

## **Appendix A-1 Environmental**

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### **MIDDLE PENINSULA STATE PARK CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

## **APPENDIX A-1 Environmental**

**November 2024**



**US Army Corps  
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**Appendix A-1 Environmental: Clean Water Act Section 404 (B)(1) Report**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**Clean Water Act Section 404 (B)(1) Report**

**November 2024**



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**Final Evaluation of 404(b)(1) Guidelines  
Contained in Vol. 45 No. 249  
of the Federal Register dated 24 December 1980**

**Section 510 Middle Peninsula State Park, Gloucester County, VA  
September 2024**

1. Technical Evaluation Factors

a. Physical and Chemical Characteristics of Aquatic Ecosystem (230.20-230.25)(Subpart C)

|  | N/A                      | Not Significant                     | Significant              |
|--|--------------------------|-------------------------------------|--------------------------|
| (1) Substrate impacts                                    | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (2) Suspended particulates/turbidity impacts             | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (3) Water Quality Control                                | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (4) Alteration of current patterns and water circulation | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (5) Alteration of normal water fluctuations/hydroperiod  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (6) Alteration of salinity gradients                     | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Placement of fill material is not anticipated to have significant impacts to the water quality of the surrounding waterway of the York River. Placement of the material will increase turbidity at the placement site; however, this will be minor, short-term impact that will dissipate once placement activities are complete. Mitigation is not required.

b. Biological Characteristics of the Aquatic Ecosystem (230.30-230.32) (Subpart D)

|   | N/A                      | Not Significant                     | Significant              |
|---|--------------------------|-------------------------------------|--------------------------|
| (1) Effect on threatened/endangered species and their habitat           | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (2) Effect on aquatic food web  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (3) Effect on other wildlife (mammals, birds, reptiles, and amphibians) | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Based on a search of Virginia's endangered species databases and coordination with the U.S. Fish and Wildlife Service and National Marine Fisheries Service, this project will not significantly affect any federally- or state-listed threatened or endangered species.

c. Special Aquatic Site (230.40-230.45)(Subpart E)

|                             | N/A                                 | Not Significant          | Significant              |
|-----------------------------|-------------------------------------|--------------------------|--------------------------|
| (1) Sanctuaries and refuges | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

|     |                           |                                     |                                     |                          |
|-----|---------------------------|-------------------------------------|-------------------------------------|--------------------------|
| (2) | Wetlands                  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (3) | Mud flats                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| (4) | Vegetated shallows        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| (5) | Coral reefs               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| (6) | Riffle and pool complexes | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |

The proposed placement site is located adjacent to existing wetlands. While minor and temporary impacts to vegetation within the wetland may occur during construction, disturbed vegetation would be re-planted along with the wetland restoration measures of the project.

d. Human Use Characteristics (230.50-230.54)(Subpart F)

|  | N/A                                 | Not Significant                     | Significant              |
|--|-------------------------------------|-------------------------------------|--------------------------|
| (1) Effects on municipal and private water supplies  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| (2) Recreational and commercial fisheries impacts  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (3) Effects on water-related recreation  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (4) Aesthetic impacts  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| (5) Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

The placement site is located within Middle Peninsula State Park, but as the park is not yet open to the public, impacts to the Park and recreation associated with the Park are not expected. Construction activities may temporarily impact recreational and commercial fisheries or activities in the York River near the placement area; however, the proposed placement site is not within any navigational channels. A preliminary visual analysis resulted in minor to no impacts to viewshed.

2. Evaluation of Dredged or Fill Material (230.60)(Part G)

- a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. **(Check only those appropriate)**

- ☒ (1) Physical characteristics
- ☐ (2) Hydrography in relation to known or anticipated sources of contaminants
- ☐ (3) Results from previous testing of the material in the vicinity of the project



- ☐ (4) Known, significant sources of persistent pesticides from land runoff or percolation
- ☐ (5) Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances
- ☐ (6) Other public records of significant introduction of contaminants from industries, municipalities, or other sources
- ☐ (7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharges
- ☐ (8) Other sources (specify)

- b. An evaluation of the appropriate information in 2a above indicated that there is reason to believe the proposed dredged or fill material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and disposal sites and not likely to exceed constraints. The material meets the testing exclusion criteria.

YES ☒ NO ☐

### 3. Disposal Site Delineation (Section 230.11(f))

- a. The following factors, as appropriate, have been considered in evaluating the disposal site.

- ☒ (1) Depth of water at disposal site
- ☒ (2) Current velocity, direction, and variability at disposal site
- ☐ (3) Degree of turbulence
- ☐ (4) Water column stratification
- ☐ (5) Discharge of vessel speed and direction
- ☒ (6) Rate of discharge
- ☒ (7) Dredged material characteristics (constituents, amount, and type of material, settling velocities)
- ☐ (8) Number of discharges per unit of time
- ☐ (9) Other factors affecting rates and patterns of mixing (specify)

- b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable.

YES ☒ NO ☐

### 4. Actions to Minimize Adverse Effects (Section 230.70-230.77)(Subpart H)

All appropriate and practicable steps have been taken, through application of recommendations of Section 230.70-230.77 to ensure minimal adverse effects of the proposed discharge.

YES ☒ NO ☐

5. Factual Determination (Section 230.11)

A review of appropriate information as identified in items 2-5 above indicates that there is a minimal potential for short- or long-term environmental effects of the proposed discharge as related to:

- ☒ a. Physical substrate at the disposal site (review sections 2a, 3, 4, & 5)
- ☒ b. Water circulation, fluctuation, & salinity (review sections 2a, 3, 4, & 5)
- ☒ c. Suspended particulates/turbidity (review sections 2a, 3, 4, & 5)
- ☒ d. Contaminant availability (review sections 2a, 3, & 4)
- ☒ e. Aquatic ecosystem structure and function (review sections 2b, c; 3, & 5)
- ☒ f. Disposal site (review sections 2, 4, & 5)
- ☒ g. Cumulative impact on the aquatic ecosystem
- ☒ h. Secondary impacts on the aquatic ecosystem

6. Review of Compliance (230.10(a)-(d))(Subpart B)

A review of the permit application indicates that:

- a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose (if no, see section 2 and information gathered for EA alternative);

YES ☒ NO ☐

- b. The activity does not appear to 1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize the existence of Federally designated marine sanctuary (if no, see section 2b and check responses from resource and water quality certifying agencies;

YES ☒ NO ☐

- c. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms

dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values (if no, see section 2);

YES ☒ NO ☐

- d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see section 5);

YES ☒ NO ☐

## 7. Findings

- ☒ a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines
- ☐ b. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines with the inclusion of the following conditions:
- c. The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) guidelines for the following reason(s):
- ☐ (1) There is a less damaging practicable alternative
  - ☐ (2) The proposed discharge will result in significant degradation of the aquatic ecosystem
  - ☐ (3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem.

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Date

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Zachary Martin,  
Chief, Environmental Analysis  
Norfolk District  
U.S. Army Corps of Engineers

**Appendix A-1 Environmental: Coastal Zone Management Act**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**Coastal Zone Management Act  
Federal Consistency Determination**

**November 2024**



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**COASTAL ZONE MANAGEMENT ACT  
FEDERAL CONSISTENCY DETERMINATION FOR THE  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510  
MIDDLE PENINSULA STATE PARK  
FEDERAL CONSISTENCY DETERMINATION**

**CONSISTENCY REVIEW:** Information to support this Federal Consistency Determination (including maps and additional supporting information) can be found in the Chesapeake Bay Environmental Restoration and Projection, Section 510, Middle Peninsula State Park, Draft Integrated Feasibility Report/Environmental Assessment (IFR/EA).

**PROJECT DESCRIPTION:** The purpose of this Federal Consistency Determination is to ensure compliance of the Section 510 Middle Peninsula State Park Project, Gloucester, Virginia with the Coastal Zone Management Act (CZMA).

The U.S. Army Corps of Engineers (USACE) is the lead federal agency for this feasibility study and the non-Federal sponsor is Virginia Department of Conservation and Recreation (DCR).

The Chesapeake Bay Environmental Restoration and Protection Program directs the Secretary of the Army, acting through USACE, to provide environmental aid to non-federal entities to benefit the Chesapeake Bay watershed. The program was authorized by Section 510 of the Water Resources Development Act (WRDA) of 1996, as amended by Section 5020 of WRDA 2007, Section 4010(a) of the Water Resources Reform and Development Act (WRRDA) of 2014, Section 306 of WRDA 2020, and Section 8376(b)(1) of WRDA 2022.

The Section 510 program provides design and construction assistance for water-related resource protection and restoration projects within the Chesapeake Bay watershed. Qualifying project types include projects for sediment and erosion control; protection of eroding shorelines and streambanks; ecosystem restoration, including restoration of submerged aquatic vegetation; protection of essential public works; beneficial uses of dredged material; wastewater treatment and related facilities; water supply and related facilities; stormwater and drainage systems; and other projects that may enhance the living resources of the estuary.

The project is located at Middle Peninsula State Park in Gloucester County, Virginia. Within the park, the study area is limited to approximately 2,000 linear feet of York River shoreline.

In a Letter of Intent signed September 21, 2020, DCR requested assistance from USACE to address severe shoreline erosion and siltation, failing bulkheads and groins, and erosion of marsh areas not previously protected at the park.

The key objectives of the project include the following:

1. To stabilize the shoreline- reducing erosion, siltation, and turbidity in the study area over the 50-year period of analysis from 2030 to 2080
2. To improve fish and wildlife habitat along the York River over the 50-year period of analysis from 2030 to 2080
3. To restore and enhance the tidal wetlands and beach shoreline interface in the study area over the 50-year period of analysis from 2030 to 2080.



Figure 1: Tentatively Selected Plan- Alternative 2A

The Tentatively Selected Plan (TSP) is Alternative 2A. This alternative consists of removal of existing shoreline structures, shoreline stabilization, wetland restoration, and reef restoration measures (Figure 1). A sill and breakwater system will span the length of the previously modified shoreline area where sand fill and native vegetation will be incorporated behind to create a natural slope and stable “pocket beaches”. In the existing marsh areas, toe protection with sand fill and native vegetation behind is proposed to restore and enhance the marsh system. Additionally, subtidal, offshore reef habitat will be placed parallel to the marsh shoreline, terminating approximately at the start of the breakwater and sill system.

The TSP also includes a general concept for temporary construction access and laydown areas (Figure 1).

**PROPERTY CLASSIFICATION:** Middle Peninsula State Park is a public resource owned by the Commonwealth of Virginia and managed by DCR. The project site is a previously modified shoreline along the York River will cordgrass-dominated wetlands located on either end of the shoreline. The uplands consist of forest, turfgrass, and agricultural lands.

**IMPACTS TO RESOURCES/USES OF THE COASTAL ZONE:** See summaries below.

**DETERMINATION:** In accordance with Section 307 of the CZMA and the CZMA Federal Consistency Regulation – 15 C.F.R. Part 930, the Norfolk District, U.S. Army Corps of Engineers determined that the proposed project would be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the Commonwealth of Virginia’s Coastal Zone Management Program.

### **Enforceable Policies**

The Virginia Coastal Zone Management Program (CZMP) contains the below enforceable policies (I-XII).

#### **I. Tidal and Non-Tidal Wetlands**

The purpose of the wetlands management program is to preserve tidal wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation. The tidal wetlands program is administered by the Virginia Marine Resources Commission (VMRC) (Virginia Code §28.2-1301 through §28.2-1320). The Virginia Water Protection Permit program administered by the Virginia Department of Environmental Quality (DEQ) includes protection of wetlands – both tidal and non-tidal. This program is authorized by Virginia Code § 62.1-44.15.5 and the Water Quality Certification requirements of §401 of the Clean Water Act of 1972.

#### *Consistency Analysis*

Best Management Practices would be put in place to ensure proper precautions for all construction activities in water to prevent any negative impacts to wetlands. During construction, the movement of construction equipment and personnel through existing wetland areas may cause minor and temporary adverse impacts as vegetation is traversed over; however, vegetation would be allowed to regrow or be replanted following construction activities in addition to new wetland habitat being created as part of the project.

Implementation of the proposed project would be fully consistent with the Tidal and Non-Tidal Wetlands enforceable policy.

## **II. Subaqueous Lands**

The management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects to marine and fisheries resources, wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the DEQ Quality Division. The program is administered by the VMRC (Virginia Code §28.2-1200 through §28.2-1213).

### *Consistency Analysis*

Construction of the TSP would require the placement of materials on Virginia state-owned bottomlands in the jurisdiction of VMRC. A Joint Permit Application would be submitted to VMRC for review, and a permit would be secured from VMRC for impacts to state-owned bottomlands prior to construction.

The proposed project would be fully consistent with the Subaqueous Lands enforceable policy.

## **III. Dunes and Beaches**

Dune protection is carried out pursuant to the Coastal Primary Sand Dune Protection Act and is intended to prevent destruction or alteration of primary dunes. This program is administered by the Marine Resources Commission (Virginia Code §28.2-1400 through §28.2-1420).

### *Consistency Analysis*

This project would not impact dunes and beaches; therefore the proposed project would be consistent with the Dunes and Beaches enforceable policy.

## **IV. Chesapeake Bay Preservation Areas**



State-local cooperative program administered by DEQ's Water Division and 84 localities in Tidewater, Virginia established pursuant to the Chesapeake Bay Act (Virginia Code §§ 62.1-44.15:67 through 62.1-44.15:79) and Chesapeake Bay Preservation Area Designation and Management Regulations (Virginia Administrative Code 9 VAC 25-830-10 *et seq.*)

#### *Consistency Analysis*

The proposed project is within Resource Protection Areas and Resource Management Areas for Gloucester County, Virginia. Under the Chesapeake Bay Preservation Act, shoreline erosion control structures such as living shorelines are permitted buffer modifications under the Regulations as long as they are constructed in accordance with the best available technical advice and applicable permit conditions and requirements. Best management practices including minimizing land disturbance and retaining existing vegetation will be followed to the maximum extent possible. All proposed land disturbance, clearing, and grading in the IFR/EA will comply with the RPA development criteria in 9VAC25-830-140. A Water Quality Impact Assessment including extent of disturbance and vegetative mitigation/restoration plans will be provided to DEQ.

The proposed project would be fully consistent with the Chesapeake Bay Preservation Areas enforceable policy.

### **V. Marine Fisheries**

The program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities. This program is administered by the VMRC (Virginia Code §28.2-200 through §28.2-713) and the Virginia Department of Wildlife Resources (DWR) (Virginia Code §29.1-100 through §29.1-570).

#### *Consistency Analysis*

The proposed project will not encroach on any oyster beds, rocks, and shoals of the Commonwealth or previously leased grounds and will enhance habitat for oysters and reef-dependent fishes.

The proposed project would be fully consistent with the Marine Fisheries enforceable policy.

### **VI. Wildlife and Inland Fisheries**

The program ensure that activities affecting wildlife and inland fisheries shall not negatively impact the Commonwealth's efforts in conserving, protecting,

replenishing, propagating and increasing of the supply of game birds, game animals, fish and other wildlife of the Commonwealth, including fish or wildlife listed as threatened or endangered by the Department of Wildlife Resources Board, the use of drugs on vertebrate wildlife, and nonindigenous aquatic nuisance, predatory, or undesirable species. This program is administered by the DWR (Virginia Code §§ 29.1-501 through §29.1-575; 4 VAC §§ 15-20-130 through §§ 15-290-60).

### *Consistency Analysis*

Within a 3-mile radius of the project site, there are 20 state listed species and six species of anadromous fishes known or likely to occur. During construction, the proposed project activity may cause temporary impacts to both terrestrial and aquatic species due to temporary displacement and avoidance caused by increased noise and/or turbidity. Following construction, an increase in quantity and quality of suitable habitat for many aquatic species is expected due to shoreline protection and aquatic ecosystem restoration measures. Not Likely to Adversely Affect determinations for federally listed species have been received from U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). The USACE will continue to coordinate with DWR during design phase, prior to construction, to avoid and minimize impacts to the state listed species to the maximum extent practicable.

The proposed project site is located within close proximity to one historic bald eagle nest identified by the Center for Conservation Biology Eagle Nest Locator and one additional bald eagle nest of unknown status identified by USACE staff biologists on site visits in 2022, 2023, and 2024. The USACE will review the state and federal guidelines for protection of bald eagles and coordinate with USFWS and DWR regarding impacts or need for a take permit.

Inland fisheries will not be impacted by the proposed project. Construction of the project is not expected to cause impacts to anadromous fish that use this waterway to migrate to freshwater spawning grounds.

No drugs will be administered to any vertebrate wildlife.

No nonindigenous aquatic nuisance, predatory, or undesirable species will be knowingly used in the proposed project. Only native species will be used for vegetation plantings.

The proposed project would be fully consistent with the Wildlife and Inland Fisheries enforceable policy.

## **VII. Plant Pests and Noxious Weeds**

The program applies to activities affecting quarantines established for pests by the Board of Agriculture and Consumer Services (BACS) or the Commissioner of Agriculture and Consumer Services, the importation of regulated articles proclaimed a menace to public health by BACS, and plant pests and noxious weeds. The program is administered by Virginia Department of Agriculture and Consumer Services (VDACS) (Virginia Code §§ 3.2-700 through 3.2-804; 2 VAC §§ 5-315-10 through -440-110):

*Consistency Analysis*

The proposed project would not impact plant pests and noxious weeds; therefore, the proposed project would be fully consistent with the Plant Pests and Noxious Weeds enforceable policy.

**VIII. Commonwealth Lands**

The program applies to activities on state-owned lands managed by the DWR and the VDCR to include the free passage of anadromous and other migratory fish, the removal of coastal resources from Back Bay, encroachments into game refuges, tampering with DWR owned or operated aquatic and terrestrial habitats, and fire use, hunting and fishing, feeding wildlife, boating and vehicle use in state parks. The program is administered by DWR (Virginia Code § 29.1-103(10) through -554; 4 VAC §§ 15-20-90 through -320-100) and VDCR (4 VAC §§ 5-30-70 through -422).

*Consistency Analysis*

The proposed project does not include any activities on state-owned lands managed by DWR.

The proposed project does include activities on state-owned lands managed by DCR with DCR as the non-federal sponsor. The activities will protect Middle Peninsula State Park from further erosion and habitat loss impacts.

Implementation of the proposed action would be fully consistent with the Commonwealth Lands enforceable policy.

**IX. Point Source Air Pollution**

The program implements the Federal Clean Air Act to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards. This program is administered by the State Air Pollution Control Board (Virginia Code §10.1-1300 through 10.1-1320).

*Consistency Analysis*

There would be temporary, negligible to minor, emissions resulting from the use of diesel-fuel land-based equipment during construction. An emissions analysis will be completed prior to draft report release, and these short-term emissions are anticipated to be below de minimis levels.

The proposed project would be fully consistent with the Point Source Air Pollution enforceable policy.

#### **X. Point Source Water Pollution**

The point source program is administered by the State Water Control Board pursuant to Virginia Code §62.1-44.15. Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to §402 of the federal Clean Water Act and administered in Virginia as the VPDES permit program. The Water Quality Certification requirements of §401 of the Clean Water Act of 1972 is administered under the Virginia Water Protection Permit program.

##### *Consistency Analysis*

The proposed project will not generate any point source discharges, and a VPDES Individual Permit would not be required.

The proposed project will comply with Water Quality Certification requirements under Section 401 of the Clean Water Act through submittal of a Joint Permit Application to DEQ for a Virginia Water Protection Permit.

The project would be fully consistent with the Point Source Water Pollution enforceable policy.

#### **XI. Non-Point Source (NPS) Water Pollution**

Virginia's Erosion and Sediment Control Law requires soil-disturbing project to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers of the Commonwealth. This program is administered by DEQ (Virginia Code §62.1-44.15:51 *et seq.*).

##### *Consistency Analysis*

Construction activities would temporarily increase turbidity around the project site. Best Management Practices (BMPs) such as the use of turbidity curtains would be implemented. Implementation of the BMPs would reduce turbidity during in-water placement of rock, sand, and reef structures. Sandy material would be expected to settle quickly from the water column shortly after placement.

The project would be fully consistent with the Non-Point Source Pollution Control enforceable policy.

## **XII. Shoreline Sanitation**

The purpose of this program is to regulate the installation of septic tanks, set standards concerning soil types suitable for septic tanks, and specify minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth. This program is administered by the Department of Health (Virginia Code §32.1-164 through §32.1-165).

### *Consistency Analysis*

There is no involvement of installation of septic tanks; therefore, the proposed project would be fully consistent with the Shoreline Sanitation enforceable policy.

## **Advisory Policies for Geographic Area of Particular Concern**

### **a. Coastal Natural Resource Areas**

These areas are vital to estuarine and marine ecosystems and/or are of great importance to areas immediately inland of the shoreline. Such areas receive special attention from the Commonwealth because of their conservation, recreational, ecological, and aesthetic values. These areas are worthy of special consideration in any planning or resources management process and include the following resources: Wetlands, aquatic spawning, nursery, feeding grounds, coastal primary sand dunes, barrier islands, significant wildlife, habitat areas, public recreation areas, sand and gravel resources, and underwater historic sites.

### *Consistency Analysis*

The proposed project will result in increased quantity and quality of estuarine habitats including wetlands, hard reef, and sandy areas within the project area. The existing wetland habitat and state park lands will also be protected from further degradation due to erosion. Any negative impacts to coastal natural resources would be avoided to the maximum extent practicable.

### **b. Coastal Natural Hazard Areas**

This policy covers areas vulnerable to continuing and severe erosion and areas susceptible to potential damage from wind, tidal, and storm related events including flooding. New buildings and other structures should be designed and sited to minimize the potential for property damage due to storms or shoreline

erosion. The areas of concern are as follows: Highly erodible areas, coastal high hazard areas, including floodplains.

*Consistency Analysis*

The proposed project will reduce impacts from erosion to coastal natural hazard areas by stabilizing the shoreline.

**c. Waterfront Development Areas**

These areas are vital to the Commonwealth because of the limited number of areas suitable for waterfront activities. The areas of concern are as follows: commercial ports, commercial fishing piers, and community waterfront.

*Consistency Analysis*

The proposed project will have no negative impacts on waterfront development areas. Implementation of the project is expected to make the shoreline more suitable for waterfront recreational activities on state-owned lands.

**Advisory Policies for Shorefront Access Planning and Protection**

**a. Virginia Public Beaches**

Approximately 25 miles of public beaches are located in the cities, counties, and towns of Virginia exclusive of public beaches on state and federal land. These public shoreline areas will be maintained to allow public access to recreational resources.

*Consistency Analysis*

The proposed project will not impact any Virginia public beaches.

**b. Virginia Outdoors Plan**

Planning for coastal access is provided by the DCR in cooperation with other state and local government agencies. The Virginia Outdoors Plan (VOP), which is published by the Department, identifies recreational facilities in the Commonwealth that provide recreational access. The VOP also serves to identify future needs of the Commonwealth in relation to the provision of recreational opportunities and shoreline access. Prior to initiating any project, consideration should be given to the proximity of the project site to recreational resources identified in the VOP.

*Consistency Analysis*

While this proposed project is within Middle Peninsula State Park, it is not open to the public and thus not identified in the VOP. The project site is located on the York River, a designated Blueway and qualified scenic river, and is approximately 2 miles upstream from Machicomoco State Park. The proposed project will not negatively impact any recreational resources identified in the VOP.

**c. Parks, Natural Areas, and Wildlife Management Areas**

Parks, wildlife management areas, and natural areas are provided for the recreational pleasure of the citizens of the Commonwealth and the nation by local, state, and federal agencies. The recreational values of these areas should be protected and maintained.

*Consistency Analysis*

The proposed project will result in beneficial impacts to Middle Peninsula State Park through the implementation of this shoreline protection and aquatic ecosystem restoration project.

**d. Waterfront Recreational Land Acquisitions**

It is the policy of the Commonwealth to protect areas, properties, lands, or any estate or interest therein, of scenic beauty, recreational utility, historical interest, or unusual features which may be acquired, preserved, and maintained for the citizens of the Commonwealth.

*Consistency Analysis*

This project does not limit the ability of the Commonwealth of Virginia in any way to acquire, preserve, or maintain waterfront recreational lands.

**e. Waterfront Recreational Facilities**

This policy applies to the provision of boat ramps, public landings, and bridges which provide water access to the citizens of the Commonwealth. These facilities shall be designed, constructed, and maintained to provide points of water access when and where practicable.

*Consistency Analysis*

The proposed project does not involve the design, construction, or maintenance of any boat ramps, public landings, or bridges.

f. **Waterfront Historic Properties**

The Commonwealth has a long history of settlement and development, and much of that history has involved both shorelines and near-shore areas. The protection and preservation of historic shorefront properties is primarily the responsibility of the Department of Historic Resources. Buildings, structures, and sites of historical, architectural, and/or archaeological interest are significant resources for the citizens of the Commonwealth. It is the policy of the Commonwealth and the Virginia CZM Program to enhance the protection of buildings, structures, and sites of historical, architectural, and archaeological significance from damage or destruction when applicable.

*Consistency Analysis*

No waterfront historic properties would be affected by this project.

Coordination is underway with the State Historic Preservation Officer (SHPO) as required by Section 106 of the National Historic Preservation Act. A Programmatic Agreement (PA) is being developed currently to ensure adverse impact of historic resources are avoided, minimized, and mitigated to the maximum extent practicable. The PA will be executed prior to completion of the feasibility study.

**Determination**

Based upon the following information, data, and analysis, the U.S. Army Corps of Engineers, Norfolk District, finds that the Chesapeake Bay Environmental Restoration and Protection, Section 510, Middle Peninsula State Park IFR/EA is consistent to the maximum extent practicable with the enforceable policies of the Virginia Coastal Zone Management Program.

Pursuant to 15 CFR 930.41, the Virginia Coastal Zone Management Program has 60 days from receipt of this letter in which to concur with or object to this Consistency Determination, or to request an extension under CFR section 930.41(b). Virginia's concurrence will be presumed if its response is not received by the U.S. Army Corps of Engineers on the 60<sup>th</sup> day from receipt of this determination.

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Date: 2024.10.25 07:38:52 -04'00'

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Date

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Zachary P. Martin  
Chief, Environmental Analysis Section  
Norfolk District, USACE



**Appendix A-1 Environmental: Endangered Species Act**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**Endangered Species Act  
Consultation Documentation**

**November 2024**



**US Army Corps  
of Engineers®**  
Norfolk District



## 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



In Reply Refer To:

08/28/2024 17:34:39 UTC

Project Code: 2024-0117650

Project Name: Section 510 Middle Peninsula State Park Feasibility Study

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.*).

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 IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through IPaC 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: <https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

**Migratory Birds:** In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see [Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service \(fws.gov\)](#).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

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 Code 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

## 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

Project Code: 2024-0117650

Project Name: Section 510 Middle Peninsula State Park Feasibility Study

Project Type: Restoration / Enhancement - Wetland

Project Description: The U.S. Army Corps of Engineers, Norfolk District (USACE) is partnering with the Virginia Department of Conservation and Recreation (DCR) for a shoreline protection and aquatic ecosystem restoration study at Middle Peninsula State Park in Gloucester County, Virginia on the York River. The study area consists of approximately 2,000 linear feet of York River shoreline. The shoreline consists of native tidal marsh habitat and previously modified shoreline, comprised of derelict wooden bulkheads, wooden timber groins, stone revetments, and gabion cages. The study area is experiencing approximately one to two feet of erosion per year leading to shoreline destabilization and loss of wetland habitat. The Feasibility Study is currently evaluating alternatives comprised of measures including shoreline stabilization (breakwaters and sills), restoration of native marsh habitat (sandfill and native vegetation), and restoration of oyster reef habitat. Tree removal is necessary for the temporary construction access road.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@37.3279301,-76.58637549117552,14z>



Counties: Gloucester County, Virginia

## ENDANGERED SPECIES ACT SPECIES

There is a total of 3 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<sup>1</sup>, 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 <i>Myotis septentrionalis</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a> | Endangered             |
| Tricolored Bat <i>Perimyotis subflavus</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/10515">https://ecos.fws.gov/ecp/species/10515</a>          | Proposed<br>Endangered |

## INSECTS

| NAME   | STATUS    |
|--|-----------|
| Monarch Butterfly <i>Danaus plexippus</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a> | Candidate |

## CRITICAL HABITATS

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

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

## **IPAC USER CONTACT INFORMATION**

Agency: Army Corps of Engineers  
Name: Peyton Mowery  
Address: 803 Front Street  
City: Norfolk  
State: VA  
Zip: 23510  
Email: peyton.j.mowery@usace.army.mil  
Phone: 7572017390





## 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



In Reply Refer To:

10/24/2024 18:41:45 UTC

Project code: 2024-0117650

Project Name: Section 510 Middle Peninsula State Park Feasibility Study

Federal Nexus: yes

Federal Action Agency (if applicable): Army Corps of Engineers

**Subject:** Federal agency coordination under the Endangered Species Act, Section 7 for  
'Section 510 Middle Peninsula State Park Feasibility Study'

Dear Peyton Mowery:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on October 24, 2024, for 'Section 510 Middle Peninsula State Park Feasibility Study' (here forward, Project). This project has been assigned Project Code 2024-0117650 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements may not be complete.**

### Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (DKey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid. Note that conservation measures for northern long-eared bat and tricolored bat may differ. If both bat species are present in the action area and the key suggests more conservative measures for one of the species for your Project, the Project may need to apply the most conservative measures in order to avoid adverse effects. If unsure which conservation measures should be applied, please contact the appropriate Ecological Services Field Office.***

### Determination for the Northern Long-Eared Bat and Tricolored Bat

Based on your IPaC submission and a standing analysis completed by the Service, you determined the proposed Project will have the following effect determinations:

| Species   | Listing Status | Determination |
|---|----------------|---------------|
| Northern Long-eared Bat ( <i>Myotis septentrionalis</i> ) | Endangered     | NLAA          |
| Tricolored Bat ( <i>Perimyotis subflavus</i> )            | Proposed       | NLAA          |
|   | Endangered     |               |

Federal agencies must consult with U.S. Fish and Wildlife Service under section 7(a)(2) of the Endangered Species Act (ESA) when an action *may affect* a listed species. Tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can *confer* under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if and when the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a NE or NLAA determination from the key to confirm that the determination is still accurate.

Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that consultation on the Action is complete for northern long-eared bat and/or tricolored bat and no further action is necessary unless either of the following occurs:

- new information reveals effects of the action that may affect the northern long-eared bat or tricolored bat in a manner or to an extent not previously considered; or,
- the identified action is subsequently modified in a manner that causes an effect to the northern long-eared bat or tricolored bat that was not considered when completing the determination key.

### 15-Day Review Period

As indicated above, the Service will notify you within 15 calendar days if we determine that this proposed Action does not meet the criteria for a “may affect, not likely to adversely affect” (NLAA) determination for the northern long-eared bat and/or tricolored bat. If we do not notify you within that timeframe, you may proceed with the Action under the terms of the NLAA concurrence provided here. This verification period allows the identified Ecological Services Field Office to apply local knowledge to evaluation of the Action, as we may identify a small subset of actions having impacts that we did not anticipate when developing the key. In such cases, the identified Ecological Services Field Office may request additional information to verify the effects determination reached through the Northern Long-eared Bat and Tricolored Bat DKey.

### Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Candidate

You may coordinate with our Office to determine whether the Action may affect the species and/or critical habitat listed above. Note that reinitiation of consultation would be necessary if a new species is listed or critical habitat designated that may be affected by the identified action before it is complete.

If you have any questions regarding this letter or need further assistance, please contact the Virginia Ecological Services Field Office and reference Project Code 2024-0117650 associated with this Project.

**Action Description**

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

**1. Name**

Section 510 Middle Peninsula State Park Feasibility Study

**2. Description**

The following description was provided for the project 'Section 510 Middle Peninsula State Park Feasibility Study':

The U.S. Army Corps of Engineers, Norfolk District (USACE) is partnering with the Virginia Department of Conservation and Recreation (DCR) for a shoreline protection and aquatic ecosystem restoration study at Middle Peninsula State Park in Gloucester County, Virginia on the York River. The study area consists of approximately 2,000 linear feet of York River shoreline. The shoreline consists of native tidal marsh habitat and previously modified shoreline, comprised of derelict wooden bulkheads, wooden timber groins, stone revetments, and gabion cages. The study area is experiencing approximately one to two feet of erosion per year leading to shoreline destabilization and loss of wetland habitat. The Feasibility Study is currently evaluating alternatives comprised of measures including shoreline stabilization (breakwaters and sills), restoration of native marsh habitat (sandfill and native vegetation), and restoration of oyster reef habitat. Tree removal is necessary for the temporary construction access road.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@37.32747955,-76.58692243836339,14z>



## DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for a least one species covered by this determination key.

## QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed bats or any other listed species?

**Note:** Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. Is the action area wholly within Zone 2 of the year-round active area for northern long-eared bat and/or tricolored bat?

**Automatically answered**

No

3. Does the action area intersect Zone 1 of the year-round active area for northern long-eared bat and/or tricolored bat?

**Automatically answered**

No

4. Does any component of the action involve leasing, construction or operation of wind turbines? Answer 'yes' if the activities considered are conducted with the intention of gathering survey information to inform the leasing, construction, or operation of wind turbines.

**Note:** For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

No

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

Yes

6. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

No

7. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

**Note:** This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

Yes

8. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

No

9. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

No

10. [Semantic] Is the action area located within 0.5 miles of a known bat hibernaculum?

**Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

**Automatically answered**

No

11. Does the action area contain any winter roosts or caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats?

No

12. Will the action cause effects to a bridge?

**Note:** Covered bridges should be considered as bridges in this question.

No

13. Will the action result in effects to a culvert or tunnel at any time of year?

No

14. Are trees present within 1000 feet of the action area?

**Note:** If there are trees within the action area that are of a sufficient size to be potential roosts for bats answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Yes

15. Does the action include the intentional exclusion of bats from a building or structure?

**Note:** Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats or tricolored bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local Ecological Services Field Office to help assess whether northern long-eared bats or tricolored bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures.

No

16. Does the action involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) **known or suspected to contain roosting bats**?

No

17. Will the action cause construction of one or more new roads open to the public?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

18. Will the action include or cause any construction or other activity that is reasonably certain to increase average daily traffic permanently or temporarily on one or more existing roads?

**Note:** For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

19. Will the action include or cause any construction or other activity that is reasonably certain to increase the number of travel lanes on an existing thoroughfare?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

20. Will the proposed Action involve the creation of a new water-borne contaminant source (e.g., leachate pond, pits containing chemicals that are not NSF/ANSI 60 compliant)?

**Note:** For information regarding NSF/ANSI 60 please visit <https://www.nsf.org/knowledge-library/nsf-ansi-standard-60-drinking-water-treatment-chemicals-health-effects>

No

21. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

No

22. Will the action include drilling or blasting?

No

23. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

No

24. Will the proposed action involve the use of herbicides or other pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

No

25. Will the action include or cause activities that are reasonably certain to cause chronic or intense nighttime noise (above current levels of ambient noise in the area) in suitable summer habitat for the northern long-eared bat or tricolored bat during the active season?

Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time. Sources of chronic or intense noise that could cause adverse effects to bats may include, but are not limited to: road traffic; trains; aircraft; industrial activities; gas compressor stations; loud music; crowds; oil and gas extraction; construction; and mining.

**Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

No

26. Does the action include, or is it reasonably certain to cause, the use of permanent or temporary artificial lighting within 1000 feet of suitable northern long-eared bat or tricolored bat roosting habitat?

**Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

No

27. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

Yes

28. Will the proposed action occur exclusively in an already established and currently maintained utility right-of-way?

No



29. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

**Note:** A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property.

No

30. Does the project intersect with the 0- 9.9% forest density category?

**Automatically answered**

No

31. Does the project intersect with the 10.0- 19.9% forest density category map?

**Automatically answered**

Yes

32. Does the project intersect with the 20.0- 29.9% forest density category map?

**Automatically answered**

Yes

33. Does the project intersect with the 30.0- 100% forest density category map?

**Automatically answered**

Yes

34. Will the action cause trees to be cut, knocked down, or otherwise brought down across an area greater than 5 acres in total extent?

No

35. Will the proposed action result in the use of prescribed fire?

**Note:** If the prescribed fire action includes other activities than application of fire (e.g., tree cutting, fire line preparation) please consider impacts from those activities within the previous representative questions in the key. This set of questions only considers impacts from flame and smoke.

No

36. Does the action area intersect the northern long-eared bat species list area?

**Automatically answered**

Yes

37. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats?

**Automatically answered**

No

38. [Semantic] Is the action area located within 150 feet of a documented northern long-eared bat roost site?

**Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

**Automatically answered**

No

39. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?

If unsure, answer "Yes."

**Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Yes

40. Has a presence/probable absence summer bat survey targeting the northern long-eared bat following the Service's [Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines](#) been conducted within the project area?

No

41. Are any of the trees proposed for cutting or other means of knocking down, bringing down, topping, or trimming suitable for northern long-eared bat roosting (i.e., live trees and/or snags  $\geq 3$  inches dbh that have exfoliating bark, cracks, crevices, and/or cavities)?

**Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Yes

42. Will any tree cutting/trimming or other knocking or bringing down of trees occur during the **Summer Occupancy season** for northern long-eared bats in the action area?

**Note:** Bat activity periods for your state can be found in Appendix L of the Service's Range-wide Indiana Bat and Northern long-eared Bat Survey [Guidelines](#).

No

43. Does the action area intersect the tricolored bat species list area?

**Automatically answered**

Yes

44. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats?

**Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

**Automatically answered**

No

45. Has a presence/probable absence bat survey targeting the [tricolored bat and following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines](#) been conducted within the project area?

No

46. Is suitable summer habitat for the tricolored bat present within 1000 feet of project activities?

(If unsure, answer ""Yes."" )

**Note:** If there are trees within the action area that may provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (*Tillandsia usneoides*), clusters of dead pine needles of large live pines) answer ""Yes."" For a complete definition of suitable summer habitat for the tricolored bat, please see Appendix A in the [Service's Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines](#).

Yes

47. Do any of the trees proposed for cutting or other means of knocking down, bringing down, topping, or trimming provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (*Tillandsia usneoides*), clusters of dead pine needles of large live pine trees)?

**Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Yes

48. Will any tree cutting/trimming or other knocking or bringing down of trees be conducted during the Pup Season for tricolored bat?

**Note:** Bat activity periods for your state can be found in Appendix L of the [Service's Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines](#).

No

49. Do you have any documents that you want to include with this submission?

No

## PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

0.7

## **IPAC USER CONTACT INFORMATION**

Agency: Army Corps of Engineers  
Name: Peyton Mowery  
Address: 803 Front Street  
City: Norfolk  
State: VA  
Zip: 23510  
Email: peyton.j.mowery@usace.army.mil  
Phone: 7572017390



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE



Virginia Field Office  
6669 Short Lane  
Gloucester, VA 23061

Date:

### **Self-Certification Letter**

Project Name:

Dear Applicant:

Thank you for using the U.S. Fish and Wildlife Service (Service) Virginia Ecological Services online project review process. By submitting this letter, in conjunction with your project review package to our office for review, you are certifying that you have completed the online project review process for the project named above in accordance with all instructions provided, using the best available information to reach your determinations. From the date of receipt, our office has 60 days (50 CFR § 402.13(c)(2)) to review your project package. If we do not concur with the Section 7 determination(s) provided or if we have any questions/concerns regarding the information provided, you will be contacted. If you are not contacted during the 60-day review period, this letter and your project review package, complete the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this self-certification letter to be valid. This letter and the project review package will be maintained in our records.

The ESA Section 7 Determination Table in the enclosed project review package summarizes your ESA analyses and determinations. These analyses resulted in a “no effect” and/or a “may affect, not likely to adversely affect” determination for proposed/listed species and/or proposed/designated critical habitat.

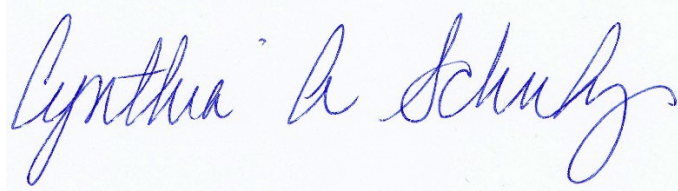
The use of the online project review process in strict accordance with the instructions provided as documented in the enclosed project review package resulted in reaching the appropriate determinations. Therefore, we concur with the not likely to adversely affect determination(s) for proposed/listed species and proposed/designated critical habitat provided in the ESA Section 7 Determination Table.

Should project plans change, surveys expire, or information on the distribution or status of proposed/listed species and/or proposed/designated critical habitat become available/change, this letter is no longer valid and you must submit an updated project package.

Note that under 50 CFR 402.12(e) of the regulations implementing Section 7 of the ESA, the accuracy of official species lists 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.

