. Hoisington, D. Painter			**DATE** 09/03/2021
WATER TYPE TNW ☐ RPW ☐ NRPW ☐		**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3.0 ft
Top of Bank Height:
LB 2.0 ft RB 2.0 ft
Water Depth: 6.00 in
Water Width: 2.0 ft
Ordinary High Water Mark (Width): 4.0 ft
Ordinary High Water Mark (Height): 4.0 in
Flow Direction: Southeast

Sinuosity ✓ Low ___ Medium ___ High

Gradient ___ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
___ None ✓ Moderate ___ Heavy

Artificial, Modified or Channelized
✓ Yes ___ No

Within Roadside Ditch
___ Yes ✓ No

Culvert Present ___ Yes ___ No
Culvert Material: Concrete
Culvert Size: 24 in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✓ Flowing water

Velocity
___ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle % Run %
Pool 100 %

Turbidity
___ Clear ✓ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	10
Sand	0.06-2mm (gritty)	70
Silt	0.004-0.06 mm	20
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ✓ Residential
___ ROW ___ Other:

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✓ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Thirty-five feet downstream of culvert, lower bed with bank. Stream appears to go under the surface between S7 and S8.

Weak evidence crayfish burrows.

Flare completely separated from pipe.

Photograph Page

Stream ID S7 Date 09/03/2021

Photograph Number 1

Photograph Direction West

Comments:

Photograph Number 2

Photograph Direction East

Comments:

Photograph Number 3

Photograph Direction West

Comments:

Photograph Number 4

Photograph Direction

Comments:

STREAM ID S8		**STREAM NAME** UNT to North River	
CLIENT HRSD		**PROJECT NAME** Middlesex Interconnector Phase II	
LAT 37.453852	**LONG** -76.468088	**STATE** Virginia	**COUNTY** Gloucester
INVESTIGATORS K. Hoisington, D. Painter			**DATE** 09/03/2021
WATER TYPE TNW ☐ RPW ☐ NRPW ☑		**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☑	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3.0 ft
Top of Bank Height:
LB 3.0 ft RB 2.0 ft
Water Depth: 6.00 in
Water Width: 2.5 ft
Ordinary High Water Mark (Width): 1.0 ft
Ordinary High Water Mark (Height): 4.0 in
Flow Direction: Southeast

Sinuosity ___ Low ✓ Medium ___ High

Gradient ✓ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
___ None ✓ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✓ No

Within Roadside Ditch
___ Yes ✓ No

Culvert Present ___ Yes ✓ No
Culvert Material: _____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✓ Flowing water

Velocity
___ Fast ✓ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 0 % Run 75 %
Pool 25 %

Turbidity
✓ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	90
Silt	0.004-0.06 mm	10
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	5
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ✓ Residential
___ ROW ___ Other:

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✓ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Moderate presence of macroinvertebrates (dragonfly nymph).

Stream goes under the surface (upstream) between S7 and S8.

Photograph Page

Stream ID S8 Date 09/03/2021

Photograph Number 1

Photograph Direction East

Comments:

Photograph Number 2

Photograph Direction West

Comments:

Photograph Number 3

Photograph Direction _____

Comments:

Photograph Number 4

Photograph Direction _____

Comments:

STREAM ID S9		**STREAM NAME** UNT to North River	
CLIENT HRSD		**PROJECT NAME** Middlesex Interconnector Phase II	
LAT 37.454461	**LONG** -76.467861	**STATE** Virginia	**COUNTY** Gloucester
INVESTIGATORS K. Hoisington, D. Painter			**DATE** 09/03/2021
WATER TYPE TNW ☐ RPW ☑ NRPW ☐		**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 2.0 ft
Top of Bank Height:
LB 2.0 ft RB 2.0 ft
Water Depth: 7.00 in
Water Width: 2.0 ft
Ordinary High Water Mark (Width): 1.0 ft
Ordinary High Water Mark (Height): 1.0 in
Flow Direction: Southeast

Sinuosity ___ Low ___ Medium ✓ High

Gradient ✓ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
___ None ✓ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✓ No

Within Roadside Ditch
___ Yes ✓ No

Culvert Present ___ Yes ✓ No
Culvert Material: _____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✓ Flowing water

Velocity
___ Fast ✓ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 10 % Run 80 %
Pool 10 %

Turbidity
✓ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	90
Silt	0.004-0.06 mm	10
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ✓ Residential
___ ROW ___ Other:

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✓ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

A square concrete structure with shallow bottom is on a concrete platform in the stream. Possibly a "soakaway" once constructed to drain water away for garden or agricultural cultivation?

Many macroinvertebrates.

Iron oxidized bacteria.

Photograph Page

Stream ID S9 Date 09/03/2021

Photograph Number 1

Photograph Direction East

Comments:

Photograph Number 2

Photograph Direction West

Comments:

Photograph Number 3

Photograph Direction _____

Comments:

Photograph Number 4

Photograph Direction _____

Comments:

STREAM ID S10		**STREAM NAME** UNT to Perkins Creek	
CLIENT HRSD		**PROJECT NAME** Middlesex Interconnector Phase II	
LAT 37.639412	**LONG** -76.578079	**STATE** Virginia	**COUNTY** Middlesex
INVESTIGATORS K. Hoisington, D. Painter			**DATE** 09/03/2021
WATER TYPE TNW ☐ RPW ☑ NRPW ☐		**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 13.0 ft
Top of Bank Height:
LB 18.0 ft RB 12.0 ft
Water Depth: 10.00 in
Water Width: 5.0 ft
Ordinary High Water Mark (Width): 6.0 ft
Ordinary High Water Mark (Height): 4.0 in
Flow Direction: West

Sinuosity ___ Low ✓ Medium ___ High

Gradient ✓ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
___ None ✓ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✓ No

Within Roadside Ditch
___ Yes ✓ No

Culvert Present ✓ Yes ___ No
Culvert Material: Concrete
Culvert Size: 36 in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✓ Flowing water

Velocity
___ Fast ___ Moderate
✓ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 0 % Run 20 %
Pool 80 %

Turbidity
___ Clear ✓ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	100
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ✓ Residential
___ ROW ✓ Other: Recreational

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✓ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Oxidizing bacteria.

Site for the proposed Urbanna Pump Station.

Riprap placed atop concrete culvert.

Photograph Page

Stream ID S10 Date 09/03/2021

Photograph Number 1

Photograph Direction NW

Comments:

Photograph Number 2

Photograph Direction South

Comments:

Photograph Number 3

Photograph Direction _____

Comments:

Photograph Number 4

Photograph Direction _____

Comments:

APPENDIX B: USACE WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W1 PEM

Investigator(s): Emily Foster, James Cook Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.513581 Long: -76.420069 Datum: WGS84

Soil Map Unit Name: Eunola loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x	No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes x	No _____	
Wetland Hydrology Present?	Yes x	No _____	

Remarks:

Linear emergent drainage/PEM at north side of Piankatank. Could not access shoreline of south side of Piankatank due to steep cliff. Will have to use top of bank. No tidal wetlands present.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes x No _____ Depth (inches): 1

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? **Yes** x **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: W 1 PEM

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	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.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

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

Herb Stratum (Plot size:)			
1. Juncus effusus Soft rush	80	Yes	OBL
2. Poa pratensis Kentucky bluegrass	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

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

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

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

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	20	x 4 =	80
UPL species		x 5 =	
Column Totals:	100 (A)		160 (B)

Prevalence Index = B/A = 1.6

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: W 1 PEM

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/1	100					sepsis	high organic
3-18	10YR 4/2	98	10YR 5/6	2			sandy loam	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W1 PEM

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction _____

Comments:

Photograph Direction _____

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W1UP

Investigator(s): Emily Foster, James Cook Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): 5

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.507361 Long: -76.419958 Datum: WGS84

Soil Map Unit Name: Steep sandy land NWI classification: N/A

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W 1 UP

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	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.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

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

Herb Stratum (Plot size: 30)			
1. Poa pratensis Kentiucky bluegrass	80	Yes	FACU
2. Taraxacum officinale	10	Yes	FACU
3. Plantago lanceolata Narrowleaf plantain	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

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

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

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (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[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: W 1 - UP

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/3	100					sandy loam	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W1 - UP

Photograph Direction North

Comments:

Photograph Direction NW

Comments:

Photograph Direction _____

Comments:

Photograph Direction _____

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W2 UP

Investigator(s): Emily Foster, James Cook Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): 10

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.629293 Long: -76.571993 Datum: WGS84

Soil Map Unit Name: Emporia-Nevarc complex, 15 to 45 percent slopes NWI classification: N/a

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W 2 UP

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera Tulip Poplar	60	Yes	FACU
2. Acer rubrum Red maple	30	Yes	FAC
3. Platanus occidentalis Sycamore	4	No	FACW
4.			
5.			
6.			
7.			
8.			

____ = Total Cover

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

Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

____ = Total Cover

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

Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

____ = Total Cover

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

Woody Vine Stratum (Plot size: 30)			
1. Hedera helix English Ivy	6	No	FACU
2.			
3.			
4.			
5.			

6 = 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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	4	x 2 =	8
FAC species	30	x 3 =	90
FACU species	66	x 4 =	264
UPL species		x 5 =	
Column Totals:	100 (A)		362 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? **Yes** ____ **No** x

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

SOIL

Sampling Point: W 2 UP

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/4	100					very fine sand	
6-18	10YR 4/4	100					very fine sand	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W2 UP

Photograph Direction SE

Comments:

Photograph Direction SW

Comments:

Photograph Direction _____

Comments:

Photograph Direction _____

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W2 PEM

Investigator(s): Emily Foster, James Cook Section, Township, Range:

Landform (hillslope, terrace, etc.): Tidal shoreline Local relief (concave, convex, none): Convex Slope (%): 10

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.629363 Long: -76.571996 Datum: WGS84

Soil Map Unit Name: Emporia-Nevarc complex, 15 to 45 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	Yes x No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes x No _____ Depth (inches): 1

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes x No _____ Depth (inches): 0

Wetland Hydrology Present? Yes x No _____

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

Remarks:

Standing water with bacteria.

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

Sampling Point: W 2 PEM

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	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: 30)			
1. Baccharis halimifolia Eastern baccharis	25	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		

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

Herb Stratum (Plot size: 30)			
1. Phragmites australis Common reed	40	Yes	FACW
2. Peltandra virginica Green arrow arum	20	Yes	OBL
3. Impatiens capensis	15	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75 = Total Cover		

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

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

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	55	x 2 =	110
FAC species	25	x 3 =	75
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	100 (A)		205 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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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 x No _____

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

SOIL

Sampling Point: W 2 PEM

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 5/2	100					very fine sand	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W2 PEM

Photograph Direction East

Comments:

Photograph Direction SW

Comments:

Photograph Direction NE

Comments:

Photograph Direction

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W3 UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): 10

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.631204 Long: -76.57524 Datum: WGS84

Soil Map Unit Name: Suffolk-Remlik complex, 15 to 45 percent slopes NWI classification: N/A

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

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

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

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

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

Remarks:

Upland point associated with W3 & W4

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W 3 UP

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	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.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

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

Herb Stratum (Plot size: 30)			
1. Poa pratensis Kentucky bluegrass	75	Yes	FACU
2. Taraxacum officinale dandelion	15	No	FACU
3. Plantago lanceolata Narrow leaf plantain	10	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

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

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

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species 100	x 4 =	400
UPL species	x 5 =	
Column Totals: 100 (A)		400 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: W 3 UP

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/3	100						

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W3 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W3 PEM

Investigator(s): Emily Foster, James Cook Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): 10

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.631185 Long: -76.575514 Datum: WGS84

Soil Map Unit Name: Suffolk-Remlik complex, 15 to 45 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	Yes x No _____	

Remarks:

Emergent slope wetland abutting shoreline of the Piankatank River.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No x	Depth (inches): _____
Water Table Present?	Yes x	No _____	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes x	No _____	Depth (inches): 1

Wetland Hydrology Present? Yes x No _____

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

Remarks:

Small areas of ponded water.

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

Sampling Point: W 3 PEM

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	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.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

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

Herb Stratum (Plot size: 30)			
1. Juncus effusus Soft rush	25	Yes	OBL
2. Rumex verticillatus Swamp dock	15	Yes	FACW
3. Phragmites australis Common reed	20	Yes	FACW
4. Carex lurida Shallow sedge	20	Yes	OBL
5. Ludwigia alterniflora Seedbox	20	No	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

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

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

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

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	65	x 1 =	65
FACW species	35	x 2 =	70
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	100 (A)		135 (B)

Prevalence Index = B/A = 1.35

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: W 3 PEM

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					mucky mineral	High organics
2-18	10YR 4/2	100					coarse sand	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W3 PEM

Photograph Direction South

Comments:

Photograph Direction North

Comments:

Photograph Direction _____

Comments:

Photograph Direction _____

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W4

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 10

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.50735900 Long: -76.41996283 Datum: WGS84

Soil Map Unit Name: Suffolk-Remlik complex, 15 to 45 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	Yes x No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No x Depth (inches): _____

Water Table Present? Yes _____ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes x No _____ Depth (inches): 1

Wetland Hydrology Present? Yes X No _____

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

Remarks:

Thick dark surface.

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

Sampling Point: W 4

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	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: 30)			
1. Baccharis halimifolia Eastern baccharis	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		

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

Herb Stratum (Plot size: 30)			
1. Phragmites australis Common reed	70	Yes	FACW
2. Solidago sempervirens Seaside goldenrod	5	No	FACW
3. Hibiscus grandifolia Swamp rosemallow	5	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		

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

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

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

x 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: W 4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	100					muck	High organic with coarse sand or thick dark surface

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W4

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Mathews Sampling Date: 7/9/2021

Applicant/Owner: HRSD State: VA Sampling Point: W5

Investigator(s): Emily Foster, James Cook Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 5-10

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.503319 Long: -76.417549 Datum: WGS84

Soil Map Unit Name: Steep sandy land NWI classification: PFO1A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x	No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x	No _____	
Wetland Hydrology Present?	Yes x	No _____	

Remarks:

Floodplain PFO adjacent to stream S3. Natural valley. Wetland/stream system does not continue North on the other side of Twiggs Ferry Road.

Observed Classifications:

Cowardin: PFO

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- x FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes x No _____

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

Remarks:

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

Sampling Point: W5

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum, Red Maple	40	Yes	FAC
2. Carpinus caroliniana, American Hornbeam	25	Yes	FAC
3.			
4.			
5.			
6.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		

Sapling Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)			
1. Woodwardia areolata, Netted Chain Fern	30	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	0	x 2 =	0
FAC species	65	x 3 =	195
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		225 (B)

Prevalence Index = B/A = 2.37

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No __

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

SOIL

Sampling Point: W5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5yr 2.5/1	100%					Sand	mucky modified
4-12	7.5yr 6/2	100%					Loamy sand	
12-20	7.5yr 6/2	100%					Sand	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks:

Photograph Log

Date: 7/9/21

Feature Name: W5

Photograph Direction West

Comments:

Photograph Direction North

Comments:

Photograph Direction East

Comments:

Photograph Direction South

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Mathews Sampling Date: 7/9/2021

Applicant/Owner: HRSD State: VA Sampling Point: W5-UP

Investigator(s): Emily Foster, James Cook Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 50

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.503372 Long: -76.417562 Datum: WGS84

Soil Map Unit Name: Steep sandy land NWI classification: N/A

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

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

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

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

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

Remarks:

Observed Classifications:

Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W5-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus alba, Northern White Oak	60	x	FACU
2. Fagus grandifolia, American Beech	30	x	FACU
3.			
4.			
5.			
6.			
	90	= Total Cover	
50% of total cover: 45	20% of total cover: 18		

Sapling Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0	= Total Cover	
50% of total cover: 0	20% of total cover: 0		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals:	90 (A)		360 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ___ No x

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

SOIL

Sampling Point: W5-UP

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10yr 3/4	100%					Sandy loam	
6-12	10yr 4/6	100%					Sandy loam	
12-20	10yr 6/6	100%					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No x

Remarks:

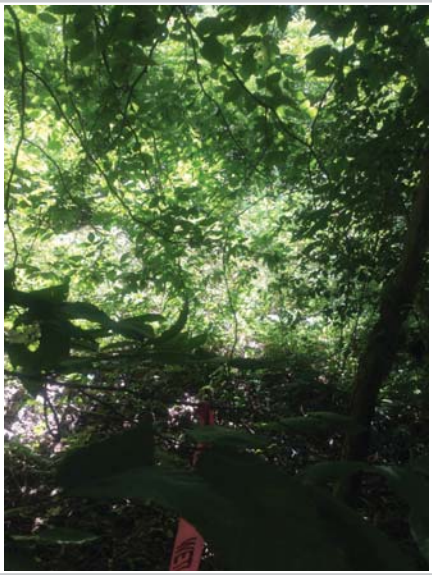
Photograph Log

Date: 7/9/21

Feature Name: W 5 - UP

Photograph Direction North

Comments:



Photograph Direction East

Comments:

Photograph Direction South

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W6

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope (%): 5-25

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.521623 Long: -76.423043 Datum: WGS84

Soil Map Unit Name: Kempsville sandy loam, 2 to 6 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	Yes x No _____	

Remarks:

PEM adjacent to Twiggs Ferry Road.

Observed Classifications:

Cowardin: _____

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- x Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- x FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No x	Depth (inches): _____
Water Table Present?	Yes _____	No x	Depth (inches): 18
Saturation Present? (includes capillary fringe)	Yes _____	No x	Depth (inches): 15

Wetland Hydrology Present? Yes x No _____

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

Remarks:

Saturation at 15, water table at 18.