Information about the online project review process including instructions and use, species information, and other information regarding project reviews within Virginia is available on our website (<https://www.fws.gov/office/virginia-ecological-services/virginia-field-office-online-review-process>). If you have any questions, please contact Troy Andersen of this office at (804) 728-0695.

Sincerely,



Cindy Schulz  
Field Supervisor  
Virginia Ecological Services

Enclosures - project review package

## Endangered Species Act (ESA) Section 7 Determination Table

Project Name: Section 510 Middle Peninsula State Park Feasibility Study

Date: 10/24/2024

Consultation Code: 2024-0117650

| <b>Species / Resource Name</b><br><i>Insert name of species or resource as listed on Official Species List.</i> | <b>Habitat/Species Presence in Action Area</b><br><i>Indicate if suitable habitat and species are present in the Action Area (see examples in Step 5).</i> | <b>Sources of Info</b><br><i>Explain what info suitable habitat/species presence is based on.</i> | <b>ESA Section 7 Determination</b><br><i>Using reasoning and decision tables in Step 5, select determination for each species (e.g. no effect, not likely to adversely affect, or likely to adversely affect).</i> | <b>Project Elements that Support Determination</b><br><i>Explain which project elements may impact the habitat or individuals of each species and any Avoidance and Minimization Measures being implemented.</i>  |
|---|--|---|--|---|
| Northern long-eared bat   | Dkey & CMs   | NLAA  |  | Tree removal would occur outside of the summer occupancy TOYR April 1-September 30  |
| Tricolored bat  | Dkey & CMs   | NLAA  |  | Tree removal would occur outside of the summer occupancy TOYR April 1-September 30  |
| Monarch Butterfly   | Suitable habitat likely present; species likely present  | IPaC  | NLAA   | Monarch butterflies may be temporarily displaced from the site during construction, but this temporary disturbance would not impair opportunities to feed, breed, and shelter in other nearby areas. Monarch butterflies would be able to re-populate the improved long-term habitat post-construction. |
| Critical habitat not present  |  | IPaC  |  |   |



**From:** [Virginia Field Office, FW5](#)  
**To:** [Mowery, Peyton CIV USARMY CENAO \(USA\)](#)  
**Subject:** [Non-DoD Source] Re: [EXTERNAL] ESA Determinations and Bald Eagle Impacts  
**Date:** Thursday, October 24, 2024 3:59:58 PM

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Dear Peyton:

Thank you for using the U.S. Fish and Wildlife Service (Service) Virginia Ecological Services online project review process for Section 510 Middle Peninsula State Park Feasibility Study/2024-0117650.

We have concluded our review and concur with your determinations. This email along with the self-certification letter and project review package, complete the review of your project in accordance with the Endangered Species Act of 1973 (16 USC 1536), as amended.

Should project plans change, surveys expire, or information on the distribution or status of proposed/listed species and/or proposed/designated critical habitat become available/change prior to the completion of project activities, this response is no longer valid and you must submit an updated project package.

Note that under 50 CFR 402.12(e) of the regulations implementing Section 7 of the ESA, the accuracy of official species lists 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.

**From:** [Mowery, Peyton CIV USARMY CENAO \(USA\)](#)  
**To:** ["nmfs.gar.esa.section7@noaa.gov"](mailto:nmfs.gar.esa.section7@noaa.gov)  
**Subject:** USACE NLAA Program: Middle Peninsula State Park  
**Date:** Wednesday, October 23, 2024 2:54:00 PM  
**Attachments:** [GARFO-Sect7-NLAA-Program-Verification-Form-MiddlePeninsula\\_Updated\\_signed.pdf](#)  
[SupportingDocuments.pdf](#)

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Good afternoon,

Please find the GARFO ESA Section 7: NLAA Program Verification Form for the USACE and Virginia Department of Conservation and Recreation's Middle Peninsula State Park Feasibility Study and supporting documentation for your review.

Please let me know if you need any additional information!

Best,

Peyton Mowery  
Biologist  
Environmental Analysis Section  
US Army Corps of Engineers | Norfolk District  
Office: 757.201.7390



## GARFO ESA Section 7: NLAA Program Verification Form

(Please submit a signed version of this form, together with any project plans, maps, supporting analyses, etc., to [nmfs.gar.esa.section7@noaa.gov](mailto:nmfs.gar.esa.section7@noaa.gov) with "USACE NLAA Program: [Application Number]" in the subject line)

### Section 1: General Project Details

|  |  |  |   |
|--|--|--|---|
| Application Number:  |  | Middle Peninsula State Park Shoreline Restoration and Protection Feasibility Study |   |
| Reinitiation:  |  | No   |   |
| Applicant(s):  |  | Virginia Department of Conservation and Recreation                                 |   |
| Permit Type:   |  | Civil Works/Federal Navigation   |   |
| Anticipated project start date (e.g., 10/1/2020)   |  | September 2029   |   |
| Anticipated project end date (e.g., 12/31/2022 – if there is no permit expiration date, write “N/A”) |  | N/A  |   |
| Project Type/Category (check all that apply to entire action):                                       |  |  |   |
| <input checked="" type="checkbox"/>  | Aquaculture (shellfish) and artificial reef creation | <input type="checkbox"/>   | Mitigation (fish/wildlife enhancement or restoration) |
| <input type="checkbox"/>   | Dredging and disposal/beach nourishment              | <input checked="" type="checkbox"/>  | Bank stabilization                                    |
| <input type="checkbox"/>   | Piers, ramps, floats, and other structures           | <input type="checkbox"/>   | If other, describe project type category:             |
| Town/City:   | Gloucester   | Zip:   | 23610   |
| State:   | Virginia   | Water body:  | York River  |

|   |  |  |
|---|--|--|
| <b>Project/Action Description and Purpose</b><br><i>(include relevant permit conditions that are not captured elsewhere on form):</i>   |  |  |
| The U.S. Army Corps of Engineers, Norfolk District (USACE) is partnering with the Virginia Department of Conservation and Recreation (DCR) for a shoreline protection and aquatic ecosystem restoration study at Middle Peninsula State Park in Gloucester County, Virginia on the York River. The study area consists of approximately 2,000 linear feet of York River shoreline consisting of native tidal marsh habitat and previously modified shoreline, comprised of derelict hard protection measure including wooden bulkheads, wooden timber groins, stone revetments, and gabion cages. This project aims to reduce erosion and improve habitat quality through shoreline stabilization (breakwaters and sills with sand fill and native vegetation), marsh habitat restoration, and offshore reef structures. The tentatively selected plan also includes the full removal of existing, derelict shoreline protection measures. Based on feasibility-level designs, the bottom impacts are approximately 2.2 acres within the total impact area of approximately 7.29 acres. Additionally, all construction is anticipated to occur by land-based equipment and no marine vessels. |  |  |
| <b>Type of Bottom Habitat Modified:</b>   | <b>Permanent/Temporary:</b>  | <b>Area (acres):</b>                               |
| Sand (saline)   | Permanent  | 2.20   |
| Select Type of Bottom Habitat   | Select Permanent or Temporary  |  |
| Select Type of Bottom Habitat   | Select Permanent or Temporary  |  |
| Project Latitude (e.g., 42.625884)  | 37.326599  |  |
| Project Longitude (e.g., -70.646114)  | -76.587992   |  |
| Mean Low Water (MLW)(m)   | 0.09   |  |
| Mean High Water (MHW)(m)  | 0.85   |  |
| Width (m)<br>of water<br>body in<br>action area:  | Stressor Category<br>(stressor that extends furthest distance into<br>water body – e.g., turbidity plume; sound<br>pressure wave): | Max extent (m)<br>of stressor into the water body: |
| 3,620.00  | Turbidity  | 500.00   |

**Section 2: ESA-listed species and/or critical habitat in the action area:**

|                                     |  |                                     |  |
|-------------------------------------|--|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Atlantic sturgeon (all DPSs)   | <input checked="" type="checkbox"/> | Kemp's ridley sea turtle                       |
| <input checked="" type="checkbox"/> | Atlantic sturgeon critical habitat<br>Indicate which DPS :<br>Chesapeake Bay | <input type="checkbox"/>            | Loggerhead sea turtle<br>(NW Atlantic DPS)     |
| <input type="checkbox"/>            | Shortnose sturgeon   | <input checked="" type="checkbox"/> | Leatherback sea turtle                         |
| <input type="checkbox"/>            | Atlantic salmon (GOM DPS)  | <input type="checkbox"/>            | North Atlantic right whale                     |
| <input type="checkbox"/>            | Atlantic salmon critical habitat<br>(GOM DPS)                                | <input type="checkbox"/>            | North Atlantic right whale<br>critical habitat |
| <input checked="" type="checkbox"/> | Green sea turtle (N. Atlantic DPS)   | <input type="checkbox"/>            | Fin whale                                      |

\* Please consult GARFO PRD's ESA Section 7 Mapper for ESA-listed species and critical habitat information for your action area at: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-species-critical-habitat-information-maps-greater>.

**Section 3: NLAA Determination (check all applicable fields):**

If the Project Design Criteria (PDC) is met, select Yes. If the PDC is not applicable (N/A) for your project (e.g., the stressor category is not included for your project activity, or for PDC 2, your project does not occur within the range of the GOM DPS of Atlantic salmon), select N/A. If the PDC is applicable, but is not met, leave both boxes blank and provide a justification for that PDC in Section 4.

| a) GENERAL PDC                      |                                     |       |   |
|-------------------------------------|-------------------------------------|-------|---|
| Yes                                 | N/A                                 | PDC # | PDC Description   |
| <input checked="" type="checkbox"/> |                                     | 1.    | No portion of the proposed action will individually or cumulatively have an adverse effect on ESA-listed species or designated critical habitat.  |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 2.    | No portion of the proposed action will occur in the tidally influenced portion of rivers/streams where Atlantic salmon presence is possible from April 10–November 7.<br><br><b>Note:</b> If the project will occur within the geographic range of the GOM DPS Atlantic salmon but their presence is not expected following the best available commercial scientific data, the work window does not need to be applied (include reference in project description).  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 3.    | No portion of the proposed action that may affect shortnose or Atlantic sturgeon will occur in areas identified as spawning grounds as follows:<br>i. Gulf of Maine: April 1–Aug. 31<br>ii. Southern New England/New York Bight: Mar. 15–Aug. 31<br>iii. Chesapeake Bay: March 15–July 1 and Sept. 15–Nov. 1<br><br><b>Note:</b> If river specific information exists that provides better or more refined time of year information, those dates may be substituted with NMFS approval (include reference in project description).                                |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 4.    | No portion of the proposed action that may affect shortnose or Atlantic sturgeon will occur in areas identified as overwintering grounds, where dense aggregations are known to occur, as follows:<br>i. Gulf of Maine: Oct. 15–April 30<br>ii. Southern New England/ New York Bight: Nov. 1–Mar. 15<br>iii. Chesapeake Bay: Nov. 1–Mar. 15<br><br><b>Note:</b> If river specific information exists that provides better or more refined time of year information, those dates may be substituted with NMFS approval (include reference in project description). |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 5.    | Within designated Atlantic salmon critical habitat, no portion of the proposed action will affect spawning and rearing areas (PBFs 1-7).  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 6.    | Within designated Atlantic sturgeon critical habitat, no work will affect hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand) (PBF 1).   |

| Yes                                 | N/A                                 | PDC # | PDC Description  |
|-------------------------------------|-------------------------------------|-------|--|
| <input checked="" type="checkbox"/> |                                     | 7.    | Work will result in no or only temporary/short-term changes in water temperature, water flow, salinity, or dissolved oxygen levels.  |
| <input checked="" type="checkbox"/> |                                     | 8.    | If ESA-listed species are (a) likely to pass through the action area at the time of year when project activities occur; and/or (b) the project will create an obstruction to passage when in-water work is completed, then a zone of passage (~50% of water body) with appropriate habitat for ESA-listed species (e.g., depth, water velocity, etc.) must be maintained (i.e., physical or biological stressors such as turbidity and sound pressure must not create barrier to passage). |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 9.    | Any work in designated North Atlantic right whale critical habitat must have no effect on the physical and biological features (PBFs).   |
| <input checked="" type="checkbox"/> |                                     | 10.   | The project will not adversely impact any submerged aquatic vegetation (SAV).  |
| <input checked="" type="checkbox"/> |                                     | 11.   | No blasting or use of explosives will occur.   |

b) The following stressors are applicable to the action  
(check all that apply – use Stressor Category Table for guidance):

|                                     |                                |
|-------------------------------------|--------------------------------|
| <input type="checkbox"/>            | Sound Pressure                 |
| <input type="checkbox"/>            | Impingement/Entrapment/Capture |
| <input checked="" type="checkbox"/> | Turbidity/Water Quality        |
| <input checked="" type="checkbox"/> | Entanglement (Aquaculture)     |
| <input checked="" type="checkbox"/> | Habitat Modification           |
| <input type="checkbox"/>            | Vessel Traffic                 |

| Activity Category                                    | Stressor Category |                                |                         |              |              |                |
|--|-------------------|--------------------------------|-------------------------|--------------|--------------|----------------|
|  | Sound Pressure    | Impingement/Entrapment/Capture | Turbidity/Water Quality | Entanglement | Habitat Mod. | Vessel Traffic |
| Aquaculture (shellfish) and artificial reef creation | N                 | N                              | Y                       | Y            | Y            | Y              |
| Dredging and disposal/beach nourishment              | N                 | Y                              | Y                       | N            | Y            | Y              |

|  | Stressor Category |                                  |                          |              |              |                |
|--|-------------------|----------------------------------|--------------------------|--------------|--------------|----------------|
| Activity Category  | Sound Pressure    | Impingement/ Entrapment/ Capture | Turbidity/ Water Quality | Entanglement | Habitat Mod. | Vessel Traffic |
| Piers, ramps, floats, and other structures                                 | Y                 | N                                | Y                        | N            | Y            | Y              |
| Transportation and development (e.g., culvert construction, bridge repair) | Y                 | N                                | Y                        | N            | Y            | Y              |
| Mitigation (fish/wildlife enhancement or restoration)                      | N                 | N                                | Y                        | N            | Y            | Y              |
| Bank stabilization and dam maintenance                                     | Y                 | N                                | Y                        | N            | Y            | Y              |

### c) SOUND PRESSURE PDC

#### Information for Pile Driving:

If your project includes **pile driving of any kind**, please attach your calculation to this verification form to verify that it fits within the scope of the behavioral/injury threshold analysis for ESA-listed species in the action area. The NMFS Office of Protected Resources Acoustic Calculator is available as one source, should you not have other information:

<https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-effects-analysis-acoustics-greater-atlantic-region>

|    | Pile material        | Pile diameter/width (inches) | Number of piles | Installation method        |
|----|----------------------|------------------------------|-----------------|----------------------------|
| a) | Select pile material |                              |                 | Select installation method |
| b) | Select pile material |                              |                 | Select installation method |
| c) | Select pile material |                              |                 | Select installation method |
| d) | Select pile material |                              |                 | Select installation method |

| Yes                      | N/A                                 | PDC # | PDC Description   |
|--------------------------|-------------------------------------|-------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 12.   | <p>If pile driving is occurring during a time of year when ESA-listed species may be present, and the anticipated noise is above the behavioral noise threshold, a “soft start” is required to allow animals an opportunity to leave the project vicinity before sound pressure levels increase. <i>In addition to using a soft start at the beginning of the work day for pile driving, one must also be used at any time following cessation of pile driving for a period of 30 minutes or longer.</i></p> <p><u>For impact pile driving:</u> pile driving will commence with an initial set of three strikes by the hammer at 40% energy, followed by a one minute wait period, then two subsequent 3-strike sets at 40% energy, with one-minute waiting periods, before initiating continuous impact driving.</p> <p><u>For vibratory pile installation:</u> pile driving will be initiated for 15 seconds at reduced energy followed by a one-minute waiting period. This sequence of 15 seconds of reduced energy driving, one-minute waiting period will be repeated two additional times, followed immediately by pile-driving at full rate and energy.</p> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 13.   | Any new pile supported structure must involve the installation of $\leq 50$ piles (below MHW).  |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 14.   | All underwater noise (pressure) is below ( $<$ ) the physiological/injury noise threshold for ESA-species in the action area.   |

d) IMPINGEMENT/ENTRAINMENT/CAPTURE PDC

**Information for Dredging/Disposal:**

|   |  |                           |  |
|---|--|---------------------------|--|
| Type of dredge:   | Select type of dredge                                |                           |  |
| Maintenance dredging?:  | Select Yes or No                                     | If “Yes”, how many acres? |  |
| If maintenance, when was the last dredge cycle?                               |  |                           |  |
| New dredging:   | Select Yes or No                                     | If “Yes”, how many acres? |  |
| Estimated number of dredging events covered by permit:                        |  |                           |  |
| ESA-species exclusion measures required (e.g., cofferdam, turbidity curtain): | Select Yes or No                                     |                           |  |
| If no exclusion measures required, explain why:                               | Select reason why no exclusion measures are required |                           |  |

**Information for Intake Structures:**

|   |  |
|---|--|
| Mesh screen size (mm) for temporary intake: |  |
|---|--|



| Yes                      | N/A                                 | PDC # | PDC Description   |
|--------------------------|-------------------------------------|-------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 15.   | Only mechanical, cutterhead, and low volume hopper (e.g., CURRITUCK, ~300 cubic yard maximum bin capacity) dredges may be used.   |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 16.   | No new dredging in Atlantic sturgeon or Atlantic salmon critical habitat (maintenance dredging still must meet all other PDCs). New dredging outside Atlantic sturgeon or salmon critical habitat is limited to one time dredge events (e.g., burying a utility line) and minor ( $\leq 2$ acres) expansions of areas already subject to maintenance dredging (e.g., marina/harbor expansion).        |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 17.   | Work behind cofferdams, turbidity curtains, or other methods to block access of animals to dredge footprint is required when operationally feasible or beneficial and ESA-listed species are likely to be present (if presence is limited to rare, transient individuals, exclusion methods are not necessary).   |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 18.   | Temporary intakes related to construction must be equipped with appropriate sized mesh screening (as determined by GARFO section 7 biologist and/or according to <a href="#">Chapter 11 of the NOAA Fisheries Anadromous Salmonid Passage Facility Design</a> ) and must not have greater than 0.5 fps intake velocities, to prevent impingement or entrainment of any ESA-listed species life stage. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 19.   | No new permanent intake structures related to cooling water, or any other inflow at facilities (e.g. water treatment plants, power plants, etc.).   |

#### e) TURBIDITY/WATER QUALITY PDC

##### Information for Turbidity Producing Activity (excluding disposal):

|  |  |
|--|--|
| ESA-species turbidity control measures required (e.g., turbidity curtain): | No   |
| If no turbidity control measures required, explain why:                    | Disturbed substrate won't generate measurable turbidity (e.g., rocks, coarse sand) |

##### Information for Dredged Material Disposal:

|  |                      |
|--|----------------------|
| Disposal site:   | Select disposal site |
| Estimated number of trips to disposal site:  |                      |
| Relevant disposal site permit/special conditions required (NAE: for offshore disposal, include Group A, B, C, or relevant Long Island Sound consultation): |                      |

| Yes                      | N/A                                 | PDC # | PDC Description   |
|--------------------------|-------------------------------------|-------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 20.   | Work behind cofferdams, turbidity curtains, or other methods to control turbidity is required when operationally feasible or beneficial and ESA-listed species are likely to be present (if presence is limited to rare, transient individuals, turbidity control methods are not necessary). |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 21.   | In-water offshore disposal may only occur at designated disposal sites that have been the subject of ESA section 7 consultation with NMFS, where a valid consultation is in place and appropriate permit/special conditions are included.   |

|  |                                     |                                  |   |
|--|-------------------------------------|----------------------------------|---|
| Yes  | N/A                                 | PDC #                            | PDC Description   |
| <input checked="" type="checkbox"/>  | <input type="checkbox"/>            | 22.                              | Any temporary discharges must meet state water quality standards (e.g., no discharges of substances in concentrations that may cause acute or chronic adverse reactions, as defined by EPA water quality standards criteria).                       |
| <input type="checkbox"/>   | <input checked="" type="checkbox"/> | 23.                              | Only repair, upgrades, relocations and improvements of existing discharge pipes or replacement in-kind are allowed; no new construction of untreated discharges.  |
| f) ENTANGLEMENT PDC  |                                     |                                  |   |
| <b>Information for Aquaculture Projects:</b>                                 |                                     |                                  |   |
| Approximate distance from shore (MHW)(m):                                    |                                     |                                  |   |
| Grow season begins (approximate):  |                                     |                                  |   |
| Grow season ends (approximate):  |                                     |                                  |   |
| Total number of vertical lines:  |                                     |                                  |   |
| Total number of horizontal lines:  |                                     |                                  |   |
| Is any gear seasonally removed from the water? If yes, which parts and when? |                                     |                                  |   |
|  | Aquaculture Gear                    | Acreage (total permit footprint) | Type of Shellfish Cultivated  |
| a)   | Select aquaculture gear             |                                  | Select type of shellfish cultivated   |
| b)   | Select aquaculture gear             |                                  | Select type of shellfish cultivated   |
| c)   | Select aquaculture gear             |                                  | Select type of shellfish cultivated   |
| Yes  | N/A                                 | PDC #                            | PDC Description   |
| <input type="checkbox"/>   | <input checked="" type="checkbox"/> | 24.                              | Shell on bottom <50 acres with maximum of 4 corner marker buoys;  |
| <input type="checkbox"/>   | <input checked="" type="checkbox"/> | 25.                              | Cage on bottom with no loose floating lines <5 acres and minimal vertical lines (1 per string of cages, 4 corner marker buoys);   |
| <input type="checkbox"/>   | <input checked="" type="checkbox"/> | 26.                              | Floating cages in <3 acres in waters and shallower than -10 feet MLLW with no loose lines and minimal vertical lines (1 per string of cages, 4 corner marker buoys);  |
| <input type="checkbox"/>   | <input checked="" type="checkbox"/> | 27.                              | Floating upweller docks in >10 feet MLLW.   |
| <input type="checkbox"/>   | <input checked="" type="checkbox"/> | 28.                              | Any in-water lines, ropes, or chains must be made of materials and installed in a manner to minimize or avoid the risk of entanglement by using thick, heavy, and taut lines that do not loop or entangle. Lines can be enclosed in a rigid sleeve. |
| g) HABITAT MODIFICATION PDC  |                                     |                                  |   |
| Yes  | N/A                                 | PDC #                            | PDC Description   |
| <input type="checkbox"/>   | <input type="checkbox"/>            | 29.                              | No conversion of habitat type (soft bottom to hard, or vice versa) for aquaculture or reef creation.  |

|  |  |  |   |
|--|--|--|---|
| h) VESSEL TRAFFIC PDC  |  |  |   |
| <b>Information for Vessel Traffic:</b>   |  |  |   |
|  | Temporary Project Vessel Type  |  | Number of Vessels   |
| a)   | Select temporary vessel type   |  |   |
| b)   | Select temporary vessel type   |  |   |
| c)   | Select temporary vessel type   |  |   |
|  | Type of Non-Commercial or Aquaculture Vessels Added<br>– only include if there is a net increase directly/indirectly resulting from project) |  | Number of Vessels<br>(if sum > 2, PDC 33 is not met and justification required in Section 4)  |
| a)   | Select type of non-commercial or aquaculture vessels   |  |   |
| b)   | Select type of non-commercial or aquaculture vessels   |  |   |
|  | Type of Commercial Vessels Added<br>(only include if there is a net increase directly/indirectly resulting from project)                     |  | Number of Vessels<br>(if > 0, PDC 33 is not met and justification required in Section 4)  |
| a)   |  |  |   |
| b)   |  |  |   |
| If no temporary/permanent vessel traffic, briefly explain (e.g., all land-based work, no net increase in vessel traffic) |  | All work will be land-based from the existing bank and uplands, so no net increase in vessel traffic due to construction is anticipated. |   |
| Yes  | N/A  | PDC #  | PDC Description   |
| <input type="checkbox"/>   | <input checked="" type="checkbox"/>  | 30.  | Maintain project vessels operating within the action area to speed limits below 10 knots and dredge vessel speeds of 4 knots maximum, while dredging.   |
| <input type="checkbox"/>   | <input checked="" type="checkbox"/>  | 31.  | Maintain a 1,500-foot buffer between project vessels and ESA-listed whales and a 150-foot buffer between project vessels and sea turtles unless the vessel is navigating to an in-water disposal site/activity. If the vessel is navigating to an in-water disposal site/activity, refer to and include the conditions contained in the appropriate GARFO-USACE/EPA consultation for the disposal site. |
| <input type="checkbox"/>   | <input checked="" type="checkbox"/>  | 32.  | The number of project vessels must be limited to the greatest extent possible, as appropriate to size and scale of project.   |
| <input type="checkbox"/>   | <input checked="" type="checkbox"/>  | 33.  | The permanent net increase in vessels resulting from a project (e.g., dock/float/pier/boating facility) must not exceed two non-commercial vessels. A project must not result in the permanent net increase of any commercial vessels (e.g., a ferry terminal).   |

#### Section 4: Justification for Review under the NLAA Program

If the action is not in compliance with all of the General PDC and appropriate stressor PDC, but you can provide justification and/or special conditions to demonstrate why the project still meets the NLAA determination and is consistent with the aggregate effects considered in the programmatic consultation, you may still certify your project through the NLAA program using

this verification form. Please identify which PDC your project does not meet (e.g., PDC 9, PDC 15, PDC 22, etc.) and provide your rationale and justification for why the project is still eligible for the verification form.

To demonstrate that the project is still NLAA, you must explain why the effects on ESA-listed species or critical habitat are **insignificant** (i.e., too small to be meaningfully measured or detected) or **discountable** (i.e., extremely unlikely to occur). **Please use this language in your justification.**

| PDC#  | Justification  |
|-------|--|
| 29    | The PDC 29 is for conversion of habitat. The project site is composed of sand. It is reasonable to conclude that there will be conversion of 0.12 acres bottom habitat from sand to primarily hard bottom resulting from the installation of oyster reef structures. However, given abundance of sand along the shoreline of Middle Peninsula State Park, we believe that the effects on ESA listed species would be extremely unlikely to occur, and therefore discountable. In fact, some diversity of habitat, that will result with the creation of an oyster reef, may be beneficial to ESA listed species. |
| PDC # |  |
| PDC # |  |

|       |  |
|-------|--|
| PDC # |  |
|-------|--|

### Section 5: USACE Verification of Determination

|   |   |   |
|---|---|---|
| <input type="checkbox"/>                      | In accordance with the NLAA Program, USACE has determined that the action complies with all applicable PDC and is not likely to adversely affect listed species.                                      |   |
| <input checked="" type="checkbox"/>           | In accordance with the NLAA Program, the USACE has determined that the action is not likely to adversely affect listed species per the justification and/or special conditions provided in Section 4. |   |
| USACE Signature:                              |   | Date:   |
| <b>MARTIN.ZACHARY.</b><br><b>P.1067264599</b> |   | Digitally signed by<br>MARTIN.ZACHARY.P.1067264599<br>Date: 2024.10.17 12:57:17 -04'00'<br>10/17/2024 |

### Section 6: GARFO Concurrence

|                          |   |       |
|--------------------------|---|-------|
| <input type="checkbox"/> | In accordance with the NLAA Program, GARFO PRD concurs with USACE's determination that the action complies with all applicable PDC and is not likely to adversely affect listed species or critical habitat.                                  |       |
| <input type="checkbox"/> | In accordance with the NLAA Program, GARFO PRD concurs with USACE's determination that the action is not likely to adversely affect listed species or critical habitat per the justification and/or special conditions provided in Section 4. |       |
| <input type="checkbox"/> | GARFO PRD does not concur with USACE's determination that the action complies with the applicable PDC (with or without justification), and recommends an individual Section 7 consultation to be completed independent from the NLAA Program. |       |
| GARFO Signature:         |   | Date: |
|                          |   |       |

**Appendix A-1 Environmental: Fish and Wildlife Coordination Act**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**Fish and Wildlife Coordination Act  
Consultation Documentation**

**November 2024**



**US Army Corps  
of Engineers®**  
Norfolk District

Draft Planning Aid Report

Section 510 Middle Peninsula, Machicomoco State Park,  
Gloucester County, VA

Prepared for: U.S. Army Corps of Engineers  
Norfolk District

Prepared by: Amy O'Donnell  
Chesapeake Bay Field Office U.S. Fish and Wildlife Service

October 2024

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## Introduction

This proposed project would occur at the Middle Peninsula unit at Machicomoco State Park in Gloucester County off Route 632 in Virginia. This park consists of 645 acres that overlooks the York River and is the first state park that celebrates and honors the legacy of the Native Tribes of Virginia. The park property is 431 acres with 2,260 linear feet of shoreline along the York River and 3,776 linear feet along Aberdeen Creek. This site has experienced severe degradation of the shoreline and marsh habitat due to wind and wave action. Virginia Department of Conservation and Recreation (Virginia DCR) requested assistance from the United States Army Corps of Engineers (USACE) in September 2020 with a living shoreline project at this site under Section 510 of the Water Resources Development Act (WRDA). Section 510 of WRDA authorizes USACE to design and construct water-related resource protection and restoration projects for areas that are within the Chesapeake Bay watershed for non-Federal partners. The Norfolk District of USACE completed a scoping report for the proposed project; this was approved by the North Atlantic Division for inclusion into the Section 510 program in November 2021.

## Project Area

The feasibility phase of this project includes the development of several project alternatives with an examination of impacts and benefits of each alternative as well as alternatives for design and construction. The proposed project would involve removal of degraded timber groins and bulkhead, grading of the existing areas into a naturally sloped shoreline, installation of offshore reef structure, and restoration of wetland and marsh areas on the east and west extents of the property. Existing offshore habitat would be improved by removing groins and installing oyster reef structures. The proposed reef would be approximately 0.5 acres and subtidal (not exposed during low tide cycles) to prevent hazards with recreational users in the area. This would provide wave attenuation effects, reducing shoreline impacts during storm events. The oyster reef structures would provide habitat for oysters as well as other Bay fauna; these reef structures would also promote nutrient mixing within the water column. Removing the bulkhead and grading the bank of the shoreline would alleviate safety issues as well as provide a larger beach shoreline with a natural slope. Wetland and marsh restoration adjacent to the project area (0.6 acres) would further protect the shoreline by increasing native plant and mussel populations. The project also is considering placement of mussels within the wetland fringe along 0.9 acres of new marsh habitat. Rehabilitation and installation of a living shoreline at Middle Peninsula State Park would improve the habitat value within the park by providing additional shoreline wading and foraging areas, removing safety hazards and preventing further shoreline and property loss.

Currently, there are five proposed alternatives (Table 1 and Figure 2) including a No Action alternative. The alternatives break the project area into three sections, sections one and three are marsh habitat, section two is the modified shoreline area (Figure 1). Alternative 1 is the No Action alternative. Alternative 2A would include removing all existing structures, then modifying the shoreline in Area 2 with breakwaters, sand fill, and a sill with a vegetated slope. The marsh habitat would be supplemented by marsh fringe enhancement, toe protection, and offshore reef habitat. Alternative 2B is the same as 2A but does not offer offshore reef habitat. Alternative 3A would also remove all existing structures; this alternative modifies the shoreline with a sill and sand fill. Alternative 3A would alter the marsh habitat with marsh fringe enhancement, toe protection, and offshore reef habitat. Alternative 3B is the same as 3A but does not offer offshore reef habitat. Figure 1. Project area

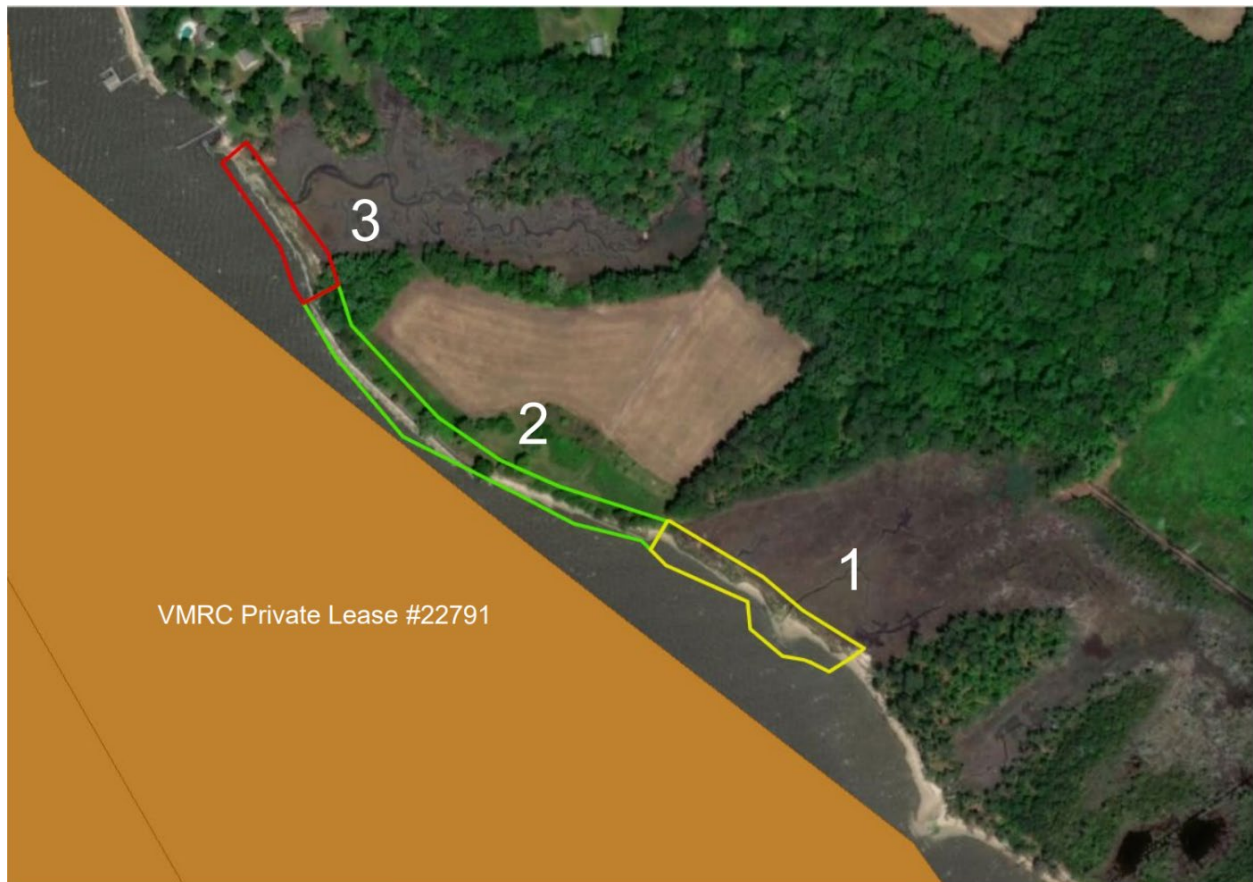


Table 1. Proposed alternatives

| Alt ID | Modified Shoreline<br>Area 2                             | Marsh Habitat<br>Area 1 and 3                                   | All                            |
|--------|--|---|--------------------------------|
| 1      | No Action  |   |                                |
| 2A     | Breakwaters with sand fill and sill with vegetated slope | Marsh fringe enhancement, toe protection, offshore reef habitat | Removal of existing structures |
| 2B     | Breakwaters with sand fill and sill with vegetated slope | Marsh fringe enhancement and toe protection                     | Removal of existing structures |
| 3A     | Sill with sand fill                                      | Marsh fringe enhancement, toe protection, offshore reef habitat | Removal of existing structures |
| 3B     | Sill with sand fill                                      | Marsh fringe enhancement and toe protection                     | Removal of existing structures |



Figure 2. Proposed alternatives



## Wildlife Resources

Avian resources present in this area was assessed using the Rapid Avian Information Locator (RAIL) tool on September 24, 2024 (Avian Knowledge Network 2021). This tool compiles information from multiple public datasets (Breeding Bird Surveys, eBird, and multiple survey methods from the Avian Knowledge Network). The birds included on this list have been observed within 10km of the project area within the last 10 years, therefore, not all species will be consistently found within the project area. This list is included simply as reference when considering the suggested alternatives. Most of the species on the list are not of conservation concern, but there are some that may nest near the project area which may necessitate time of year restrictions for habitat that will be undergoing active construction during the nesting season. Species that are birds of conservation concern that have the potential to nest in or around the project area are: American kestrel (*Falco sparverius*), black-throated green warbler (*Setophaga virens*), brown-headed nuthatch (*Sitta pusilla*), chimney swift (*Chaetura pelagica*), Chuck-will's-widow (*Antrostomus carolinensis*), Kentucky warbler (*Geothlypis formosa*), prairie warbler (*Setophaga discolor*), prothonotary warbler (*Protonotaria citrea*), red-headed woodpecker (*Melanerpes erythrocephalus*), and wood thrush (*Hylocichla mustelina*). Several species are listed as non-breeding birds of conservation concern: dunlin (*Calidris alpina*), lesser yellowlegs (*Tringa flavipes*), rusty blackbird (*Euphagus carolinus*), and semipalmated sandpiper (*Calidris pusilla*). All species on the list are protected by the Migratory Bird Treaty Act (MBTA) therefore it is illegal to take any of these birds including eggs and parts of the nests. If nesting time of year considerations are not possible, please consider contacting the local Service field office (Virginia Field Office) if there are any suspected nesting birds found within the project area during construction phases.

### Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) was federally listed as an endangered species and was delisted in 2007 because of successful population recovery. This species is now protected under the Bald and Golden Eagle Protection Act (BGEPA) as well as the MBTA. The Center for Conservation Biology (CCB) has created an online mapping portal that shows bald eagle nest locations in Virginia. This data is compiled through spring and winter aerial flights of the tributaries in the lower Chesapeake Bay. There is a reported nest within the construction area for this project (Figure 3). The last year this nest was checked, according to the CCB mapper portal, was 2016 but unless the nesting tree has fallen over there is no reason to believe that eagles would not still be using this nest each year. There is a time of year restriction for activities that may result in eagle nest disturbance. As defined by BGEPA, the goal is minimal disturbance during the nesting season, December 15 - June 30 (Watts and Byrd 2013). If the eagle nest is still active at the construction site, a disturbance permit may be required for construction to continue during the time of year restriction. The alternatives proposed will not provide new nesting areas for bald eagles. If there is removal of trees within the marsh area (area 1 in Figure 1), then the eagle nest may be lost, which would require a nest take permit from the Service. Please contact your local Service field office or Virginia Department of Game and Inland Fisheries to confirm the current status of the bald eagle nest before proceeding with construction.

Figure 3. Known bald eagle nest with buffer within the project area (Watts and Byrd 2013)



### Anadromous and Catadromous Fish

The Anadromous Fish Conservation Act (16 USCS §§ 757a-757f) was enacted in 1965 to conserve, develop, and enhance the anadromous fish resources of the U.S. that are subject to depletion from water resource development and other causes which the U.S. has made conservation commitments by international agreements, and the fish in the Great Lakes and Lake Champlain that ascend streams to spawn. Inter-jurisdictional, catadromous and anadromous fish are a Service trust resource. Anadromous fish spend most of their adult lives in saltier water but return each year to spawn in freshwater. Catadromous fish spend most of their adult lives in fresh water and return to salt water to spawn.

According to the Virginia Institute of Marine Science (Hewitt et al. 2009), anadromous fishes from the York River include:

- alewife herring (*Alosa pseudoharengus*)
- hickory shad (*Alosa mediocris*)
- American shad (*Alosa sapidissima*)
- blueback herring (*Alosa aestivalis*)
- striped bass (*Morone saxatilis*)
- yellow perch (*Perca flavescens*)

### Essential Fish Habitat

One of the priorities of National Oceanic and Atmospheric Administration (NOAA) is Essential Fish Habitat (EFH). Using the best available science, NOAA Fisheries along with regional fishery management councils identify and map EFH for each life stage of over 1,000 federally managed species (see species present within the project area in Table 2). EFH includes a variety of habitat in which fish spawn, breed, feed, and grow to maturity. These habitats include wetlands, reefs, seagrass, rivers, and coastal estuaries. High priorities for EFH are referred to as Habitat Areas of Particular Concern (HAPC) due to major ecological functions, sensitivity to decline, stress from development, and/or rare habitat. Using NOAA's EFH Mapper at coordinates for the Alternatives 1-3B, several species were identified to use the habitat around the project area (NOAA 2021). The Service recommends that the USACE pursue appropriate coordination and consultation with National Marine Fisheries Service (NMFS) who has Federal jurisdiction over EFH prior to



construction occurring (see <https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-assessment-consultations>).

Table 2. Species within the project area identified with the essential fish habitat mapper

| Species   | Lifestage (s) Found at Location |
|---|---------------------------------|
| Atlantic Herring ( <i>Clupea harengus</i> )         | Juvenile, adult                 |
| Red Hake ( <i>Urophycis chuss</i> )                 | Adult, eggs/larvae/juvenile     |
| Clearnose Skate ( <i>Raja eglanteria</i> )          | Adult, juvenile                 |
| Windowpane Flounder ( <i>Scophthalmus aquosus</i> ) | Juvenile                        |
| Bluefish ( <i>Pomatomus saltatrix</i> )             | Adult, juvenile                 |
| Atlantic Butterfish ( <i>Peprilus triacanthus</i> ) | Adult, juvenile                 |
| Summer Flounder ( <i>Paralichthys dentatus</i> )    | Larvae, juvenile, adult         |

## At-Risk Species

At-risk species conservation promotes the proactive conservation of species that are in decline but that don't warrant protection under Endangered Species Act (ESA). These species are defined as those that are in decline and at risk of being a candidate for ESA and may include state-listed species, species identified by states as greatest conservation need or species with state heritage ranks. The intent is to improve the status of at-risk species before they are sent to the Service for review, and to avoid listing the species (USFWS Species at risk, n.d.).

### Wood Thrush

The wood thrush (*Hylocichla mustelina*) is an at-risk bird species that inhabits forested areas. It is widespread across the eastern United States. This species is known for its flute-like song and is typically found in the underbrush or along the forest floor, and identified by a reddish-brown back feathers with a white and brown speckled breast and underside. This species is subject to habitat loss, degradation, and fragmentation in its breeding grounds as well as overwintering areas (USFWS Wood Thrush, n.d.). They feed on leaf litter, invertebrates, and fruits. Nests are in the lower branches of shrubs or small trees; clutch size is 3-4 turquoise-green eggs (Cornell Wood Thrush 2024). Because the project area mainly encompasses shoreline rather than forested area, this species is not likely to be directly affected by the project. If there was opportunity for tree plantings, this species could ultimately benefit from additional forest habitat.

### Alewife Herring

Alewife herring (*Alosa pseudoharengus*) is an at-risk fish species and is a Species of Greatest Conservation Need Tier 4a in the Virginia Wildlife Action Plan (VDGIF 2015). It can be identified by an elongated body that tapers near a deeply forked tail, silver color along the sides that can appear purple and blue, an elongated anal fin that is shaped like a sickle, and a sharp keel on the underside. This fish is anadromous; it migrates upstream into areas of freshwater to spawn in riffles with clean gravelly substrate between February and May. Juveniles will use rivers and estuaries as a nursery before migrating to the ocean (VDWR 2024a). This project may have temporary negative impacts on alewife herring during construction of the shoreline and nearshore structures; the proposed alternatives could result in improved water quality which would benefit this species.

### Blueback Herring

Blueback herring (*Alosa aestivalis*) is also a Service at-risk species and is a Species of Greatest Conservation Need Tier 4 in the Virginia Wildlife Action Plan. This species has an elongated body that tapers quickly at the tail, eye diameter equal to snout length, a deeply forked caudal fin, silver sides that can appear purple and blue, elongated sickle shaped anal fin, and a sharp keel. This fish species is anadromous and will migrate into areas of clean freshwater to spawn on gravelly substrates between March and June. Juveniles will continue to use tidal river and estuaries as a nursery before migrating to the ocean (VDWR 2024b). This project may have temporary negative impacts on blueback herring during the construction phase of the shoreline and nearshore structures; the proposed alternatives could result in improved water quality which would be an overall benefit this species.

### Endangered Species

A polygon of the project area was submitted into the Service's Information for Planning and Consultation (IPaC) system September 24, 2024. This generated a list of threatened and endangered species reasonably certain to occur in the project area. The species below were listed in IPaC but are not likely to be adversely affected by any of the alternatives for the proposed project. All listed species below may benefit from restored marsh areas as it may provide feeding and loafing spots.

#### Northern Long-eared bat

The northern long-eared bat (*Myotis septentrionalis*) is classified as endangered. This species is medium sized, about 3-3.7 inches (in) in length with a 9-10 in wingspan. It is distinguished by its long ears. This species of bat is experiencing substantial population declines, up to 99 percent, due to white-nose syndrome, a fungal disease that disrupts hibernation periods. During the summer these bats roost underneath bark or in crevices of trees and overwinter in caves and mines. Breeding begins in late summer or early fall at the hibernacula. Due to delayed fertilization this species will return pregnant to summer areas where they roost in colonies and give birth to a single pup. The females in the colony will birth typically around the same time which can be as early as mid-May but as late as July depending on the location. Young bats will start flying about 3 weeks after they are born (USFWS NLEB, n.d.). Due to the lack of trees within the project area, this project is not likely to adversely affect this species. Providing areas where native insects can thrive, such as in the proposed restored marsh areas, can provide food resources for this species.

#### Tricolored bat

The tricolored bat (*Perimyotis subflavus*) is proposed as endangered. It is a small bat distinguished by its tricolored fur, often appearing yellow or orange. This bat has also experienced precipitous population declines of more than 90percent due to white-nose syndrome. This species of bat overwinters in caves and mines; spring through fall they roost in trees among leaves of live or recently dead deciduous hardwood trees. Similar to northern long-eared bat, tricolored bats have delayed fertilization and mate in the fall but are not fertilized until spring emergence from hibernation. This species typically gives birth to two young between May and July. Their young begin to fly at about 3 weeks (USFWS 2021). Due to the lack of trees within the project area, this project is not likely to adversely affect this species. Providing areas where native insects can thrive, such as in the proposed marsh restoration areas, can provide food sources and loafing areas for this species.



## Monarch Butterfly

The monarch butterfly (*Danaus plexippus*) is a species that is not yet listed as threatened or endangered. Rather, it is a candidate species with a final listing decision is expected in December 2024. This butterfly is large and easily recognized by its bright orange wings and black border and veins. They lay their eggs on *Asclepias* spp. (milkweed), their obligate host plant. Larvae emerge within a week and develop through five instars over a period of 9 to 18 days. Larvae then pupate into a chrysalis and emerge 6 to 14 days later as an adult butterfly. Multiple generations of monarchs are produced during the breeding season and are known for their extensive migration patterns. The final generation of the fall will migrate on the East Coast up to 3,000 kilometers (km) to their overwinter grounds in Mexico (USFWS 2020). The expected disturbance from construction may make the area temporarily unsuitable for monarchs to feed or rest which will cause displacement from the area but will not impair opportunities to feed, breed and shelter in other nearby areas. Therefore, this project is not likely to adversely affect this species. Each of the alternatives will provide improved long-term habitat for this species post-construction, even more so if there are pollinator-friendly or *Asclepias* species of plants included in any seed mixed to be used during construction in upland areas.

## Aquatic Endangered Species

A polygon of the project area was submitted into the the NOAA Fisheries Greater Atlantic Region ESA Section 7 Mapper (NOAA 2022) on September 24, 2024 to identify all resources within 1.5 km of 1-3B (Table 3).

Table 3: Species present within the project footprint according to NOAA Fisheries Greater Atlantic Region ESA Section 7 Mapper (NOAA Fisheries Greater Atlantic Regional Fisheries Office Protected Resources Division 2022). These species are present during the migration and foraging period.

|                           | Presence period |
|---------------------------|-----------------|
| Atlantic sturgeon*        | Mar 15 – 30 Nov |
| green sea turtles         | May 1 – Nov 30  |
| Kemp’s Ridley sea turtles | May 1 – Nov 30  |
| leatherback sea turtle    | May 1 – Nov 30  |
| loggerhead sea turtle     | May 1 – Nov 30  |

\*The project area is located in or near critical habitat for the Atlantic sturgeon

## Green Sea Turtle

The green sea turtle (*Chelonia mydas*), federally listed as threatened, grows to a maximum size of approximately 1 meter in shell length, and can weight nearly 200 kilograms (kg). They have a small head, single-clawed flippers and a heart-shaped shell. The carapace of the shell has 5 vertebral scutes, 4 pairs of coastal scutes, and 12 pairs of marginal scutes. The head has a single pair of prefrontal scales and four postorbital scales behind each eye, with are distinguishing characteristics that differentiate this species from other hard-shell sea turtles. The term “green” refers to the subdermal fat, the carapace is generally light to dark brown and changes as the turtle grows from hatchling to adult. This species is globally distributed and is believed to inhabit coastal waters of over 140 countries and nest in over than 80 countries worldwide (Seminoff et al. 2015). They spend most of their lives in coastal foraging grounds, including shallow waters on open coastline and in protected bays and lagoons. They rely primarily on

marine algae and submerged aquatic vegetation (SAV) for their diet, with some populations feeding extensively on invertebrates. Green turtles nest on sandy, ocean-facing beaches; characteristics vary but typically nesting beaches have intact dune structures and native vegetation. The clutches are laid at night at the base of a primary dune. Mean clutch size varies, an average is about 100 eggs per clutch (Seminoff et al. 2015). This species is regarded as a species of conservation concern; they are impacted by a variety of sources such as coastal development, beachfront lighting, erosion from sand mining, non-native vegetation, and sea level rise which affects hatchlings and nesting turtles. Fishing and marine pollution are shown to affect foraging and migrating green turtles, and fishery bycatch (trawling, gill net, and dredging) are also continued threats (Seminoff et al. 2015). Disease and predation are continuing threats to the North American population. The Service recommends that the USACE pursue appropriate coordination and consultation with NMFS ([nmfs.gar.esa.section7@noaa.gov](mailto:nmfs.gar.esa.section7@noaa.gov)) who has Federal jurisdiction over the green sea turtle.

#### Kemp's Ridley Sea Turtle

The Kemp's Ridley sea turtle (*Lepidochelys kempii*), federally listed as endangered, is one of the smallest of the sea turtles with adults reaching about 2 feet in length. The core habitat for Kemp's Ridley sea turtle occurs in the nearshore and inshore waters of the northern Gulf of Mexico, ninety-five percent of worldwide nesting occurs in Tamaulipas, Mexico with occasional nesting in North Carolina, South Carolina, and Florida. Adult and sub-adult Kemp's Ridley sea turtles primarily occupy nearshore habitat that contain muddy or sandy bottoms where prey can be found. Hatchlings typically associate with floating *Sargassum* seaweed and juveniles remain within Gulf of Mexico currents while others are swept into the Atlantic Ocean by the Gulf Stream. Nesting occurs from April into July along the coast of Mexico, with an average of 2.5 times per season. Clutch size is around 100 eggs. The decline of Kemp's Ridley sea turtles is due primarily to human activities, including the direct harvest of adults and eggs and incidental capture in commercial fishing operations. Other threats include marine debris, disease, chemical pollution, noise, and habitat degradation (NMFS et al. 2011). The Service recommends that the USACE pursue appropriate coordination and consultation with NMFS who has Federal jurisdiction over Kemp's Ridley sea turtle.

#### Leatherback Sea Turtle

The leatherback (*Dermochelys coriacea*), federally listed as endangered, is the largest, deepest diving, and most migratory and wide ranging of all the sea turtles. They inhabit open ocean and nest on sandy beaches backed with vegetation and sloped sufficiently so that distance to dry sand is limited. The leatherback sea turtle is distributed worldwide in tropical and temperate waters of the Atlantic, Pacific, and Indian Oceans. Nesting occurs from March to July at an average of five to seven times within the nesting season. Clutch size averages 80 to 85 eggs. The decline of leatherback sea turtles is attributed to exploitation by humans for their eggs and meat, as well as incidental take in numerous commercial fisheries in the Pacific. Other factors include degradation of nesting habitat from coastal development, disorientation of hatchlings by beachfront lighting, nest predation by native and non-native predators, degradation of foraging habitat, marine pollution and debris, and watercraft strikes (NMFS and USFWS 2013). The Service recommends that the USACE pursue appropriate coordination and consultation with NMFS who has Federal jurisdiction over leatherback sea turtle.

### Loggerhead Sea Turtle

The loggerhead sea turtle (*Caretta caretta*), federally listed as endangered, is characterized by a large head with blunt jaws. It is found worldwide in tropical and temperate waters of the Atlantic, Pacific, and Indian Oceans, and is widely distributed throughout its range. The loggerhead sea turtle may be found hundreds of miles out to sea as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. Foraging occurs in coral reefs, rocky places, and shipwrecks. Nesting occurs mainly on open beaches or along narrow bays having suitable sand and it is often found in association with other species of sea turtles. Loggerhead sea turtles are known to nest from one to seven times within a nesting season with an average of 4.1 nests. Average clutch size varies from 100 to 126 eggs. Threats include loss or degradation of nesting habitat from coastal development and beach armoring, disorientation of hatchlings by beachfront lighting, nest predation by native and nonnative predators, degradation of foraging habitat, marine pollution and debris, watercraft strikes, disease, and incidental take from channel dredging and commercial trawling, longline, and gill net fisheries (NMFS and USFWS 2008). The Service recommends that the USACE pursue appropriate coordination and consultation with NMFS who has Federal jurisdiction over loggerhead sea turtle.

### Atlantic Sturgeon

Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), federally listed as endangered, is an anadromous species occurring on the Atlantic Coast of North America. Atlantic sturgeon are long-lived, anadromous fish reported to reach lengths of 459 centimeters (cm) and body weights of 364.9 kg. The Atlantic sturgeon is a bottom-feeder without teeth and has four whiskers halfway between its snout and mouth. The species has five rows of armor-like scales – called scutes – and the tail is longer on the top than on the bottom (ASSRT 2007). The species tends to reach maturity at 16 and 17 years for males and females, respectively. The number of eggs that can be produced is about 25,000 eggs per kg of body weight and females are thought to spawn once every 2 to 6 years, whereas males are thought to spawn every 1 to 5 years. Juveniles tend to spend 1 to 3 years in freshwater before spending their adult life in the marine environment. Spawning typically occurs in the spring over large gravel and other substrates when flow, pH, and other cues are optimal (ASSRT 2007). Populations of Atlantic sturgeon can be found from Quebec, Canada down along the Atlantic Coast and Gulf Coast to Louisiana with possible extirpation in Rhode Island and presumed extirpation in Washington, D.C. (NatureServe 2017). The primary threats for this species include habitat degradation including alteration and obstruction, vessel strikes, urbanization, pollution, and fishery by-catch (ASSRT 2007). The Service recommends that the USACE pursue appropriate coordination and consultation with NMFS who has Federal jurisdiction over Atlantic sturgeon especially considering the project area falls within critical habitat for this species.

### State Listed

The peregrine falcon (*Falco peregrinus*) is a medium sized raptor with long pointed wings and a long narrow tail; they are easily recognized by their dark crown and sideburns. This species experienced large population declines due to widespread use of DDT along with human disturbance, it was federally listed as endangered in 1970. Through large efforts of the Eastern Peregrine Falcon Recovery Team, this species was delisted in 1994. Because this species has not recovered as a nesting population in their historic range within Virginia, they remain state listed as threatened (VDWR Peregrine, n.d.). This species is not expected to be nesting within the project area. It is not expected to be directly impacted by any of the alternatives.

## Aquatic Resources

### Benthic organisms

Benthic organisms reside on and in the soft sediment of fresh and salt waters. *Capitella* spp. is the most universal and abundant polluted water benthic organism (polychaete worm); polychaetes provide a significant food resource for fish and birds in shallow tidal area. Construction can create sediment plumes which can displace or bury sediment benthic organisms, and the ones buried under any materials used to develop an island will not survive. They will not be able to recolonize the footprint of the island, but they will be able to recolonize the areas surrounding the construction. The action of dredging disrupts sediments and buries benthic macroinvertebrates, which could temporarily negatively impact anadromous and catadromous fish. Best management practices should be implemented to avoid detrimental impacts to these important aquatic resources. Activities such as bank grading associated with shoreline stabilization or placement of dredge material for a living shoreline have potential to produce significant suspended sediment. USACE should minimize these effects, where possible.

### Submerged Aquatic Vegetation

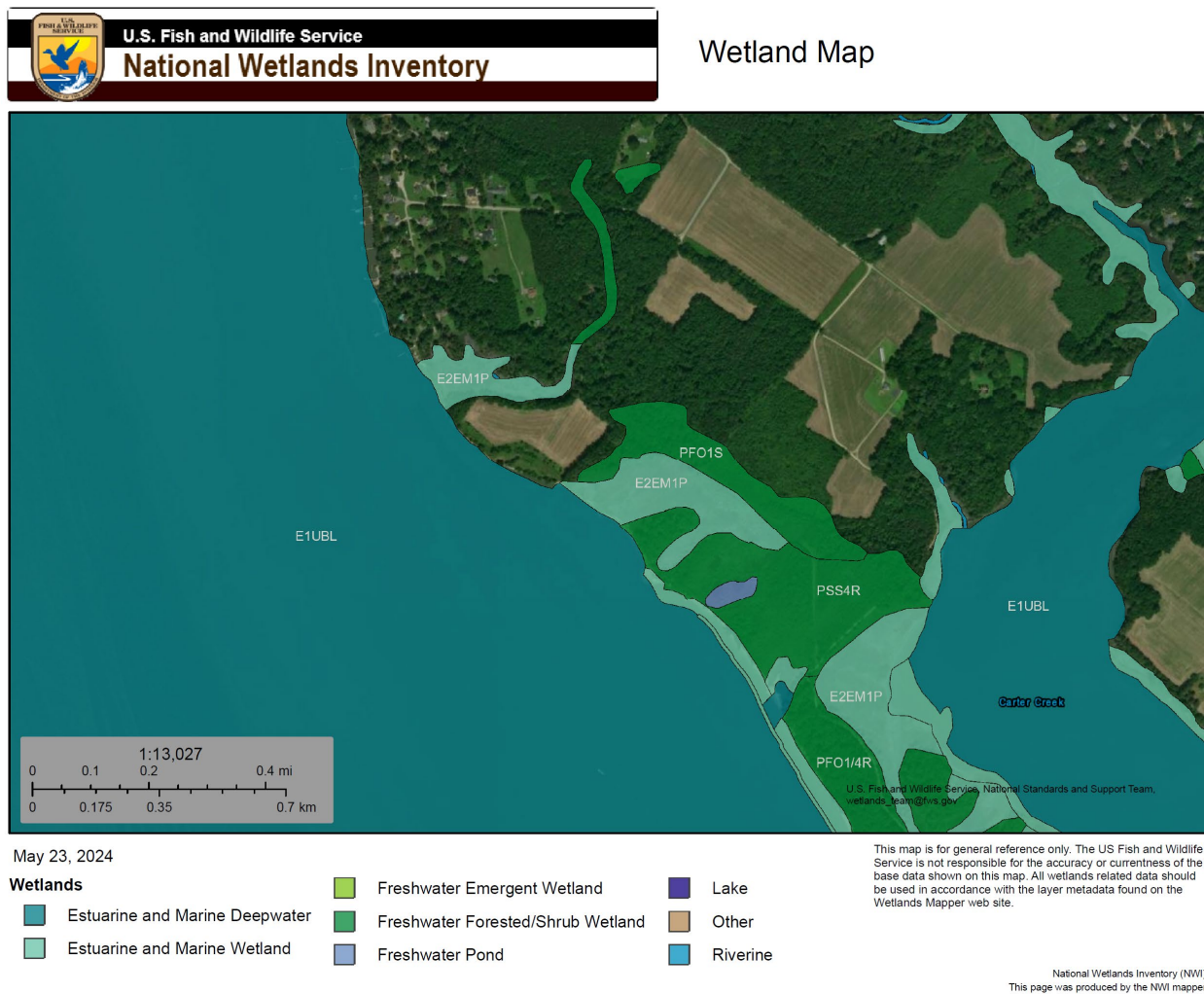
Submerged aquatic vegetation (SAV) are vascular, rooted, underwater flowering plants; they play an important role in bay ecosystems. The Chesapeake Bay is home to over 26 species of SAV, including freshwater, estuarine and marine species (Virginia Institute of Marine Science n.d.). SAV beds provide habitat and nursery areas, food and refuge for many species including blue crab (*Callinectes sapidus*), striped bass (*Morone saxatilis*), bay scallops (*Argopecten irradians*), waterfowl and other aquatic species (Virginia Institute of Marine Science n.d.). SAV benefits the environment directly by taking up nutrients, reducing shoreline erosion, trapping suspended particles, stabilizing sediments and adding oxygen to the water (Virginia Institute of Marine Science n.d.). SAV beds can provide habitat for benthic invertebrates, fish, and crabs; waterbirds will also forage in shallow waters and SAV beds (Prosser et al. 2018).

We viewed VIMS' Interactive SAV map (Virginia Institute of Marine Science 2022) to determine SAV presence in proximity to the proposed action area. The closest SAV beds were located approximately 12 miles away at the mouth of the York River where they are not likely to be affected by project actions. Restoring this shoreline and including diverse attributes such as reef balls, breakwaters, and sills included in Alternatives 2A-3B could ultimately benefit SAV by increasing water quality, providing wave attenuation in the area, as well as providing a sandy substrate for SAV to colonize.

### Wetland

This project area encompasses several different wetland types (Figure 4): estuarine and marine deepwater, estuarine and marine wetland, freshwater emergent wetland, freshwater forested/shrub wetland, and freshwater pond. This information is from the National Wetlands Inventory (NWI) established by the Service, classified from aerial imagery (USFWS Wetland Mapper, n.d.). Due to the current dilapidation of the site including shoreline erosion, failing bulkheads, revetments and groins, and erosion of the unprotected tidal marshes, the wetland types in the project area likely are degrading. The alternatives, aside from the No Action, would be expected to improve wetland types across the project site.

Figure 4: Wetland types within the project area



## Conclusion

This project offers a variety of alternatives that, aside from the No Action, will provide an assortment of benefits to the natural resources within the project area. Under the No Action alternative, the shoreline would remain its current state and condition of degradation. This would likely result in continuing loss of shoreline, erosion of tidal marshes, and failing bulkhead, groins, revetment, and gabion cages.

Alternatives 2A-3B will remove the existing failing structures, either pulling them out completely or cutting at the mud line and leaving the current submerged structures in place. While each of these alternatives offer an array of management measures that will benefit natural resources that use this area, Alternative 2A offers the most diversity of habitat types and thus the highest potential benefits for natural resources within the project area. An array of avian species will benefit from restored shoreline; restored saltwater marsh is a high priority for the Chesapeake Bay watershed, many species rely on this habitat for foraging and nesting habitat. Modifying the shoreline with breakwaters, sills, sandfill, and vegetation offers a heterogenous landscape that will protect the shoreline via wave attenuation while providing diverse habitat areas for aquatic species.

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**Appendix A-1 Environmental: Magnuson-Stevens Fishery Conservation and Management Act**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**Magnuson-Stevens Fishery Conservation and Management Act  
Essential Fish Habitat Assessment**

**November 2024**



**US Army Corps  
of Engineers®**  
Norfolk District

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## 1 Introduction

The purpose of this document is to present the findings of the Essential Fish Habitat (EFH) Assessment conducted for the construction, maintenance, and adaptive management of the Chesapeake Bay Environmental Restoration and Protection Program, Section 510, Middle Peninsula State Park Feasibility Study as required by the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended (MSA). The U.S. Army Corps of Engineers, Norfolk District (USACE) is partnering with the Virginia Department of Conservation and Recreation (DCR) for a shoreline protection and aquatic ecosystem restoration study at Middle Peninsula State Park in Gloucester County, Virginia on the York River.

The objectives of this EFH Assessment are to describe, in detail, how implementation of the Tentatively Selected Plan (TSP) may affect EFH, federally managed species, and their prey as designated by the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) and the regional Fisheries Management Council (FMC) for the Region of Influence (ROI) of the project.

## 2 Study Purpose and Scope

The Chesapeake Bay Comprehensive Water Resources and Restoration Plan (CBCP) was a product developed to provide a single, comprehensive, and integrated restoration plan that would assist with implementation of the 2014 Chesapeake Bay Watershed Agreement. It was the culmination of a Bay-wide analysis which characterized problems, needs, and opportunities among the Chesapeake Bay watershed. The Final Commonwealth of Virginia Annex (USACE 2019) focused specifically on the region within the Commonwealth of Virginia and identified the Middle Peninsula watersheds (including the Pamunkey, Mattaponi, Piankatank, and York River watersheds) as the state-selected watersheds for vegetative buffers, oyster bed restoration, and wetland creation/restoration. Numerous agencies, including the National Fish and Wildlife Foundation (NFWF), The Nature Conservancy (TNC), and the U.S. Fish and Wildlife Service (USFWS), have identified the Piankatank and York River watersheds as specific priorities.

The CBCP identified shoreline erosion as a problem in the Middle Peninsula region, with the banks of the York River being documented as having moderate shoreline erosion (USACE 2019). Shoreline erosion has been a concern in the study area for many years. Prior to ownership by the Commonwealth of Virginia, private landowners installed structural measures to protect the shoreline from erosion. In the 1950's, prior to ownership by DCR, a series of approximately 30 timber groins were installed along the shoreline at varying orientations. Behind the beach area, a wooden bulkhead was constructed. Stone revetments and gabion cages were also additions. Today, these measures are failing structurally and are no longer effective as a shoreline protection measure, resulting in erosion, vegetation collapse, and increased sediment transport into the river. The derelict structures also pose safety hazards to the public.

In a Letter of Intent signed September 21, 2020, DCR requested that USACE, Norfolk District, conduct a feasibility study, under the Chesapeake Bay Environmental Restoration and Protection Program (CBERPP), to investigate shoreline erosion and siltation, failing bulkheads and groins, and erosion of marsh areas not previously protected by the structural measures.

The scope of the study includes an investigation of the habitats present as well as an assessment of the shoreline erosion/habitat loss. Measures to address both shoreline protection and aquatic ecosystem restoration were considered, including the use of structural, nonstructural, and nature-based solutions, to determine potential alternatives to address the problems identified. Environmental impacts of the

proposed alternatives were evaluated to incorporate environmental concerns into the decision-making process.

## 2.1 Study Authority

The CBERPP directs the Secretary of the Army, acting through USACE, to provide environmental aid to non-federal entities to benefit the Chesapeake Bay watershed. CBERPP was authorized by Section 510 of the Water Resources Development Act (WRDA) of 1996, as amended by Section 5020 of WRDA 2007, Section 4010(a) of the Water Resources Reform and Development Act (WRRDA) of 2014, Section 306 of WRDA 2020, and Section 8376(b)(1) of WRDA 2022.

The Section 510 program provides design and construction assistance for water-related resource protection and restoration projects within the Chesapeake Bay watershed. Qualifying project types include projects for sediment and erosion control; protection of eroding shorelines and streambanks; ecosystem restoration, including restoration of submerged aquatic vegetation; protection of essential public works; beneficial uses of dredged material; wastewater treatment and related facilities; water supply and related facilities; stormwater and drainage systems; and other projects that may enhance the living resources of the estuary.

## 2.2 Region of Influence/Action Area

Located in Gloucester County, Virginia, the 431-acre Middle Peninsula State Park contains 2,260 linear feet of York River shoreline (Figure 2-1).

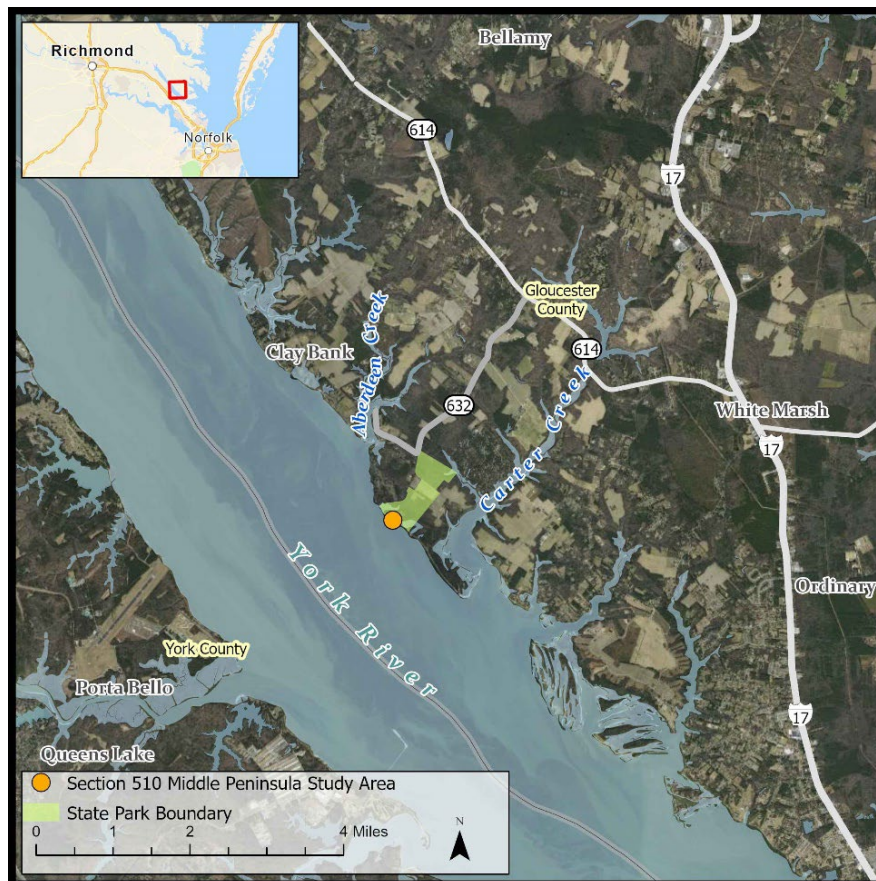


Figure 2-1: Geographic Area



The proposed Region of Influence (ROI)/Action Area includes approximately 2,000 linear feet of shoreline including approximately 1,000 linear feet of wetland habitat and 1,000 linear feet of modified shoreline comprised of dilapidated wooden bulkheads, timber groins, stone revetments, and gabion cages (Figure 2-2). The ROI also includes the surface, pelagic, and benthic waters associated with the proposed construction footprint and a 500-meter radius to account for the potential turbidity plume from removal of existing structures and in-water placement of materials. At current design levels, transportation of materials and placement of materials will occur via land-based equipment.



Figure 2-2: ROI/Action Area

## 3 Project Description

### 3.1 Management Measures

In the initial request for assistance, the DCR expressed a desire for a living shoreline type project to reduce erosion and siltation, improve wetland and aquatic habitats, and provide an opportunity for creation and educational opportunities once the park opens to the public. The measures considered for this project therefore include a list of potential shoreline stabilization management measures common in living shoreline approaches along with additional measures to support aquatic ecosystem restoration and enhancement and removal of existing structures.

#### 3.1.1 Breakwaters and Sills

Breakwaters and sills are an essential component of a living shoreline and serve as protection for wave energy that would otherwise impact the shoreline leading to erosion, damage, and/or removal of tidal vegetation. For the purposes of this project, breakwaters refer to chevron shaped structures while sills refer to rectangle structures parallel to shore. At current design levels, both will be constructed using VDOT Class III Rip Rap with a maximum relief of + 5.00 mean low water (MLW). The rip rap is expected to rest directly on the existing benthic substrates.

#### 3.1.2 Sand Fill

The sand fill measure includes the addition of sand substrate behind the breakwater and sill structures on top of the existing benthic substrates for additional shoreline protection and creation of stable pocket beaches and wetland habitat. At current design levels, the substrate utilized would consist of clean sand (<5% fines passing #200 sieve) with a median grain size of 0.6 mm (+/-0.25mm).

#### 3.1.3 Vegetation

The vegetation measure includes shoreline plantings of native low marsh, high marsh, and riparian species to enhance habitat value and create a natural buffer to help stabilize the shoreline. Native plants such as smooth cordgrass (*Sporobolus alterniflorus*), saltmarsh hay (*Sporobolus pumilus*), and marsh elder (*Iva frutescens*) would be planted into the sand fill measure at their respective elevations.

#### 3.1.4 Marsh Fringe Enhancement

The marsh fringe enhancement measure includes the addition of sand fill on top of existing benthic substrates and native low marsh vegetative plantings (*Sporobolus alterniflorus*) to restore the natural slope of the existing wetlands lost to erosion and to enhance habitat value. The sand fill substrate would be the same material as described previously in Section 3.1.2

#### 3.1.5 Toe Protection

The toe protection measure would serve as protection from wave energy that would otherwise impact the existing wetlands and marsh fringe enhancement measures. At current design levels, it would be constructed using VDOT Class II Rip Rap with a maximum relief of + 3.00 MLW.

### 3.1.6 Offshore Reef Habitat

The offshore reef habitat measure would provide additional habitat benefits in the subtidal area for oysters and other reef-dependent species. Due to the medium wave energy environment, robust artificial reef structures such as pre-cast concrete oyster reef structures or VDOT Class III Rip Rap would be placed at a maximum relief of 12 inches from the existing benthic substrate.

### 3.1.7 Removal of Existing Structures

The removal of existing structures measure includes the pulling of existing timber groins, wooden bulkhead, gabion cages, and stone revetments. The structures would be completely extracted from the benthic substrates. While the extraction method would ultimately be up to the discretion of the contractor, clamshell bucket extraction utilizing a land-based crane would likely be a feasible method. Following removal, the stone substrate from the gabion cages and revetments may be evaluated for repurposing as the substrate for the breakwater, sill, and toe protection measures as opposed to all new VDOT Class III Rip Rap.

## 3.2 Final Array of Alternatives

Alternative plans were formulated by combining appropriate management areas for each region of the shoreline, Modified Shoreline (Area 2) and Marsh Habitat (Areas 1 and 3), to establish living shoreline concepts that accomplish the main goals of the project: shoreline protection and aquatic ecosystem restoration. The Final Array of Alternatives (Table 3-1) resulted in one No Action and four Action Alternatives.

**Table 3-1: Final Array of Alternatives**

| Alt IDs | Modified Shoreline (Area 2) |       |           |            | Marsh Habitat (Areas 1 and 3) |                |                       | All                            |
|---------|-----------------------------|-------|-----------|------------|-------------------------------|----------------|-----------------------|--------------------------------|
|         | Breakwaters                 | Sills | Sand Fill | Vegetation | Marsh Fringe Enhancement      | Toe Protection | Offshore Reef Habitat | Removal of Existing Structures |
| 1       | No Action                   |       |           |            |                               |                |                       |                                |
| 2A      | X                           | X     | X         | X          | X                             | X              | X                     | X                              |
| 2B      | X                           | X     | X         | X          | X                             | X              |                       | X                              |
| 3A      |                             | X     | X         | X          | X                             | X              | X                     | X                              |
| 3B      |                             | X     | X         | X          | X                             | X              |                       | X                              |

While the five alternatives differentiate between the modified shoreline and marsh habitat regions, the measures were combined to span the entire 2,000 linear feet of shoreline, creating alternatives that represent an integrated plan across the entire shoreline.



The Final Array of Alternatives includes:

- Alternative 1: The No Action Alternative, which represents the future without project condition.
- Alternative 2A: A combination of sills and breakwaters, with sand fill and vegetation, in Area 2; along with marsh fringe enhancement, toe protection, and offshore reef habitat in Areas 1 and 3.
- Alternative 2B: A combination of sills and breakwaters, with sand fill and vegetation, in Area 2; along with marsh fringe enhancement with toe protection in Areas 1 and 3.
- Alternative 3A: A sill system, with sand fill and vegetation, in Area 2; along with marsh fringe enhancement, toe protection, and offshore reef habitat in Areas 1 and 3.
- Alternative 3B: A sill system, with sand fill and vegetation, in Area 2; along with marsh fringe enhancement with toe protection in Areas 1 and 3.

The approximate volumes of material required for the implementation of each action alternatives has been determined at current design levels (Table 3-2). Alternative 2A includes the largest overall construction footprint including 2.2 acres of bottom impacts resulting in 1.4 acres of wetland habitat and 0.12 acres of oyster reef habitat.

**Table 3-2: Volume Estimates for the Final Array of Alternatives**

| Alternative | Footprint (acres) | Wetland Habitat (acres) | Oyster Habitat (acres) | Sand Fill (cu ft) | Class III Rip Rap (tons) | Alternative Reef Structures (# of structures) |
|-------------|-------------------|-------------------------|------------------------|-------------------|--------------------------|---|
| 1           | -                 | -                       | -                      | -                 | -                        |   |
| 2A          | 2.2               | 1.4                     | 0.12                   | 276,426           | 8,432                    | 244   |
| 2B          | 2.1               | 1.4                     | -                      | 276,426           | 8,432                    | -   |
| 3A          | 1.9               | 1.1                     | 0.12                   | 189,688           | 7,605                    | 293   |
| 3B          | 1.8               | 1.1                     | -                      | 189,688           | 7,605                    | -   |

### 3.3 The Tentatively Selected Plan

Following analysis of the Final Array of Alternatives (Table 3-1), Alternative 2A was selected as the Tentatively Selected Plan (TSP) as it maximized benefits for the plans under consideration. The conceptual design for the TSP is illustrated in Figure 3-1. The current conceptual design includes conservative estimates (Table 3-2) and maximizes the footprint until additional survey and specifications

would be completed during the next phase of design. Exact specification for all measures in the TSP will be determined during the Design and Implementation Phase. The assessment of impacts on EFH, managed species, and their associated prey will be completed considering the implementation of the TSP at current design levels.

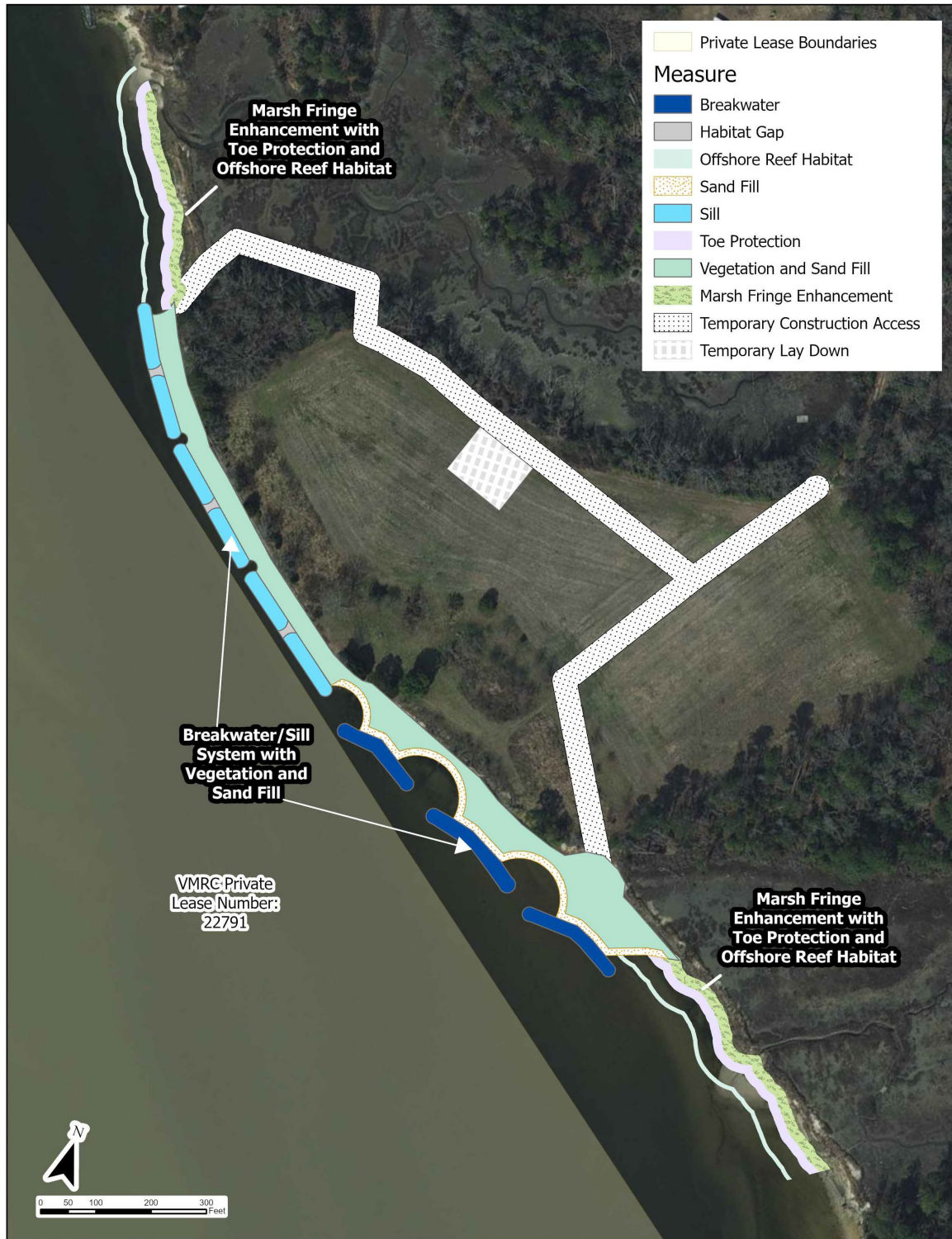


Figure 3-1: Tentatively Selected Plan (Alternative 2A)

## 4 Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Act put forth a mandate for NOAA Fisheries, FMC, and other federal agencies to identify and protect EFH of economically important marine and estuarine fisheries. To achieve this goal, suitable fish habitats need to be maintained.