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

Sampling Point: W6

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 30 ft)			
1. Rubus pensilvanicus, Pennsylvania Blackberry	5	Yes	FAC
2. Acer rubrum, Red Maple	2	Yes	FAC
3. Morella cerifera, Southern Bayberry	2	Yes	FAC
4.			
5.			
6.			
	9 = Total Cover		
50% of total cover: 4.5	20% of total cover: 1.8		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Woodwardia areolata, Netted Chain Fern	60	Yes	OBL
2. Juncus effusus, Lamp Rush	12	No	OBL
3. Parathelypteris noveboracensis, New York Fern	10	No	FAC
4. Osmundastrum cinnamomeum, Cinnamon Fern	3	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	72	x 1 =	72
FACW species	3	x 2 =	6
FAC species	19	x 3 =	57
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	94 (A)		135 (B)

Prevalence Index = B/A = 1.44

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No __

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

SOIL

Sampling Point: W6

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	10yr 2/1	100%						< 70% soil particles masked
11-18	5y 6/1	60%	10yr 7/8	40%	C	M	Sandy clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks:

Photograph Log

Date: 7/14/21

Feature Name: W6

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction West

Comments:

Photograph Direction East

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W6-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 20-40

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.521394 Long: -76.422937 Datum: WGS84

Soil Map Unit Name: Kempsville sandy loam, 2 to 6 percent slopes NWI classification:

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

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

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

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

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

Remarks:

Upland adjacent to Twiggs Ferry Rd., upslope frpm W6 (PEM)

Observed Classifications:

Cowardin: uplands

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W6-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera, Tuliptree	50	Yes	FACU
2. Ilex opaca, American Holly	35	Yes	FAC
3.			
4.			
5.			
6.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		
Sapling Stratum (Plot size: 30 ft)			
1. Quercus alba, Northern White Oak	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Woody Vine Stratum (Plot size: 30 ft)			
1. Smilax rotundifolia, Horsebrier	30	Yes	FAC
2. Campsis radicans, Trumpet-Creeper	5	No	FAC
3. Parthenocissus quinquefolia, Virginia-Creeper	5	No	FACU
4.			
5.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	130 (A)		450 (B)

Prevalence Index = B/A = 3.46

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ___ No x

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

SOIL

Sampling Point: W6-UP

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10yr 4/3	100%					Sandy loam	
12-18	2.5y 7/6	100%					Sand	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No x

Remarks:

Photograph Log

Date: _____

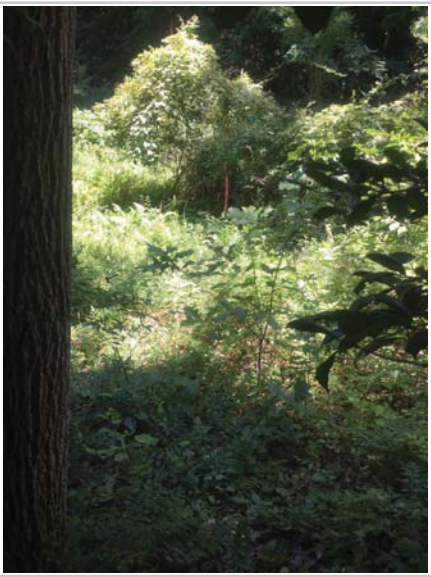
Feature Name:

Photograph Direction North

Comments:

Photograph Direction South

Comments:



Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W7

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope (%): 10-45

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.503972 Long: -76.418445 Datum: WGS84

Soil Map Unit Name: Steep sandy land NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x	No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x	No _____	
Wetland Hydrology Present?	Yes x	No _____	

Remarks:
PFO adjacent to Tigs Ferry Rd

Observed Classifications:
Cowardin: PFO

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- x FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes x No _____

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

Remarks:

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

Sampling Point: W7

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica, Black Tupelo	35	Yes	FAC
2. Ilex opaca, American Holly	30	Yes	FAC
3.			
4.			
5.			
6.			
	65	= Total Cover	
50% of total cover: 32.5	20% of total cover: 13		
Sapling Stratum (Plot size: 30 ft)			
1. Carpinus caroliniana, American Hornbeam	15	Yes	FAC
2. Acer rubrum, Red Maple	5	Yes	FAC
3. Magnolia virginiana, Sweet-Bay	5	Yes	FACW
4.			
5.			
6.			
	25	= Total Cover	
50% of total cover: 12.5	20% of total cover: 5		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Woodwardia areolata, Netted Chain Fern	30	Yes	OBL
2. Saururus cernuus, Lizard's-Tail	15	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	45	= Total Cover	
50% of total cover: 22.5	20% of total cover: 9		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	5	x 2 =	10
FAC species	85	x 3 =	255
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	135 (A)		310 (B)

Prevalence Index = B/A = 2.30

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No __

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

SOIL

Sampling Point: W7

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10yr 2/2	100%					Sand	< 70% soil particles masked
6-18	7.5yr 4/2	100%					Sand	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No _____

Remarks:

hMucky sand top 2-3 inches.

Photograph Log

Date: 7/14/21

Feature Name: W 7

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Mathews Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W7-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 25-50

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.503938 Long: -76.418407 Datum: WGS84

Soil Map Unit Name: Steep sandy land NWI classification: N/A

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

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

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

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

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

Remarks:

Observed Classifications:

Cowardin: Upland

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W7-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya glabra, Pignut Hickory	40	Yes	FACU
2. Ilex opaca, American Holly	30	Yes	FAC
3.			
4.			
5.			
6.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Sapling Stratum (Plot size: 30 ft)			
1. Ilex opaca, American Holly	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	80 (A)		280 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ___ No X

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

SOIL

Sampling Point: W7-UP

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5yr 3/2	100%					Sand	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No x

Remarks:

Photograph Log

Date: 7/14/21

Feature Name: W7-UP

Photograph Direction West

Comments:

Photograph Direction East

Comments:

Photograph Direction North

Comments:

Photograph Direction South

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W8

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-10

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.5299071 Long: -76.4217679 Datum: WGS84

Soil Map Unit Name: Suffolk-Remlik complex, 15 to 45 percent slopes NWI classification: N/A

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

Are Vegetation x, Soil x, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	Yes x No _____	

Remarks:

Sparsely vegetated concave surface upslope from very large box culvert. Drainage patterns. Disturbed roadside area.

Observed Classifications:

Cowardin: PEM

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- x Sparsely Vegetated Concave Surface (B8)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- x Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes x No _____

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

Remarks:

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

Sampling Point: W8

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Celtis occidentalis, Common Hackberry	8	Yes	FACU
2. Ligustrum sinense, Chinese Privet	5	Yes	FAC
3.			
4.			
5.			
6.			
	13 = Total Cover		
50% of total cover: 6.5	20% of total cover: 2.6		

Sapling Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)			
1. Microstegium vimineum, Japanese Stilt Grass	3	Yes	FAC
2. Pilea pumila, Canadian Clearweed	2	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	2	x 2 =	4
FAC species	8	x 3 =	24
FACU species	8	x 4 =	32
UPL species	0	x 5 =	0
Column Totals:	18 (A)		60 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

x 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: W8

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5yr 4/2	95%	7.5yr 3/4	5%	C	PL	loamy clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks:

Photograph Log

Date: 7/14/21

Feature Name: W 8

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W8-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 10-30

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.5299789 Long: -76.4217398 Datum: WGS84

Soil Map Unit Name: Suffolk-Remlik complex, 15 to 45 percent slopes NWI classification: N/A

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 x No _____

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

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

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

Remarks:

Hillsde upslope from sparsely vegetated concave W8.

Observed Classifications:

Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W8-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense, Chinese Privet	30	Yes	FAC
2. Celtis occidentalis, Common Hackberry	25	Yes	FACU
3.			
4.			
5.			
6.			
	55 = Total Cover		
50% of total cover: 27.5	20% of total cover: 11		

Sapling Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)			
1. Ligustrum sinense, Chinese Privet	15	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

Woody Vine Stratum (Plot size: 30 ft)			
1. Vitis aestivalis, Summer Grape	35	Yes	FACU
2.			
3.			
4.			
5.			
	35 = Total Cover		
50% of total cover: 17.5	20% of total cover: 7		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	105 (A)		375 (B)

Prevalence Index = B/A = 3.57

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ___ No x

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

SOIL

Sampling Point: W8-UP

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10yr 3/3	100%					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No x

Remarks:

Photograph Log

Date: 7/14/21

Feature Name: W 8 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W9

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.540568 Long: -76.432867 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 0 to 2 percent slopes NWI classification: N/A

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

Are Vegetation x, Soil x, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes x	No _____	
Wetland Hydrology Present?	Yes x	No _____	

Remarks:

Disturbed roadside PEM in mowed powerline easement.