The Essential Fish Habitat Mapper was utilized to identify the managed species with EFH located within the ROI (Table 4-1; NOAA 2024a). Additionally, the ROI was also identified as occurring within the Habitat Area of Particular Concern (HAPC) for Summer Flounder and within designated anadromous fish use area by the Virginia Department of Wildlife Resources (2024).

**Table 4-1. Managed Fishes with EFH in the ROI (NOAA 2024)**

| Species/Management Unit | Scientific Name              | Life Stage(s)                |
|-------------------------|------------------------------|------------------------------|
| Atlantic Butterfish     | <i>Peprilus triacanthus</i>  | Adult, Juvenile              |
| Atlantic Herring        | <i>Clupea harengus</i>       | Adult, Juvenile              |
| Bluefish                | <i>Pomatomus saltatrix</i>   | Adult, Juvenile              |
| Clearence Skate         | <i>Raja eglanteria</i>       | Adult, Juvenile              |
| Red Hake                | <i>Urophycis chuss</i>       | Adult, Juvenile, Larvae, Egg |
| Summer Flounder         | <i>Paralichthys dentatus</i> | Adult, Juvenile, Larvae      |
| Windowpane Flounder     | <i>Scopthalmus aquosus</i>   | Juvenile                     |

**Table 4-2: Anadromous Fish Use for the York River (VDWR 2024)**

| Species/Management Unit | Scientific Name             | Tier |
|-------------------------|-----------------------------|------|
| Alewife                 | <i>Alosa pseudoharengus</i> | IV   |
| Blueback Herring        | <i>Alosa aestivalis</i>     | IV   |
| American Shad           | <i>Alosa sapidissima</i>    | IV   |
| Striped Bass            | <i>Morone saxatilis</i>     | -    |
| Yellow Perch            | <i>Perca flavescens</i>     | -    |
| Hickory Shad            | <i>Alosa mediocris</i>      | -    |

## 4.1 Water Column

The water column is the medium which connects all aquatic habitats and can act as a corridor between differing essential habitats for managed species. Many managed species rely on different portions of the water column for different life stages. The implementation of the TSP would consist of actions in the water column that may affect surface, pelagic, and benthic EFH.

### 4.1.1 Surface Waters

Surface waters are all waters naturally open to the atmosphere including seas and estuaries. Oceanic and estuarine surface waters are subject to frequent shifts in wind direction and speed, temperature, and salinity. This EFH is generally used by the egg and larval life stages of many fishes, and surface currents aid in the distribution of planktonic fishes throughout a given habitat range. This EFH occurs in the ROI.

### 4.1.2 Pelagic Waters

Pelagic waters for EFH refers to habitat and associated managed species in the water column as opposed to the sea floor. This EFH occurs between the surface and benthic waters where the variable depths and temperature provide habitat for egg, larval, juvenile, and adult life stages for numerous estuarine and marine managed species. This EFH occurs in the ROI for several managed fishes and their associated life stages (Table 4-3).

**Table 4-3: Listed Fishes with EFH in Pelagic Waters**

| Species/Management Unit | Scientific Name              | Life Stage(s)   |
|-------------------------|------------------------------|-----------------|
| Atlantic Butterfish     | <i>Peprilus triacanthus</i>  | Adult, Juvenile |
| Atlantic Herring        | <i>Clupea harengus</i>       | Adult, Juvenile |
| Bluefish                | <i>Pomatomus saltatrix</i>   | Adult, Juvenile |
| Red Hake                | <i>Urophycis chuss</i>       | Larvae, Egg     |
| Summer Flounder         | <i>Paralichthys dentatus</i> | Larvae          |

### 4.1.3 Benthic Waters

Benthic waters provide EFH for managed demersal species which live in close relation with the benthic substrates including those species and associated life stages in Table 4-4.

**Table 4-4: Listed Fishes with EFH in Benthic Waters**

| Species/Management Unit | Scientific Name              | Life Stage(s)   |
|-------------------------|------------------------------|-----------------|
| Clearence Skate         | <i>Raja eglanteria</i>       | Adult, Juvenile |
| Red Hake                | <i>Urophycis chuss</i>       | Adult, Juvenile |
| Summer Flounder         | <i>Paralichthys dentatus</i> | Adult, Juvenile |
| Windowpane Flounder     | <i>Scopthalmus aquosus</i>   | Juvenile        |

The benthic EFH is dependent on the substrate type. Within the ROI, the benthic habitats are considered to be sand dominant according to the Chesapeake Bay Coastal Marine Ecological Standard (CMECS) Substrate Component Geodatabase compiled by the NOAA Fisheries Office of Habitat Conservation (Figure 4-1). No additional geotechnical surveys have been conducted by USACE at this time. Should additional surveys be conducted at later phases of the project with differing substrate composition results, consultation would be re-initiated by the USACE.



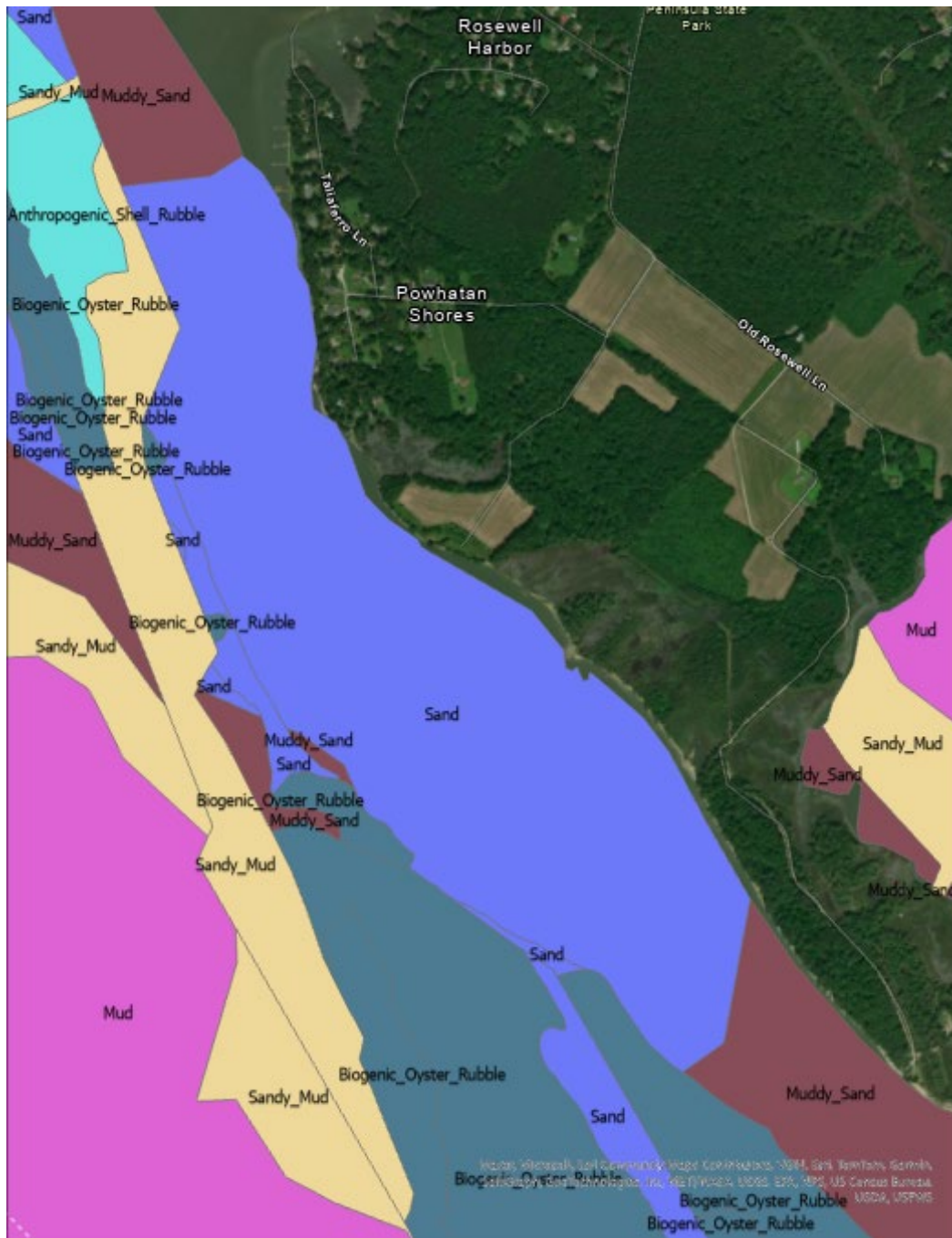


Figure 4-1: Chesapeake Bay CMECS Substrate Composition (NOAA 2023a)

#### 4.1.3.1 Benthic Invertebrates

The benthic communities within the estuarine system of the York River are complex and include an array of species that play critical roles in the food web within the ROI. The typical Chesapeake Bay tributary ecosystem includes benthic communities comprised of epifauna (organisms that live attached to surfaces), infauna (organisms that live within the benthic sediments), and other bottom-dwelling species. Typical epifaunal composition includes oysters, mussels, sponges, sea squirts, and barnacles

while typical infaunal composition includes worms, clams, and other tunneling organisms. Monitoring of the benthic fauna in the York River has identified over 150 species (CBP 2013).

Several species of benthic fauna like oysters and mussels are filter feeders that improve water clarity by removing particulate and potentially toxic materials and link the primary producer, phytoplankton, community to higher trophic levels in the food web. Many infaunal and epifaunal benthic species are also food sources for managed species and their prey.

## 4.2 Submerged Aquatic Vegetation

The term submerged aquatic vegetation (SAV) is used to describe over 20 species of underwater flowering plants that grow in the shallow waters of the Chesapeake Bay. The SAV meadows provide a series of important ecosystem services including forage, nursery, and shelter habitat for managed species and their prey and are considered HAPC for summer flounder.

According to annual Chesapeake Bay monitoring conducted by the Virginia Institute of Marine Science (VIMS), no SAV is currently present within the ROI, and no SAV has been observed within the ROI going back to the start of annual surveys in 1971 (VIMS 2022).

## 4.3 Wetlands

Wetland habitat is defined as “areas where water covers the soil or is present either at or near the surface of the soil all year or for varying periods of time during the year, including the growing season” (USEPA 2024). It is defined by the presence of hydric soils, hydrophytic vegetation, and hydrology indicators. The Chesapeake Bay’s tidal wetlands provide a series of important ecosystem services including forage, nursery, and shelter habitat for managed species and their prey.

The existing wetland habitat around the ROI is considered tidal or estuarine wetland and dominated by native cordgrass species, including smooth cordgrass (*Sporobolus alterniflorus*) in the low marsh between mean low water (MLW) and mean high water (MHW) and saltmarsh hay (*Sporobolus pumilus*) in the high marsh. In higher elevations of the existing wetlands, saltbush species including marsh elder (*Iva frutescens*) and salt bush (*Baccharis halmifolia*) are present.

# 5 Managed Fish Species

The following section describes the managed fish species with EFH in the ROI.

## 5.1 Atlantic Butterfish

The proposed action occurs within an area designated as EFH for juvenile and adult life stages of Atlantic Butterfish. The essential habitat for this species occurs in pelagic habitats in inshore estuaries and embayment, and the depths and temperatures vary for each life stage.

Juvenile Atlantic Butterfish are found at bottom depths between 10 and 280 meters with water temperatures ranging from 6.5 - 27 °C while adults are found at bottom depths between 10 and 250 meters with water temperatures ranging from 4.5 - 27.5°C. Both juveniles and adults prefer salinities above 5 ppt and range from Massachusetts Bay to Pamlico Sound, North Carolina, Gulf of Maine and South Atlantic Bight, on Georges Bank, inner continental shelf south of Delaware Bay, and on outer

continental shelf from New England to Southern Carolina. Their diets consist of planktonic prey, squids, and fishes (NOAA 2011).

## 5.2 Atlantic Herring

The proposed action occurs within an area designated EFH for the juvenile and adult life stages of the Atlantic Herring. The essential habitat for juveniles includes intertidal and sub-tidal pelagic habitats while the essential habitat for adults includes only sub-tidal pelagic habitats. The depths and temperatures vary for each life stage.

Both juvenile and adults are found at maximum depths of 300 meters. Juveniles exist in water temperatures ranging from 3 - 15°C but can be found in temperatures as high as 22°C in their Mid-Atlantic range and can tolerate low salinities. Adults can be found in water temperatures below 10°C with low salinities. Juvenile and adult Atlantic Herring EFH ranges from Maine to Cape Hatteras, North Carolina. Atlantic herring diet consists of zooplankton, krill, and fish larvae (NOAA 2017).

## 5.3 Bluefish

The proposed action occurs within an area designated EFH for both juvenile and adult life stages of Bluefish. This species inhabits the continental shelf waters of temperate zones and are commonly found in large bays and estuaries. Generally, juveniles occur in Mid-Atlantic estuaries from May through October while adults enter estuaries earlier in the season beginning in April. The adults and juveniles prefer warm water temperatures (above 14 - 16°C and migrate south of Cape Hatteras in winter months). Juveniles are generally found in salinities ranging from 23 - 33 ppt but can withstand salinities as low as 3 ppt. Adults generally prefer high salinities, greater than 25 ppt. Both adults and juveniles are opportunistic piscivores and will forage on available food (NOAA 1998).

## 5.4 Clearnose Skate

The proposed action occurs within an area designated EFH for both juvenile and adult life stages of Clearnose Skate. Designated essential habitat for this species occurs anywhere along the East Coast. Juveniles prefer sub-tidal benthic habitats from New Jersey to the St. Johns River in Florida; however, they can be found in higher salinity zones of the Chesapeake Bay in areas with mud and sand or rocky bottom. Adults prefer sub-tidal benthic habitats from New Jersey to Cape Hatters and the higher salinity zones in Chesapeake Bay. Adults also prefer mud and sand or rocky bottoms. Both juvenile and adult life stages are found in temperatures from 9 –30°C (NOAA 2017). The preferred diet for the Clearnose Skate consists of crustaceans, bivalves, polychaetas, squids, and fishes (Stehmann and McEachran 1978).

## 5.5 Red Hake

The proposed action occurs within an area designated EFH for eggs, larvae, juvenile, and adult life stages of Red Hake. Designated essential habitat for eggs and larvae include pelagic habitats, bays, and estuaries in the Mid-Atlantic. Juvenile essential habitat includes intertidal and sub-tidal benthic habitats, bays, and estuaries. Juveniles are found at a maximum depth of 80 meters and prefer bottom habitats with mud substrates. Adults prefer depths of 50 – 750 meters and as shallow as 20 meters Essential habitats for adults include shell beds, mud and sand, and artificial reefs. Red Hake have been observed at water temperatures ranging from 2 – 17°C, however, are most common at water temperatures 7 - 10°C (NOAA 2017). Red Hake feed at night, primarily on crustaceans and fishes (NOAA 2024b).



## 5.6 Summer Flounder

The proposed action occurs within an area designated EFH for larvae, juvenile, and adult life stages of the Summer Flounder, as well as HAPC for Summer Flounder. Larvae essential habitat ranges in pelagic waters from Gulf of Maine to Cape Hatteras, North Carolina. Summer Flounder larvae are most abundant nearshore, preferring depths of 9 to 70 meters, and inshore estuaries with salinities ranging from 0.5 - 25 ppt. Juveniles inhabit estuarine habitats, including salt marsh creeks, seagrass beds, mudflats, and open bay areas, which are used as nursery areas. Juveniles prefer water temperatures greater than 2°C and salinities between 10 – 30 ppt. Adult Summer Flounder can range from Gulf of Maine to Cape Hatteras, North Carolina. Adults generally are found in shallow coastal and estuarine waters during warmer months and move offshore in colder months. Inshore, adults prefer mixing and seawater salinity zones. Summer flounder prey on fish and invertebrates (NOAA 2014).

## 5.7 Windowpane Flounder

The proposed action occurs within an area designated EFH for the juvenile life stage of Windowpane Flounder. Juveniles are found in intertidal and sub-tidal benthic habitats, estuaries, coastal marine, and continental shelf ranging from Gulf of Maine to Florida. Juvenile essential habitat includes mud and sand bottom substrate at a maximum depth of 60 meters (NOAA 2016). Juveniles can be found in waters with temperatures below 25°C, salinities between 5.5 - 36 ppt, and feed on copepods (NOAA 2014). Windowpane flounder feed on bottom-dwelling organisms.

# 6 Potential Impacts to Prey Species

The reduction of benthic communities as a result of in-water placement of sandfill, breakwaters, sills, and reef structures would reduce biomass available for consumption by managed species that may use the ROI as feeding grounds. Prey individuals may be crushed or displaced as the result of in-water placement.

Although the project would convert existing benthic and pelagic habitat to wetlands and reef habitat, population levels of prey species are expected to remain regionally healthy due to the availability of these lost habitats elsewhere in the York River. Additionally, the creation of these wetland and hard reef habitats would result in EFH for some managed species.

## 6.1 Benthic Invertebrates

The ROI includes benthic communities of epifauna and infauna that forage for managed species and their prey. Potential prey of managed species expected to be impacted by implementation of the TSP include but are not limited to species such as clams, worms, oysters, snails, and crustaceans. These species serve as key component of secondary production in local food webs.

Implementation of the TSP would result in adverse and beneficial, temporary and permanent, negligible to minor impacts to the benthic invertebrate communities. Ultimately, it is anticipated to have a net beneficial impact on benthic community and trophic dynamics in the ROI. See Section 7.1.1. Benthic Community Disturbance for an extended discussion.

## 6.2 Atlantic Menhaden

The Atlantic Menhaden (*Brevoortia tyrannus*) migrates into the Chesapeake Bay from spring to autumn to feed on planktonic organisms. Following spawning events in the Atlantic Ocean, the Chesapeake Bay becomes important nursery habitat for the Atlantic Coast's Menhaden population. The Menhaden larvae are carried back into tributaries by oceanic currents, and the juveniles spend their first year in the Chesapeake Bay (Lippson and Lippson 2006). As filter feeders, Atlantic Menhaden form an important connection between the bottom and top of the food chain, connecting the primary producers to large predators like Bluefish. The Atlantic Menhaden fishery is also one of the largest commercial fisheries on the Atlantic Coast with catch used in the production of fish meal, fish oil, and fish soluble as well as for the bait fishery.

Implementation of the TSP would result in minor and temporary impacts to Atlantic Menhaden due to displacement from the construction footprint.

## 6.3 Atlantic Croaker

The Atlantic Croaker (*Micropogon undulates*) is a demersal species, preferring areas with sandy or muddy benthic substrates. Juveniles reside in the Chesapeake Bay region year-round, utilizing tidal streams with soft mud and plant material as nursery and feeding grounds while adults only reside in early spring to summer before migrating offshore (Cowan and Birdsong 1985). Croakers are highly opportunistic feeders, with adults and juveniles feeding on polychaetes, crustaceans, small fishes, and other invertebrates (Lassuy 1983).

Implementation of the TSP would result in minor and temporary impacts to Atlantic Croaker due to displacement of individuals and their prey from the construction footprint.

## 6.4 Blue Crab

The Blue Crab (*Callinectes sapidus*) is a bottom-dwelling crustacean that uses multiple habitats during its life cycle including SAV meadows, wetlands, and oyster reefs. Their distribution varies by age, sex, and season. Juvenile blue crabs use SAV meadows and wetlands, including native cordgrass-dominated marshes like those found in the ROI as nursery habitat. Males are more abundant in the lower salinity tributaries of the upper Chesapeake Bay while females are more abundant in the higher salinity main stem and lower tributaries like the York River. Blue crabs may also be found within the ROI in the summer months when they are found in shallower waters before burrowing in sediments in deeper portion of the Chesapeake Bay (NOAA 2024c).

Blue crabs are opportunistic eaters consuming a wide range of benthic fauna including clams, oysters, mussels, and other small crustaceans along with freshly dead fish and plant and animal detritus. They are also a food source for other consumers including larger fish and birds as well as humans (NOAA 2024c).

Implementation of the TSP would result in minor and temporary impacts to Blue Crabs due to displacement from the construction footprint; however, the creation and enhancement of wetland and reef habitat would be anticipated to result in positive impacts to both adult and juvenile life stages.

## 7 Potential Impacts to EFH and Managed Species

### 7.1 Direct Impacts to EFH and Managed Species

Implementation of the TSP would be anticipated to result in direct impacts to EFH, managed species, and their associated prey species.

#### 7.1.1 Benthic Community Disturbance

In-water placement of sand fill, rock, and artificial substrate reef materials and removal of existing shoreline structures would result in direct impacts to the sandy bottom benthic habitat in the project footprint in depths of approximately -3 feet mean low water (MLW) as well as to the managed species that reside in benthic waters including Clearnose Skate (adult and juvenile), Red Hake (juvenile and adult), Summer Flounder (juvenile and adult), and Windowpane Flounder (juvenile) (Table 4-3).

During the construction of the TSP, the benthic community would be disturbed resulting in displacement of juvenile and adult life stages of motile species from the approximately 2.2-acre project footprint and mortality events for sessile species and egg and larval life stages from burial, crushing, or compaction. Those species susceptible to burial, crushing, or compaction includes the diet of some managed species including Clearnose Skate (adult and juvenile) and Red Hake (juvenile). The sandy bottom would be permanently converted to reef, tidal flat, and wetland habitats.

Following construction, managed fishes and other benthic species would be expected to repopulate the remaining sandy bottom benthic habitat area from unimpacted areas within the ROI. The addition of hard structure habitat from offshore reef structures would increase the amount and quality of foraging, nursery, and shelter habitat in the project footprint from 0 acres to 0.12 acres for managed species like adult Red Hake as well as reef-building and dependent benthic prey species such as oysters, mussels, and blue crabs. The addition of approximately 1.4 acres of native wetland habitat would also improve provide habitat for managed species like Summer Flounder and prey species like blue crabs that also utilize wetland for foraging, nursery, and shelter habitat. As many benthic species have different physical habitat requirements throughout their life cycles, this increase in diverse and connected quality habitats including sandy bottom, tidal flats, emergent wetland, and reef within the ROI could result in positive impacts to abundance of managed species and their prey.

The direct impacts of benthic community disturbance from implementation of the TSP would be anticipated to result in permanent and minor impacts to EFH, managed species, and their associated prey species. All sandy bottom within the project footprint will be covered, but similar benthic habitat would remain available in adjacent areas of the ROI and York River and different types of EFH will be created within the project footprint.

#### 7.1.2 Underwater Noise

In-water placement of sand fill, rock, and artificial reef materials and removal of existing shoreline structures would result in direct impacts to underwater noise levels. Depending on source, duration, and location of anthropogenic noise, fishes could experience impacts such as hearing loss, stress response, avoidance, and./disruption of behaviors.

The source of underwater noise from placement and removal of materials would be temporary and background noise levels would return to existing conditions following construction. As implementation

of the TSP is currently designed to occur by land-based construction equipment, no increases in underwater noise levels from marine construction vessels would be anticipated.

The direct impacts of increased underwater noise from implementation of the TSP would be anticipated to result in temporary and minor impacts to EFH, managed species, and their associated prey as fishes would be expected to avoid the project footprint during construction and return once noise levels return to existing conditions.

#### 7.1.3 Vessel Traffic

Construction of the TSP is currently designed to occur by land-based construction, so vessel traffic within the ROI would not increase as a result of project implementation; therefore, no impacts from vessel traffic on EFH and managed species would be anticipated. If construction method changes to marine vessels at later phases of the project, the USACE would re-initiate coordination.

#### 7.1.4 HAPC

The ROI is located with the designated HAPC for Summer Flounder. Due to the absence of SAV in the ROI (VIMS 2022), no impacts would be anticipated. If future SAV surveys show the establishment of SAV in the ROI during later phases of the project, the USACE would re-initiate coordination.

#### 7.1.5 Turbidity Plumes and Total Suspended Sediments

In-water placement of sand fill, rock, and artificial substrate reef materials and removal of existing shoreline structures would result in direct impacts to managed species through the resulting turbidity plume and total suspended sediment (TSS) concentrations.

The turbidity plume would be expected to be a distance of up to approximately 500 m according to information provided by NOAA Fisheries (2023b) for the actions most similar to those for implementation of the TSP, beach nourishment and pile driving and removal. The TSS levels would be expected to be up to 64 mg/L which would be below those shown to have adverse impacts to fishes and benthic communities (Burton 1993; Wilber and Clarke 2001; EPA 1986). Substrate for the sand fill measure would be clean, medium coarse sand (0.6 mm +/- 0.25 mm, <5% fines passing #200 sieve) and would be expected to settle within hours of placement. Additionally, based on the existing sandy bottom, the increased turbidity from the removal of existing structures and placement of rock and reef structures would also be expected to settle within hours of removal and in-water placement.

Turbidity plumes within the water column would result in direct impacts to managed species that occur in pelagic habitat including Atlantic Butterfish (juvenile and adult), Atlantic Herring (juvenile and adult), Bluefish (juvenile and adult), Red Hake (egg and larvae), and Summer Flounder (larvae) (Table 4-2). Due to the motility of these fishes, direct impacts such as gill damage and disruption of sight feeding would be expected to be minor as fishes could temporarily avoid the area during construction. Additionally, associated planktonic prey species within pelagic habitat for juvenile Windowpane Flounder (juvenile), Atlantic Herring (juvenile and adult), and Atlantic Butterfish (juvenile and adult) and filter-feeding benthic prey species would be directly impacted due to sediment deposition.

Best management practices would be used to minimize the turbidity plume impacts to EFH, managed species, and their associated prey species to the maximum extent practical including the use of turbidity curtains.

## 7.2 Indirect Impacts to EFH and Managed Species

Implementation of the TSP would be anticipated to result in indirect impacts to EFH, managed species, and their associated prey species.

### 7.2.1 Water Quality

Managed species and their associated prey have varying tolerances to negative changes in water quality which could lead to increased stress, disease susceptibility, and/or mortality. Implementation of the TSP could result in impacts to local water quality, indirectly impacting EFH, managed species, and their associated prey. The full extent of indirect impacts is currently unknown though it could be expected that the resulting wetland and oyster habitat may increase water quality due to trapping of excess nutrients, pollutants, and sediments, indirectly impacting EFH.

Best management practices would be used to minimize impacts to water quality including erosion and sediment control measures in accordance with the Virginia Erosion and Sediment Control Handbook (VDEQ 2013).

## 7.3 Cumulative Impacts to EFH and Managed Species

In the future, predicted climate change impacts including changes in weather pattern and currents, increased oceanic and estuarine surface temperatures, sea level change, and coastal flooding may lead to long-term changes in the nature and character of the estuarine ecosystem in the ROI. At the continued rate of erosion, the ROI will continue losing shoreline and associated native wetlands. The Chesapeake Bay system, in general, has demonstrated high sensitivity to climate variability, based on a synthesis of research.

Climate change has the potential to affect fish populations and their associated habitats in the future. Sea level change may cause an increase in salinity in upstream areas that could affect breeding sites and survival of early life stages (eggs, larvae, and young-of-the-year). There could be shifts in breeding habitat availability or timing of spawning, and the effects of this change on fish populations is uncertain but could be detrimental. Shifts in salinity, temperature, and sea level all may result in shifts in prey species availability, which could also impact fish populations. While continued development and climate change will likely impact fishes, implementation of the TSP is not anticipated to substantially contribute cumulatively to injuries and/or mortalities resulting from these impacts. The TSP will be designed for a 50-year lifespan and adaptive management, operation, and maintenance activities will be completed as needed to ensure the project is sustainable given sea level change impacts.

## 8 Best Management Practices

To minimize potential impacts to EFH, managed species, and their associated prey within the ROI, several best management practices may be incorporated into construction activities for implementation of the TSP. The following BMPs may be implemented, to the extent practicable to reduce impacts.

## 8.1 Best Management Practices for Water Quality and Turbidity

- Limit the amount and extent of turbidity and sedimentation by using appropriate sedimentation and turbidity controls such as turbidity curtains, settling basins, cofferdams, and/or operational modification such as conducting work at low tide.
- Prepare and implement a Spill Prevention Plan and employ measures to prevent spills of fuels or lubricants into lands and waters.
- Ensure stone material is clean of dirt and debris prior to placement.

## 8.2 Best Management Practices for Noise

- Construction equipment should be properly maintained to minimize noise impacts.
- Coordination prior to construction would be conducted to ensure compliance with all local regulations regarding noise and vibration ordinances.

## 9 Conclusion

The USACE makes the preliminary determination that the TSP is likely to *adversely affect EFH* through modification of existing benthic and pelagic habitat. Any conservation recommendations for this specific project should be provided formally by NOAA Fisheries.

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**Appendix A-1 Environmental: Greenhouse Gas Analysis**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**Greenhouse Gas Analysis**

**November 2024**



**US Army Corps  
of Engineers®**  
Norfolk District

|      |                              |     |          |             |              |        |        |        |        |        |        |          |         |        |                        |             |             |             |          | Emissions Rates |          |          |          |          |  |  |
|------|------------------------------|-----|----------|-------------|--------------|--------|--------|--------|--------|--------|--------|----------|---------|--------|------------------------|-------------|-------------|-------------|----------|-----------------|----------|----------|----------|----------|--|--|
| Unit | Equipment                    | HP  | kW       | Load Factor | Total Hours  |        |        |        |        |        |        |          |         |        | Emissions Rates        |             |             |             |          |                 |          |          |          |          |  |  |
|      |                              |     |          |             | (hrs x unit) | VOC    | CO     | Nox    | SOx    | PM10   | PM2.5  | CO2      | CH4     | N2O    | VOC                    | CO          | Nox         | SOx         | PM10     | PM2.5           | CO2      | CH4      | N2O      |          |  |  |
| 1    | Carry Deck Crane             | 180 | 134.226  | 0.5         |              | 8      | 0.1032 | 0.4696 | 0.7914 | 0.0009 | 0.0439 | 0.0373   | 82.4655 | 0.0093 | 0.0041                 | 55.40849    | 252.1301184 | 424.9058256 | 0.483214 | 23.57009        | 20.02652 | 44276.06 | 4.993207 | 2.201306 |  |  |
| 1    | Hydraulic Excavator          | 148 | 110.3636 | 0.57        |              | 346    | 0.1148 | 0.5936 | 0.7881 | 0.0011 | 0.0549 | 0.0466   | 93.2732 | 0.0104 | 0.0046                 | 2498.726    | 12920.2437  | 17153.71303 | 23.9425  | 1194.948        | 1014.291 | 2030176  | 226.3655 | 100.1232 |  |  |
| 1    | Power Winch                  | 87  | 64.8759  | 0.7         |              | 2      | 0.0185 | 0.0632 | 0.117  | 0.0002 | 0.0044 | 0.0037   | 15.3491 | 0.0017 | 0.0007                 | 1.680286    | 5.740219632 | 10.62667242 | 0.018165 | 0.399636        | 0.336057 | 1394.101 | 0.154405 | 0.063578 |  |  |
| 2    | Dump Truck                   | 300 | 223.71   | 0.3         |              | 3249   | 0.0023 | 0.0093 | 0.0274 | 0      | 0.0013 | 0.0011   | 4.2152  | 0.0001 | 0.0001                 | 501.5153    | 2027.866274 | 5974.573754 | 0        | 283.4652        | 239.8552 | 919124.9 | 21.80501 | 21.80501 |  |  |
| 1    | Brush Chipper                | 70  | 52.199   | 0.25        | 13           | 0.0021 | 0.0141 | 0.0158 | 0      | 0.0006 | 0.0005 | 2.7816   | 0.0001  | 0.0001 | 0.356258               | 2.392019175 | 2.68041865  | 0           | 0.101788 | 0.084823        | 471.8894 | 0.016965 | 0.016965 |          |  |  |
| 1    | Clamshell Bucket             | 140 | 104.398  | 0.57        | 1179         | 0.0835 | 0.3007 | 0.2768 | 0.0004 | 0.0239 | 0.0203 | 28.4894  | 0.0075  | 0.0033 | 5858.242               | 21096.68739 | 19419.89714 | 28.06344    | 1676.79  | 1424.219        | 1998776  | 526.1894 | 231.5233 |          |  |  |
| 1    | Telescope Boom Crawler Crane | 215 | 160.3255 | 0.5         | 1179         | 0.1032 | 0.4696 | 0.7914 | 0.0009 | 0.0439 | 0.0373 | 82.4655  | 0.0093  | 0.0041 | 9753.626               | 44382.7799  | 74796.70361 | 85.06069    | 4149.072 | 3525.293        | 7793970  | 878.9605 | 387.4987 |          |  |  |
| 1    | Post Hole Drill              | 180 | 134.226  | 0.5         | 34           | 0.071  | 0.7264 | 0.6977 | 0.0016 | 0.0296 | 0.0252 | 144.2114 | 0.0064  | 0.0028 | 162.0108               | 1657.530029 | 1592.041163 | 3.650947    | 67.54252 | 57.50242        | 329067.6 | 14.60379 | 6.389158 |          |  |  |
| 1    | Front-End Loader             | 160 | 119.312  | 0.5         | 15           | 0.0021 | 0.0141 | 0.0158 | 0      | 0.0006 | 0.0005 | 2.7816   | 0.0001  | 0.0001 | 1.879164               | 12.617244   | 14.138472   | 0           | 0.536904 | 0.44742         | 2489.087 | 0.089484 | 0.089484 |          |  |  |
| 2    | Manlift Straight Boom        | 50  | 37.285   | 0.7         | 36           | 0.0592 | 0.1757 | 0.184  | 0.0003 | 0.0156 | 0.0132 | 19.6128  | 0.0053  | 0.0024 | 55.62325               | 165.0845574 | 172.883088  | 0.281875    | 14.65748 | 12.40248        | 18427.83 | 4.979785 | 2.254997 |          |  |  |
| 2    | Crawler Tractor              | 115 | 85.7555  | 0.44        | 293          | 0.0473 | 0.2505 | 0.2773 | 0.0004 | 0.0201 | 0.0171 | 34.1405  | 0.0043  | 0.0019 | 522.9298               | 2769.427565 | 3065.717619 | 4.42224     | 222.2175 | 189.0507        | 377443.7 | 47.53908 | 21.00564 |          |  |  |
| 1    | Flatbed Truck                | 240 | 178.968  | 0.25        | 33           | 0.0021 | 0.0141 | 0.0158 | 0      | 0.0006 | 0.0005 | 2.7816   | 0.0001  | 0.0001 | 3.100621               | 20.8184526  | 23.3284788  | 0           | 0.885892 | 0.738243        | 4106.993 | 0.147649 | 0.147649 |          |  |  |
| 2    | Truck                        | 240 | 178.968  | 0.25        | 733          | 0.0007 | 0.0071 | 0.0007 | 0      | 0.0001 | 0.0001 | 1.1009   | 0.0001  | 0.0001 | 22.95712               | 232.8507906 | 22.9571202  | 0           | 3.279589 | 3.279589        | 36104.99 | 3.279589 | 3.279589 |          |  |  |
|      |                              |     |          |             |              |        |        |        |        |        |        |          |         |        | Total Emissions (lbs)  |             |             |             |          |                 |          |          |          |          |  |  |
|      |                              |     |          |             |              |        |        |        |        |        |        |          |         |        | Total Emissions (tons) |             |             |             |          |                 |          |          |          |          |  |  |
|      |                              |     |          |             |              |        |        |        |        |        |        |          |         |        | Total Emissions (g)    |             |             |             |          |                 |          |          |          |          |  |  |
|      |                              |     |          |             |              |        |        |        |        |        |        |          |         |        | 19438.06               | 85546.16826 | 122674.1664 | 145.9231    | 7637.467 | 6487.527        | 13555829 | 1729.124 | 776.3986 |          |  |  |
|      |                              |     |          |             |              |        |        |        |        |        |        |          |         |        | 9.719028               | 42.77308413 | 61.3370832  | 0.072962    | 3.818733 | 3.243764        | 6777.914 | 0.864562 | 0.388199 |          |  |  |
|      |                              |     |          |             |              |        |        |        |        |        |        |          |         |        | 8816954                | 38803089.21 | 55644065.88 | 66189.59    | 3464297  | 2942693         | 6.15E+09 | 784317.6 | 352168.5 |          |  |  |

Welcome to the Net Emissions Analysis Tool (NEAT)

NEAT is designed to help practitioners quantify the gross and net emissions for various emissions sources.

**How to use this model:**

**Step 0:** While not an official model step, NEAT encourages the gathering of metadata to document the sources of data used in order to run the NEAT model, use the "0. Metadata" sheet to keep track of all your references and sources.

**Step 1:** Input the project background data into the "Project Data" sheet, this information will get carried through into other sheets for calculations.

**Step 2:** Use the "Construction Emissions" sheet to input the emissions calculated for construction activities.

**Step 3:** Use the "O&M Emissions" sheet to input the emissions calculated for Operations and Maintenance (O&M) activities.

**Step 4:** Use the "Wetland & Aq. Hab. Emissions" sheet to verify the aquatic ecosystem for your project and then provide additional project details to calculate emissions.

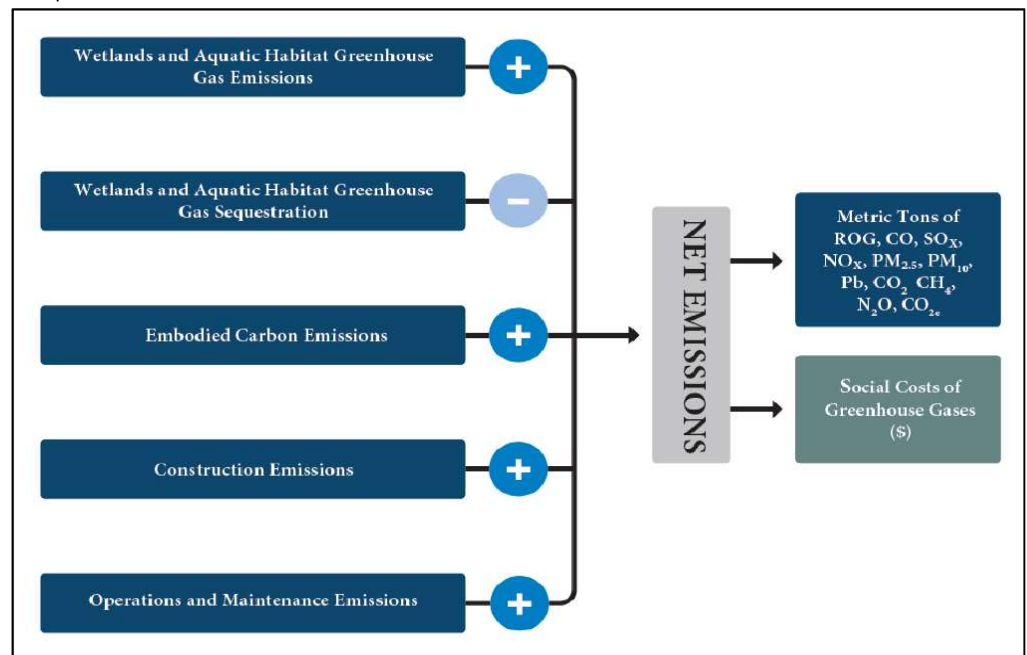
**Step 5:** Use the "Embodied Carbon in Materials" sheet to calculate how certain materials contribute greenhouse gases.

**Step 6:** Review the "NET Emissions" sheet which provides the net total emissions from each air pollutant and greenhouse gas for use in environmental compliance such as NEPA studies.