Observed Classifications:

Cowardin: PEM

HYDROLOGY

Wetland Hydrology Indicators:

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

- x Surface Water (A1)
- ___ High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes x No _____

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

Remarks:

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

Sampling Point: W9

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Murdanna keisak, Wart-Removing Herb	45	Yes	OBL
2. Phalaris arundinacea, Reed Canary Grass	15	Yes	OBL
3. Juncus effusus, Lamp rush	15	Yes	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75 = Total Cover		
50% of total cover: 37.5	20% of total cover: 15		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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: 100.0% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

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

Mowed veg. some species unidentifiable

SOIL

Sampling Point: W9

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10yr 2/2	100%					Muck	< 70% soil particles masked
1-18	10yr 5/2	80%	10yr 5/8	20%	C	PL	Sandy clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No _____

Remarks:

0-1" muck

Photograph Log

Date: 7/14/21

Feature Name: W9

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W9-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.540627 Long: -76.432808 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 0 to 2 percent slopes NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No x
Hydric Soil Present?	Yes _____	No x	
Wetland Hydrology Present?	Yes _____	No x	

Remarks:

Observed Classifications:

Cowardin: Upland

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W9-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus taeda, Loblolly Pine	35	Yes	FAC
2. Acer rubrum, Red Maple	20	Yes	FAC
3. Quercus rubra, Northern Red Oak	15	Yes	FACU
4.			
5.			
6.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Sapling Stratum (Plot size: 30 ft)			
1. Juniperus virginiana, Eastern Red-Cedar	14	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	14 = Total Cover		
50% of total cover: 7	20% of total cover: 2.8		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Woody Vine Stratum (Plot size: 30 ft)			
1. Campsis radicans, Trumpet-Creeper	12	Yes	FAC
2. Rubus pensilvanicus, Pennsylvania Blackberry	10	Yes	FAC
3.			
4.			
5.			
	22 = Total Cover		
50% of total cover: 11	20% of total cover: 4.4		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	77	x 3 =	231
FACU species	29	x 4 =	116
UPL species	0	x 5 =	0
Column Totals:	106 (A)		347 (B)

Prevalence Index = B/A = 3.27

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

x 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: W9-UP

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10yr 5/4	100%					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No x

Remarks:

Photograph Log

Date: 7/14/21

Feature Name: W 9 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W10-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 5-15

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.554113 Long: -76.451894 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: Upland

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

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

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

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

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

Remarks:
Upslope from W10

Observed Classifications:
Cowardin: uplands

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W10-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum, Red Maple	65	Yes	FAC
2. Magnolia virginiana, Sweet-Bay	5	No	FACW
3.			
4.			
5.			
6.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Sapling Stratum (Plot size: 30 ft)			
1. Juniperus virginiana, Eastern Red-Cedar	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Quercus alba, Northern White Oak	5	Yes	FACU
2. Vitis aestivalis, Summer Grape	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Woody Vine Stratum (Plot size: 30 ft)			
1. Smilax rotundifolia, Horsebrier	10	Yes	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	75	x 3 =	225
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	100 (A)		315 (B)

Prevalence Index = B/A = 3.15

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ___ No x

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

SOIL

Sampling Point: W10-UP

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10yr 4/3	100%					Sandy loam	
12-18	10yr 6/6	100%					Loamy sand	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No x

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W 10 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W10

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.554191 Long: -76.451741 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: N/A

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

Are Vegetation x, Soil x, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x	No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x	No _____	
Wetland Hydrology Present?	Yes x	No _____	

Remarks:

Small disturbed depression adjacent to General Puller Ave. Filled wirh invasive privet. Narrow linear area with ponding water, but poorly defined bed and bank. Water ends directly outside of survey area to the south. Marginal wetland indicators visible to the south, feature likely continues south to Scroggins Creeks.

Observed Classifications:

Cowardin: PFO

HYDROLOGY

Wetland Hydrology Indicators:

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

- x Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes x No _____ Depth (inches): 2

Water Table Present? Yes _____ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): 17

Wetland Hydrology Present? Yes x No _____

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

Remarks:

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

Sampling Point: W10

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum, Red Maple	35	Yes	FAC
2. Ligustrum sinense, Chinese Privet	20	Yes	FAC
3. Liriodendron tulipifera, Tuliptree	5	No	FACU
4.			
5.			
6.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		
Sapling Stratum (Plot size: 30 ft)			
1. Ligustrum sinense, Chinese Privet	25	Yes	FAC
2. Liquidambar styraciflua, Sweet-Gum	15	Yes	FAC
3.			
4.			
5.			
6.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Saururus cernuus, Lizard's-Tail	5	Yes	OBL
2. Woodwardia areolata, Netted Chain Fern	5	Yes	OBL
3. Campsis radicans, Trumpet-Creeper	5	Yes	FAC
4. Toxicodendron radicans, Eastern Poison Ivy	5	Yes	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

x 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: W10

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5yr 4/2	80%	10yr 5/6	20%	C	PL	Sandy clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W 10

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W11

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 0-25

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.554596 Long: -76.454609 Datum: WGS84

Soil Map Unit Name: Emporia-Nevarc complex, 15 to 45 percent slopes NWI classification: N/A

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

Are Vegetation x, Soil x, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	Yes x No _____	

Remarks:

Emergent and scrubby vegetation alongside ditch, which likely becomes a stream downslope outside of suvey area. Cannot access ditch bottom due to impenetrably dense vegetation.

Observed Classifications:

Cowardin: PSS

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- x Crayfish Burrows (C8)
- x 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 x	Depth (inches): _____
Water Table Present?	Yes _____	No x	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes x	No _____	Depth (inches): 12

Wetland Hydrology Present? Yes x No _____

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

Remarks:

Drainage/stream headwaters visible downslope, cant penetrate vegetation and very steep slope prohibits access

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

Sampling Point: W11

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 30 ft)			
1. Ligustrum sinense, Chinese Privet	30	Yes	FAC
2. Rubus pensilvanicus, Pennsylvania Blackberry	20	Yes	FAC
3. Salix nigra, Black Willow	20	Yes	OBL
4.			
5.			
6.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Verbesina alternifolia, Wingstem	25	Yes	FAC
2. Salix nigra, Black Willow	10	Yes	OBL
3. Sorghum halepense, Johnson Grass	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		
Woody Vine Stratum (Plot size: 30 ft)			
1. Campsis radicans, Trumpet-Creeper	20	Yes	FAC
2. Vitis aestivalis, Summer Grape	5	Yes	FACU
3.			
4.			
5.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	0	x 2 =	0
FAC species	95	x 3 =	285
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	140 (A)		375 (B)

Prevalence Index = B/A = 2.68

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

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

SOIL

Sampling Point: W11

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10yr 4/2	90%	7.5yr 5/6	10%			Sandy clay	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W 11

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W11-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Interstream divide Local relief (concave, convex, none): None Slope (%): 5-15

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.554574 Long: -76.454985 Datum: WGS84

Soil Map Unit Name: Emporia loam, 2 to 6 percent slopes NWI classification:

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

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

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

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

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

Remarks:
Slope adjacent to W11. abuts General Puller Blvd.

Observed Classifications:
Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W11-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus resinosa, Red Pine	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		
Sapling Stratum (Plot size: 30 ft)			
1. Juniperus virginiana, Eastern Red-Cedar	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Poa pratensis, Kentucky Blue Grass	50	Yes	FACU
2. Plantago lanceolata, English Plantain	15	No	FACU
3. Liquidambar styraciflua, Sweet-Gum	10	No	FAC
4. Trifolium pratense, Red Clover	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Woody Vine Stratum (Plot size: 30 ft)			
1. Toxicodendron radicans, Eastern Poison Ivy	10	Yes	FAC
2. Lonicera japonica, Japanese Honeysuckle	10	Yes	FACU
3.			
4.			
5.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species		x 4 =	
UPL species	0	x 5 =	0
Column Totals:	(A)		(B)

Prevalence Index = B/A = 0.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ____ No x

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

SOIL

Sampling Point: W11-UP

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5y 5/4	100%					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No x

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W 11 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W12

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.563021 Long: -76.471869 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: N/A

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

Are Vegetation x, Soil x, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x	No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x	No _____	
Wetland Hydrology Present?	Yes x	No _____	

Remarks:
Likely hydrologically isolated PEM adjacent to soybean field and General Puller Blvd. Appears regularly mowed, some ponding.

Observed Classifications:
Cowardin: PEM

HYDROLOGY

Wetland Hydrology Indicators:

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

- x Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- x Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- x Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- x FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes x	No _____	Depth (inches): 1-2
Water Table Present?	Yes _____	No x	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No x	Depth (inches): _____

Wetland Hydrology Present? Yes x No _____

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

Remarks:
Tadpoles observed.

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

Sampling Point: W12

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Eleocharis obtusa, Blunt Spike-Rush	30	Yes	OBL
2. Murdannia keisak, Wart-Removing-Herb	30	Yes	OBL
3. Echinochloa crus-galli, Large Barnyard Grass	25	Yes	FACW
4. Carex vulpinoidea, Common Fox Sedge	15	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	40	x 2 =	80
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		140 (B)

Prevalence Index = B/A = 1.40

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: W12

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10yr 4/2	85%	7.5yr 5/6	15%	C	PL	Sandy clay	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W12

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W12-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 5-15

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.56296 Long: -76.471939 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification:

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

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

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

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

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

Remarks:
Mowed uplands

Observed Classifications:
Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W12-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Poa pratensis, Kentucky Blue Grass	35	Yes	FACU
2. Trifolium repens, White Clover	35	Yes	FACU
3. Plantago lanceolata, English Plantain	30	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ___ No x

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

SOIL

Sampling Point: W12-UP

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10yr 4/4	100%					Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No x

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W 12 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/29/2021

Applicant/Owner: HRSD State: VA Sampling Point: W13

Investigator(s): Emily Foster, Kristen Walls Section, Township, Range:

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.56608 Long: -76.474214 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: N/A

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

Are Vegetation x, Soil x, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x	No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x	No _____	
Wetland Hydrology Present?	Yes x	No _____	

Remarks:
Roadside depression adjacent to ag. Field.