**Step 7:** Review the "Social Costs Greenhouse Gas" sheet to find the total social costs from GHG.

| Color-Code for User Inputs: |   |
|-----------------------------|---|
| <div></div>                 | -drop down box is available for choosing an input from a list |
| <div></div>                 | -inputs can be typed in (user defined input)                  |
| <div></div>                 | -no input available, calculations results                     |
| <div></div>                 | -no input available, table header                             |
| <div></div>                 | -no input available, table header                             |

Conceptual Model of NEAT:



Note: This model has the sheets protected by a password to avoid accidentally breaking the model. If the password is needed to unlock the model please contact Jason Emmons at [jason.d.emmons@usace.army.mil](mailto:jason.d.emmons@usace.army.mil)

Enter the project information below, your inputs will be used for various model calculations and outputs.

| Alternative Sequential Identifier | Input Names for Project Alternatives/Construction Phases: | Construction Timing               |                              |  | Operations & Maintenance, Monitoring and Management Timing |                                      |  |
|-----------------------------------|---|-----------------------------------|------------------------------|--|--|--------------------------------------|--|
|                                   |   | Starting Year                     | Ending Year                  | Construction Years Total   | Starting Year  | Ending Year                          | O&M Project Lifetime (default is 50 years) |
| 1                                 | Alternative 1 - No Action Alternative                     | Choose Construction Starting Year | Choose Construction End Year | Ending year input must be equal or more than starting year value | Choose a Construction End Year First                       | Choose a Construction End Year First | 50   |
| 2                                 | Alternative 2A  | 2027                              | 2027                         | 1  | 2028   | 2078                                 | 50   |
| 3                                 | Alternative 3   | Choose Construction Starting Year | Choose Construction End Year | Ending year input must be equal or more than starting year value | Choose a Construction End Year First                       | Choose a Construction End Year First | 50   |
| 4                                 | Alternative 4   | Choose Construction Starting Year | Choose Construction End Year | Ending year input must be equal or more than starting year value | Choose a Construction End Year First                       | Choose a Construction End Year First | 50   |
| 5                                 | Alternative 5   | Choose Construction Starting Year | Choose Construction End Year | Ending year input must be equal or more than starting year value | Choose a Construction End Year First                       | Choose a Construction End Year First | 50   |
| 6                                 | Alternative 6   | Choose Construction Starting Year | Choose Construction End Year | Ending year input must be equal or more than starting year value | Choose a Construction End Year First                       | Choose a Construction End Year First | 50   |
| 7                                 | Alternative 7   | Choose Construction Starting Year | Choose Construction End Year | Ending year input must be equal or more than starting year value | Choose a Construction End Year First                       | Choose a Construction End Year First | 50   |
| 8                                 | Alternative 8   | Choose Construction Starting Year | Choose Construction End Year | Ending year input must be equal or more than starting year value | Choose a Construction End Year First                       | Choose a Construction End Year First | 50   |

Note - the O&M project lifetime gets used to calculate Net emissions and also carries through to the social costs which are calculated for each specific year. The dates of construction start and end carry through most all subsequent steps for calculations.

Choose the no-action alternative from the drop down menu below:

Alternative 1 - No Action Alternative

Note: drop down menu will not automatically refresh when a new name is written for the no-action alternative above, and must be re-selected from the drop down menu after changing the name.



Input the Operations & Maintenance emissions expected for each alternative for a representative year as output from your preferred equipment emissions model such as CALEEMOD (California) or the EPA MOVES3 model (CONUS) or any other model you choose. Be sure to export results in GRAMS so that they can be added into NEAT. These emissions values will get combined with other emissions to calculate the "Net Emissions".

| Alternative 1 - No Action Alternative                           |  | Yearly O&M Emissions |        |             | Project Lifetime O&M Emissions |        |             |
|---|--|----------------------|--------|-------------|--------------------------------|--------|-------------|
| Years   |  | 1                    |        |             | 50                             |        |             |
| Air Quality Pollutant Emissions (Clean Air Act)                 |  | Grams                | Pounds | Metric Tons | Grams                          | Pounds | Metric Tons |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Carbon Monoxide (CO)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Sulfur Oxides (SOx)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxides (NOx)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Lead - (Pb)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Greenhouse Gas Emissions (NEPA)                                 |  |                      |        |             |                                |        |             |
| Carbon Dioxide (CO <sub>2</sub> )                               |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Methane (CH <sub>4</sub> )                                      |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxide (N <sub>2</sub> O)                                |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |

| Alternative 2A  |  | Yearly O&M Emissions |        |             | Project Lifetime O&M Emissions |        |             |
|---|--|----------------------|--------|-------------|--------------------------------|--------|-------------|
| Years   |  | 1                    |        |             | 50                             |        |             |
| Air Quality Pollutant Emissions (Clean Air Act)                 |  | Grams                | Pounds | Metric Tons | Grams                          | Pounds | Metric Tons |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Carbon Monoxide (CO)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Sulfur Oxides (SOx)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxides (NOx)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Lead - (Pb)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Greenhouse Gas Emissions (NEPA)                                 |  |                      |        |             |                                |        |             |
| Carbon Dioxide (CO <sub>2</sub> )                               |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Methane (CH <sub>4</sub> )                                      |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxide (N <sub>2</sub> O)                                |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |

| Alternative 3   |  | Yearly O&M Emissions |        |             | Project Lifetime O&M Emissions |        |             |
|---|--|----------------------|--------|-------------|--------------------------------|--------|-------------|
| Years   |  | 1                    |        |             | 50                             |        |             |
| Air Quality Pollutant Emissions (Clean Air Act)                 |  | Grams                | Pounds | Metric Tons | Grams                          | Pounds | Metric Tons |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Carbon Monoxide (CO)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Sulfur Oxides (SOx)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxides (NOx)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Lead - (Pb)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Greenhouse Gas Emissions (NEPA)                                 |  |                      |        |             |                                |        |             |
| Carbon Dioxide (CO <sub>2</sub> )                               |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Methane (CH <sub>4</sub> )                                      |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxide (N <sub>2</sub> O)                                |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |

| Alternative 4   |  | Yearly O&M Emissions |        |             | Project Lifetime O&M Emissions |        |             |
|---|--|----------------------|--------|-------------|--------------------------------|--------|-------------|
| Years   |  | 1                    |        |             | 50                             |        |             |
| Air Quality Pollutant Emissions (Clean Air Act)                 |  | Grams                | Pounds | Metric Tons | Grams                          | Pounds | Metric Tons |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Carbon Monoxide (CO)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Sulfur Oxides (SOx)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxides (NOx)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Lead - (Pb)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Greenhouse Gas Emissions (NEPA)                                 |  |                      |        |             |                                |        |             |
| Carbon Dioxide (CO <sub>2</sub> )                               |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Methane (CH <sub>4</sub> )                                      |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxide (N <sub>2</sub> O)                                |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |

| Alternative 5   |  | Yearly O&M Emissions |        |             | Project Lifetime O&M Emissions |        |             |
|---|--|----------------------|--------|-------------|--------------------------------|--------|-------------|
| Years   |  | 1                    |        |             | 50                             |        |             |
| Air Quality Pollutant Emissions (Clean Air Act)                 |  | Grams                | Pounds | Metric Tons | Grams                          | Pounds | Metric Tons |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Carbon Monoxide (CO)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Sulfur Oxides (SOx)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxides (NOx)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Lead - (Pb)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Greenhouse Gas Emissions (NEPA)                                 |  |                      |        |             |                                |        |             |
| Carbon Dioxide (CO <sub>2</sub> )                               |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Methane (CH <sub>4</sub> )                                      |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxide (N <sub>2</sub> O)                                |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |

| Alternative 6   |  | Yearly O&M Emissions |        |             | Project Lifetime O&M Emissions |        |             |
|---|--|----------------------|--------|-------------|--------------------------------|--------|-------------|
| Years   |  | 1                    |        |             | 50                             |        |             |
| Air Quality Pollutant Emissions (Clean Air Act)                 |  | Grams                | Pounds | Metric Tons | Grams                          | Pounds | Metric Tons |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Carbon Monoxide (CO)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Sulfur Oxides (SOx)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxides (NOx)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Lead - (Pb)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Greenhouse Gas Emissions (NEPA)                                 |  |                      |        |             |                                |        |             |
| Carbon Dioxide (CO <sub>2</sub> )                               |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Methane (CH <sub>4</sub> )                                      |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxide (N <sub>2</sub> O)                                |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |

| Alternative 7   |  | Yearly O&M Emissions |        |             | Project Lifetime O&M Emissions |        |             |
|---|--|----------------------|--------|-------------|--------------------------------|--------|-------------|
| Years   |  | 1                    |        |             | 50                             |        |             |
| Air Quality Pollutant Emissions (Clean Air Act)                 |  | Grams                | Pounds | Metric Tons | Grams                          | Pounds | Metric Tons |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Carbon Monoxide (CO)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Sulfur Oxides (SOx)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxides (NOx)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Lead - (Pb)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Greenhouse Gas Emissions (NEPA)                                 |  |                      |        |             |                                |        |             |
| Carbon Dioxide (CO <sub>2</sub> )                               |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Methane (CH <sub>4</sub> )                                      |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxide (N <sub>2</sub> O)                                |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |

| Alternative 8   |  | Yearly O&M Emissions |        |             | Project Lifetime O&M Emissions |        |             |
|---|--|----------------------|--------|-------------|--------------------------------|--------|-------------|
| Years   |  | 1                    |        |             | 50                             |        |             |
| Air Quality Pollutant Emissions (Clean Air Act)                 |  | Grams                | Pounds | Metric Tons | Grams                          | Pounds | Metric Tons |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Carbon Monoxide (CO)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Sulfur Oxides (SOx)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxides (NOx)  |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Lead - (Pb)   |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Greenhouse Gas Emissions (NEPA)                                 |  |                      |        |             |                                |        |             |
| Carbon Dioxide (CO <sub>2</sub> )                               |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Methane (CH <sub>4</sub> )                                      |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |
| Nitrous Oxide (N <sub>2</sub> O)                                |  |                      | 0.00   | 0.00        | 0.00                           | 0.00   | 0.00        |

Wetland and aquatic ecosystems must be classified prior to modeling. GRC emissions, on either the Wetland and Deepwater Habitat Type key below or the online Wetland Mapper tool to classify wetland and deepwater habitats within the project area. Depending on your wetland or deepwater habitat type, a different rate of greenhouse gas production or sequestration will be used in the following calculations on Step 4, "Ecosystem Dynamics".

Choose one habitat type below:

Wetland Type 1: No Action Alternative  
Wetland Type 2: Wetland and Aquatic Habitat Type 1: No Action Alternative  
Wetland Type 3: Wetland and Aquatic Habitat Type 2: No Action Alternative

Wetland Type 4: Wetland and Aquatic Habitat Type 3: No Action Alternative  
Wetland Type 5: Wetland and Aquatic Habitat Type 4: No Action Alternative  
Wetland Type 6: Wetland and Aquatic Habitat Type 5: No Action Alternative

Wetland and Aquatic Habitat Type 1: No Action Alternative

Wetland Type 1: No Action Alternative

Wetland Type 2: Wetland and Aquatic Habitat Type 1: No Action Alternative

Wetland Type 3: Wetland and Aquatic Habitat Type 2: No Action Alternative

Wetland Type 4: Wetland and Aquatic Habitat Type 3: No Action Alternative

Wetland Type 5: Wetland and Aquatic Habitat Type 4: No Action Alternative

Wetland Type 6: Wetland and Aquatic Habitat Type 5: No Action Alternative

Wetland and Aquatic Habitat Type 1: No Action Alternative

Wetland Type 1: No Action Alternative

Wetland Type 2: Wetland and Aquatic Habitat Type 1: No Action Alternative

Wetland Type 3: Wetland and Aquatic Habitat Type 2: No Action Alternative

Wetland Type 4: Wetland and Aquatic Habitat Type 3: No Action Alternative

Wetland Type 5: Wetland and Aquatic Habitat Type 4: No Action Alternative

Wetland Type 6: Wetland and Aquatic Habitat Type 5: No Action Alternative

| Wetland Type  | General Description   |
|---|---|
| Wetland Type 1: No Action Alternative                                     | Wetland Type 1: No Action Alternative                                     |
| Wetland Type 2: Wetland and Aquatic Habitat Type 1: No Action Alternative | Wetland Type 2: Wetland and Aquatic Habitat Type 1: No Action Alternative |
| Wetland Type 3: Wetland and Aquatic Habitat Type 2: No Action Alternative | Wetland Type 3: Wetland and Aquatic Habitat Type 2: No Action Alternative |
| Wetland Type 4: Wetland and Aquatic Habitat Type 3: No Action Alternative | Wetland Type 4: Wetland and Aquatic Habitat Type 3: No Action Alternative |
| Wetland Type 5: Wetland and Aquatic Habitat Type 4: No Action Alternative | Wetland Type 5: Wetland and Aquatic Habitat Type 4: No Action Alternative |
| Wetland Type 6: Wetland and Aquatic Habitat Type 5: No Action Alternative | Wetland Type 6: Wetland and Aquatic Habitat Type 5: No Action Alternative |

Wetland and Deepwater Habitat Type Input Tables Select up to 8 different habitat types for each alternative and their associated area percentage and starting year of completion. Please note that the area percentage can be negative (existing habitat area) or positive (existing habitat area) though they should be applied as positive, as that would mean the percentage of habitat would be negative after the construction completion. Negative areas can be given a future year of completion to reduce loss of wetland and deepwater habitat as a future loss, such as a wetland loss due to a road or a 20 year after construction completion for instance. Please note, negative habitat area is not recommended as a method for reporting for no action alternatives, as this can lead to site accounting for total wetland and deepwater habitat areas and double subtraction of the no action alternatives.

| Project Alternative                   | Wetland and Aquatic Habitat Type 1                                     |   |                    |             | Wetland and Aquatic Habitat Type 2                                       |   |                    |             | Wetland and Aquatic Habitat Type 3                                       |   |                    |             |
|---------------------------------------|--|---|--------------------|-------------|--|---|--------------------|-------------|--|---|--------------------|-------------|
|                                       | Wetland and Aquatic Habitat Type (M-Marine, E-Estuarine, P-Palustrine) | % of Total Habitat Area (Percent Between 0-100) | Year of Completion | Total Years | Wetland and Deepwater Habitat Type (M-Marine, E-Estuarine, P-Palustrine) | % of Total Habitat Area (Percent Between 0-100) | Year of Completion | Total Years | Wetland and Deepwater Habitat Type (M-Marine, E-Estuarine, P-Palustrine) | % of Total Habitat Area (Percent Between 0-100) | Year of Completion | Total Years |
| Alternative 1 - No Action Alternative | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           |
| Alternative 2A Wetland Type           | MSE Emergent   | 10  | 2020               | 14          | M-Nearshore  |   |                    | 0           | MSE Emergent   |   |                    | 0           |
| Alternative 3 Wetland Type            | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           |
| Alternative 4 Wetland Type            | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           |
| Alternative 5 Wetland Type            | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           |
| Alternative 6 Wetland Type            | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           |
| Alternative 7 Wetland Type            | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           |
| Alternative 8 Wetland Type            | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           | MSE Emergent   |   |                    | 0           |

Activity Input Tables Select the Activity Level in acres per thousand (g/ha) rate, activity required only for Marine and Estuarine Wetland and Aquatic Habitats, activity is not used for Freshwater Wetland and Aquatic Habitats, leave as zero if not used.

| Project Alternative                   | Habitat Type 1 Activity | Habitat Type 2 Activity | Habitat Type 3 Activity |
|---------------------------------------|-------------------------|-------------------------|-------------------------|
| Alternative 1 - No Action Alternative | 0                       | 0                       | 0                       |
| Alternative 2A Wetland Type           | 0                       | 0                       | 0                       |
| Alternative 3 Wetland Type            | 0                       | 0                       | 0                       |
| Alternative 4 Wetland Type            | 0                       | 0                       | 0                       |
| Alternative 5 Wetland Type            | 0                       | 0                       | 0                       |
| Alternative 6 Wetland Type            | 0                       | 0                       | 0                       |
| Alternative 7 Wetland Type            | 0                       | 0                       | 0                       |
| Alternative 8 Wetland Type            | 0                       | 0                       | 0                       |

Estimates Calculation Table: Greenhouse gas emissions for wetland and aquatic habitats are estimated below using inputs from the previous step. Emissions estimated on this sheet will contribute to the NET emissions determination.

| Alternative                           | Total Wetland and Deepwater Habitat Created Direct Input (acres) Inputs have will override the calculated total to the right) | Total Material Placed for Wetland and Deepwater Habitat (cy) | Average Depth of Placed Sediment (ft) | Total Habitat Created - Avg Calculated (acres) | Total Area of Wetland and Deepwater Habitat Created (m <sup>2</sup> ) | Yearly Average Sequestered CO <sub>2</sub> (grams/yr) | Yearly Average CH <sub>4</sub> Production (grams/yr) | Yearly Average N <sub>2</sub> O Production (grams/yr) | Project Lifetime Sequestered CO <sub>2</sub> (grams) | Project Lifetime CH <sub>4</sub> Emission (grams) | Project Lifetime N <sub>2</sub> O Emission (grams) | Project Lifetime Sequestered CO <sub>2</sub> (pounds) | Project Lifetime CH <sub>4</sub> Emission (pounds) | Project Lifetime N <sub>2</sub> O Emission (pounds) | Project Lifetime Sequestered CO <sub>2</sub> (metric tons) | Project Lifetime CH <sub>4</sub> Emission (metric tons) | Project Lifetime N <sub>2</sub> O Emission (metric tons) |
|---------------------------------------|---|--|---------------------------------------|--|---|---|--|---|--|---|--|---|--|---|--|---|--|
| Alternative 1 - No Action Alternative |   |  |                                       | place inputs for area calculation              | Input area to the left  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| Alternative 2A                        | 1.62  | 122.02   | 1.00                                  | 0.21   | 6,573.1   | 1,210,420.0   | 305.8  | 174.3   | 51,502,908.4   | 15,288.6  | 8,715.9  | 113,606.5   | 33.7   | 19.2  | 51.5   | 0.0   | 0.0  |
| Alternative 3                         |   |  |                                       | place inputs for area calculation              | Input area to the left  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| Alternative 4                         |   |  |                                       | place inputs for area calculation              | Input area to the left  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| Alternative 5                         |   |  |                                       | place inputs for area calculation              | Input area to the left  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| Alternative 6                         |   |  |                                       | place inputs for area calculation              | Input area to the left  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| Alternative 7                         |   |  |                                       | place inputs for area calculation              | Input area to the left  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| Alternative 8                         |   |  |                                       | place inputs for area calculation              | Input area to the left  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |

Source Data for Calculations

| Wetland and Aquatic Habitat Type  | Carbon Dioxide (CO <sub>2</sub> ) Sequestered Rate (grams CO <sub>2</sub> /m <sup>2</sup> /yr) | Carbon Dioxide (CO <sub>2</sub> ) Sequestered Rate (grams CO <sub>2</sub> /m <sup>2</sup> /yr) | Carbon Dioxide (CO <sub>2</sub> ) Sequestered Rate (grams CO <sub>2</sub> /m <sup>2</sup> /yr) |
|---|--|--|--|
| Wetland Type 1: No Action Alternative                                     | 0.00   | 0.00   | 0.00   |
| Wetland Type 2: Wetland and Aquatic Habitat Type 1: No Action Alternative | 0.00   | 0.00   | 0.00   |
| Wetland Type 3: Wetland and Aquatic Habitat Type 2: No Action Alternative | 0.00   | 0.00   | 0.00   |
| Wetland Type 4: Wetland and Aquatic Habitat Type 3: No Action Alternative | 0.00   | 0.00   | 0.00   |
| Wetland Type 5: Wetland and Aquatic Habitat Type 4: No Action Alternative | 0.00   | 0.00   | 0.00   |
| Wetland Type 6: Wetland and Aquatic Habitat Type 5: No Action Alternative | 0.00   | 0.00   | 0.00   |

Default Greenhouse Gas Production and Sequestration Rates for each Wetland and Aquatic Habitat Type

| Wetland and Aquatic Habitat Type  | Carbon Dioxide (CO <sub>2</sub> ) Sequestered Rate (grams CO <sub>2</sub> /m <sup>2</sup> /yr) | Carbon Dioxide (CO <sub>2</sub> ) Sequestered Rate (grams CO <sub>2</sub> /m <sup>2</sup> /yr) | Carbon Dioxide (CO <sub>2</sub> ) Sequestered Rate (grams CO <sub>2</sub> /m <sup>2</sup> /yr) |
|---|--|--|--|
| Wetland Type 1: No Action Alternative                                     | 0.00   | 0.00   | 0.00   |
| Wetland Type 2: Wetland and Aquatic Habitat Type 1: No Action Alternative | 0.00   | 0.00   | 0.00   |
| Wetland Type 3: Wetland and Aquatic Habitat Type 2: No Action Alternative | 0.00   | 0.00   | 0.00   |
| Wetland Type 4: Wetland and Aquatic Habitat Type 3: No Action Alternative | 0.00   | 0.00   | 0.00   |
| Wetland Type 5: Wetland and Aquatic Habitat Type 4: No Action Alternative | 0.00   | 0.00   | 0.00   |
| Wetland Type 6: Wetland and Aquatic Habitat Type 5: No Action Alternative | 0.00   | 0.00   | 0.00   |

Wetland and Aquatic Habitat Type: GWP Emissions Calculated Outputs for New Calculations Calculations

| Alternative                           | Sequestered CO <sub>2</sub> (metric tons) | Sequestered CO <sub>2</sub> (metric tons) | Sequestered CO <sub>2</sub> (metric tons) |
|---------------------------------------|---|---|---|
| Alternative 1 - No Action Alternative | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 2A                        | 1,210,420.0                               | 1,210,420.0                               | 1,210,420.0                               |
| Alternative 3                         | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 4                         | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 5                         | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 6                         | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 7                         | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 8                         | 0.00                                      | 0.00                                      | 0.00                                      |

Wetland and Aquatic Habitat Type: GWP Emissions Calculated Outputs for New Calculations Calculations

| Alternative                           | Sequestered CO <sub>2</sub> (metric tons) | Sequestered CO <sub>2</sub> (metric tons) | Sequestered CO <sub>2</sub> (metric tons) |
|---------------------------------------|---|---|---|
| Alternative 1 - No Action Alternative | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 2A                        | 1,210,420.0                               | 1,210,420.0                               | 1,210,420.0                               |
| Alternative 3                         | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 4                         | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 5                         | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 6                         | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 7                         | 0.00                                      | 0.00                                      | 0.00                                      |
| Alternative 8                         | 0.00                                      | 0.00                                      | 0.00                                      |

Embodied carbon accounts for the emissions of CO<sub>2</sub> that one unit of a product requires for its production, such as the fraction of factory emissions needed to produce one bag of cement. The below calculations take into account the greenhouse gases produced to make the materials that are used. Depending on whether the material is included in a no-action vs with action alternative, the net total may be reduced or increased, respectively.

Embodied Carbon from Cement

| Alternative                           | Cubic Yards of Cement | Pounds of Carbon Dioxide per Cubic Yard of Cement | CO <sub>2</sub> Emissions (grams) | CO <sub>2</sub> Emissions (pounds) | CO <sub>2</sub> Emissions (Metric Tons) |
|---------------------------------------|-----------------------|---|-----------------------------------|------------------------------------|---|
| Alternative 1 - No Action Alternative |                       |   | 0.00                              | 0.00                               | 0.00                                    |
| Alternative 2A                        | 0                     | 0   | 0.00                              | 0.00                               | 0.00                                    |
| Alternative 3                         |                       |   | 0.00                              | 0.00                               | 0.00                                    |
| Alternative 4                         |                       |   | 0.00                              | 0.00                               | 0.00                                    |
| Alternative 5                         |                       |   | 0.00                              | 0.00                               | 0.00                                    |
| Alternative 6                         |                       |   | 0.00                              | 0.00                               | 0.00                                    |
| Alternative 7                         |                       |   | 0.00                              | 0.00                               | 0.00                                    |
| Alternative 8                         |                       |   | 0.00                              | 0.00                               | 0.00                                    |



Gross and Net Total Emissions for the project alternatives are calculated below:

| Include O&M Air Pollutant Emissions In Net Calculations         |               |             |             |               |             |             | YES |
|---|---------------|-------------|-------------|---------------|-------------|-------------|-----|
| Gross Emissions   |               |             |             | Net Emissions |             |             |     |
| Alternative 1 - No Action Alternative                           |               |             |             |               |             |             |     |
| Pollutant Emissions (Clean Air Act)                             | Grams         | Pounds      | Metric Tons | Grams         | Pounds      | Metric Tons |     |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Monoxide (CO)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Sulfur Oxides (SOx)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxides (NOx)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Lead - (Pb)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Greenhouse Gas Emissions (NEPA)                                 |               |             |             |               |             |             |     |
| Carbon Dioxide (CO <sub>2</sub> )                               | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Methane (CH <sub>4</sub> )                                      | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxide (N <sub>2</sub> O)                                | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Dioxide Equivalents (CO <sub>2</sub> e)                  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Alternative 2A  |               |             |             |               |             |             |     |
| Pollutant Emissions (Clean Air Act)                             | Grams         | Pounds      | Metric Tons | Grams         | Pounds      | Metric Tons |     |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) | 8816953.82    | 19438.07    | 8.82        | 8816953.82    | 19438.07    | 8.82        |     |
| Carbon Monoxide (CO)  | 38803089.21   | 85546.24    | 38.80       | 38803089.21   | 85546.24    | 38.80       |     |
| Sulfur Oxides (SOx)   | 66189.59      | 145.92      | 0.07        | 66189.59      | 145.92      | 0.07        |     |
| Nitrous Oxides (NOx)  | 55644065.88   | 122674.27   | 55.64       | 55644065.88   | 122674.27   | 55.64       |     |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            | 2942692.91    | 6487.53     | 2.94        | 2942692.91    | 6487.53     | 2.94        |     |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              | 3464296.72    | 7637.47     | 3.46        | 3464296.72    | 7637.47     | 3.46        |     |
| Lead - (Pb)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Greenhouse Gas Emissions (NEPA)                                 |               |             |             |               |             |             |     |
| Carbon Dioxide (CO <sub>2</sub> )                               | 6097289560.35 | 13442233.46 | 6097.30     | 6097289560.35 | 13442233.46 | 6097.30     |     |
| Methane (CH <sub>4</sub> )                                      | 799606.22     | 1762.83     | 0.80        | 799606.22     | 1762.83     | 0.80        |     |
| Nitrous Oxide (N <sub>2</sub> O)                                | 360884.37     | 795.61      | 0.36        | 360884.37     | 795.61      | 0.36        |     |
| Carbon Dioxide Equivalents (CO <sub>2</sub> e)                  | 6224823259.39 | 13723397.37 | 6224.84     | 6224823259.39 | 13723397.37 | 6224.84     |     |
| Alternative 3   |               |             |             |               |             |             |     |
| Pollutant Emissions (Clean Air Act)                             | Grams         | Pounds      | Metric Tons | Grams         | Pounds      | Metric Tons |     |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Monoxide (CO)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Sulfur Oxides (SOx)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxides (NOx)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Lead - (Pb)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Greenhouse Gas Emissions (NEPA)                                 |               |             |             |               |             |             |     |
| Carbon Dioxide (CO <sub>2</sub> )                               | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Methane (CH <sub>4</sub> )                                      | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxide (N <sub>2</sub> O)                                | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Dioxide Equivalents (CO <sub>2</sub> e)                  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Alternative 4   |               |             |             |               |             |             |     |
| Pollutant Emissions (Clean Air Act)                             | Grams         | Pounds      | Metric Tons | Grams         | Pounds      | Metric Tons |     |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Monoxide (CO)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Sulfur Oxides (SOx)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxides (NOx)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Lead - (Pb)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Greenhouse Gas Emissions (NEPA)                                 |               |             |             |               |             |             |     |
| Carbon Dioxide (CO <sub>2</sub> )                               | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Methane (CH <sub>4</sub> )                                      | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxide (N <sub>2</sub> O)                                | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Dioxide Equivalents (CO <sub>2</sub> e)                  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Alternative 5   |               |             |             |               |             |             |     |
| Pollutant Emissions (Clean Air Act)                             | Grams         | Pounds      | Metric Tons | Grams         | Pounds      | Metric Tons |     |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Monoxide (CO)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Sulfur Oxides (SOx)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxides (NOx)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Lead - (Pb)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Greenhouse Gas Emissions (NEPA)                                 |               |             |             |               |             |             |     |
| Carbon Dioxide (CO <sub>2</sub> )                               | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Methane (CH <sub>4</sub> )                                      | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxide (N <sub>2</sub> O)                                | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Dioxide Equivalents (CO <sub>2</sub> e)                  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Alternative 6   |               |             |             |               |             |             |     |
| Pollutant Emissions (Clean Air Act)                             | Grams         | Pounds      | Metric Tons | Grams         | Pounds      | Metric Tons |     |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Monoxide (CO)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Sulfur Oxides (SOx)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxides (NOx)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Lead - (Pb)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Greenhouse Gas Emissions (NEPA)                                 |               |             |             |               |             |             |     |
| Carbon Dioxide (CO <sub>2</sub> )                               | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Methane (CH <sub>4</sub> )                                      | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxide (N <sub>2</sub> O)                                | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Dioxide Equivalents (CO <sub>2</sub> e)                  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Alternative 7   |               |             |             |               |             |             |     |
| Pollutant Emissions (Clean Air Act)                             | Grams         | Pounds      | Metric Tons | Grams         | Pounds      | Metric Tons |     |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Monoxide (CO)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Sulfur Oxides (SOx)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxides (NOx)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Lead - (Pb)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Greenhouse Gas Emissions (NEPA)                                 |               |             |             |               |             |             |     |
| Carbon Dioxide (CO <sub>2</sub> )                               | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Methane (CH <sub>4</sub> )                                      | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxide (N <sub>2</sub> O)                                | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Dioxide Equivalents (CO <sub>2</sub> e)                  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Alternative 8   |               |             |             |               |             |             |     |
| Pollutant Emissions (Clean Air Act)                             | Grams         | Pounds      | Metric Tons | Grams         | Pounds      | Metric Tons |     |
| Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC) | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Monoxide (CO)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Sulfur Oxides (SOx)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxides (NOx)  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 2.5 micron (PM <sub>2.5</sub> )            | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Particulate Matter - 10 micron (PM <sub>10</sub> )              | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Lead - (Pb)   | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Greenhouse Gas Emissions (NEPA)                                 |               |             |             |               |             |             |     |
| Carbon Dioxide (CO <sub>2</sub> )                               | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Methane (CH <sub>4</sub> )                                      | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Nitrous Oxide (N <sub>2</sub> O)                                | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |
| Carbon Dioxide Equivalents (CO <sub>2</sub> e)                  | 0.00          | 0.00        | 0.00        | 0.00          | 0.00        | 0.00        |     |



[illegible]

[illegible]

## **Appendix A-1 Environmental: NEPA Scoping**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**National Environmental Policy Act Scoping  
Letters, Comments, and Response**

**November 2024**



**US Army Corps  
of Engineers®**  
Norfolk District



**DEPARTMENT OF THE ARMY  
US ARMY CORPS OF ENGINEERS  
NORFOLK DISTRICT  
FORT NORFOLK  
803 FRONT STREET  
NORFOLK VA 23510-1011**

June 5, 2023

**SUBJECT: Initiation of NEPA Scoping and NEPA Scoping Comment Period for the Section 510 Middle Peninsula State Park Feasibility Study**

To Whom It May Concern:

This scoping letter is being promulgated by the U.S. Army Corps of Engineers (USACE) in compliance with public coordination requirements of the National Environmental Policy Act of 1969 (NEPA). The purpose of this correspondence is to formally initiate the scoping process as defined by 40 CFR 1501.7 for the Section 510 Middle Peninsula State Park Feasibility Study. The USACE is the lead federal agency for this study and the Commonwealth of Virginia Department of Conservation and Recreation (VDCR) is the non-federal sponsor. The study authority is Section 510 of the Water Resources Development Act (WRDA) 1996 (Public Law 104-303), as amended, which authorizes USACE to design and construct water-related resource protection and restoration projects within the Chesapeake Bay watershed for non-Federal interests. The purpose of the project is to rehabilitate and install a living shoreline at Middle Peninsula State Park to restore habitat and to prevent shoreline property loss. A map of the approximate study area is provided in Attachment 1. Potential measures being considered include but are not limited to the following: removal of derelict timber groins, removal of degrading bulkhead, grading the existing topography into a natural sloping shoreline, installation of an offshore reef structure, and restoration of wetland and marsh areas.

The purpose of the scoping period is to commence the public process for the generation of a NEPA document to assess the effects of the alternatives associated with the Section 510 Middle Peninsula State Park Feasibility Study. The NEPA document is anticipated to be an Environmental Assessment for this study. The scoping process will aid in determining the scope of the analysis and any potentially significant issues. This process will also help identify alternatives and information needed to evaluate alternatives.

We welcome your views, questions, comments, concerns, and suggestions. The USACE believes that this study will benefit significantly from your involvement. Written scoping comments for the Section 510 Middle Peninsula State Park Feasibility Study are to be provided no later than July 5, 2023. Written comments or inquiries regarding the Section 510 Middle Peninsula State Park Feasibility Study should be addressed to

Ms. Peyton Mowery by email: [peyton.j.mowery@usace.army.mil](mailto:peyton.j.mowery@usace.army.mil) or by Telephone: 757-201-7390. Thank you in advance for your participation.

Sincerely,

Zachary Martin  
U.S. Army Corps of Engineers  
Norfolk District  
Chief, Environmental Analysis Section  
Planning and Policy Branch



DEPARTMENT OF THE ARMY  
US ARMY CORPS OF ENGINEERS  
NORFOLK DISTRICT  
FORT NORFOLK  
803 FRONT STREET  
NORFOLK VA 23510-1011

June 5, 2023

Attachment 1: Map of Approximate Study Area





**From:** [Mowery, Peyton CIV USARMY CENAO \(USA\)](#)  
**To:** [David OBrien - NOAA Federal](#); [Christine Vaccaro - NOAA Federal](#); [Nevshehirlan, Stepan](#); [Andersen, Troy M](#); [Valerie.Fulcher@deq.virginia.gov](mailto:Valerie.Fulcher@deq.virginia.gov)  
**Cc:** [Martin, Zachary P \(Zach\) CIV \(USA\)](#); [Harr, Richard M CIV USARMY CENAO \(USA\)](#)  
**Subject:** NEPA scoping request: Section 510 Middle Peninsula State Park feasibility study  
**Date:** Monday, June 5, 2023 2:48:00 PM  
**Attachments:** [Middle Peninsula 510 NEPA Scoping Letter 20230605 signed.pdf](#)

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Good afternoon,

Please see the attached NEPA scoping request for the Section 510 Middle Peninsula State Park feasibility study (Gloucester, VA). The purpose of the project is to rehabilitate and install a living shoreline at Middle Peninsula State Park to restore habitat and to prevent shoreline property loss. We have entered the public scoping period of the project and will be accepting scoping comments for 30-days (up to 5 July 2023). If you have any questions or require additional information, please let me know!

Thank you in advance for your future cooperation on this project.

Best,

Peyton Mowery  
Biologist  
Environmental Analysis Section  
US Army Corps of Engineers | Norfolk District  
Office: 757.201.7390 | Cell: 215.534.8878

**From:** [Fulcher, Valerie \(DEQ\)](#)  
**To:** [dgif-ESS Projects \(DWR\)](#); [Ballou, Thomas \(DEQ\)](#); [Churchill, Nikolas \(DEQ\)](#); [Henicheck, Michelle \(DEQ\)](#); [Gavan, Larry \(DEQ\)](#); [Moore, Daniel \(DEQ\)](#); [Hannah, Jeffrey \(DEQ\)](#); [Kirchen, Roger \(DHR\)](#); [MRC - Scoping \(MRC\)](#); [advisory@vims.edu \(advisory@vims.edu\)](#); [EIR Coordination \(VDOT\)](#); [ImpactReview \(impactreview@vof.org\)](#); [Tignor, Keith \(VDACS\)](#); [Didier, Karl \(Virginia\)](#); [Lasher, Terrance J. \(DOF\)](#); [Folks, Clint \(DOF\)](#); [odwreview \(VDH\)](#); [Spears, David \(Energy\)](#); [Green, Ryan \(DEQ\)](#); [Lawrence, Lewis](#); [klandry@gloucesterva.info \(klandry@gloucesterva.info\)](#)  
**Cc:** [Mowery, Peyton CIV USARMY CENAO \(USA\)](#); [DCR-PRR Environmental Review \(DCR\)](#)  
**Subject:** [Non-DoD Source] NEW SCOPING Section 510 Middle Peninsula State Park Feasibility Study  
**Date:** Wednesday, June 7, 2023 9:47:14 AM  
**Attachments:** [Middle Peninsula 510 NEPA Scoping Response.pdf](#)  
[Middle Peninsula 510 NEPA Scoping Letter 20230605 signed.pdf](#)

---

Good morning—attached is a **request for scoping comments** on the following:

### Section 510 Middle Peninsula State Park Feasibility Study

If you choose to make comments, please send them directly to the project sponsor ([peyton.j.mowery@usace.army.mil](mailto:peyton.j.mowery@usace.army.mil)) and copy the DEQ Office of Environmental Impact Review: [eir@deq.virginia.gov](mailto:eir@deq.virginia.gov). We will coordinate a review when the environmental document is completed.

DEQ-OEIR's scoping response is also attached.

If you have any questions regarding this request, please email our office at [eir@deq.virginia.gov](mailto:eir@deq.virginia.gov).

**Valerie**

**Valerie A. Fulcher, CAP, OM, Admin/Data Coordinator Senior**  
**Department of Environmental Quality**  
**Environmental Enhancement - Office of Environmental Impact Review**  
**1111 East Main Street**  
**Richmond, VA 23219**  
**NEW PHONE NUMBER: 804-659-1550**  
**Email: [Valerie.Fulcher@deq.virginia.gov](mailto:Valerie.Fulcher@deq.virginia.gov)**  
**<https://www.deq.virginia.gov/permits-regulations/environmental-impact-review>**

For program updates and public notices please subscribe to Constant

Contact: <https://lp.constantcontact.com/su/MVcCump/EIR>



*Commonwealth of Virginia*

***VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY***

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219

P.O. Box 1105, Richmond, Virginia 23218

(800) 592-5482 FAX (804) 698-4178

[www.deq.virginia.gov](http://www.deq.virginia.gov)

Travis A. Voyles  
Acting Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus  
Director  
(804) 698-4020

June 7, 2023

Ms. Peyton Mowery  
Department of the Army  
US Army Corps of Engineers  
Norfolk District  
803 Front Street  
Norfolk, Virginia 23510-1011

RE: Section 510 Middle Peninsula State Park Feasibility Study

Dear Ms. Mowery:

This letter is in response to the scoping request for the above-referenced project.

As you may know, the Department of Environmental Quality, through its Office of Environmental Impact Review (DEQ-OEIR), is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act (NEPA) and responding to appropriate federal officials on behalf of the Commonwealth. Similarly, DEQ-OEIR coordinates Virginia's review of federal consistency documents prepared pursuant to the Coastal Zone Management Act which applies to all federal activities which are reasonably likely to affect any land or water use or natural resources of Virginia's designated coastal resources management area must be consistent with the enforceable policies Virginia Coastal Zone Management (CZM) Program. In addition, DEQ-OEIR coordinates Virginia's review of state Environmental Impact Reports (EIRs) prepared in accordance with Virginia sections 10.1-1188 et seq. which requires State agencies to prepare and submit EIRs for the construction of facilities that will cost \$500,000 or more. The requirement also covers acquisition of land for construction, which includes leases, and expansion of existing facilities.

**DOCUMENT SUBMISSIONS**

In order to ensure an effective coordinated review of the NEPA document, federal consistency, and EIR documentation, notification should be sent directly to OEIR. We request that you submit one electronic to [eir@deq.virginia.gov](mailto:eir@deq.virginia.gov) (25 MB maximum) or make the documents available for download at a website, file transfer protocol (ftp) site or the VITA LFT file share system (Requires an "invitation" for access. An invitation request should be sent to [eir@deq.virginia.gov](mailto:eir@deq.virginia.gov)). We request that the review of these documents be done concurrently, if possible. Please allow adequate time for these concurrent reviews. Specifically, we request a minimum of a 60-day review period.

The NEPA document and the federal consistency documentation (if applicable) should include U.S. Geological Survey topographic maps as part of their information. We strongly encourage you to issue shape files with the NEPA document. In addition, project details should be adequately described for the benefit of the reviewers.

## **ENVIRONMENTAL REVIEW UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT: PROJECT SCOPING AND AGENCY INVOLVEMENT**

As you may know, NEPA (PL 91-190, 1969) and its implementing regulations (Title 40, *Code of Federal Regulations*, Parts 1500-1508) requires a draft and final Environmental Impact Statement (EIS) for federal activities or undertakings that are federally licensed or federally funded which will or may give rise to significant impacts upon the human environment. An EIS carries more stringent public participation requirements than an Environmental Assessment (EA) and provides more time and detail for comments and public decision-making. The possibility that an EIS may be required for the proposed project should not be overlooked in your planning for this project. Accordingly, we refer to “NEPA document” in the remainder of this letter.

While this Office does not participate in scoping efforts beyond the advice given herein, other agencies are free to provide scoping comments concerning the preparation of the NEPA document. Accordingly, we are providing notice of your scoping request to several state agencies and those localities and Planning District Commissions, including but not limited to:

### Department of Environmental Quality:

- DEQ Regional Office\*
- Air Division\*
- Office of Wetlands and Stream Protection\*
- Office of Local Government Programs\*
- Division of Land Protection and Revitalization
- Office of Stormwater Management\*

Department of Conservation and Recreation

Department of Health\*

Department of Agriculture and Consumer Services

Department of Wildlife Resources\*

Virginia Marine Resources Commission\*

Department of Historic Resources

Department of Mines, Minerals, and Energy

Department of Forestry

Department of Transportation

Note: The agencies noted with a star (\*) administer one or more of the enforceable policies of the Virginia CZM Program.