Observed Classifications:
Cowardin: PEM

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- x 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)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- x Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes x No _____

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

Remarks:

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

Sampling Point: W13

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Murdannia keisak, Wart-Removing-Herb	30	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	30 (A)		30 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

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

vegetation frequently mowed and unidentifiable

SOIL

Sampling Point: W13

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5y 3/2	100%					Muck	< 70% soil particles masked
3-6	2.5y 5/2	70%	7.5yr 5/6	30%	C	PL	Sandy clay	
6-18	2.5y 5/2	50%	10yr 5/6	50%	C	M	Clay	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No _____

Remarks:

Photograph Log

Date: 7/29/21

Feature Name: W13

Photograph Direction West

Comments:

Photograph Direction East

Comments:

Photograph Direction South

Comments:

Photograph Direction North

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/29/2021

Applicant/Owner: HRSD State: VA Sampling Point: W13-up

Investigator(s): Emily Foster, Kristen Walls Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.566157 Long: -76.474355 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification:

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

Are Vegetation x, Soil x, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No x
Hydric Soil Present?	Yes _____	No x	
Wetland Hydrology Present?	Yes _____	No x	

Remarks:
soybean field adacent to road

Observed Classifications:
Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W13-up

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua, Sweet-Gum	25	✓	FAC
2. Pinus taeda, Loblolly Pine	20	✓	FAC
3.			
4.			
5.			
6.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		
Sapling Stratum (Plot size: 30 ft)			
1. Juniperus virginiana, Eastern Red-Cedar	10	✓	FACU
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. soybean			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 67.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	55 (A)		175 (B)

Prevalence Index = B/A = 3.18

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

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

SOIL

Sampling Point: W13-up

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10yr 4/4	100%					Sandy loam	
5-10	7.5yr 4/4	100%					Sandy loam	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** x

Remarks:

Photograph Log

Date: 7/29/21

Feature Name: W13-UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction West

Comments:

Photograph Direction East

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/29/2021

Applicant/Owner: HRSD State: VA Sampling Point: W14

Investigator(s): Emily Foster, Kristen Walls Section, Township, Range:

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope (%): 0-15

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.579991 Long: -76.486446 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification:

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

Are Vegetation x, Soil x, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x No _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	Yes x No _____	

Remarks:

Excavated drainage ditch with dense hydric vegetation draining southest.

Observed Classifications:

Cowardin: PEM

HYDROLOGY

Wetland Hydrology Indicators:

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

- x Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes x No _____

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

Remarks:

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

Sampling Point: W14

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Typha latifolia, Broad-Leaf Cat-Tail	50	yes	OBL
2. Dichanthelium clandestinum, Deer-Tongue Rosette G	15	yes	FACW
3. Microstegium vimineum, Japanese Stilt Grass	20	yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	15	x 2 =	30
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	85 (A)		140 (B)

Prevalence Index = B/A = 1.65

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

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

SOIL

Sampling Point: W14

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5y 4/2	70%	5yr 5/6	30%	C	PL	Clay	
12-18	2.5y 6/1	70%	5yr 5/6	30%	C		Clay	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes __x__ No _____

Remarks:

Photograph Log

Date: 7/29/21

Feature Name: W14

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/29/2021

Applicant/Owner: HRSD State: VA Sampling Point: W14-UP

Investigator(s): Emily Foster, Kristen Walls Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 5-10

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.580091 Long: -76.48655 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification:

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 x	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No x
Hydric Soil Present?	Yes _____	No x	
Wetland Hydrology Present?	Yes _____	No x	

Remarks:

Observed Classifications:

Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

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

Sampling Point: W14-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum, Red Maple	40	Yes	FAC
2. Pinus taeda, Loblolly Pine	25	Yes	FAC
3. Quercus alba, Northern White Oak	20	Yes	FACU
4.			
5.			
6.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		
Sapling Stratum (Plot size: 30 ft)			
1. Vaccinium formosum, Southern Blueberry	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Woody Vine Stratum (Plot size: 30 ft)			
1. Smilax rotundifolia, Horsebrier	15	Yes	FAC
2.			
3.			
4.			
5.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

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: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	110 (A)		350 (B)

Prevalence Index = B/A = 3.18

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: W14-UP

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	10yr 3/2	100%					Loam	
15-18	10yr 4/4						Sandy loam	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No x

Remarks:

Photograph Log

Date: 7/29/21

Feature Name: W14

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction West

Comments:

Photograph Direction East

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Beaverdam Pump Station City/County: Gloucester Sampling Date: 09/03/2021

Applicant/Owner: HRSD State: VA Sampling Point: **W15-UP**

Investigator(s): K. Hoisington, D. Painter Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 20

Subregion (LRR or MLRA): LRRT Lat: 37.454388 Long: -76.468539 Datum: NAD 83

Soil Map Unit Name: Lumbee sandy loam 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 ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks: Cowardin Code: Upland HGM: Water Type:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (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? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: **W15-UP**

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	70	✓	FAC
2. *Liquidambar styraciflua*	5		
3.			
4.			
5.			
6.			
7.			
8.			
	75	= Total Cover	
50% of total cover: 37.5	20% of total cover: 15.0		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Asimina triloba*	5	✓	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5	= Total Cover	
50% of total cover: 2.5	20% of total cover: 1.0		
Herb Stratum (Plot size: 5)			
1. *Ligustrum sinense*	5	✓	FACU
2. *Vaccinium corymbosum*	5	✓	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10	= Total Cover	
50% of total cover: 5.0	20% of total cover: 2.0		
Woody Vine Stratum (Plot size: 15)			
1. *Smilax rotundifolia*	5	✓	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
50% of total cover: 2.5	20% of total cover: 1.0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	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[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✓ No ___

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

SOIL

Sampling Point: **W15-UP**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/3	100						sandy loam
6-12	7.5YR 3/3	80	10YR 3/3	20				sandy loam
12-18	7.5YR 3/3	80	10YR 3/3	20				sandy loam

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

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

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

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

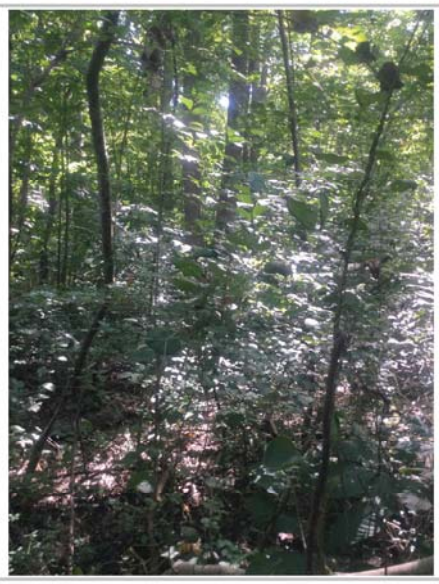
Photograph Log

Date: 9/3/21

Photograph Number _____

Photograph Direction North

Comments:



Photograph Number _____

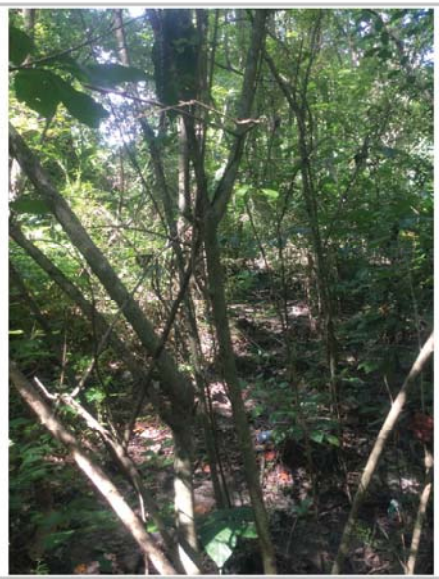
Photograph Direction East

Comments:

Photograph Number _____

Photograph Direction South

Comments:



Photograph Number _____

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 9/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W15

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR or MLRA): MLRA 1538 of LRR T Lat: 37.454564 Long: -76.468726 Datum: WGS84

Soil Map Unit Name: Lumbee sandy loam NWI classification: PFO1Ed

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (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): 18
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 15

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: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	60	Y	FAC
2. Liquidambar styraciflua	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		

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

Sapling/Shrub Stratum (Plot size: _____)			
1. Ilex opaca	10	Y	FAC
2. Lindera benzoin	10	Y	FACW
3. Liriodendron tulipifera	2		FACU
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		

50% of total cover: 11 20% of total cover: 4

Herb Stratum (Plot size: _____)			
1. Osmundastrum cinnamomeum	30	Y	FACW
2. Woodwardia virginica	60	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	_____ = Total Cover		

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

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

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	40	x 2 =	80
FAC species	90	x 3 =	270
FACU species	2	x 4 =	8
UPL species		x 5 =	
Column Totals:	192 (A)		418 (B)

Prevalence Index = B/A = 2.18

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✓ No _____

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

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 3/2	100					Loam	High organics
2-12	10 YR 4/2	100					ClLo	
12-18	10 YR 5/1	98	10YR 6/6	2	C	M	SaCl	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Photograph Log

Date: 9/15/21

Feature Name: W15

Photograph Direction North

Comments:

Photograph Direction East

Comments:

Photograph Direction South

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 9/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W16

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR or MLRA): MLRA 1538 of LRR T Lat: 37.584816 Long: -76.490421 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: N/A