## **STATE ENVIRONMENTAL IMPACT REPORTS**

Pursuant to the Virginia Code sections 10.1-1188 et seq., state agencies are required to prepare and submit EIRs for the construction of facilities that will \$500,000 or more. The requirement also covers acquisition of land for construction, which includes leases, and expansion of existing facilities. This requirement applies to any state facility construction or expansion “undertaken by any state agency, board, commission, authority or any branch of state government, including public institutions of higher education.”

The coordinated response is sent for consideration to the Secretary of Administration, who represents the Governor, under Executive Order 88(01). The secretary's approval, after consideration of DEQ's comments, is required before funds can be released for the project. DEQ has 60 days after receipt of the environmental impact report to make its comments to the secretary and the proponent agency. Please note that the requirement for an EIR is not related to the funding source.

DEQ accepts NEPA documents for review under the EIR law provided the informational requirements for and EIR are met. Additional information on the Virginia's review EIRs can be found online at: <http://www.deq.virginia.gov/Programs/EnvironmentalImpactReview/StateEnvironmentalImpactReviews.aspx>

## **FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT**

Pursuant to the federal Coastal Zone Management Act of 1972, as amended, and its implementing regulations in Title 15, *Code of Federal Regulations*, Part 930, federal activities, including permits, licenses, and federally funded projects, located in Virginia's Coastal Management Zone or those that can have reasonably foreseeable effects on Virginia's coastal uses or coastal resources must be conducted in a manner which is consistent, to the maximum extent practicable, with the Virginia CZM Program.

Additional information on the Virginia's review for federal consistency documents can be found online at <http://www.deq.virginia.gov/Programs/EnvironmentalImpactReview/FederalConsistencyReviews.aspx>

## **DATA BASE ASSISTANCE**

Below is a list of databases that may assist you in the preparation of a NEPA document:

- DEQ Online Database: Virginia Environmental Geographic Information Systems

Information on Permitted Solid Waste Management Facilities, Impaired Waters, Petroleum Releases, Registered Petroleum Facilities, Permitted Discharge (Virginia Pollution Discharge Elimination System Permits) Facilities, Resource Conservation and Recovery Act (RCRA) Sites, Water Monitoring Stations, National Wetlands Inventory:

- [www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx](http://www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx)

- DEQ Virginia Coastal Geospatial and Educational Mapping System (GEMS)

Virginia's coastal resource data and maps; coastal laws and policies; facts on coastal resource values; and direct links to collaborating agencies responsible for current data:

- <http://128.172.160.131/gems2/>

- MARCO Mid-Atlantic Ocean Data Portal

The Mid-Atlantic Ocean Data Portal is a publicly available online toolkit and resource center that consolidates available data and enables users to visualize and analyze ocean resources and human use information such as fishing grounds, recreational areas, shipping lanes, habitat areas, and energy sites, among others.

<http://portal.midatlanticocean.org/visualize/#x=-73.24&y=38.93&z=7&logo=true&controls=true&basemap=Ocean&tab=data&legends=false&layers=true>

- DHR Data Sharing System.

Survey records in the DHR inventory:

- [www.dhr.virginia.gov/archives/data\\_sharing\\_sys.htm](http://www.dhr.virginia.gov/archives/data_sharing_sys.htm)

- DCR Natural Heritage Search

Produces lists of resources that occur in specific counties, watersheds or physiographic regions:

- [www.dcr.virginia.gov/natural\\_heritage/dbsearchtool.shtml](http://www.dcr.virginia.gov/natural_heritage/dbsearchtool.shtml)

- Wetland Condition Assessment Tool (WetCAT)

- <https://www.deq.virginia.gov/water/wetlands-streams/wetcat>

- DWR Fish and Wildlife Information Service

Information about Virginia's Wildlife resources:

- <http://vafwis.org/fwis/>

- Total Maximum Daily Loads Approved Reports

- <https://www.deq.virginia.gov/programs/water/waterqualityinformationtmdls/tmdl/tmdldevelopment/approvedtmdlreports.aspx>

- Virginia Outdoors Foundation: Identify VOF-protected land

- <http://vof.maps.arcgis.com/home/index.html>

- Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Database: Superfund Information Systems

Information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation, including sites that are on the National Priorities List (NPL) or being considered for the NPL:

- [www.epa.gov/superfund/sites/cursites/index.htm](http://www.epa.gov/superfund/sites/cursites/index.htm)

- EPA RCRAInfo Search

Information on hazardous waste facilities:

- [www.epa.gov/enviro/facts/rcrainfo/search.html](http://www.epa.gov/enviro/facts/rcrainfo/search.html)

- EPA Envirofacts Database

EPA Environmental Information, including EPA-Regulated Facilities and Toxics Release Inventory Reports:

- [www.epa.gov/enviro/index.html](http://www.epa.gov/enviro/index.html)

- EPA NEPAassist Database

Facilitates the environmental review process and project planning:

<http://nepaassisttool.epa.gov/nepaassist/entry.aspx>

If you have questions about the environmental review process and/or the federal consistency review process, please feel free to contact me (telephone (804) 659-1915 or e-mail [bettina.rayfield@deq.virginia.gov](mailto:bettina.rayfield@deq.virginia.gov)).

I hope this information is helpful to you.

Sincerely,

A handwritten signature in black ink, appearing to read "Bettina Rayfield". The signature is fluid and cursive, with a long horizontal stroke at the end.

Bettina Rayfield, Program Manager  
Environmental Impact Review and  
Long-Range Priorities

Travis A. Voyles  
*Secretary of Natural and Historic Resources*

Matthew S. Wells  
*Director*

Andrew W. Smith  
*Chief Deputy Director*



**COMMONWEALTH of VIRGINIA**  
**DEPARTMENT OF CONSERVATION AND RECREATION**

Frank N. Stovall  
*Deputy Director  
for Operations*

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

Laura Ellis  
*Deputy Director for  
Administration and Finance*

June 30, 2023

Peyton Mowery  
USACE- Norfolk District  
803 Front Street  
Norfolk, VA 23510

Re: Section 510 Middle Peninsula State Park Feasibility Study

Dear Ms. Mowery:

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.

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.

DCR recommends an invasive species inventory for the proposed restoration area and the development and use of an adaptive management plan for the control of invasive species. DCR recommends the planting of Virginia native plant species including native pollinator species that bloom throughout the spring and summer, to maximize benefits to native pollinators. Guidance on native plant species can be found here: <http://www.dcr.virginia.gov/natural-heritage/solar-site-native-plants-finder>.

If there are impacts in the southern section of the project area and the harvested area is not allowed to revegetate, the proposed project will impact an Ecological Core (C5) as identified in the Virginia Natural Landscape Assessment (<https://www.dcr.virginia.gov/natural-heritage/vaconvisvnl>). 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 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. Interior core areas begin 100 meters inside core edges and continue to the deepest parts of cores. Cores also provide the natural, economic, and quality of life benefits of open space, recreation, thermal moderation, water quality (including drinking water recharge and protection, and erosion prevention), and air quality (including sequestration of carbon, absorption of gaseous pollutants, and production of oxygen). 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.

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*State Parks • Soil and Water Conservation • Outdoor Recreation Planning  
Natural Heritage • Dam Safety and Floodplain Management • Land Conservation*



Impacts to cores occur when their natural cover is partially or completely converted permanently to developed land uses. Habitat conversion to development causes reductions in ecosystem processes, native biodiversity, and habitat quality due to habitat loss; less viable plant and animal populations; increased predation; and increased introduction and establishment of invasive species.

DCR recommends avoidance of impacts to cores. When avoidance cannot be achieved, DCR recommends minimizing the area of impacts overall and concentrating the impacted area at the edges of cores, so that the most interior remains intact.

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.

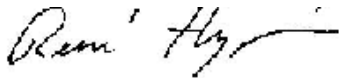
There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity. Please note, this project is entirely within the Middle Peninsula State Park. Please contact Josh Ellington, Chief of Resources Management for Virginia State Parks at [josh.ellington@dcr.virginia.gov](mailto:josh.ellington@dcr.virginia.gov) or 804-489-0700 for more information.

New and updated information is continually added to Biotics. Please re-submit the project for review once the site plan design is completed prior to implementation of the project.

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](mailto:amy.martin@dwr.virginia.gov).

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,



S. René Hypes  
Natural Heritage Project Review Coordinator

Cc: Bettina Rayfield, DEQ-OEIR  
Josh Ellington, DCR-State Parks

**From:** [Traver, Carrie](#)  
**To:** [Mowery, Peyton CIV USARMY CENAO \(USA\)](#)  
**Cc:** [Witman, Timothy](#)  
**Subject:** [Non-DoD Source] NEPA scoping request: Section 510 Middle Peninsula State Park feasibility study  
**Date:** Wednesday, July 5, 2023 3:38:11 PM

---

Good afternoon, Peyton,

Thank you for coordinating. EPA is not providing detailed comments at this time, but recommends that any potential resource tradeoffs be carefully evaluated.

We ask that you continue to engage EPA as the project goes forward. Also, please include us in any agency meetings.

Thank you,  
Carrie

**Carrie Traver**

Environmental Assessment Branch  
Office of Communities, Tribes, & Environmental Assessment  
U.S. Environmental Protection Agency, Region 3  
215-814-2772  
[traver.carrie@epa.gov](mailto:traver.carrie@epa.gov)



*Commonwealth of Virginia*

***VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY***

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Travis A. Voyles  
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus  
Director  
(804) 698-4020

**MEMORANDUM**

**TO:** Peyton Mowrey, United States Army Corps of Engineers

**FROM:** V'lent Lassiter, Chesapeake Bay Preservation Act Locality Liaison

**DATE:** June 21, 2023

**SUBJECT:** SCOPING: Middle Peninsula State Park Feasibility Study, Gloucester County

We have reviewed the Scoping request submittal for the proposed project and offer the following comments regarding consistency with the provisions of the *Chesapeake Bay Preservation Area Designation and Management Regulations* (Regulations):

In Gloucester County, the areas protected by the *Chesapeake Bay Preservation Act*, as locally implemented, require conformance with performance criteria. These areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) as designated by the local government. RPAs include tidal wetlands, certain non-tidal wetlands and tidal shores, and a minimum 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow. The RMA, which requires less stringent performance criteria, includes all remaining areas of Gloucester County.

The purpose of this project is to install a living shoreline at Middle Peninsula State Park to restore habitat and prevent shoreline property loss. A map of the project area was provided in the Scoping request, and although the exact length of the shoreline to be treated was not given, using the scale that accompanied the map it appears to be approximately 3,000 linear feet along the York River. Potential measures being considered include but are not limited to the following: removal of derelict timber groins, removal of degrading bulkhead, grading the existing topography into a natural sloping shoreline, installation of an offshore reef structure, and restoration of wetland and marsh areas.

Under Section 9 VAC 25-830-140 5(4) of the Regulations, shoreline erosion control projects such as living shorelines are permitted within the RPA. Trees and woody vegetation may be removed, necessary control techniques employed, and appropriate vegetation established to protect or stabilize the shoreline in accordance with best available technical advice and

applicable permit conditions or requirements. Mature trees may only be removed as necessary for the installation and maintenance of the project consistent with the best available technical advice. Trees must be utilized in the project when vegetation is being established as appropriate to site conditions and project specifications. Inclusion of native species in tree planting is preferred.

A Water Quality Impact Assessment (WQIA) or similar documentation is required for land disturbance within the RPA. The purpose of the WQIA is to identify potential impacts of a proposed land disturbance on water quality and lands within the RPA and to determine specific measures for mitigation of those impacts. In addition, activities that occur within CBPAs are subject to the general performance criteria provisions found in Section 9 VAC 25-830-130 of the Regulations. The general performance criteria include, but is not limited to, disturbing no more land than necessary to provide for the proposed use, minimizing impervious cover, and preserving indigenous vegetation to the maximum extent practicable consistent with the proposed use. In addition, all land disturbing activity exceeding 2,500 square feet must comply with the requirements of the *Virginia Erosion and Sediment Control Handbook*, Third Edition, 1992, and be consistent with stormwater management criteria as described in 9 VAC 25-870-51 and 9 VAC 25-870-103 of the *Virginia Stormwater Management Regulations*.

Provided adherence to the above requirements, the proposed activity would be consistent with the *Chesapeake Bay Preservation Act* and Regulations.

# Virtual Public Meeting

## Virtual Public Meeting, 5 to 7 p.m. Dec. 18

The U.S. Army Corps of Engineers, Norfolk District (USACE) and the Commonwealth of Virginia Department of Conservation and Recreation (DCR) invite the public to attend an informational meeting about the Middle Peninsula State Park Feasibility Study, as part of the Section 510, Chesapeake Bay Environmental Restoration and Protection Program. The purpose of the meeting is to provide the public an opportunity to learn more about the ecosystem restoration and shoreline protection project at DCR's Middle Peninsula unit at Machicomoco State Park in Gloucester County, Virginia.

The meeting is scheduled for 5 to 7 p.m. Monday, Dec. 18 and will be held virtually via WebEx. To join the meeting, go to: <https://usace1.webex.com/meet/richard.m.harr>.

Pursuant with the National Environmental Policy Act (NEPA), the USACE plans to prepare a NEPA document to evaluate impacts from reasonable project alternatives and determine the potential for significant impacts.

The public is invited to submit NEPA scoping comments at the meeting and/or until **Wednesday, Jan. 17.**

Please submit comments or questions to Peyton Mowery, Biologist, via email (CENAO.Section.510@usace.army.mil), telephone (757-201-7390), or mail at U.S. Army Corps of Engineers, Norfolk District, ATTN: Peyton Mowery, Planning and Policy Branch, 803 Front St., Norfolk, VA 23510.

**From:** [Donna Milligan](#)  
**To:** [CENAO-Section 510 Middle Peninsula](#)  
**Subject:** [Non-DoD Source] Middle Peninsula State Park  
**Date:** Monday, December 18, 2023 6:08:46 PM

---

Hi,

I'd like to advocate for a sandy public beach at Middle Peninsula State Park. Sandy beach access is limited along many areas of the Bay with Gloucester County only having one public beach. Gloucester Point Beach Park and public fishing pier is extremely crowded much of the summer. Having additional beach access on the York River would provide important recreational access for many people in the region. Utilizing larger attached breakwaters with sand fill would create a nice beach area similar to Yorktown Beach.

Also a separate kayak launch would also be appreciated!

Thanks  
Donna Milligan  
Gloucester County Resident

**From:** [Patty](#)  
**To:** [CENAO-Section 510 Middle Peninsula](#)  
**Subject:** [Non-DoD Source] Middle Peninsula State Park  
**Date:** Monday, December 18, 2023 6:17:15 PM

---

Thank you for allowing me to share my concerns.  
This email should link you to me.  
Merry Christmas to all!

Patricia Kellogg  
4270 Gum Point Lane  
Gloucester, VA 23061  
804)824-6770



| Date Received | Last Name | First Name | Email  | Comment   | USACE Response   | Notes |
|---------------|-----------|------------|--|---|--|-------|
| 12/19/2023    | Milligan  | Donna      | <a href="mailto:damilligan@yahoo.com">damilligan@yahoo.com</a> | <p>Hi,</p> <p>I'd like to advocate for a sandy public beach at Middle Peninsula State Park. Sandy beach access is limited along many areas of the Bay with Gloucester County only having one public beach. Gloucester Point Beach Park and public fishing pier is extremely crowded much of the summer. Having additional beach access on the York River would provide important recreational access for many people in the region. Utilizing larger attached breakwaters with sand fill would create a nice beach area similar to Yorktown Beach.</p> <p>Also a separate kayak launch would also be appreciated!</p> <p>Thanks<br/>Donna Milligan<br/>Gloucester County Resident</p> | <p>The U.S. Army Corps of Engineers Norfolk District (USACE) would like to thank you for your participation in our National Environmental Policy Act (NEPA) Scoping Meeting for the Section 510 Middle Peninsula Feasibility Study. We would like to acknowledge receipt of your comment regarding desire for a sandy public beach and separate kayak launch at the Middle Peninsula Unit of Machicomoco State Park. We are aware that public access to the York River is important to the residents of Gloucester County and that has been taken under consideration as part of the study. The Draft Integrated Feasibility Study and Environmental Assessment including our Tentatively Selected Plan for the study is expected to be released in 2024 for public review and comment. As you provided a comment during our Scoping Phase, you will receive notification of its release via the email you provided. The information will also be available on our website. Thank you again for your involvement in our study and your comment! If you have any additional questions or comments, please do not hesitate to reach out.</p>   |       |
| 12/19/2023    | Kellogg   | Patricia   | <a href="mailto:ykrvpatty@aol.com">ykrvpatty@aol.com</a>       | <p>Thank you for allowing me to share my concerns.<br/>This email should link you to me.<br/>Merry Christmas to all!</p> <p>Patricia Kellogg<br/>4270 Gum Point Lane<br/>Gloucester, VA 23061<br/>804)824-6770</p>  | <p>The U.S. Army Corps of Engineers Norfolk District (USACE) would like to thank you for your participation in our National Environmental Policy Act (NEPA) Scoping Meeting for the Section 510 Middle Peninsula Feasibility Study. We would like to acknowledge receipt of your comments including concerns regarding impacts to your property adjacent to THE project site and adjacent property owner involvement in the study. Considerations and constraints, such as avoiding or minimizing impacts to adjacent properties, are identified early in the study process and will continue to play a role throughout plan formulation and selection, project design, and implementation. Participation and input from the public is highly valuable to our studies, especially during the beginning stages, and taken under consideration as part of the study. The Draft Integrated Feasibility Study and Environmental Assessment including our Tentatively Selected Plan for the study is expected to be release in 2024 for public review and comment. As you provided a comment during our Scoping Phase, you will receive notification of its release via the email you provided. The information will also be made available on our website. The Draft Report Release is the next opportunity for the public to provide formal comments, but you are welcome to reach out any time. Thank you again for your involvement in our study and your formal comments! If you have any additional questions or comments, please do not hesitate to reach out.</p> |       |



## **Appendix A-1 Environmental: List of Agencies and Persons Consulted**

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### **MIDDLE PENINSULA STATE PARK CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

#### **List of Agencies and Persons Consulted**

**November 2024**



**US Army Corps  
of Engineers®**  
Norfolk District

### List of Agencies and Persons Consulted

| Agency   | Names   |
|--|---|
| Federal  |   |
| Advisory Council on Historic Preservation          |   |
| U.S. Environmental Protection Agency               | Carrie Traver, Timothy Witman, Emma Esch                                      |
| National Marine Fisheries Service                  | Brian Hopper, David O'Brien, Christine Vaccaro, Karen Greene                  |
| U.S. Fish and Wildlife Service                     | Troy Andersen, Rachel Case, Sabrina Deeley, Amy O'donnell                     |
| State  |   |
| Virginia Department of Conservation and Recreation | Joshua Ellington, Gretchen Gorecki, Adam Newland, Lauren McMillan, Rene Hypes |
| Virginia Department of Environmental Quality       | Valerie Fulcher, Bettina Rayfield, V'lent Lassiter, Daniel Moore              |
| Virginia Department of Historic Resources          | Samantha Henderson  |
| Virginia Institute of Marine Science               | Lyle Varnell, Emily Hein, Donna Milligan, Scott Hardaway                      |
| Virginia Marine Resources Commission               | Mike Johnson  |
| Tribal   |   |
| Delaware Nation                                    | Katelyn Lucas   |
| Pamunkey Indian Tribe                              | Shaleigh Howells, Chief Robert Gray   |
| Rappahannock Tribe                                 | Rexford Jones, Marion Werkheiser, Chief Anne Richardson                       |
| Upper Mattaponi Tribe                              | Reggie Tupponce, Chief Frank Adams, Leigh Mitchell, Marion Werkheiser         |

## **Appendix A-1 Environmental: Ecological Modeling and Environmental Benefits Analysis**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**Ecological Modeling and Environmental Benefits Analysis**

**November 2024**



**US Army Corps  
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## 1 Introduction

This document provides a summary of the ecological modeling completed to evaluate and compare the environmental benefits of the final array of project alternatives. The results of this analysis were used as input into the Cost Effectiveness/Incremental Cost Analysis (CE/ICA) to identify the best buy plan(s). For a more detailed analysis of the CE/ICA, please refer to Appendix A-5, Economic Analysis.

## 2 Summary of the Final Array of Alternatives

Table 2-1 provides an overview of the final array of alternatives that were evaluated in detail in the ecological modeling. The No Action Alternative (Alternative 1) is a continuation of the existing conditions (0.24 acres wetland habitat and 0 acres oyster habitat) with no implementation of shoreline protection or environmental restoration measures leading to continued shoreline erosion and wetland habitat loss. All action alternatives include wetland restoration as represented by the sand fill, vegetation, and marsh fringe enhancement measures (1.62 acres for Alternative 2A/2B and 1.34 acres for Alternatives 3A/3B). Only Alternatives 2A and 2B include the implementation of subtidal, offshore reef habitat (0.1247 acres).

**Table 2-1. Final Array of Alternatives**

| Alt IDs | Modified Shoreline (Area 2) |       |           |            | Marsh Habitat (Areas 1 and 3) |                |                       | All                            |
|---------|-----------------------------|-------|-----------|------------|-------------------------------|----------------|-----------------------|--------------------------------|
|         | Breakwaters                 | Sills | Sand Fill | Vegetation | Marsh Fringe Enhancement      | Toe Protection | Offshore Reef Habitat | Removal of Existing Structures |
| 1       | No Action                   |       |           |            |                               |                |                       |                                |
| 2A      | X                           | X     | X         | X          | X                             | X              | X                     | X                              |
| 2B      | X                           | X     | X         | X          | X                             | X              |                       | X                              |
| 3A      |                             | X     | X         | X          | X                             | X              | X                     | X                              |
| 3B      |                             | X     | X         | X          | X                             | X              |                       | X                              |

## 3 Models Utilized for Ecological Modeling

The environmental benefits analysis was completed to measure the increase in quantity and quality of native wetland and reef habitat as a result of the implementation of the no action and four action alternatives. While the wetland and offshore reef habitats are not the only aquatic habitat types present within the project site and focus may offer a limited scope of the broader ecosystem, they are the specific habitats targeted by the study objectives and restoration measures in the final array. The habitat quality for each alternative was determined by conducting the New England Salt Marsh Model (USEPA 2006) and the Oyster Habitat Suitability Index Model (OHSIM) (Swannack et al. 2014). These two ecological models were selected by their abilities to meet the study goals, objectives, and required level of detail.

### 3.1. New England Salt Marsh Model

The New England Salt Marsh Model quantifies the habitat values of coastal salt marshes based on marsh characteristics and the presence of habitat types that contribute to wildlife use. The model consists of eight variables to assess marsh quality: (1) size class, (2) morphology, (3) habitat type, (4) extent of anthropogenic modification, (5) vegetation, (6) vegetative heterogeneity, (7) surrounding land cover and use, and (8) connectivity and associated habitat (USEPA 2006).

For the purposes of this model, the marsh unit includes existing and constructed wetland, tidal flat, and estuarine open water habitat within the project footprint.

The model scores were calculated in accordance with published protocols including the use of aerial imagery, visual assessment, and USACE plan drawings. Scores can range from 0-1, where low scores represent low marsh value while high scores represent high marsh value.

This model was approved by the USACE Ecosystem Center of Expertise (ECO-PCX) for other Chesapeake Bay regional projects including the Continuing Authorities Program Section 206, Belle Isle State Park Feasibility Study and the Lynnhaven River Basin Ecosystem Restoration Project.

### 3.2. Oyster Habitat Suitability Index Model

The OHSIM was developed to provide insight into choosing sites for restoring oyster reefs for ecosystem restoration projects by using a series of linear equations to calculate habitat suitability for the Eastern oyster. The model consists of four variables that represents the relationship between an environmental variable and a stage of the oyster's life history: (1) percent cultch cover, (2) mean salinity during spawning season, (3) minimum annual salinity, and (4) annual mean salinity (Swannack et al. 2014).

For the purposes of this model, the only substrate considered for the cultch variable was any existing oyster reefs at the project site and the specific offshore reef measure (0.1247 acres) in Alternatives 2A and 3A (Table 2-1). While the sills, breakwaters, and/or toe protection in the action alternatives (Table 2-1) may also provide suitable cultch where submerged for the establishment of oyster populations, their associated acreages were not included in the model to best differentiate habitat value between the alternatives with additional optimized oyster reef habitat measures (Alternatives 2A and 3A) and those without (Alternatives 1, 2B, and 3B). The sills, breakwaters, and/or toe protection measures are being optimized for shoreline protection and erosion reduction as opposed to high quality oyster habitat.

The model scores were calculated in accordance with published protocols including the use of best available water quality data and USACE plan drawings. Scores can range from 0-1, where low scores represent low oyster reef suitability while high scores represent high oyster reef suitability.

This model was approved by the USACE Ecosystem Center of Expertise (ECO-PCX) for the Chesapeake Bay region.

## 4 Ecological Modeling Methodology

The New England Salt Marsh Model and OHSIM scores were determined for the no action and all four action alternatives and multiplied by their associated acreages over the 50-year period of analysis to produce habitat units (HUs). The HUs are used to present the quality of habitat provided by the area over the course of one year and thus were calculated annually to include an analysis of acreage loss over the period of analysis due to sea level change (SLC) and erosion.

While the reef habitat and inputs for the OHSIM are not expected to be significantly impacted by SLC or erosion (Table 5-5), the wetland and New England Salt Marsh Model inputs are expected to be significantly impacted over the 50-year period of analysis (Table 5-1). This loss of wetland habitat

acreage due to SLC was estimated using the USACE Sea Level Analysis Tool (SLAT) at the low, intermediate, and high scenarios and USACE plan drawings. For the No Action Alternative, existing and future without project conditions for erosion of the existing wetlands are considered to be the same, and the assumption of a consistent erosion rate of two feet per year was used to determine change in acreage according to USACE plan drawings. For the action alternatives, future without project conditions for erosion are assumed to be a rate of zero feet per year due to implementation of the shoreline protection measures.

The annual HUs were then averaged over the period of analysis to measure benefits in terms of average annual habitat units (AAHU). Each models' outputs were weighted equally and then summed to create a single combined AAHU calculation for each alternative. It is assumed that the AAHU will remain the same under the No Action Alternative as no additional restoration features will be implemented and thus those AAHUs are zero.

## 5 Ecological Modeling Results

The following tables present the inputs and results from the New England Salt Marsh Model and OHSIM.

### 5.1. New England Salt Marsh Model

**Table 5-1: Wetland Habitat Acres in 2030 and 2080 including SLC and Erosion**

| Alternative | Wetland Habitat Acres |      |              |      | Annual Change (acres/ year) |              |        |
|-------------|-----------------------|------|--------------|------|-----------------------------|--------------|--------|
|             | 2030                  | 2080 |              |      |                             |              |        |
|             |                       | Low  | Intermediate | High | Low                         | Intermediate | High   |
| 1           | 0.24                  | 0    | 0            | 0    | 0.012                       | 0.012        | 0.035  |
| 2A          | 1.62                  | 1.44 | 1.36         | 0.61 | 0.0019                      | 0.0026       | 0.010  |
| 2B          | 1.62                  | 1.44 | 1.36         | 0.61 | 0.0019                      | 0.0026       | 0.010  |
| 3A          | 1.35                  | 1.20 | 1.05         | 0.45 | 0.0015                      | 0.0031       | 0.0092 |
| 3B          | 1.35                  | 1.20 | 1.05         | 0.45 | 0.0015                      | 0.0031       | 0.0092 |

**Table 5-2: Wetland Habitat Units for SLC Low Scenario by Alternative**

| Year | Score |      |      |      |      | Acreage |      |      |      |      | Habitat Units |      |      |      |      |
|------|-------|------|------|------|------|---------|------|------|------|------|---------------|------|------|------|------|
|      | 1     | 2A   | 2B   | 3A   | 3B   | 1       | 2A   | 2B   | 3A   | 3B   | 1             | 2A   | 2B   | 3A   | 3B   |
| 2030 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.24    | 1.62 | 1.62 | 1.35 | 1.35 | 0.11          | 0.83 | 0.83 | 0.69 | 0.69 |
| 2031 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.23    | 1.62 | 1.62 | 1.35 | 1.35 | 0.11          | 0.83 | 0.83 | 0.69 | 0.69 |
| 2032 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.22    | 1.62 | 1.62 | 1.34 | 1.34 | 0.10          | 0.82 | 0.82 | 0.68 | 0.68 |
| 2033 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.21    | 1.62 | 1.62 | 1.34 | 1.34 | 0.08          | 0.82 | 0.82 | 0.68 | 0.68 |
| 2034 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.20    | 1.61 | 1.61 | 1.34 | 1.34 | 0.07          | 0.82 | 0.82 | 0.68 | 0.68 |
| 2035 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.18    | 1.61 | 1.61 | 1.34 | 1.34 | 0.05          | 0.82 | 0.82 | 0.68 | 0.68 |
| 2036 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.17    | 1.61 | 1.61 | 1.34 | 1.34 | 0.03          | 0.82 | 0.82 | 0.68 | 0.68 |

# Appendix A-1 Environmental: Ecological Modeling and Environmental Benefits Analysis

|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 2037 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.16 | 1.61 | 1.61 | 1.34 | 1.34 | 0.02 | 0.82 | 0.82 | 0.68 | 0.68 |
| 2038 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.15 | 1.61 | 1.61 | 1.33 | 1.33 | 0.01 | 0.81 | 0.81 | 0.68 | 0.68 |
| 2039 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.13 | 1.61 | 1.61 | 1.33 | 1.33 | 0.01 | 0.81 | 0.81 | 0.67 | 0.67 |
| 2040 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.12 | 1.60 | 1.60 | 1.33 | 1.33 | 0    | 0.81 | 0.81 | 0.67 | 0.67 |
| 2041 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.11 | 1.60 | 1.60 | 1.33 | 1.33 | 0    | 0.81 | 0.81 | 0.67 | 0.67 |
| 2042 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.10 | 1.60 | 1.60 | 1.33 | 1.33 | 0    | 0.81 | 0.81 | 0.67 | 0.67 |
| 2043 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.09 | 1.60 | 1.60 | 1.33 | 1.33 | 0    | 0.80 | 0.80 | 0.67 | 0.67 |
| 2044 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.07 | 1.60 | 1.60 | 1.33 | 1.33 | 0    | 0.80 | 0.80 | 0.67 | 0.67 |
| 2045 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.06 | 1.59 | 1.59 | 1.32 | 1.32 | 0    | 0.80 | 0.80 | 0.67 | 0.67 |
| 2046 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.05 | 1.59 | 1.59 | 1.32 | 1.32 | 0    | 0.80 | 0.80 | 0.66 | 0.66 |
| 2047 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.04 | 1.59 | 1.59 | 1.32 | 1.32 | 0    | 0.80 | 0.80 | 0.66 | 0.66 |
| 2048 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.02 | 1.59 | 1.59 | 1.32 | 1.32 | 0    | 0.79 | 0.79 | 0.66 | 0.66 |
| 2049 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.01 | 1.59 | 1.59 | 1.32 | 1.32 | 0    | 0.79 | 0.79 | 0.66 | 0.66 |
| 2050 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.58 | 1.58 | 1.32 | 1.32 | 0    | 0.79 | 0.79 | 0.66 | 0.66 |
| 2051 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.58 | 1.58 | 1.32 | 1.32 | 0    | 0.79 | 0.79 | 0.66 | 0.66 |
| 2052 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.58 | 1.58 | 1.31 | 1.31 | 0    | 0.79 | 0.79 | 0.65 | 0.65 |
| 2053 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.58 | 1.58 | 1.31 | 1.31 | 0    | 0.79 | 0.79 | 0.65 | 0.65 |
| 2054 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.58 | 1.58 | 1.31 | 1.31 | 0    | 0.78 | 0.78 | 0.65 | 0.65 |
| 2055 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.58 | 1.58 | 1.31 | 1.31 | 0    | 0.78 | 0.78 | 0.65 | 0.65 |
| 2056 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.57 | 1.57 | 1.31 | 1.31 | 0    | 0.78 | 0.78 | 0.65 | 0.65 |
| 2057 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.57 | 1.57 | 1.31 | 1.31 | 0    | 0.78 | 0.78 | 0.65 | 0.65 |
| 2058 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.57 | 1.57 | 1.30 | 1.30 | 0    | 0.78 | 0.78 | 0.65 | 0.65 |
| 2059 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.57 | 1.57 | 1.30 | 1.30 | 0    | 0.77 | 0.77 | 0.64 | 0.64 |
| 2060 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.57 | 1.57 | 1.30 | 1.30 | 0    | 0.77 | 0.77 | 0.64 | 0.64 |
| 2061 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.56 | 1.56 | 1.30 | 1.30 | 0    | 0.77 | 0.77 | 0.64 | 0.64 |
| 2062 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.56 | 1.56 | 1.30 | 1.30 | 0    | 0.77 | 0.77 | 0.64 | 0.64 |
| 2063 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.56 | 1.56 | 1.30 | 1.30 | 0    | 0.77 | 0.77 | 0.64 | 0.64 |
| 2064 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.56 | 1.56 | 1.30 | 1.30 | 0    | 0.76 | 0.76 | 0.64 | 0.64 |
| 2065 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.56 | 1.56 | 1.29 | 1.29 | 0    | 0.76 | 0.76 | 0.63 | 0.63 |
| 2066 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.56 | 1.56 | 1.29 | 1.29 | 0    | 0.76 | 0.76 | 0.63 | 0.63 |
| 2067 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.55 | 1.55 | 1.29 | 1.29 | 0    | 0.76 | 0.76 | 0.63 | 0.63 |
| 2068 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.55 | 1.55 | 1.29 | 1.29 | 0    | 0.76 | 0.76 | 0.63 | 0.63 |
| 2069 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.55 | 1.55 | 1.29 | 1.29 | 0    | 0.76 | 0.76 | 0.63 | 0.63 |



|      |      |      |      |      |      |   |      |      |      |      |   |      |      |      |      |
|------|------|------|------|------|------|---|------|------|------|------|---|------|------|------|------|
| 2070 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.55 | 1.55 | 1.29 | 1.29 | 0 | 0.75 | 0.75 | 0.63 | 0.63 |
| 2071 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.55 | 1.55 | 1.29 | 1.29 | 0 | 0.75 | 0.75 | 0.63 | 0.63 |
| 2072 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.54 | 1.54 | 1.28 | 1.28 | 0 | 0.75 | 0.75 | 0.62 | 0.62 |
| 2073 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.54 | 1.54 | 1.28 | 1.28 | 0 | 0.75 | 0.75 | 0.62 | 0.62 |
| 2074 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.54 | 1.54 | 1.28 | 1.28 | 0 | 0.75 | 0.75 | 0.62 | 0.62 |
| 2075 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.54 | 1.54 | 1.28 | 1.28 | 0 | 0.74 | 0.74 | 0.62 | 0.62 |
| 2076 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.54 | 1.54 | 1.28 | 1.28 | 0 | 0.74 | 0.74 | 0.62 | 0.62 |
| 2077 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.53 | 1.53 | 1.28 | 1.28 | 0 | 0.74 | 0.74 | 0.62 | 0.62 |
| 2078 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.53 | 1.53 | 1.27 | 1.27 | 0 | 0.74 | 0.74 | 0.62 | 0.62 |
| 2079 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.53 | 1.53 | 1.27 | 1.27 | 0 | 0.74 | 0.74 | 0.62 | 0.61 |
| 2080 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.53 | 1.53 | 1.27 | 1.27 | 0 | 0.73 | 0.73 | 0.61 | 0.61 |

**Table 5-3: Wetland Habitat Units for SLC Intermediate Scenario by Alternative**

| Year | Score |      |      |      |      | Acreage |      |      |      |      | Habitat Units |      |      |      |      |
|------|-------|------|------|------|------|---------|------|------|------|------|---------------|------|------|------|------|
|      | 1     | 2A   | 2B   | 3A   | 3B   | 1       | 2A   | 2B   | 3A   | 3B   | 1             | 2A   | 2B   | 3A   | 3B   |
| 2030 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.24    | 1.62 | 1.62 | 1.35 | 1.35 | 0.11          | 0.83 | 0.83 | 0.69 | 0.69 |
| 2031 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.23    | 1.62 | 1.62 | 1.34 | 1.34 | 0.11          | 0.83 | 0.83 | 0.68 | 0.68 |
| 2032 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.22    | 1.62 | 1.62 | 1.34 | 1.34 | 0.10          | 0.82 | 0.82 | 0.68 | 0.68 |
| 2033 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.21    | 1.62 | 1.62 | 1.34 | 1.34 | 0.08          | 0.82 | 0.82 | 0.68 | 0.68 |
| 2034 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.20    | 1.61 | 1.61 | 1.33 | 1.33 | 0.07          | 0.82 | 0.82 | 0.68 | 0.68 |
| 2035 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.18    | 1.61 | 1.61 | 1.33 | 1.33 | 0.05          | 0.82 | 0.82 | 0.67 | 0.67 |
| 2036 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.17    | 1.61 | 1.61 | 1.33 | 1.33 | 0.03          | 0.81 | 0.81 | 0.67 | 0.67 |
| 2037 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.16    | 1.61 | 1.61 | 1.32 | 1.32 | 0.02          | 0.81 | 0.81 | 0.67 | 0.67 |
| 2038 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.15    | 1.60 | 1.60 | 1.32 | 1.32 | 0.01          | 0.81 | 0.81 | 0.66 | 0.66 |
| 2039 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.13    | 1.60 | 1.60 | 1.32 | 1.32 | 0.01          | 0.80 | 0.80 | 0.66 | 0.66 |
| 2040 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.12    | 1.60 | 1.60 | 1.31 | 1.31 | 0.00          | 0.80 | 0.80 | 0.66 | 0.66 |
| 2041 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.11    | 1.60 | 1.60 | 1.31 | 1.31 | 0.00          | 0.80 | 0.80 | 0.65 | 0.65 |
| 2042 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.10    | 1.59 | 1.59 | 1.31 | 1.31 | 0.00          | 0.80 | 0.80 | 0.65 | 0.65 |
| 2043 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.09    | 1.59 | 1.59 | 1.31 | 1.31 | 0.00          | 0.79 | 0.79 | 0.65 | 0.65 |
| 2044 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.07    | 1.59 | 1.59 | 1.30 | 1.30 | 0.00          | 0.79 | 0.79 | 0.64 | 0.64 |
| 2045 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.06    | 1.58 | 1.58 | 1.30 | 1.30 | 0.00          | 0.79 | 0.79 | 0.64 | 0.64 |
| 2046 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.05    | 1.58 | 1.58 | 1.30 | 1.30 | 0.00          | 0.79 | 0.79 | 0.64 | 0.64 |
| 2047 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.04    | 1.58 | 1.58 | 1.29 | 1.29 | 0.00          | 0.78 | 0.78 | 0.64 | 0.64 |