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (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): 12
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Sampling Point: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	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. Liquidambar styraciflua	5	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		

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

Herb Stratum (Plot size: _____)			
1. Mikania scandens	95	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		

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

Woody Vine Stratum (Plot size: _____)			
1. Smilax rotundifolia	5	Y	FAC
2.			
3.			
4.			
5.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x 1 =	_____
FACW species	95	x 2 =	190
FAC species	10	x 3 =	30
FACU species	_____	x 4 =	_____
UPL species	_____	x 5 =	_____
Column Totals:	105 (A)		220 (B)

Prevalence Index = B/A = 2.09

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	10 YR 5/2	90	10 YR 5/8	10			Cl	
15-18	10 YR 5/2	70	10 YR 5/8	30			SaCl	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Photograph Log

Date: 9/14/21

Photograph Number _____

Photograph Direction North

Comments:

Photograph Number _____

Photograph Direction East

Comments:

Photograph Number _____

Photograph Direction South

Comments:

Photograph Number _____

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 9/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W16-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR or MLRA): MLRA 1538 of LRR T Lat: 37.584784 Long: -76.490324 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification:

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 X	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)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (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? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: W16-UP

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus taeda	50	Y	FAC
2. Acer rubrum	10	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	60	= Total Cover	

50% of total cover: 30 20% of total cover: 12

Sapling/Shrub Stratum (Plot size:)			
1. Liquidambar styraciflua	5	N	FAC
2. Acer rubrum	5	N	FAC
3. Ligustrum sinense	10	N	FAC
4. Liriodendron tulipifera	5	N	FACU
5. Phyllostachys aurea	60	Y	ND
6.			
7.			
8.			
	85	= Total Cover	

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

Herb Stratum (Plot size:)			
1. Toxicodendron radicans	10	Y	FAC
2. Microstegium vimineum	15	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	25	= Total Cover	

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

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

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: W16-UP

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 3/2	100					CLo	
6-18	10 YR 3/2	50	10 YR 5/8	50			SaCl	Disturbed soil w/ mixed layer dual matrix

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Photograph Log

Date: 9/14/21

Photograph Number _____

Photograph Direction North

Comments:

Photograph Number _____

Photograph Direction East

Comments:

Photograph Number _____

Photograph Direction South

Comments:

Photograph Number _____

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: GSA1-1-UP

Investigator(s): Emily Foster Section, Township, Range:

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): linear Slope (%): 0-5

Subregion (LRR or MLRA): Lat: 37.447841 Long: -76.472296 Datum: NAD83

Soil Map Unit Name: Meggett sandy loam NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: Upland HGM: Water Type:

Forested uplands adjacent to GSA1-1-WET.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (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? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

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

Remarks:

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

Sampling Point: **GSA1-1-UP**

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	40	✓	FAC
2. *Platanus occidentalis*	20	✓	FACW
3. *Acer negundo*	5		FAC
4. *Oxydendron arboreum*	5		FACU
5.			
6.			
7.			
8.			
	70	= Total Cover	
50% of total cover: 35.0	20% of total cover: 14.0		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Ligustrum sinense*	5	✓	FAC
2. *Acer rubrum*	5	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	10	= Total Cover	
50% of total cover: 5.0	20% of total cover: 2.0		
Herb Stratum (Plot size: 5)			
1. *Lonicera japonica*	10	✓	FACU
2. *Glechoma hederacea*	5	✓	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	= Total Cover	
50% of total cover: 7.5	20% of total cover: 3.0		
Woody Vine Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	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[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✓ No ___

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

SOIL

Sampling Point: **GSA1-1-UP**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					LoCl	
6-12	10YR 4/1	98	10YR 3/3	2	C	M/PL	Cl	
12-18	10YR 4/1	90	10YR 5/6	10	C	M/PL	Cl	

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

[2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Transitional zone soils, technically meets F3 here, but no hydrology indicators present. Loses F3 indicator immediately upslope.

Photograph Log

Date: 1/12/22

Photograph Number _____

Photograph Direction North

Comments:

Photograph Number _____

Photograph Direction East

Comments:

Photograph Number _____

Photograph Direction South

Comments:

Photograph Number _____

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: **GSA1-1-WET**

Investigator(s): Emily Foster Section, Township, Range:

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): linear Slope (%): 0-5

Subregion (LRR or MLRA): Lat: 37.447841 Long: -76.472188 Datum: NAD83

Soil Map Unit Name: Meggett sandy loam NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: PUB HGM: Water Type:

Linear abandoned agricultural drainage ditch, adjacent to GSA1-2-PSS, with very narrow strip up upland between the two features. No observable flow, ~6-12" of ponded water, approximately 6' wide.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (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): 9
Water Table Present?	Yes ✓	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ____

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

Remarks:

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

Sampling Point: **GSA1-1-WET**

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	10	✓	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
50% of total cover: 5.0	20% of total cover: 2.0		
Herb Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		
Woody Vine Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	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[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✓ No ___

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

Very little vegetation rooted in the abandoned agriculture ditch. Filled with standing water and leaves.

SOIL

Sampling Point: GSA1-1-WET

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					ClLo	
6-12	10YR 2/1	100					ClLo	
12-18	10YR 2/1	60					ClLo	
12-18	10YR 4/1	40			D	M	Sa	Depleted sand inclusions

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Slight hydrogen sulfide odor. Depleted sand inclusions starting at 12". Closest additional indicator matches A11, assuming soil contains 60% depleted sand below 18".

Photograph Log

Date: 1/12/22

Photograph Number _____

Photograph Direction North

Comments:

Photograph Number _____

Photograph Direction East

Comments:

Photograph Number _____

Photograph Direction South

Comments:

Photograph Number _____

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: **GSA1-2-PSS**

Investigator(s): Emily Foster Section, Township, Range:

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Flat Slope (%): 0-5

Subregion (LRR or MLRA): Lat: 37.446857 Long: -76.471293 Datum: NAD83

Soil Map Unit Name: Meggett sandy loam NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: PSS HGM: Slope Water Type: RPWWN

Abandoned agriculture field, potentially prior-converted-croplands (PCC). Developing scrub shrub community dominated by sweetgum, box elder, and silky dogwood saplings.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (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): 13

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

Wetland Hydrology Present? Yes ✓ No ____

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

Remarks:

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

Sampling Point: **GSA1-2-PSS**

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Cornus amomum*	20	✓	FACW
2. *Liquidambar styraciflua*	10	✓	FAC
3. *Acer negundo*	10	✓	FAC
4.			
5.			
6.			
7.			
8.			
	40 = Total Cover		
50% of total cover: 20.0	20% of total cover: 8.0		
Herb Stratum (Plot size: 5)			
1. *Carex lurida*	50	✓	OBL
2. *Scirpus cyperinus*	15		OBL
3. *Juncus effuses*	10		OBL
4. *Andropogon glomeratus*	15		FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
50% of total cover: 45.0	20% of total cover: 18.0		
Woody Vine Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	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[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✓ No ___

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

SOIL

Sampling Point: GSA1-2-PSS

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	100					LoCl	
6-18	10YR 4/2	80	7.5YR 4/6	20	C	M/PL	ClLo	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Photograph Log

Date: 1/12/22

Photograph Number _____

Photograph Direction North

Comments:

Photograph Number _____

Photograph Direction East

Comments:

Photograph Number _____

Photograph Direction South

Comments:

Photograph Number _____

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: GSA1-2-UP

Investigator(s): Emily Foster Section, Township, Range:

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): linear Slope (%): 0-5

Subregion (LRR or MLRA): Lat: 37.44678 Long: -76.471314 Datum: NAD83

Soil Map Unit Name: Meggett sandy loam NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: Upland HGM: Water Type:

Mowed, unimproved access road. Evidence that this location is used for access, and is closely mowed/maintained.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (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? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

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

Remarks:

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

Sampling Point: **GSA1-2-UP**

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		
Herb Stratum (Plot size: 5)			
1. *Turf grasses*	95		ND
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
50% of total cover: 47.5	20% of total cover: 19.0		
Woody Vine Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (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[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ____ No ✓

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

Vegetation is closely mowed, and consists of turf grasses and sparse field weeds. Vegetation composition is approximate, as most vegetation is unidentifiable due to season and mowing.

SOIL

Sampling Point: **GSA1-2-UP**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					ClLo	
6-12	10YR 3/2	90	10YR 3/6	10	C	PL	ClLo	
12-20	10YR 4/2	95	10YR 5/6	5	C	PL	ClLo	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Photograph Log

Date: 1/12/22

Photograph Number _____

Photograph Direction East

Comments:

Photograph Number _____

Photograph Direction West

Comments:

Photograph Number _____

Photograph Direction _____

Comments:

Photograph Number _____

Photograph Direction _____

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: **GSA2-1-PEM**

Investigator(s): Emily Foster Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Other (Explain) Local relief (concave, convex, none): cancave Slope (%): 3-5

Subregion (LRR or MLRA): _____ Lat: 37.446056 Long: -76.473862 Datum: NAD83

Soil Map Unit Name: Lumbee sandy loam NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: PEM HGM: Slope Water Type: RPWWN

Unmaintained roadside drainage ditch with prevalence of wetland vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (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): 12
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Sampling Point: **GSA2-1-PEM**

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		
Herb Stratum (Plot size: 5)			
1. *Persicaria saggittata*	75	✓	OBL
2. *Vernonia novboraccensis*	5		FACW
3. *Panicum virgatum*	10		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
50% of total cover: 45.0	20% of total cover: 18.0		
Woody Vine Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	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[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✓ No ___

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

SOIL

Sampling Point: **GSA2-1-PEM**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	98	10YR 4/6	2	C	PL	SaCLo	
6-12	10YR 5/4	100					Sa	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Photograph Log

Date: 1/12/22

Photograph Number _____

Photograph Direction NE

Comments: Unmaintained roadside ditch with prevalence of wetland vegetation.