Appendix A-1 Environmental: Ecological Modeling and Environmental Benefits Analysis

|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 2048 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.02 | 1.58 | 1.58 | 1.29 | 1.29 | 0.00 | 0.78 | 0.78 | 0.63 | 0.63 |
| 2049 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0.01 | 1.57 | 1.57 | 1.29 | 1.29 | 0.00 | 0.78 | 0.78 | 0.63 | 0.63 |
| 2050 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.57 | 1.57 | 1.28 | 1.28 | 0.00 | 0.78 | 0.78 | 0.63 | 0.63 |
| 2051 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.57 | 1.57 | 1.28 | 1.28 | 0.00 | 0.77 | 0.77 | 0.62 | 0.62 |
| 2052 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.57 | 1.57 | 1.28 | 1.28 | 0.00 | 0.77 | 0.77 | 0.62 | 0.62 |
| 2053 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.56 | 1.56 | 1.28 | 1.28 | 0.00 | 0.77 | 0.77 | 0.62 | 0.62 |
| 2054 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.56 | 1.56 | 1.27 | 1.27 | 0.00 | 0.76 | 0.76 | 0.61 | 0.61 |
| 2055 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.56 | 1.56 | 1.27 | 1.27 | 0.00 | 0.76 | 0.76 | 0.61 | 0.61 |
| 2056 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.56 | 1.56 | 1.27 | 1.27 | 0.00 | 0.76 | 0.76 | 0.61 | 0.61 |
| 2057 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.55 | 1.55 | 1.26 | 1.26 | 0.00 | 0.76 | 0.76 | 0.61 | 0.61 |
| 2058 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.55 | 1.55 | 1.26 | 1.26 | 0.00 | 0.75 | 0.75 | 0.60 | 0.60 |
| 2059 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.55 | 1.55 | 1.26 | 1.26 | 0.00 | 0.75 | 0.75 | 0.60 | 0.60 |
| 2060 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.54 | 1.54 | 1.25 | 1.25 | 0.00 | 0.75 | 0.75 | 0.60 | 0.60 |
| 2061 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.54 | 1.54 | 1.25 | 1.25 | 0.00 | 0.75 | 0.75 | 0.59 | 0.59 |
| 2062 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.54 | 1.54 | 1.25 | 1.25 | 0.00 | 0.74 | 0.74 | 0.59 | 0.59 |
| 2063 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.54 | 1.54 | 1.24 | 1.24 | 0.00 | 0.74 | 0.74 | 0.59 | 0.59 |
| 2064 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.53 | 1.53 | 1.24 | 1.24 | 0.00 | 0.74 | 0.74 | 0.58 | 0.58 |
| 2065 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.53 | 1.53 | 1.24 | 1.24 | 0.00 | 0.74 | 0.74 | 0.58 | 0.58 |
| 2066 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.53 | 1.53 | 1.24 | 1.24 | 0.00 | 0.73 | 0.73 | 0.58 | 0.58 |
| 2067 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.53 | 1.53 | 1.23 | 1.23 | 0.00 | 0.73 | 0.73 | 0.57 | 0.57 |
| 2068 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.52 | 1.52 | 1.23 | 1.23 | 0.00 | 0.73 | 0.73 | 0.57 | 0.57 |
| 2069 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.52 | 1.52 | 1.23 | 1.23 | 0.00 | 0.73 | 0.73 | 0.57 | 0.57 |
| 2070 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.52 | 1.52 | 1.22 | 1.22 | 0.00 | 0.72 | 0.72 | 0.57 | 0.57 |
| 2071 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.52 | 1.52 | 1.22 | 1.22 | 0.00 | 0.72 | 0.72 | 0.56 | 0.56 |
| 2072 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.51 | 1.51 | 1.22 | 1.22 | 0.00 | 0.72 | 0.72 | 0.56 | 0.56 |
| 2073 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.51 | 1.51 | 1.21 | 1.21 | 0.00 | 0.71 | 0.71 | 0.56 | 0.56 |
| 2074 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.51 | 1.51 | 1.21 | 1.21 | 0.00 | 0.71 | 0.71 | 0.55 | 0.55 |
| 2075 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.51 | 1.51 | 1.21 | 1.21 | 0.00 | 0.71 | 0.71 | 0.55 | 0.55 |
| 2076 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.50 | 1.50 | 1.20 | 1.20 | 0.00 | 0.71 | 0.71 | 0.55 | 0.55 |
| 2077 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.50 | 1.50 | 1.20 | 1.20 | 0.00 | 0.70 | 0.70 | 0.54 | 0.54 |
| 2078 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.50 | 1.50 | 1.20 | 1.20 | 0.00 | 0.70 | 0.70 | 0.54 | 0.54 |
| 2079 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.12 | 1.12 | 0.90 | 0.90 | 0.00 | 0.70 | 0.70 | 0.54 | 0.54 |
| 2080 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0    | 1.11 | 1.11 | 0.89 | 0.89 | 0    | 0.70 | 0.70 | 0.53 | 0.53 |

Table 5-4: Wetland Habitat Units for SLC High Scenario by Alternative

| Year | Score |      |      |      |      | Acreage |      |      |      |      | Habitat Units |      |      |      |      |
|------|-------|------|------|------|------|---------|------|------|------|------|---------------|------|------|------|------|
|      | 1     | 2A   | 2B   | 3A   | 3B   | 1       | 2A   | 2B   | 3A   | 3B   | 1             | 2A   | 2B   | 3A   | 3B   |
| 2030 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.24    | 1.62 | 1.62 | 1.35 | 1.35 | 0.02          | 0.83 | 0.83 | 0.69 | 0.69 |
| 2031 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.209   | 1.61 | 1.61 | 1.34 | 1.34 | 0.02          | 0.82 | 0.82 | 0.68 | 0.68 |
| 2032 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.174   | 1.60 | 1.60 | 1.33 | 1.33 | 0.01          | 0.81 | 0.81 | 0.67 | 0.67 |
| 2033 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.139   | 1.59 | 1.59 | 1.32 | 1.32 | 0.01          | 0.80 | 0.80 | 0.66 | 0.66 |
| 2034 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.104   | 1.58 | 1.58 | 1.31 | 1.31 | 0.01          | 0.79 | 0.79 | 0.65 | 0.65 |
| 2035 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.069   | 1.57 | 1.57 | 1.30 | 1.30 | 0.00          | 0.78 | 0.78 | 0.64 | 0.64 |
| 2036 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0.034   | 1.56 | 1.56 | 1.29 | 1.29 | 0.00          | 0.77 | 0.77 | 0.63 | 0.63 |
| 2037 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.55 | 1.55 | 1.28 | 1.28 | 0.00          | 0.76 | 0.76 | 0.62 | 0.62 |
| 2038 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.54 | 1.54 | 1.27 | 1.27 | 0.00          | 0.75 | 0.75 | 0.61 | 0.61 |
| 2039 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.53 | 1.53 | 1.27 | 1.27 | 0.00          | 0.74 | 0.74 | 0.60 | 0.60 |
| 2040 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.52 | 1.52 | 1.26 | 1.26 | 0.00          | 0.73 | 0.73 | 0.60 | 0.60 |
| 2041 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.51 | 1.51 | 1.25 | 1.25 | 0.00          | 0.71 | 0.71 | 0.59 | 0.59 |
| 2042 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.50 | 1.50 | 1.24 | 1.24 | 0.00          | 0.70 | 0.70 | 0.58 | 0.58 |
| 2043 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.49 | 1.49 | 1.23 | 1.23 | 0.00          | 0.69 | 0.69 | 0.57 | 0.57 |
| 2044 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.48 | 1.48 | 1.22 | 1.22 | 0.00          | 0.68 | 0.68 | 0.56 | 0.56 |
| 2045 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.47 | 1.47 | 1.21 | 1.21 | 0.00          | 0.67 | 0.67 | 0.55 | 0.55 |
| 2046 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.46 | 1.46 | 1.20 | 1.20 | 0.00          | 0.66 | 0.66 | 0.54 | 0.54 |
| 2047 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.45 | 1.45 | 1.19 | 1.19 | 0.00          | 0.65 | 0.65 | 0.53 | 0.53 |
| 2048 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.44 | 1.44 | 1.18 | 1.18 | 0.00          | 0.64 | 0.64 | 0.52 | 0.52 |
| 2049 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.43 | 1.43 | 1.17 | 1.17 | 0.00          | 0.63 | 0.63 | 0.51 | 0.51 |
| 2050 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.42 | 1.42 | 1.16 | 1.16 | 0.00          | 0.62 | 0.62 | 0.50 | 0.50 |
| 2051 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.41 | 1.41 | 1.16 | 1.16 | 0.00          | 0.61 | 0.61 | 0.49 | 0.49 |
| 2052 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.40 | 1.40 | 1.15 | 1.15 | 0.00          | 0.60 | 0.60 | 0.49 | 0.49 |
| 2053 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.39 | 1.39 | 1.14 | 1.14 | 0.00          | 0.59 | 0.59 | 0.48 | 0.48 |
| 2054 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.38 | 1.38 | 1.13 | 1.13 | 0.00          | 0.58 | 0.58 | 0.47 | 0.47 |
| 2055 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.37 | 1.37 | 1.12 | 1.12 | 0.00          | 0.57 | 0.57 | 0.46 | 0.46 |
| 2056 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.36 | 1.36 | 1.11 | 1.11 | 0.00          | 0.56 | 0.56 | 0.45 | 0.45 |
| 2057 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.35 | 1.35 | 1.10 | 1.10 | 0.00          | 0.55 | 0.55 | 0.44 | 0.44 |
| 2058 | 0.46  | 0.51 | 0.51 | 0.51 | 0.51 | 0       | 1.34 | 1.34 | 1.09 | 1.09 | 0.00          | 0.54 | 0.54 | 0.43 | 0.43 |

|      |      |      |      |      |      |   |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|---|------|------|------|------|------|------|------|------|------|
| 2059 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.32 | 1.32 | 1.08 | 1.08 | 0.00 | 0.53 | 0.53 | 0.42 | 0.42 |
| 2060 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.31 | 1.31 | 1.07 | 1.07 | 0.00 | 0.52 | 0.52 | 0.41 | 0.41 |
| 2061 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.30 | 1.30 | 1.06 | 1.06 | 0.00 | 0.51 | 0.51 | 0.40 | 0.40 |
| 2062 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.29 | 1.29 | 1.05 | 1.05 | 0.00 | 0.50 | 0.50 | 0.39 | 0.39 |
| 2063 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.28 | 1.28 | 1.05 | 1.05 | 0.00 | 0.49 | 0.49 | 0.38 | 0.38 |
| 2064 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.27 | 1.27 | 1.04 | 1.04 | 0.00 | 0.48 | 0.48 | 0.38 | 0.38 |
| 2065 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.26 | 1.26 | 1.03 | 1.03 | 0.00 | 0.47 | 0.47 | 0.37 | 0.37 |
| 2066 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.25 | 1.25 | 1.02 | 1.02 | 0.00 | 0.46 | 0.46 | 0.36 | 0.36 |
| 2067 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.24 | 1.24 | 1.01 | 1.01 | 0.00 | 0.45 | 0.45 | 0.35 | 0.35 |
| 2068 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.23 | 1.23 | 1.00 | 1.00 | 0.00 | 0.44 | 0.44 | 0.34 | 0.34 |
| 2069 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.22 | 1.22 | 0.99 | 0.99 | 0.00 | 0.43 | 0.43 | 0.33 | 0.33 |
| 2070 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.21 | 1.21 | 0.98 | 0.98 | 0.00 | 0.42 | 0.42 | 0.32 | 0.32 |
| 2071 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.20 | 1.20 | 0.97 | 0.97 | 0.00 | 0.40 | 0.40 | 0.31 | 0.31 |
| 2072 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.19 | 1.19 | 0.96 | 0.96 | 0.00 | 0.39 | 0.39 | 0.30 | 0.30 |
| 2073 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.18 | 1.18 | 0.95 | 0.95 | 0.00 | 0.38 | 0.38 | 0.29 | 0.29 |
| 2074 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.17 | 1.17 | 0.94 | 0.94 | 0.00 | 0.37 | 0.37 | 0.28 | 0.28 |
| 2075 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.16 | 1.16 | 0.93 | 0.93 | 0.00 | 0.36 | 0.36 | 0.27 | 0.27 |
| 2076 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.15 | 1.15 | 0.93 | 0.93 | 0.00 | 0.35 | 0.35 | 0.26 | 0.26 |
| 2077 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.14 | 1.14 | 0.92 | 0.92 | 0.00 | 0.34 | 0.34 | 0.26 | 0.26 |
| 2078 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.13 | 1.13 | 0.91 | 0.91 | 0.00 | 0.33 | 0.33 | 0.25 | 0.25 |
| 2079 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.12 | 1.12 | 0.90 | 0.90 | 0.00 | 0.32 | 0.32 | 0.24 | 0.24 |
| 2080 | 0.46 | 0.51 | 0.51 | 0.51 | 0.51 | 0 | 1.11 | 1.11 | 0.89 | 0.89 | 0.00 | 0.31 | 0.31 | 0.23 | 0.23 |

## 5.2. Oyster Habitat Suitability Index Model

**Table 5-5: Oyster Habitat Acres in 2030 and 2080**

| Alternative | Oyster Habitat Acres |        |              |        |
|-------------|----------------------|--------|--------------|--------|
|             | 2030                 | 2080   |              |        |
|             |                      | Low    | Intermediate | High   |
| 1           | 0                    | 0      | 0            | 0      |
| 2A          | 0.1247               | 0.1247 | 0.1247       | 0.1247 |
| 2B          | 0                    | 0      | 0            | 0      |
| 3A          | 0.1247               | 0.1247 | 0.1247       | 0.1247 |
| 3B          | 0                    | 0      | 0            | 0      |

Table 5-6: Oyster Habitat Units by Alternative

| Year | Score |      |    |      |    | Acreage |        |    |        |    | Habitat Units |      |    |      |    |
|------|-------|------|----|------|----|---------|--------|----|--------|----|---------------|------|----|------|----|
|      | 1     | 2A   | 2B | 3A   | 3B | 1       | 2A     | 2B | 3A     | 3B | 1             | 2A   | 2B | 3A   | 3B |
| 2030 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2031 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2032 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2033 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2034 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2035 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2036 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2037 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2038 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2039 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2040 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2041 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2042 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2043 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2044 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2045 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2046 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2047 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2048 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2049 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2050 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2051 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2052 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2053 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2054 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2055 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2056 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2057 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2058 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |
| 2059 | 0     | 0.90 | 0  | 0.90 | 0  | 0       | 0.1247 | 0  | 0.1247 | 0  | 0             | 0.11 | 0  | 0.11 | 0  |

Appendix A-1 Environmental: Ecological Modeling and Environmental Benefits Analysis

|      |   |      |   |      |   |   |        |   |        |   |   |      |   |      |   |
|------|---|------|---|------|---|---|--------|---|--------|---|---|------|---|------|---|
| 2060 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2061 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2062 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2063 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2064 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2065 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2066 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2067 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2068 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2069 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2070 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2071 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2072 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2073 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2074 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2075 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2076 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2077 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2078 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2079 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |
| 2080 | 0 | 0.90 | 0 | 0.90 | 0 | 0 | 0.1247 | 0 | 0.1247 | 0 | 0 | 0.11 | 0 | 0.11 | 0 |

## 6 Environmental Benefits Analysis

**Table 5-1: Summary of Net Average Annualized Habitat Units for All SLC Scenarios**

|             | Low                                   |                |                | Intermediate                          |                |                | High                                  |                |                |
|-------------|---------------------------------------|----------------|----------------|---------------------------------------|----------------|----------------|---------------------------------------|----------------|----------------|
| Alternative | New England Salt Marsh Model Net AAHU | OHSIM Net AAHU | Total Net AAHU | New England Salt Marsh Model Net AAHU | OHSIM Net AAHU | Total Net AAHU | New England Salt Marsh Model Net AAHU | OHSIM Net AAHU | Total Net AAHU |
| 1           | 0                                     | 0              | 0              | 0                                     | 0              | 0              | 0                                     | 0              | 0              |
| 2A          | 0.77                                  | 0.11           | 0.88           | 0.75                                  | 0.11           | 0.86           | 0.57                                  | 0.11           | 0.68           |
| 2B          | 0.8                                   | 0              | 0.80           | 0.75                                  | 0              | 0.75           | 0.57                                  | 0              | 0.57           |
| 3A          | 0.64                                  | 0.11           | 0.75           | 0.60                                  | 0.11           | 0.71           | 0.46                                  | 0.11           | 0.57           |
| 3B          | 0.64                                  | 0              | 0.64           | 0.60                                  | 0              | 0.60           | 0.46                                  | 0              | 0.46           |

As seen in Table 5-7, all action alternatives provide a greater amount of environmental benefit than the existing habitat conditions at all three SLC scenarios. Due to the larger construction acreage, the wetland benefits contribute more to the net environmental benefits than the reef benefits; however, the reef provides enough benefit to significantly differentiated between Alternatives 2A and 2B and Alternatives 3A and 3B. The Alternative 2A has the potential to provide the greatest amount of benefit over the period of analysis, providing an increase of 0.68-0.88 AAHUs from the existing conditions or No Action. From an ecological perspective, Alternative 2A provides the greatest ecosystem restoration benefits. The results from Table 5-7 were carried forward for the CE/ICA.

## 7 References

Swannack, T.M., Reif, M., and Soniat, T.M. (2014) A robust, spatially explicit model for identifying oyster restoration sites.

United States Environmental Protection Agency (USEPA). 2006. A Framework for the Assessment of the Wildlife Habitat Value of New England Salt Marshes. EPA/600/R-06/132. Office of Research and Development. Washington, DC 20460

## **Appendix A-1 Environmental: Adaptive Management and Monitoring Plan**

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### **MIDDLE PENINSULA STATE PARK CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

#### **Adaptive Management and Monitoring Plan**

**November 2024**



**US Army Corps  
of Engineers®**  
Norfolk District



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## 1 Introduction

This document is the Adaptive Management and Monitoring (AMMP) for the Section 510 Middle Peninsula State Park Project in Gloucester, Virginia. The Project Delivery Team (PDT) developed this plan to describe the adaptive management and monitoring for the project and to provide metrics for evaluating project success. The AMMP is not intended to be a static document, but rather a dynamic document that will be updated as needed to reflect progress of science-based restoration goals and strategies in the Chesapeake Bay region.

## 2 Authority and Purpose

Section 2039 of the Water Resources Development Act (WRDA) of 2007 (33 U.S.C. § 2330a) requires that feasibility studies for ecosystem restoration projects include a plan for monitoring the success of the restoration efforts. Monitoring includes the systematic collection and analysis of data that provides useful information for assessing project performance, determining whether ecological success has been achieved, or whether adaptive management may need to occur to attain project benefits. Section 2039 also directs that monitoring plans include a contingency plan (adaptive management plan) “for taking corrective actions in cases in which monitoring demonstrates that restoration measures are not achieving ecological success in accordance with criteria described in the monitoring plan.” (33 USCS § 2330a).

The purpose of the project is to conduct aquatic ecosystem restoration to improve environmental quality through the construction of subtidal, offshore reef habitat and stabilization of eroding shoreline and adjacent cordgrass-dominated wetlands.

## 3 Introduction to Adaptive Management and Monitoring

The adaptive management and monitoring approach replaces dependency on numerical models and traditional planning guidelines which were used in the past to manage the unpredictability of complex environmental projects and, instead, applies a focused “learning-by-doing” approach to decision-making. The “learning-by-doing” approach is proactive and provides an iterative and deliberate process using the principles of scientific investigation. Potential applications of this “learning by doing” adaptive management approach include:

- transfer of lessons learned from one program/project to another to avoid pitfalls.
- use of physical models/modeling to test possible outcomes of management decisions.
- incorporation of flexibility and versatility into project design and implementation.

Initiating a formal AMMP early in the project enables the PDT to identify and resolve key uncertainties and other potential issues that can influence project outcomes during every stage of the planning and project implementation process. Therefore, early implementation of the AMMP will result in a project that can better succeed under a wide range of uncertain conditions and be adjusted as necessary. Through a program of regular and intentional monitoring that allows a better understanding of the ecosystem and the project’s place in the system, design, and operation are continuously refined. Information that can guide an AMMP can include results from scientific research and monitoring, new or updated modeling information, and input from environmental managers, stakeholders, and the public.

### 3.1 Adaptive Management and Monitoring Team

As part of the AMMP, an Adaptive Management Team (AMT) will be established to implement the project. The AMMP provides the framework and guidance for the AMT to review and assess monitoring results including recommending adaptive management actions when ecological success is not achieved, triggering decision criteria. The AMT will consist of USACE staff and the non-federal sponsor, the Virginia Department of Conservation and Recreation (DCR), as well as any academic institutions or other contractors contracted to perform the desired monitoring work. The AMT is subject to change depending on the monitoring contractors hired throughout the ten-year monitoring period.

## 4 Monitoring

An effective monitoring program will be required to determine if the reef habitat and wetland habitat project outcomes are consistent with the original goals and objectives of the project and if adaptive management needs to occur to protect a federal project and investment. Monitoring of restoration projects contributes to the understanding of complex ecological systems and is essential to documenting restoration performance and adaptive project and program approaches when needs arise.

The reef structures and wetlands will need to be assessed up to ten years post-placement to determine success of the oyster population and vegetation survival, respectively. The wetlands should be monitored annually while the reefs should be monitored at years 1, 3, and 6 post construction. Monitoring activities will be organized and supervised by USACE until the project is turned over to the DCR. The project may be turned over prior to year 10 should the AMT decide sustainable project outcomes have been achieved.

All monitoring reports will be attached as an appendix to this AMMP for future reference.

### 4.1 Success Metrics

#### 4.1.1 Reef Success Metrics

The 2011 Report from Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team (GIT) Oyster Metrics Workgroup established metrics for evaluating the success of restored oyster reef sanctuaries in the Chesapeake Bay. The oyster population on the reef habitat will be evaluated using these reef-level restoration metrics in relation to project goals.

##### *4.1.1.1 Oyster Demographics*

The number and age/size classes of oysters per unit of the reef area will be monitored. According to the GIT metrics, by year three, an oyster sanctuary should achieve the minimally function reef-level restoration goal of 15 oysters per square meter covering 30 percent of the reef area and two age classes. By year six, the fully restored goal of 50 oysters per square meter covering 30 percent of the area and two age classes should be achieved and maintained. The age class threshold brings attention to the sex ratio of oysters on the reef. As oysters are protandric hermaphrodites, oysters from the initial settlement will progressively contain a higher ratio of females, so a younger class with a higher proportion of males is needed for sustained, successful spawning seasons.

#### 4.1.1.2 Oyster Biomass

The oyster biomass, measured as dry weight of tissue, per unit of reef area will be monitored. The anticipated biomass for restored oyster habitat is represented below. According to the GIT metrics, by year three, an oyster sanctuary should achieve the minimally functional reef-level restoration goal of 15 grams per square meter. By year six, the fully restored goal of 50 grams per square meter and may continue to increase past year six with some undistributed reefs in ideal conditions exceeding 100 grams per square meter.

**Table 4-1: Oyster Biomass Goals Over Time for Restored Reef Habitat**

| Year | Biomass (dry weight of oyster tissue in grams per square meter restored reef) |
|------|---|
| 1    | 5   |
| 2    | 10  |
| 3    | 20  |
| 4    | 30  |
| 5    | 40  |
| 6    | 50  |

#### 4.1.1.3 Oyster Shell Accretion

*The volume of live and brown oyster shell per unit of reef area will be monitored. A restored oyster reef needs to maintain a non-negative shell budget as shell needs to be available for larval settlement during spawning events. The volume of shell should equal five liters per square meter by year six when oyster biomass is expected to be 50 grams per square meter. At a minimum, it should remain neutral.*

#### 4.1.1.4 Reef Height

The height of the restored reef should be monitored to ensure it is maintaining the expected relief from the river bottom. Subsidence of the reef can lead to higher risk of sedimentation and degradation of the reef project as hard substrate is lost.

### 4.1.2. Wetland Success Metrics

#### 4.1.2.1 Vegetative Cover

The vegetative cover of the constructed wetland areas should be monitored to assess survival rate and species composition. The anticipated progression of cover as vegetation matures is represented below. By year 5, the wetland should reach 70-80% vegetation covered to be considered successfully restored.

**Table 4-2: Vegetative Cover Rates Over Time for Restored Wetland Habitat**

| Year | Vegetative Cover |
|------|------------------|
| 1    | 10-20%           |
| 2    | 30-50%           |
| 3    | 50-70%           |
| 4    | 60-70%           |
| 5    | 70-80%           |

## 4.2 Monitoring Requirements

### 4.2.1 Reef Monitoring Requirements

Monitoring activities should occur during the late fall to early spring (October-April) in Years 1, 3 and 6 to assess reefs following natural annual spat sets to assess demographics, biomass, and reef height as well as mortality. If minimum success criteria are not established by Year 6 and adaptive management measures implemented, monitoring should continue annually for the remaining adaptive management and monitoring period to ensure success.

For oyster restoration projects, a variety of monitoring methodologies exist including direct monitoring by divers, benthic grabs, and/or visual documentation with remotely operated underwater vehicles or stationary camera as well as new emergency technologies such as rapid assessment production that are proposed to be more cost efficient and less destructive to the reef. As technologies continue to evolve, the AMT should evaluate which methodologies would be best suited for determining the success of the project in relation to the established goals.

An annual monitoring report should be produced by the AMT following each monitoring event.

### 4.2.2. Wetland Monitoring Requirements

Monitoring activities should occur during the late summer to early fall (August-October) when vegetative cover is at its peak. The first monitoring event should occur at least six months following the initial plantings of native vegetation. If minimum success criteria are not established by Year 5 and adaptive management measures implemented, monitoring should continue annually for the remaining adaptive management and monitoring period to ensure success.

For wetland restoration projects, monitoring should entail the establishment of transects across all constructed areas to allow for random sampling. Random one-meter square quadrats should be sampled along these transect for percent vegetative cover, species composition including invasive species, stem height, and the number of flowering shoots. The first monitoring event following initial plantings should also calculate the percent survivorship of planted plugs to determine planting success.

An annual monitoring report should be produced by the AMT following each monitoring event.

## 5 Adaptive Management

The primary incentive for implementing adaptive management is to increase the likelihood of achieving desired project outcomes given identified uncertainties. Adaptive management provides an organized, coherent, and documented process that suggest management actions in relation to measure project performance compared to do desired project outcomes. This process establishes the critical feedback among project monitoring and informed project management and learning through reduced uncertainty.

Due to inherent uncertainty present in any ecosystem restoration project, the USACE has designed an adaptive management plan to ensure the proposed project provides the National Ecosystem Restoration (NER) benefits over the project life. This includes a series of potential actions to reverse downward trends in established success criteria for reef and wetland habitat. As successful reef and wetland restoration occurs throughout the Chesapeake Bay Watershed, effective strategies and monitoring techniques will be applied to this project.

### 5.1 Example Adaptive Management Scenarios

The following are example scenarios that may trigger adaptive management of the Section 510 Middle Peninsula State Park Project reef and wetland habitat restoration. These examples include:

- Monitoring activities that determine if success metrics are not being met.
- Monitoring activities that can help determine causes for those metrics not being met.
- Examples adaptive management actions.

This section should be used as a guide by the AMT and not interpreted as being inclusive of every scenario and potential action that could be taken over the adaptive management and monitoring period due to inherent uncertainties and continued improvement in science and technology.

#### 5.1.1 Oyster larval recruitment does not meet minimum success metric.

As the project design does not include seeding with spat-on-shell oysters or deployment of reef balls pre-set with spat, natural oyster larval recruitment within the Lynnhaven River Basin system will lead to population of the reef. Adaptive management actions would be triggered if the following monitoring activities show that oyster larval recruitment is less than 15 spat per meter squared by year three and/or less than 50 spat per meter squared by year six.

#### *5.1.1.1 Monitoring Activities*

- Assess oyster population demographics including density and year class frequency distributions and available shell budget during year one, year three, and year six monitoring events.
- Identify areas of the reef where density is below the 15-50 per meter squared range.
- Gather any relevant available data on stock source supplying larvae to reefs including existing models or other organizations' monitoring data and determine if it is too low to be supply larval recruits.
- Review recent history for significant weather events and if there have been any large freshwater inputs that could affect recruitment.
- Monitor sedimentation rates at the project site.

#### *5.1.1.2 Adaptive Management Actions*

- Spat-on-shell can be applied to low density areas during the following reproductive season to increase oyster stock population and increase shell budget and hard substrate availability for wild larvae in the system. This spat-on-shell should be produced using York River adult oysters, if possible. It should be applied at a minimum density of approximately 250 spat per meter squared.
- If heavy sedimentation is observed on the reefs, divers could be deployed to remove the sediment to increase available surface area for settlement.

#### *5.1.2 From a structural perspective, reef height is degrading.*

While some post-construction settlement of the reef substrate is expected, the reef is also expected to retain its grade from the sea floor. Subsidence of the reef can lead to higher risk of sedimentation and degradation of the reef project. Adaptive management would be triggered if the reef height becomes lower six than inches.

#### *Monitoring Activities*

##### *5.1.2.1 Monitoring Activities*

- Use acoustic mapping to assess reef height from the river bottom post-construction at year one, year three, and year six monitoring events.
- If acoustic mapping shows degradation, the reef should be further monitoring for potential cases including poaching and large-scale weather events like hurricanes.
- Evaluate recent NOAA bottom surveys of the York River and ground truth the sediment type in the reef areas.

##### *5.1.2.2 Adaptive Management Actions*

- Reef height can be re-established by lifting the existing structures or the addition on substrate depending on original constructed substrate of the reef. However, this should be coupled with

review of NOAA bottom surveys and ground truthing of sediment type to ensure the bottom suitability is hard enough to support the weight of the reef balls. If degraded areas are seen to be on bottom type too soft to support substrate, such as mud classification, consider targeting adaptive management in areas with the most suitable bottom type.

- If significant evidence of poaching, USACE can coordinate with the Virginia Marine Resources Commission (VMRC) to identify opportunities for VMRC to strengthen enforcement measures.
- If evidence of movement of substrate or scouring under reef structures due to large weather events, wave action, and/or strong currents, the size of the substrate should be evaluated and increased to prevent future movement.

### 5.1.3 Wetland vegetative cover is not meeting minimum success criteria.

#### 5.1.3.1 *Monitoring Activities*

- Assess wetland vegetation annually including percent cover and species composition.
- Test soil to determine soil pH and composition.
- Survey wetland elevations for subsidence and changes to due sea level change.
- Evaluate signs of predation and/or human impacts.

#### 5.1.2.2 *Adaptive Management Actions*

- Additional plantings can be completed.
- If invasive species are observed to represent 10% of vegetative cover or more, invasive species management measures should be introduced to control spread.
- Depending on results from soil testing, fertilizer, mycorrhizae additions, and/or other potential soil amendments can be done to increase soil suitability for wetland vegetation.
- If wetland elevations are observed to have decreased post-construction due to subsidence or sea-level change, additional soils may be added to raise elevations.
- If evidence of predation, goose fencing can be added to allow vegetation to establish and mature. Additional fencing, signage, or similar deterrence measures could be added if evidence of park visitors trampling vegetation to keep them away from low density areas and allow them to regrow.

## 6 References

Oyster Metrics Workgroup. 2011. Restoration goals, quantitative metrics and assessment protocols for evaluating success on restored oyster reef sanctuaries.



## **Appendix A-1 Environmental: Section 106 Initiation**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**Section 106 Initiation**

**November 2024**



**US Army Corps  
of Engineers®**  
Norfolk District

**Miller, Susan G CIV USARMY CENAO (USA)**

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**From:** Miller, Susan G CIV USARMY CENAO (USA)  
**Sent:** Tuesday, March 7, 2023 2:45 PM  
**To:** Lauren McMillan  
**Cc:** gretchen.gorecki@dcv.virginia.gov; Harr, Richard M CIV USARMY CENAO (USA)  
**Subject:** Middle Peninsula Draft SHPO Ltr  
**Attachments:** MP SP Draft SHPO pkg.zip; Middle Peninsula SP Tribal Contacts.xlsx; Consulting Parties.xlsx

Hello Lauren,

Please find attached a copy of the draft SHPO letter package for the subject undertaking. Please comment in track changes and return at your earliest convenience as a file with your initials.

I have also attached the list of tribal and consulting party invitations we plan on sending. The tribal letters will be similar to the SHPO letter, so would appreciate your comments on the SHPO letter to base those letters on.

If you have any questions or would like to talk through anything, please feel free to contact me.

Thanks for your review,

Sue

Susan G. Miller, M.A., RPA  
Archaeologist & Tribal Liaison  
Norfolk District, U.S. Army Corps of Engineers  
Planning and Policy Branch  
Environmental Analysis Section  
803 Front Street  
Norfolk, Virginia 23510  
(757) 201-7008



**DEPARTMENT OF THE ARMY  
US ARMY CORPS OF ENGINEERS  
NORFOLK DISTRICT  
FORT NORFOLK  
803 FRONT STREET  
NORFOLK VA 23510-1011**

APRIL 19, 2023

SUBJECT: Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106 Initiation

Samantha Henderson, Archaeologist  
Division of Review and Compliance  
Virginia Department of Historic Resources  
2801 Kensington Avenue  
Richmond, VA 23221-2470

Dear Ms. Henderson:

The Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula State Park (MPSP) along the York River in Gloucester County, Virginia. The project would remove the derelict timber groins and degrading bulkhead, grade the existing topography into a natural sloping shoreline, install an offshore reef structure, and restore the wetland and marsh areas on the eastern and western extents of the property (Figure 1). The project is on State property and is authorized by Section 510 of the Water Resources Development Act of 1996, as amended, within the Chesapeake Bay Environmental Restoration and Protection Program. The Section 510 program contributes to achieving protection and restoration goals established by the 2009 Executive Order 13508 and the 2014 Chesapeake Bay Program Agreement by restoring clean water, recovering habitat, and sustaining fish and wildlife.

The MPSP is not currently open to the public but is planned to open for recreation accessible by land and the York River. The project is needed to address failing timber groins and bulkhead walls that pose a safety hazard to recreational use of the shoreline and are no longer effective at reducing erosion along the riverbank. The proposed action is the removal of the timber groins and bulkhead, grading the riverbank, native plantings, and placement of reef structures below the low-tide level near shore. The No Action alternative would not remove the failing shoreline erosion structures and replace them with nature-based shoreline restoration and reefs that reduce shoreline erosion. The No Action alternative would potentially lead to more erosion that could adversely impact historic properties.

As the project involves demolition and earth disturbance, it meets the definition of an undertaking per 36 CFR 800.16(y). As such, USACE is initiating Section 106 of the National Historic Preservation Act consultation for the proposed action. We are consulting your office on the definition of the Area of Potential Effects (APE) for the undertaking, the previously documented surveys and historic and archaeological resources in the APE, our proposed methods for identifying historic properties, and a preliminary list of potential consulting parties.

The undertaking consists of demolition and removal of the existing groins and bulwark, grading a slope along the riverbank, placing artificial reefs on the river bottom, planting vegetation, upgrading the existing access road with gravel and using a construction equipment staging area. The archaeological APE as defined by 36 CFR 800.16(d) is approximately 10.8 acres (see Figure 1). Historic data indicates the archaeological APE has had previous residences, outbuildings, agricultural use including recently plowed fields, and above- and below-ground utilities. Demolition of the groins and bulwark will pull them down and cut any remaining portions 1-2 feet deep. The grading and graveling of the existing road would extend a maximum 2 foot deep. Creating the slope along the shore will involve removing vegetation and organics up to a foot deep. The oyster reef will be placed on the water bottom with no excavation, with minimal settlement.

The architectural APE for above ground cultural resources is the area within which physical and visual impacts to historic properties could occur if present in the APE (Figure 1). The architectural APE is a buffer within approximately ¼ mile of the area of direct effects (69.5 acres) and is defined in part based on Department of Historic Resource's (DHR) guidance "Assessing Visual Effects on Historic Properties".

The Virginia Cultural Resources Information System (VCRIS) provided online by DHR was checked for information on previously completed surveys and documented sites in the APE by persons meeting or exceeding the Secretary of the Interior Professional Qualification Standards at 36 CFR 61 on February 6 and 27, 2023. Six Phase I archaeological surveys described in Table 1 have been previously completed in the archaeological APE (Figure 2). Three known sites are within the archaeological APE and are shown in Figure 3.

In 1974, the Virginia Archaeological Research Center at the University of Virginia completed a judgmental survey that overlapped the archaeological APE (DHR# GL-014). Searching for the Powhatan Werowocomoco village, the collection survey extended from Carter's Creek and the historic Rosewell Plantation along the York River one mile to approximately Gum Point. In a handwritten report authored by John Anderson, the survey documented numerous artifact clusters as one site, which subsequent investigations divided into discrete sites. The report indicates that artifacts were collected on the beach in the vicinity of the previous historic house sited within the APE and noted in the fields just north of the house.

In 1988, James River Institute for Archaeology (JRIA) completed a long linear archaeological survey (GL-021) for the Coleman Bridge replacement study, with subsurface shovel testing through the center of the current APE. The survey did not meet current standards with 75 foot spacing and had varied spacing in some areas. The survey documented site 44GL0286 as an Early to Late Woodland temporary camp, indicating multiple artifacts were seen at low tide along the beach. JRIA recommended Phase II testing. Site 44GL0287 was recorded as an 18<sup>th</sup> century artifact scatter on a farmstead/plantation and subsurface features in the northeast part of site also recommended for Phase II testing. No boundary for the survey is provided in VCRIS or the report.

In 1988, Karell Archaeological Services completed a submerged archaeological survey (GL-022) for the Virginia Department of Transportation offshore of the current APE. Magnetic anomaly 44GL0302 was recorded as a light scatter of small metal objects. The site form indicates its eligibility for the National Register of Historic Places (NRHP) is unevaluated, but the report recommends the target has low potential for significant cultural remains and no further investigation is recommended. Target 44GL0302 is outside the current archaeological APE circa 350 feet.

| <b>DHR Survey #</b> | <b>Report</b>   | <b>Sites in the APE &amp; NRHP Eligibility</b>   |
|---------------------|---|--|
| GL-014              | Anderson, John R.<br>1974. A Surface Survey of the Carter Creek Area, Gloucester County, Virginia. Virginia Archaeological Research Center, University of Virginia. DHR Report #GL-014.   | Judgmental surface collection survey. Undesignated unevaluated multiple component site subsequently recorded as individual sites. 44GL0254 in the APE Woodland campsite unevaluated. |
| GL-021              | Hodges, Charles, C. Hudgins, R. Hunter, and M. McCartney.<br>1988. George P. Coleman Bridge York River Crossing Study Land Based Technical Report Phase 1B Historic and Archaeological Resources. James River Institute for Archaeology Inc. DHR Report #GL-21. | 44GL0286 Early to Late Woodland and 44GL0287 18 <sup>th</sup> Century domestic/plantation recommended for Phase II testing. No mapping of survey boundaries available.               |
| GL-022              | Koski-Karell, Daniel<br>1988. George P. Coleman Bridge York River Crossing Study Underwater Archaeology Technical Report. Karell Archaeological Services. DHR Report #GL-022.   | 44GL0302 magnetic anomaly unevaluated  |

|        |  |  |
|--------|--|--|
| YO-62  | Higgins, T., R. Hunter, Jr., C. Downing, G. Robinson, M. Brown III, and F. White. 1989. Phase II Evaluation of Cultural Resources within the Proposed York River Crossing Alternatives Appendix B: Vol. 3. College of William and Mary Archaeological Project Center. DHR Report #YO-62. | Phase I testing under current guidelines at 44GL0286 and 44GL0287. Both sites recommended eligible for the NRHP.   |
| GL-103 | Harpole, Thane, David Brown and Anna Hayden. 2013. Middle Peninsula State Park Archaeological Survey: 2012 Summary Report. The Fairfield Foundation. DHR Report #GL-103.   | 44GL0286: 32 judgmental shovel tests plotted on unscaled maps. Multi-component Middle to Late Woodland prehistoric occupation with a small 18 <sup>th</sup> -century historic component. Recommended expanding site boundary and additional Phase II testing. Recommended eligible for the NRHP. Still unevaluated in VCRIS. |
| GL-117 | David Brown, Thane Harpole, and Anna Hayden. 2014. Middle Peninsula State Park Archaeological Survey: 2011-2013 Summary Report. The Fairfield Foundation. DHR Report #GL-117.  | 44GL0287 Phase I tested 18 <sup>th</sup> - and 19 <sup>th</sup> -Century domestic and farmstead artifact scatter. Few prehistoric lithics and ceramics noted. Recommended additional PHII testing. Recommended eligible for NRHP. Still unevaluated in VCRIS.  |

In 2012, the Fairfield Foundation excavated 32 judgmentally placed shovel test pits in locations of tree plantings within the bounds of 44GL0286 (GL-103). The majority of the artifacts recovered were oyster shell along with Middle and Late Woodland ceramics and low densities of historic artifacts. The Fairfield Foundation recommended expanding the boundaries of site 44GL0286 and that the site is potentially eligible for the NRHP. In 2013, the Fairfield Foundation expanded their survey in the APE into the field to the south of the Rosewell Plantation Road with an additional 47 shovel test pits (GL-117) at 44GL0287. These shovel test pits were placed at 50-foot intervals within an approximately 5.5-acre site area. Although some testing was characterized as "Phase II", no excavation units were placed in an effort to identify features, only shovel testing was performed. The Fairfield Foundation recommended expanding the boundary of site 44GL0287 and the site as potentially eligible for the NRHP. The current site boundaries and eligibility recommendations have not been evaluated in VCRIS by DHR staff.

USACE proposes a qualified consultant meeting the Secretary of the Interior's Professional Qualifications (36 CFR 61) conduct a Phase I archaeological survey, a Phase I historic architectural reconnaissance survey and historic properties visual impact survey in accordance with the Secretary of Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), DHR's *Guidelines for Conducting Historic Resources Survey in Virginia* (2017) and any subsequent updates, and DHR's guidance "Assessing Visual Effects on Historic Properties". The Phase I archaeological survey would be in the entire archaeological APE to provide systematic subsurface testing. Previous investigations in the shoreline area of previously identified sites 44GL0286 and 44GL0254 were mainly surficial and did not adequately assess site extent into the tidal area.

We would also like to consult with you on potential consulting parties that may be interested in this undertaking. Concurrent with this letter, we are inviting the Delaware Nation, Pamunkey Indian Tribe, Upper Mattaponi Tribe and Rappahannock Tribe, Inc. governments to participate in the Section 106 consultation. We are also inviting the Gloucester County Historical Committee and Fairfield Foundation as consulting parties. Please let me know of any other potentially interested consulting parties we should contact.