Photograph Number _____

Photograph Direction _____

Comments:

Photograph Number _____

Photograph Direction _____

Comments:

Photograph Number _____

Photograph Direction _____

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: **GSA2-UP**

Investigator(s): Emily Foster Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): concave Slope (%): 3-5

Subregion (LRR or MLRA): _____ Lat: 37.446347 Long: -76.474169 Datum: NAD83

Soil Map Unit Name: Rumford loamy fine sand, 2 to 6 percent slopes NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: Upland HGM: Water Type:

Cleared and mowed uplands adjacent to John Clayton Memorial Highway

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (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? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Sampling Point: **GSA2-UP**

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		
Herb Stratum (Plot size: 5)			
1. *Turf grasses*	85	✓	ND
2. *Trifolium repens*	10		FACU
3. *Lamium amplexicaule*	5		ND
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50.0	20% of total cover: 20.0		
Woody Vine Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (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[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ____ No ✓

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

Closely mowed vegetation. Species composition is approximate.

SOIL

Sampling Point: **GSA2-UP**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 3/2	100					SaLo	
8-20	10YR 4/4	100					LoCl	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Photograph Log

Date: 1/12/22

Photograph Number _____

Photograph Direction North

Comments:

Photograph Number _____

Photograph Direction East

Comments:

Photograph Number _____

Photograph Direction NNW

Comments:

Photograph Number _____

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: GSA3-UP

Investigator(s): Emily Foster Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): linear Slope (%): 5-10

Subregion (LRR or MLRA): Lat: 37.444008 Long: -76.47516 Datum: NAD83

Soil Map Unit Name: Johns variant loamy sand NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: Upland HGM: Water Type:

Upland forest adjacent to John Clayton Memorial Highway

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (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? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

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

Remarks:

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

Sampling Point: **GSA3-UP**

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	60	✓	FACU
2. *Acer rubrum*	20	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	80	= Total Cover	
50% of total cover: 40.0	20% of total cover: 16.0		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Ligustrum sinense*	35	✓	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	35	= Total Cover	
50% of total cover: 17.5	20% of total cover: 7.0		
Herb Stratum (Plot size: 5)			
1. *Polystichum acrostichoides*	15	✓	FACU
2. *Lonicera japonica*	10	✓	FACU
3. *Ilex opaca*	5		
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	
50% of total cover: 15.0	20% of total cover: 6.0		
Woody Vine Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (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[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ____ No ✓

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

SOIL

Sampling Point: **GSA3-UP**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					SaLo	
10-16	10YR 3/3	100					SaLo	
18-20	10YR 5/3	100					Sa	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Photograph Log

Date: 1/12/22

Photograph Number _____

Photograph Direction North

Comments:

Photograph Number _____

Photograph Direction East

Comments:

Photograph Number _____

Photograph Direction South

Comments:

Photograph Number _____

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/9/2021

Applicant/Owner: HRSD State: VA Sampling Point: EF-UP-101

Investigator(s): Emily Foster, James Cook Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 5-25

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.50550502 Long: -78.41971250 Datum: WGS84

Soil Map Unit Name: _____ NWI classification: _____

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

Remarks:

Lacks wetland hydrology and soils. Despite NWI, no stream channel, soils key out cosistently 2.5y 4/3. Soils are moist, but presumably only from tropical storm Elsa from the previous day. Likely develops into foested wetlan downslope, outside of survey area within forestline.

Observed Classifications:

Cowardin: upl

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

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

Wetland Hydrology Present? Yes _____ No x

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

Remarks:

Soils moist but not saturated, no water table.

VEGETATION (Five Strata) – Use scientific names of plants

Sampling Point: EF-UP-101

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juglans nigra, Black Walnut	15	Yes	UPL
2.			
3.			
4.			
5.			
6.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		
Sapling Stratum (Plot size: 30 ft)			
1. Rubus pensilvanicus, Pennsylvania Blackberry	25	Yes	FAC
2. Ligustrum sinense, Chinese Privet	20	Yes	FAC
3. Rosa multiflora, Rambler Rose	20	Yes	FACU
4. Sambucus nigra, Black Elder	15	No	FACW
5.			
6.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Verbesina alternifolia, Wingstem	25	Yes	FAC
2. Microstegium vimineum, Japanese Stilt Grass	20	Yes	FAC
3. Phytolacca americana, American Pokeweed	10	No	FACU
4. Campsis radicans, Trumpet-Creeper	5	No	FAC
5. Lonicera japonica, Japanese Honeysuckle	5	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	95	x 3 =	285
FACU species	35	x 4 =	140
UPL species	15	x 5 =	75
Column Totals:	160 (A)		530 (B)

Prevalence Index = B/A = 3.31

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: EF-UP-101

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10yr 3/2	100%					Loam	
6-20	2.5y 4/3	100%					Loamy sand	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** x

Remarks:

Photograph Log

Date: 7/9/21

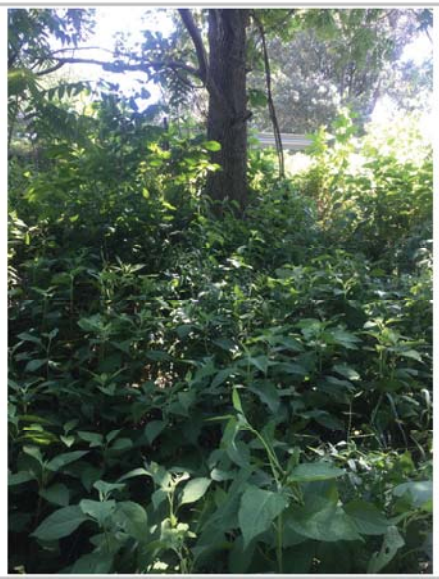
Feature Name: EF-UP-101

Photograph Direction North

Comments:

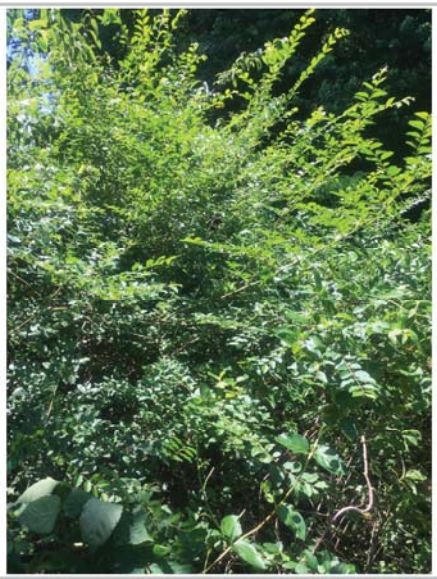
Photograph Direction NE

Comments:



Photograph Direction East

Comments:



Photograph Direction West

Comments:

APPENDIX C: NRCS WEB SOIL SURVEY

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Mathews County, Virginia, and Middlesex County, Virginia

November 15, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:116,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1500 3000 6000 9000

Feet
0 5000 10000 20000 30000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:15,800 to 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mathews County, Virginia
Survey Area Data: Version 13, Sep 14, 2021

Soil Survey Area: Middlesex County, Virginia
Survey Area Data: Version 14, Sep 14, 2021

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 11, 2019—Oct 15, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Dr	Dragston fine sandy loam, shallow	0.0	0.0%
Fa	Fallsington fine sandy loam	0.4	0.2%
KtA	Kempsville loamy fine sand, thick surface, 0 to 2 percent slopes	1.3	0.5%
SaA	Sassafras fine sandy loam, 0 to 2 percent slopes	4.0	1.6%
SdA	Sassafras loamy fine sand, 0 to 2 percent slopes	4.2	1.7%
StE	Steep sandy land	2.5	1.0%
W	Water	2.5	1.0%
Wo	Woodstown fine sandy loam	2.0	0.8%
Subtotals for Soil Survey Area		**16.8**	**6.7%**
Totals for Area of Interest		**250.0**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Bethera and Daleville soils	3.4	1.4%
4	Catpoint loamy sand	0.6	0.3%
5B	Craven silt loam, 2 to 6 percent slopes	0.7	0.3%
6A	Emporia loam, 0 to 2 percent slopes	3.9	1.6%
6B	Emporia loam, 2 to 6 percent slopes	55.5	22.2%
7D	Emporia-Nevarc complex, 6 to 15 percent slopes	6.9	2.7%
7F	Emporia-Nevarc complex, 15 to 45 percent slopes	3.3	1.3%
8	Eunola loam	5.2	2.1%
9A	Kempsville sandy loam, 0 to 2 percent slopes	3.2	1.3%
9B	Kempsville sandy loam, 2 to 6 percent slopes	17.7	7.1%
13	Myatt loam	2.6	1.0%
15	Ochlockonee silt loam	5.8	2.3%
18B	Rumford fine sandy loam, 2 to 6 percent slopes	3.1	1.3%
19A	Slagle silt loam, 0 to 2 percent slopes	39.3	15.7%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19B	Slagle silt loam, 2 to 6 percent slopes	62.5	25.0%
20A	Suffolk fine sandy loam, 0 to 2 percent slopes	0.5	0.2%
20B	Suffolk fine sandy loam, 2 to 6 percent slopes	10.5	4.2%
21D	Suffolk-Remlik complex, 6 to 15 percent slopes	1.0	0.4%
21F	Suffolk-Remlik complex, 15 to 45 percent slopes	1.9	0.7%
22B	Udorthents and Psamments, gently sloping	0.7	0.3%
W	Water	4.8	1.9%
Subtotals for Soil Survey Area		**233.2**	**93.3%**
Totals for Area of Interest		**250.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Mathews County, Virginia

Dr—Dragston fine sandy loam, shallow

Map Unit Setting

National map unit symbol: 40b8
Elevation: 0 to 120 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Dragston and similar soils: 85 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dragston

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 25 inches: fine sandy loam
H3 - 25 to 75 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Hydric soil rating: No

Minor Components

Fallsington

Percent of map unit: 7 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex

Across-slope shape: Convex
Hydric soil rating: Yes

Fa—Fallsington fine sandy loam

Map Unit Setting

National map unit symbol: 40bb
Elevation: 0 to 200 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Fallsington and similar soils: 85 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fallsington

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 37 inches: sandy clay loam
H3 - 37 to 93 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Elkton

Percent of map unit: 8 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

KtA—Kempsville loamy fine sand, thick surface, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40bf
Elevation: 100 to 400 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Kempsville and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kempsville

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 11 inches: loamy fine sand
H2 - 11 to 40 inches: sandy clay loam
H3 - 40 to 79 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

SaA—Sassafras fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40bk
Elevation: 10 to 330 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sassafras and similar soils: 85 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sassafras

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 36 inches: sandy clay loam
H3 - 36 to 70 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Fallsington

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

SdA—Sassafras loamy fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40bm
Elevation: 10 to 330 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Sassafras and similar soils: 85 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sassafras

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 8 inches: loamy fine sand
H2 - 8 to 36 inches: loam
H3 - 36 to 70 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Fallsington

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

StE—Steep sandy land

Map Unit Setting

National map unit symbol: 40bp
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Steep sandy land: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Steep Sandy Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 6 inches: fine sand
H2 - 6 to 60 inches: sand

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Wo—Woodstown fine sandy loam

Map Unit Setting

National map unit symbol: 40bv
Elevation: 10 to 120 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodstown and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodstown

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C
Hydric soil rating: No

Middlesex County, Virginia

3—Bethera and Daleville soils

Map Unit Setting

National map unit symbol: 40hl
Elevation: 0 to 120 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Bethera and similar soils: 40 percent
Daleville and similar soils: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bethera

Setting

Landform: Depressions
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 34 inches: clay
H3 - 34 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Rare
Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Description of Daleville

Setting

Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave

Parent material: Marine deposits

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Myatt

Percent of map unit: 5 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

4—Catpoint loamy sand

Map Unit Setting

National map unit symbol: 40hm
Elevation: 0 to 70 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Catpoint and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Catpoint

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 11 inches: loamy sand
H2 - 11 to 57 inches: loamy sand
H3 - 57 to 72 inches: sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Hydric soil rating: No

5B—Craven silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 40hp
Elevation: 0 to 120 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Craven and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Craven

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 2 inches: silt loam
H2 - 2 to 28 inches: clay
H3 - 28 to 66 inches: sandy loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Bethera

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Daleville

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

6A—Emporia loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40hq
Elevation: 20 to 150 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F

Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Emporia and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Emporia

Setting
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile
H1 - 0 to 14 inches: loam
H2 - 14 to 31 inches: clay loam
H3 - 31 to 59 inches: sandy clay loam
H4 - 59 to 66 inches: sandy clay loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 36 to 54 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Hydric soil rating: No

6B—Emporia loam, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 40hr
Elevation: 20 to 150 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Emporia and similar soils: 75 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Emporia

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 31 inches: clay loam
H3 - 31 to 59 inches: sandy clay loam
H4 - 59 to 66 inches: sandy clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 36 to 54 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Hydric soil rating: No

7D—Emporia-Nevarc complex, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: 40hs
Elevation: 20 to 300 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Emporia and similar soils: 50 percent
Nevarc and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Emporia

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 31 inches: clay loam
H3 - 31 to 59 inches: sandy clay loam
H4 - 59 to 66 inches: sandy clay loam

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 36 to 54 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Nevarc

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: silt loam
H2 - 14 to 51 inches: clay
H3 - 51 to 64 inches: sandy clay loam

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Hydric soil rating: No

7F—Emporia-Nevarc complex, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: 40ht
Elevation: 20 to 300 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Emporia and similar soils: 50 percent
Nevarc and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Emporia

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 31 inches: clay loam
H3 - 31 to 59 inches: sandy clay loam
H4 - 59 to 66 inches: sandy clay loam

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 36 to 54 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Nevarc

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: silt loam
H2 - 14 to 51 inches: clay
H3 - 51 to 64 inches: sandy clay loam

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Hydric soil rating: No

8—Eunola loam

Map Unit Setting

National map unit symbol: 40hv
Elevation: 120 to 450 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Eunola and similar soils: 80 percent

Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eunola

Setting
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile
H1 - 0 to 9 inches: loam
H2 - 9 to 28 inches: clay loam
H3 - 28 to 41 inches: sandy loam
H4 - 41 to 60 inches: sand

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Myatt
Percent of map unit: 3 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

9A—Kempsville sandy loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 40hw
Elevation: 100 to 400 feet

Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Kempsville and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kempsville

Setting
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile
H1 - 0 to 6 inches: sandy loam
H2 - 6 to 31 inches: sandy clay loam
H3 - 31 to 51 inches: sandy loam
H4 - 51 to 62 inches: sandy clay loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

9B—Kempsville sandy loam, 2 to 6 percent slopes

Map Unit Setting
National map unit symbol: 40hx
Elevation: 100 to 400 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kempsville and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kempsville

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 31 inches: sandy clay loam
H3 - 31 to 51 inches: sandy loam
H4 - 51 to 62 inches: sandy clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

13—Myatt loam

Map Unit Setting

National map unit symbol: 40h3
Elevation: 0 to 450 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Myatt and similar soils: 80 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myatt

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 40 inches: clay loam
H3 - 40 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Bibb

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Kinston

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

15—Ochlockonee silt loam

Map Unit Setting

National map unit symbol: 40h5
Elevation: 50 to 800 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Ochlockonee and similar soils: 75 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ochlockonee

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 34 inches: loam
H3 - 34 to 62 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: FrequentNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Bibb

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Kinston

Percent of map unit: 4 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

18B—Rumford fine sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 40h9
Elevation: 80 to 150 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Rumford and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rumford

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 37 inches: fine sandy loam
H3 - 37 to 60 inches: loamy fine sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Hydric soil rating: No

19A—Slagle silt loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 40hb
Elevation: 70 to 350 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Slagle and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Slagle

Setting
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile
H1 - 0 to 9 inches: silt loam
H2 - 9 to 24 inches: loam
H3 - 24 to 38 inches: loam
H4 - 38 to 60 inches: loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

19B—Slagle silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 40hc
Elevation: 70 to 350 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Slagle and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Slagle

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 24 inches: loam
H3 - 24 to 38 inches: loam
H4 - 38 to 60 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Hydric soil rating: No

20A—Suffolk fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40hd
Elevation: 30 to 150 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Suffolk and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffolk

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 38 inches: sandy clay loam
H3 - 38 to 62 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

20B—Suffolk fine sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 40hf
Elevation: 30 to 150 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Suffolk and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffolk

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 38 inches: sandy clay loam
H3 - 38 to 62 inches: loamy sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

21D—Suffolk-Remlik complex, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: 40hg
Elevation: 10 to 450 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Suffolk and similar soils: 45 percent
Remlik and similar soils: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffolk

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 38 inches: sandy clay loam
H3 - 38 to 62 inches: loamy sand

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Remlik

Setting

Landform: Marine terraces

Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 27 inches: loamy sand
H2 - 27 to 38 inches: sandy loam
H3 - 38 to 70 inches: loamy fine sand

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Bibb

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Kinston

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

21F—Suffolk-Remlik complex, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: 40hh
Elevation: 10 to 450 feet

Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Suffolk and similar soils: 45 percent
Remlik and similar soils: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffolk

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 38 inches: sandy clay loam
H3 - 38 to 62 inches: loamy sand

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Remlik

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 27 inches: loamy sand
H2 - 27 to 38 inches: sandy loam
H3 - 38 to 70 inches: loamy fine sand

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Bibb

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Kinston

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

22B—Udorthents and Psamments, gently sloping

Map Unit Setting

National map unit symbol: 40hj
Elevation: 0 to 100 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 50 percent
Psamments and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.