Thank you in advance for your review. Please contact me at (757) 201-7008 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

MILLER.SUSAN.GL  
ENETTE.13649843  
55  
Susan G. Miller, MA, RPA  
Norfolk District Archaeologist/Tribal Liaison

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CC: Lauren McMillan, Virginia State Parks  
Enclosures

**Miller, Susan G CIV USARMY CENAO (USA)**

---

**From:** Samantha Henderson <Samantha.Henderson@dhr.virginia.gov>  
**Sent:** Thursday, May 18, 2023 11:31 AM  
**To:** Miller, Susan G CIV USARMY CENAO (USA)  
**Subject:** [Non-DoD Source] Middle Peninsula State Park Living Shoreline Project (DHR File No. 2023-3373) | e-Mail #03856

Dear Ms. Miller:

The Department of Historic Resources (DHR) has received the Middle Peninsula State Park Living Shoreline Project (DHR File No. 2023-3373) for our review and comment. Our comments are provided to the U.S Army Corps of Engineers (Corps) as assistance in meeting its responsibilities under Section 106 of the National Historic Preservation Act. It is our understanding that the project involves shoreline restoration of approximately 2100 feet of shoreline at the Middle Peninsula State Park in Gloucester County, Virginia.

Based on this information, DHR concurs with the Corps' recommendation to conduct a Phase I Cultural Resource survey of the project Area of Potential Effects (APE), including a systematic archaeological survey, architectural survey, and a visual impact survey. The studies must be conducted by or under the direct supervision of a qualified professionals meeting the Secretary of the Interior's Professional Qualification Standards (48 FR 44738-39) in the appropriate fields and should be consistent with DHR's Guidelines for Conducting Historic Resources Survey in Virginia (September 2017). As this undertaking will occur on Commonwealth of Virginia property the selected consultant who will complete the archaeological survey must apply for and receive a Permit for Archaeological Field Investigation on State-Controlled Land. The Application can be submitted to me for review and distribution for approval within DHR.

Thank you for your consideration of historic resources. Please continue to consult with DHR so that we may successfully complete the Section 106 process.

Regards,

Sam Henderson, Archaeologist

Division of Review and Compliance

Phone: (804) 482-6088

Samantha.Henderson@dhr.virginia.gov





**DEPARTMENT OF THE ARMY  
US ARMY CORPS OF ENGINEERS  
NORFOLK DISTRICT  
FORT NORFOLK  
803 FRONT STREET  
NORFOLK VA 23510-1011**

APRIL 19, 2023

**SUBJECT: Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106  
Initiation**

Ms. Katelyn Lucas, Historic Preservation Assistant  
Delaware Nation  
P.O. Box 825  
Anadarko, OK 73005-0825

Dear Ms. Lucas:

The Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula State Park (MPSP) along the York River in Gloucester County, Virginia. We are inviting the Nation to be a consulting party in the Section 106 compliance process for this project.

The project would remove the derelict timber groins and degrading bulkhead, grade the existing topography into a natural sloping shoreline, install an offshore reef structure, and restore the wetland and marsh areas on the eastern and western extents of the property (Figure 1). The project is on State property and is authorized by Section 510 of the Water Resources Development Act of 1996, as amended, within the Chesapeake Bay Environmental Restoration and Protection Program. The Section 510 program contributes to achieving protection and restoration goals established by the 2009 Executive Order 13508 and the 2014 Chesapeake Bay Program Agreement by restoring clean water, recovering habitat, and sustaining fish and wildlife.

The MPSP is not currently open to the public but is planned to open for recreation accessible by land and the York River. The project is needed to address failing timber groins and bulkhead walls that pose a safety hazard to recreational use of the shoreline and are no longer effective at reducing erosion along the riverbank. The proposed action is the removal of the timber groins and bulkhead, grading the riverbank, native plantings, and placement of reef structures below the low-tide level near shore. The No Action alternative would not remove the failing shoreline erosion structures and replace them with nature-

based shoreline restoration and reefs that reduce shoreline erosion. The No Action alternative would potentially lead to more erosion that could adversely impact historic properties.

The undertaking consists of demolition and removal of the existing groins and bulwark, grading a slope along the riverbank, placing artificial reefs on the river bottom, planting vegetation, upgrading the existing access road with gravel and using a construction equipment staging area. The archaeological APE as defined by 36 CFR 800.16(d) is approximately 10.8 acres (see Figure 1). Historic data indicates the archaeological APE has had previous residences, outbuildings, agricultural use including recently plowed fields, and above- and below-ground utilities. Demolition of the groins and bulwark will pull them down and cut any remaining portions 1-2 feet deep. The grading and graveling of the existing road would extend a maximum 2 foot deep. Creating the slope along the shore will involve removing vegetation and organics up to a foot deep. The oyster reef will be placed on the water bottom with no excavation, with minimal settlement.

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The Virginia Cultural Resources Information System (VCRIS) provided online by DHR was checked for information on previously completed surveys and documented sites in the APE by persons meeting or exceeding the Secretary of the Interior Professional Qualification Standards at 36 CFR 61 on February 6 and 27, 2023. Six Phase I archaeological surveys described in Table 1 have been previously completed in the archaeological APE (Figure 2). Three known sites are within the archaeological APE and are shown in Figure 3.

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shovel testing through the center of the current APE. The survey did not meet current standards with 75 foot spacing and had varied spacing in some areas. The survey documented site 44GL0286 as an Early to Late Woodland temporary camp, indicating multiple artifacts were seen at low tide along the beach. JRIA recommended Phase II testing. Site 44GL0287 was recorded as an 18<sup>th</sup>-century artifact scatter on a farmstead/plantation and subsurface features in the northeast part of site also recommended for Phase II testing. No boundary for the survey is provided in VCRIS or the report.

| <b>DHR Survey #</b> | <b>Report</b>   | <b>Sites in the APE &amp; NRHP Eligibility</b>   |
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| YO-62               | Higgins, T., R. Hunter, Jr., C. Downing, G. Robinson, M. Brown III, and F. White.<br>1989. Phase II Evaluation of Cultural Resources within the Proposed York River Crossing Alternatives Appendix B: Vol. 3. College of William and Mary Archaeological Project Center. DHR Report #YO-62. | Phase I testing under current guidelines at 44GL0286 and 44GL0287. Both sites recommended eligible for the NRHP.   |

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| GL-103 | Harpole, Thane, David Brown and Anna Hayden.<br>2013. Middle Peninsula State Park Archaeological Survey: 2012 Summary Report. The Fairfield Foundation. DHR Report #GL-103.      | 44GL0286: 32 judgmental shovel tests plotted on unscaled maps. Multi-component Middle to Late Woodland prehistoric occupation with a small 18 <sup>th</sup> -century historic component. Recommended expanding site boundary and additional Phase II testing. Recommended eligible for the NRHP. Still unevaluated in VCRIS. |
| GL-117 | David Brown, Thane Harpole, and Anna Hayden.<br>2014. Middle Peninsula State Park Archaeological Survey: 2011-2013 Summary Report. The Fairfield Foundation. DHR Report #GL-117. | 44GL0287 Phase I tested 18 <sup>th</sup> - and 19 <sup>th</sup> -Century domestic and farmstead artifact scatter. Few prehistoric lithics and ceramics noted. Recommended additional PHII testing. Recommended eligible for NRHP. Still unevaluated in VCRIS.  |

In 2012, the Fairfield Foundation excavated 32 judgmentally placed shovel test pits in locations of tree plantings within the bounds of 44GL0286 (GL-103). Most of the artifacts recovered were oyster shell along with Middle and Late Woodland ceramics and low densities of historic artifacts. The Fairfield Foundation recommended expanding the boundaries of site 44GL0286 and that the site is potentially eligible for the NRHP. In 2013, the Fairfield Foundation expanded their survey into the field to the south of the Rosewell Plantation Road with an additional 47 shovel test pits (GL-117) at 44GL0287. These shovel test pits were placed at 50-foot intervals within an approximately 5.5-acre site area. Although some testing was characterized as “Phase II”, no excavation units were placed in an effort to identify features, only shovel testing was performed. The Fairfield Foundation recommended expanding the boundary of site 44GL0287 and the site as potentially eligible for the NRHP. The current site boundaries and eligibility recommendations have not been evaluated in VCRIS by DHR staff.

USACE proposes a qualified consultant meeting the Secretary of the Interior’s Professional Qualifications (36 CFR 61) conduct a Phase I archaeological survey, a Phase I historic architectural reconnaissance survey and historic properties visual impact survey in accordance with the Secretary of Interior’s *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), DHR’s *Guidelines for Conducting Historic Resources Survey in Virginia* (2017) and any subsequent updates, and DHR’s guidance “Assessing Visual Effects on Historic Properties”.

The Phase I archaeological survey would be in the entire archaeological APE to provide systematic subsurface testing. Previous investigations in the shoreline area of previously identified sites 44GL0286 and 44GL0254 were mainly surficial and did not adequately assess site extent into the tidal area.

Thank you in advance for letting us know if the Delaware Nation would like to be a consulting party in the Section 106 compliance process for this project. Your reply by May 19, 2023, would be greatly appreciated. Please contact me at (757) 630-9074 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

**MILLER.SUSA**

**N.GLENETTE.1**

**364984355**

Susan G. Miller, M.A., R.P.A

District Archaeologist/Tribal Liaison

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Attachments



## *Delaware Nation*

### **Tribal Historic Preservation Department**

31064 State Highway 281

Anadarko, OK 73005

Phone (405)247-2448

May 5, 2023

To Whom It May Concern:

The Delaware Nation Historic Preservation Department received correspondence regarding the following referenced project(s).

#### **Project:**

USACE Section 510 Middle Peninsula State Park Living Shoreline, Virginia

Our office is committed to protecting tribal heritage, culture, and religion with particular concern for archaeological sites potentially containing burials and associated funerary objects. The Lenape people occupied and/or interacted in the area indicated in your letter prior to European contact until their eventual removal to our present locations. **We accept your invitation to consult on this project.** Information on the project vicinity shows that precontact, historic, and/or other traditional sites and/or resources of value to Delaware Nation are within or nearby the project area. **We concur with the need for a Phase I archaeological for the entire APE expecting ground disturbance.** Delaware Nation objects to projects that will disturb or destroy archaeological sites, especially burial sites, that may be eligible for the National Register of Historic Places. **Please provide us with copies of the State Historic Preservation Officer's report and any archaeological survey reports once they are completed before we can make a determination on this project.**

Please note that Delaware Nation, the Delaware Tribe of Indians, and the Stockbridge Munsee Community are the only Federally Recognized Delaware/Lenape entities in the United States and consultation for Lenape homelands must be made with only the designated staff of these three Nations (and/or other federally recognized tribal nations who may have overlapping areas of interest). We appreciate your cooperation in contacting the Delaware Nation Historic Preservation Office to conduct proper Section 106 consultation. Should you have any questions, feel free to contact our offices at 405-247-2448 ext. 1403.

*Katelyn Lucas*

Katelyn Lucas  
Tribal Historic Preservation Officer  
Delaware Nation  
405-544-8115  
klucas@delawarenation-nsn.gov



**DEPARTMENT OF THE ARMY  
US ARMY CORPS OF ENGINEERS  
NORFOLK DISTRICT  
FORT NORFOLK  
803 FRONT STREET  
NORFOLK VA 23510-1011**

APRIL 19, 2023

**SUBJECT: Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106  
Initiation**

Ms. Shaleigh Howells, Cultural Resource Director  
Pamunkey Indian Tribal Resource Office  
1054 Pocahontas Trail  
King William, VA 23086

Dear Ms. Howells:

The Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula State Park (MPSP) along the York River in Gloucester County, Virginia. We are inviting the Pamunkey Indian Tribe to be a consulting party in the Section 106 compliance process for this project.

The project would remove the derelict timber groins and degrading bulkhead, grade the existing topography into a natural sloping shoreline, install an offshore reef structure, and restore the wetland and marsh areas on the eastern and western extents of the property (Figure 1). The project is on State property and is authorized by Section 510 of the Water Resources Development Act of 1996, as amended, within the Chesapeake Bay Environmental Restoration and Protection Program. The Section 510 program contributes to achieving protection and restoration goals established by the 2009 Executive Order 13508 and the 2014 Chesapeake Bay Program Agreement by restoring clean water, recovering habitat, and sustaining fish and wildlife.

The MPSP is not currently open to the public but is planned to open for recreation accessible by land and the York River. The project is needed to address failing timber groins and bulkhead walls that pose a safety hazard to recreational use of the shoreline and are no longer effective at reducing erosion along the riverbank. The proposed action is the removal of the timber groins and bulkhead, grading the riverbank, native plantings, and placement of reef structures below the low-tide level near shore. The No Action alternative would not remove the failing shoreline erosion structures and replace them with nature-

based shoreline restoration and reefs that reduce shoreline erosion. The No Action alternative would potentially lead to more erosion that could adversely impact historic properties.

The undertaking consists of demolition and removal of the existing groins and bulwark, grading a slope along the riverbank, placing artificial reefs on the river bottom, planting vegetation, upgrading the existing access road with gravel and using a construction equipment staging area. The archaeological APE as defined by 36 CFR 800.16(d) is approximately 10.8 acres (see Figure 1). Historic data indicates the archaeological APE has had previous residences, outbuildings, agricultural use including recently plowed fields, and above- and below-ground utilities. Demolition of the groins and bulwark will pull them down and cut any remaining portions 1-2 feet deep. The grading and graveling of the existing road would extend a maximum 2 foot deep. Creating the slope along the shore will involve removing vegetation and organics up to a foot deep. The oyster reef will be placed on the water bottom with no excavation, with minimal settlement.

The architectural APE for above ground cultural resources is the area within which physical and visual impacts to historic properties could occur if present in the APE (Figure 1). The architectural APE is a buffer within approximately ¼ mile of the area of direct effects (69.5 acres) and is defined in part based on Department of Historic Resource's (DHR) guidance "Assessing Visual Effects on Historic Properties".

The Virginia Cultural Resources Information System (VCRIS) provided online by DHR was checked for information on previously completed surveys and documented sites in the APE by persons meeting or exceeding the Secretary of the Interior Professional Qualification Standards at 36 CFR 61 on February 6 and 27, 2023. Six Phase I archaeological surveys described in Table 1 have been previously completed in the archaeological APE (Figure 2). Three known sites are within the archaeological APE and are shown in Figure 3.

In 1974, the Virginia Archaeological Research Center at the University of Virginia completed a judgmental survey that overlapped the archaeological APE (DHR# GL-014). Searching for the Powhatan Werowocomoco village, the collection survey extended from Carter's Creek and the historic Rosewell Plantation along the York River one mile to approximately Gum Point. In a handwritten report authored by John Anderson, the survey documented numerous artifact clusters as one site, which subsequent investigations divided into discrete sites. The report indicates that artifacts were collected on the beach in the vicinity of the previous historic house sited within the APE and noted in the fields just north of the house.

In 1988, James River Institute for Archaeology (JRIA) completed a long linear archaeological survey (GL-021) for the Coleman Bridge replacement study, with subsurface



shovel testing through the center of the current APE. The survey did not meet current standards with 75 foot spacing and had varied spacing in some areas. The survey documented site 44GL0286 as an Early to Late Woodland temporary camp, indicating multiple artifacts were seen at low tide along the beach. JRIA recommended Phase II testing. Site 44GL0287 was recorded as an 18<sup>th</sup>-century artifact scatter on a farmstead/plantation and subsurface features in the northeast part of site also recommended for Phase II testing. No boundary for the survey is provided in VCRIS or the report.

| <b>DHR Survey #</b> | <b>Report</b>   | <b>Sites in the APE &amp; NRHP Eligibility</b>   |
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| GL-014              | Anderson, John R.<br>1974. A Surface Survey of the Carter Creek Area, Gloucester County, Virginia. Virginia Archaeological Research Center, University of Virginia. DHR Report #GL-014.   | Judgmental surface collection survey. Undesignated unevaluated multiple component site subsequently recorded as individual sites. 44GL0254 in the APE Woodland campsite unevaluated. |
| GL-021              | Hodges, Charles, C. Hudgins, R. Hunter, and M. McCartney.<br>1988. George P. Coleman Bridge York River Crossing Study Land Based Technical Report Phase 1B Historic and Archaeological Resources. James River Institute for Archaeology Inc. DHR Report #GL-21.                             | 44GL0286 Early to Late Woodland and 44GL0287 18 <sup>th</sup> Century domestic/plantation recommended for Phase II testing. No mapping of survey boundaries available.               |
| GL-022              | Koski-Karell, Daniel<br>1988. George P. Coleman Bridge York River Crossing Study Underwater Archaeology Technical Report. Karell Archaeological Services. DHR Report #GL-022.   | 44GL0302 magnetic anomaly unevaluated  |
| YO-62               | Higgins, T., R. Hunter, Jr., C. Downing, G. Robinson, M. Brown III, and F. White.<br>1989. Phase II Evaluation of Cultural Resources within the Proposed York River Crossing Alternatives Appendix B: Vol. 3. College of William and Mary Archaeological Project Center. DHR Report #YO-62. | Phase I testing under current guidelines at 44GL0286 and 44GL0287. Both sites recommended eligible for the NRHP.   |

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| GL-103 | Harpole, Thane, David Brown and Anna Hayden.<br>2013. Middle Peninsula State Park Archaeological Survey: 2012 Summary Report. The Fairfield Foundation. DHR Report #GL-103.      | 44GL0286: 32 judgmental shovel tests plotted on unscaled maps. Multi-component Middle to Late Woodland prehistoric occupation with a small 18 <sup>th</sup> -century historic component. Recommended expanding site boundary and additional Phase II testing. Recommended eligible for the NRHP. Still unevaluated in VCRIS. |
| GL-117 | David Brown, Thane Harpole, and Anna Hayden.<br>2014. Middle Peninsula State Park Archaeological Survey: 2011-2013 Summary Report. The Fairfield Foundation. DHR Report #GL-117. | 44GL0287 Phase I tested 18 <sup>th</sup> - and 19 <sup>th</sup> -Century domestic and farmstead artifact scatter. Few prehistoric lithics and ceramics noted. Recommended additional PHII testing. Recommended eligible for NRHP. Still unevaluated in VCRIS.  |

In 2012, the Fairfield Foundation excavated 32 judgmentally placed shovel test pits in locations of tree plantings within the bounds of 44GL0286 (GL-103). Most of the artifacts recovered were oyster shell along with Middle and Late Woodland ceramics and low densities of historic artifacts. The Fairfield Foundation recommended expanding the boundaries of site 44GL0286 and that the site is potentially eligible for the NRHP. In 2013, the Fairfield Foundation expanded their survey into the field to the south of the Rosewell Plantation Road with an additional 47 shovel test pits (GL-117) at 44GL0287. These shovel test pits were placed at 50-foot intervals within an approximately 5.5-acre site area. Although some testing was characterized as “Phase II”, no excavation units were placed in an effort to identify features, only shovel testing was performed. The Fairfield Foundation recommended expanding the boundary of site 44GL0287 and the site as potentially eligible for the NRHP. The current site boundaries and eligibility recommendations have not been evaluated in VCRIS by DHR staff.

USACE proposes a qualified consultant meeting the Secretary of the Interior’s Professional Qualifications (36 CFR 61) conduct a Phase I archaeological survey, a Phase I historic architectural reconnaissance survey and historic properties visual impact survey in accordance with the Secretary of Interior’s *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), DHR’s *Guidelines for Conducting Historic Resources Survey in Virginia* (2017) and any subsequent updates, and DHR’s guidance “Assessing Visual Effects on Historic Properties”.

The Phase I archaeological survey would be in the entire archaeological APE to provide systematic subsurface testing. Previous investigations in the shoreline area of previously identified sites 44GL0286 and 44GL0254 were mainly surficial and did not adequately assess site extent into the tidal area.

Thank you in advance for letting us know if the Pamunkey Indian Tribe would like to be a consulting party in the Section 106 compliance process for this project. Your reply by May 19, 2023, would be greatly appreciated. Please contact me at (757) 630-9074 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

MILLER.SUSAN.GLE  
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Susan G. Miller, M.A., R.P.A  
District Archaeologist/Tribal Liaison

Attachments

CC: Chief Robert Gray, Pamunkey Indian Tribe



**DEPARTMENT OF THE ARMY  
US ARMY CORPS OF ENGINEERS  
NORFOLK DISTRICT  
FORT NORFOLK  
803 FRONT STREET  
NORFOLK VA 23510-1011**

APRIL 19, 2023

**SUBJECT: Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106  
Initiation**

Ms. Rexford Jones, Director of Environmental Services  
Rappahannock Tribe, Inc.  
5036 Indian Neck Road  
Indian Neck, VA 23148

Dear Ms. Jones:

The Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula State Park (MPSP) along the York River in Gloucester County, Virginia. We are inviting the Rappahannock Tribe, Inc. to be a consulting party in the Section 106 compliance process for this project.

The project would remove the derelict timber groins and degrading bulkhead, grade the existing topography into a natural sloping shoreline, install an offshore reef structure, and restore the wetland and marsh areas on the eastern and western extents of the property (Figure 1). The project is on State property and is authorized by Section 510 of the Water Resources Development Act of 1996, as amended, within the Chesapeake Bay Environmental Restoration and Protection Program. The Section 510 program contributes to achieving protection and restoration goals established by the 2009 Executive Order 13508 and the 2014 Chesapeake Bay Program Agreement by restoring clean water, recovering habitat, and sustaining fish and wildlife.

The MPSP is not currently open to the public but is planned to open for recreation accessible by land and the York River. The project is needed to address failing timber groins and bulkhead walls that pose a safety hazard to recreational use of the shoreline and are no longer effective at reducing erosion along the riverbank. The proposed action is the removal of the timber groins and bulkhead, grading the riverbank, native plantings, and placement of reef structures below the low-tide level near shore. The No Action alternative would not remove the failing shoreline erosion structures and replace them with nature-

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The undertaking consists of demolition and removal of the existing groins and bulwark, grading a slope along the riverbank, placing artificial reefs on the river bottom, planting vegetation, upgrading the existing access road with gravel and using a construction equipment staging area. The archaeological APE as defined by 36 CFR 800.16(d) is approximately 10.8 acres (see Figure 1). Historic data indicates the archaeological APE has had previous residences, outbuildings, agricultural use including recently plowed fields, and above- and below-ground utilities. Demolition of the groins and bulwark will pull them down and cut any remaining portions 1-2 feet deep. The grading and graveling of the existing road would extend a maximum 2 foot deep. Creating the slope along the shore will involve removing vegetation and organics up to a foot deep. The oyster reef will be placed on the water bottom with no excavation, with minimal settlement.

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Thank you in advance for letting us know if the Rappahannock Tribe, Inc. would like to be a consulting party in the Section 106 compliance process for this project. Your reply by May 19, 2023, would be greatly appreciated. Please contact me at (757) 630-9074 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

MILLER.SUSAN  
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64984355

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Susan G. Miller, M.A., R.P.A  
District Archaeologist/Tribal Liaison

Attachments

CC: Marion Werkheiser, Cultural Heritage Partners



## Miller, Susan G CIV USARMY CENAO (USA)

---

**From:** Anne Richardson <arichardson@rappahannocktribe.org>  
**Sent:** Wednesday, April 19, 2023 5:48 PM  
**To:** Miller, Susan G CIV USARMY CENAO (USA); Rexford Jones  
**Cc:** Marion Werkheiser; Lauren McMillan; Mowery, Peyton CIV USARMY CENAO (USA)  
**Subject:** [Non-DoD Source] Re: USACE Middle Peninsula State Park Living Shoreline Section 106 Initiation

Dear Ms. Miller:

We do not wish to be a consulting party on this Project.

Thanks,

Chief Anne Richardson

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**From:** Miller, Susan G CIV USARMY CENAO (USA) <Susan.G.Miller@usace.army.mil>  
**Sent:** Wednesday, April 19, 2023 3:53:10 PM  
**To:** Rexford Jones <rjones@rappahannocktribe.org>  
**Cc:** Anne Richardson <arichardson@rappahannocktribe.org>; Marion Werkheiser <marion@culturalheritagepartners.com>; Lauren McMillan <lauren.mcmillan@dcr.virginia.gov>; Mowery, Peyton CIV USARMY CENAO (USA) <Peyton.J.Mowery@usace.army.mil>  
**Subject:** USACE Middle Peninsula State Park Living Shoreline Section 106 Initiation

Dear Ms. Jones,

Please find attached a letter inviting the Rappahannock Tribe, Inc. to participate in the Section 106 consultation for the subject project located in Gloucester County, Virginia. Also attached are graphics referred to in the letter. The USACE Norfolk District and non-federal sponsor Virginia Department of Conservation and Recreation – State Parks are proposing a project to address erosion on the north bank of the York River in the vicinity of Middle Peninsula State Park. USACE is the lead federal agency for Section 106 compliance.

Please let me know if you have any difficulty opening the attached or need additional information or assistance.

Respectfully,

Sue

Susan G. Miller, M.A., RPA  
Archaeologist & Tribal Liaison  
Norfolk District, U.S. Army Corps of Engineers  
Planning and Policy Branch  
Environmental Analysis Section  
803 Front Street  
Norfolk, Virginia 23510  
(757) 201-7008



**DEPARTMENT OF THE ARMY  
US ARMY CORPS OF ENGINEERS  
NORFOLK DISTRICT  
FORT NORFOLK  
803 FRONT STREET  
NORFOLK VA 23510-1011**

APRIL 19, 2023

**SUBJECT: Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106 Initiation**

Mr. Reggie Tupponce, Tribal Administrator  
Upper Mattaponi Tribe  
13476 King William Road  
King William, VA 23086

Dear Mr. Tupponce:

The Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula State Park (MPSP) along the York River in Gloucester County, Virginia. We are inviting the Upper Mattaponi Tribe to be a consulting party in the Section 106 compliance process for this project.

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| GL-117 | David Brown, Thane Harpole, and Anna Hayden.<br>2014. Middle Peninsula State Park Archaeological Survey: 2011-2013 Summary Report. The Fairfield Foundation. DHR Report #GL-117. | 44GL0287 Phase I tested 18 <sup>th</sup> - and 19 <sup>th</sup> -Century domestic and farmstead artifact scatter. Few prehistoric lithics and ceramics noted. Recommended additional PHII testing. Recommended eligible for NRHP. Still unevaluated in VCRIS.  |

In 2012, the Fairfield Foundation excavated 32 judgmentally placed shovel test pits in locations of tree plantings within the bounds of 44GL0286 (GL-103). Most of the artifacts recovered were oyster shell along with Middle and Late Woodland ceramics and low densities of historic artifacts. The Fairfield Foundation recommended expanding the boundaries of site 44GL0286 and that the site is potentially eligible for the NRHP. In 2013, the Fairfield Foundation expanded their survey into the field to the south of the Rosewell Plantation Road with an additional 47 shovel test pits (GL-117) at 44GL0287. These shovel test pits were placed at 50-foot intervals within an approximately 5.5-acre site area. Although some testing was characterized as “Phase II”, no excavation units were placed in an effort to identify features, only shovel testing was performed. The Fairfield Foundation recommended expanding the boundary of site 44GL0287 and the site as potentially eligible for the NRHP. The current site boundaries and eligibility recommendations have not been evaluated in VCRIS by DHR staff.

USACE proposes a qualified consultant meeting the Secretary of the Interior’s Professional Qualifications (36 CFR 61) conduct a Phase I archaeological survey, a Phase I historic architectural reconnaissance survey and historic properties visual impact survey in accordance with the Secretary of Interior’s *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), DHR’s *Guidelines for Conducting Historic Resources Survey in Virginia* (2017) and any subsequent updates, and DHR’s guidance “Assessing Visual Effects on Historic Properties”.

The Phase I archaeological survey would be in the entire archaeological APE to provide systematic subsurface testing. Previous investigations in the shoreline area of previously identified sites 44GL0286 and 44GL0254 were mainly surficial and did not adequately assess site extent into the tidal area.

Thank you in advance for letting us know if the Upper Mattaponi Tribe would like to be a consulting party in the Section 106 compliance process for this project. Your reply by May 19, 2023, would be greatly appreciated. Please contact me at (757) 630-9074 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

MILLER.SUSAN.G

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Susan G. Miller, M.A., R.P.A

District Archaeologist/Tribal Liaison

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Attachments

CC: Chief Frank Adams, Upper Mattaponi Tribe  
Ms. Leigh Mitchell, Cultural Protection Director, Upper Mattaponi Tribe  
Ms. Marion Werkheiser, Cultural Heritage Partners

## Miller, Susan G CIV USARMY CENAO (USA)

---

**From:** Reggie Tupponce <admin@umitribe.gov>  
**Sent:** Tuesday, May 16, 2023 4:56 PM  
**To:** Miller, Susan G CIV USARMY CENAO (USA)  
**Cc:** Leigh Mitchell  
**Subject:** [Non-DoD Source] Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106 Initiation

Good afternoon,

The Upper Mattaponi Tribe is requesting Consulting Party Status on the Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106 Initiation. Please send all communications regarding this project to me at this email address as well as to Leigh Mitchell, our Environmental and Cultural Protection Director, whose email is copied.

Thank you,

Reggie Tupponce  
Tribal Administrator  
Upper Mattaponi Tribe  
13476 King William Road  
King William, Virginia 23086  
(804) 769-0041  
[admin@umitribe.gov](mailto:admin@umitribe.gov)



### CONFIDENTIALITY NOTICE:

**This message and the accompanying documents contain information that belongs to the sender and may contain information that is privileged, confidential, or exempt from disclosure under applicable law. If the reader of this e-mail is not the intended recipient, you are hereby notified that you are strictly prohibited from reading, disseminating, distributing, copying, or taking action in reliance on the content of this communication. If you have received this e-mail in error, please notify the sender immediately and destroy the original transmission.**



**DEPARTMENT OF THE ARMY  
US ARMY CORPS OF ENGINEERS  
NORFOLK DISTRICT  
FORT NORFOLK  
803 FRONT STREET  
NORFOLK VA 23510-1011**

APRIL 20, 2023

SUBJECT: Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106 Initiation

Mr. Thomas Karow, President  
Fairfield Foundation  
P.O. Box 157  
White Marsh, VA 23183

Dear Mr. Karow:

The Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula State Park (MPSP) along the York River in Gloucester County, Virginia. We are inviting the Fairfield Foundation to be a consulting party in the Section 106 compliance process for this project.

The project would remove the derelict timber groins and degrading bulkhead, grade the existing topography into a natural sloping shoreline, install an offshore reef structure, and restore the wetland and marsh areas on the eastern and western extents of the property (Figure 1). The project is on State property and is authorized by Section 510 of the Water Resources Development Act of 1996, as amended, within the Chesapeake Bay Environmental Restoration and Protection Program. The Section 510 program contributes to achieving protection and restoration goals established by the 2009 Executive Order 13508 and the 2014 Chesapeake Bay Program Agreement by restoring clean water, recovering habitat, and sustaining fish and wildlife.

The MPSP is not currently open to the public but is planned to open for recreation accessible by land and the York River. The project is needed to address failing timber groins and bulkhead walls that pose a safety hazard to recreational use of the shoreline and are no longer effective at reducing erosion along the riverbank. The proposed action is the removal of the timber groins and bulkhead, grading the riverbank, native plantings, and placement of reef structures below the low-tide level near shore. The No Action alternative would not remove the failing shoreline erosion structures and replace them with nature-based shoreline restoration and reefs that reduce shoreline erosion. The No Action



alternative would potentially lead to more erosion that could adversely impact historic properties.

The undertaking consists of demolition and removal of the existing groins and bulwark, grading a slope along the riverbank, placing artificial reefs on the river bottom, planting vegetation, upgrading the existing access road with gravel and using a construction equipment staging area. The archaeological APE as defined by 36 CFR 800.16(d) is approximately 10.8 acres (see Figure 1). Historic data indicates the archaeological APE has had previous residences, outbuildings, agricultural use including recently plowed fields, and above- and below-ground utilities. Demolition of the groins and bulwark will pull them down and cut any remaining portions 1-2 feet deep. The grading and graveling of the existing road would extend a maximum 2 foot deep. Creating the slope along the shore will involve removing vegetation and organics up to a foot deep. The oyster reef will be placed on the water bottom with no excavation, with minimal settlement.

The architectural APE for above ground cultural resources is the area within which physical and visual impacts to historic properties could occur if present in the APE (Figure 1). The architectural APE is a buffer within approximately ¼ mile of the area of direct effects (69.5 acres) and is defined in part based on Department of Historic Resource's (DHR) guidance "Assessing Visual Effects on Historic Properties".

The Virginia Cultural Resources Information System (VCRIS) provided online by DHR was checked for information on previously completed surveys and documented sites in the APE by persons meeting or exceeding the Secretary of the Interior Professional Qualification Standards at 36 CFR 61 on February 6 and 27, 2023. Six Phase I archaeological surveys described in Table 1 have been previously completed in the archaeological APE (Figure 2). Three known sites are within the archaeological APE and are shown in Figure 3.

In 1974, the Virginia Archaeological Research Center at the University of Virginia completed a judgmental survey that overlapped the archaeological APE (DHR# GL-014). Searching for the Powhatan Werowocomoco village, the collection survey extended from Carter's Creek and the historic Rosewell Plantation along the York River one mile to approximately Gum Point. In a handwritten report authored by John Anderson, the survey documented numerous artifact clusters as one site, which subsequent investigations divided into discrete sites. The report indicates that artifacts were collected on the beach in the vicinity of the previous historic house sited within the APE and noted in the fields just north of the house.

In 1988, James River Institute for Archaeology (JRIA) completed a long linear archaeological survey (GL-021) for the Coleman Bridge replacement study, with subsurface shovel testing through the center of the current APE. The survey did not meet current

standards with 75 foot spacing and had varied spacing in some areas. The survey documented site 44GL0286 as an Early to Late Woodland temporary camp, indicating multiple artifacts were seen at low tide along the beach. JRIA recommended Phase II testing. Site 44GL0287 was recorded as an 18<sup>th</sup>-century artifact scatter on a farmstead/plantation and subsurface features in the northeast part of site also recommended for Phase II testing. No boundary for the survey is provided in VCRIS or the report.

| <b>DHR Survey #</b> | <b>Report</b>   | <b>Sites in the APE &amp; NRHP Eligibility</b>   |
|---------------------|---|--|
| GL-014              | Anderson, John R.<br>1974. A Surface Survey of the Carter Creek Area, Gloucester County, Virginia. Virginia Archaeological Research Center, University of Virginia. DHR Report #GL-014.   | Judgmental surface collection survey. Undesignated unevaluated multiple component site subsequently recorded as individual sites. 44GL0254 in the APE Woodland campsite unevaluated. |
| GL-021              | Hodges, Charles, C. Hudgins, R. Hunter, and M. McCartney.<br>1988. George P. Coleman Bridge York River Crossing Study Land Based Technical Report Phase 1B Historic and Archaeological Resources. James River Institute for Archaeology Inc. DHR Report #GL-21.                             | 44GL0286 Early to Late Woodland and 44GL0287 18 <sup>th</sup> Century domestic/plantation recommended for Phase II testing. No mapping of survey boundaries available.               |
| GL-022              | Koski-Karell, Daniel<br>1988. George P. Coleman Bridge York River Crossing Study Underwater Archaeology Technical Report. Karell Archaeological Services. DHR Report #GL-022.   | 44GL0302 magnetic anomaly unevaluated  |
| YO-62               | Higgins, T., R. Hunter, Jr., C. Downing, G. Robinson, M. Brown III, and F. White.<br>1989. Phase II Evaluation of Cultural Resources within the Proposed York River Crossing Alternatives Appendix B: Vol. 3. College of William and Mary Archaeological Project Center. DHR Report #YO-62. | Phase I testing under current guidelines at 44GL0286 and 44GL0287. Both sites recommended eligible for the NRHP.   |
| GL-103              | Harpole, Thane, David Brown and Anna Hayden.  | 44GL0286: 32 judgmental shovel tests plotted on unscaled maps.   |

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In 2012, the Fairfield Foundation excavated 32 judgmentally placed shovel test pits in locations of tree plantings within the bounds of 44GL0286 (GL-103). Most of the artifacts recovered were oyster shell along with Middle and Late Woodland ceramics and low densities of historic artifacts. The Fairfield Foundation recommended expanding the boundaries of site 44GL0286 and that the site is potentially eligible for the NRHP. In 2013, the Fairfield Foundation expanded their survey into the field to the south of the Rosewell Plantation Road with an additional 47 shovel test pits (GL-117) at 44GL0287. These shovel test pits were placed at 50-foot intervals within an approximately 5.5-acre site area. Although some testing was characterized as “Phase II”, no excavation units were placed in an effort to identify features, only shovel testing was performed. The Fairfield Foundation recommended expanding the boundary of site 44GL0287 and the site as potentially eligible for the NRHP. The current site boundaries and eligibility recommendations have not been evaluated in VCRIS by DHR staff.

USACE proposes a qualified consultant meeting the Secretary of the Interior’s Professional Qualifications (36 CFR 61) conduct a Phase I archaeological survey, a Phase I historic architectural reconnaissance survey and historic properties visual impact survey in accordance with the Secretary of Interior’s *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), DHR’s *Guidelines for Conducting Historic Resources Survey in Virginia* (2017) and any subsequent updates, and DHR’s guidance “Assessing Visual Effects on Historic Properties”.

The Phase I archaeological survey would be in the entire archaeological APE to provide systematic subsurface testing. Previous investigations in the shoreline area of previously identified sites 44GL0286 and 44GL0254 were mainly surficial and did not adequately assess site extent into the tidal area.

Thank you in advance for letting us know if the Fairfield Foundation would like to be a consulting party in the Section 106 compliance process for this project. Your reply by May 20, 2023, would be greatly appreciated. Please contact me at (757) 630-9074 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

MILLER.SUSAN.  
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Susan G. Miller, M.A., R.P.A  
District Archaeologist/Tribal Liaison

Attachments

## Miller, Susan G CIV USARMY CENAO (USA)

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**From:** Fairfield Foundation <fairfield@fairfieldfoundation.org>  
**Sent:** Thursday, April 20, 2023 4:14 PM  
**To:** Miller, Susan G CIV USARMY CENAO (USA)  
**Cc:** Lauren McMillan; Mowery, Peyton CIV USARMY CENAO (USA)  
**Subject:** Re: [Non-DoD Source] Re: Middle Peninsula State Park Living Shoreline Section 106 Initiation

Yes - I'm the primary contact :)  
Dave

On Thu, Apr 20, 2023 at 4:11 PM Miller, Susan G CIV USARMY CENAO (USA) <[Susan.G.Miller@usace.army.mil](mailto:Susan.G.Miller@usace.army.mil)> wrote:

Dr. Brown,

Very good, thank you for responding so quickly! Could you please confirm that you are the primary contact for the Foundation on this project?

Thank you,

Susan

Susan G. Miller, M.A., RPA

Archaeologist & Tribal Liaison

Norfolk District, U.S. Army Corps of Engineers

Planning and Policy Branch

Environmental Analysis Section

803 Front Street

Norfolk, Virginia 23510

(757) 201-7008

---

**From:** Fairfield Foundation <[fairfield@fairfieldfoundation.org](mailto:fairfield@fairfieldfoundation.org)>  
**Sent:** Thursday, April 20, 2023 3:31 PM  
**To:** Miller, Susan G CIV USARMY CENAO (USA) <[Susan.G.Miller@usace.army.mil](mailto:Susan.G.Miller@usace.army.mil)>  
**Cc:** Lauren McMillan <[lauren.mcmillan@dcr.virginia.gov](mailto:lauren.mcmillan@dcr.virginia.gov)>; Mowery, Peyton CIV USARMY CENAO (USA) <[Peyton.J.Mowery@usace.army.mil](mailto:Peyton.J.Mowery@usace.army.mil)>  
**Subject:** [Non-DoD Source] Re: Middle Peninsula State Park Living Shoreline Section 106 Initiation

Hellow,

the Fairfield Foundation would like to be a consulting party in the Section 106 compliance process for this project. Thank you for this invitation and we look forward to learning more.

Sincerely,

Dr. David A. Brown, Co-Director, The Fairfield Foundation

On Thu, Apr 20, 2023 at 2:14 PM Miller, Susan G CIV USARMY CENAO (USA) <[Susan.G.Miller@usace.army.mil](mailto:Susan.G.Miller@usace.army.mil)> wrote:

Hello Mr. Krakow,

Please find attached a letter inviting the Fairfield Foundation to participate in the Section 106 consultation for the subject project located in Gloucester County, Virginia. Also attached are graphics referred to in the letter. The USACE Norfolk District and non-federal sponsor Virginia Division of Conservation and Recreation – State Parks are proposing a project to address erosion on the north bank of the York River in the vicinity of Middle Peninsula State Park. USACE is the lead federal agency for Section 106 compliance.

Please let me know if you have any difficulty opening the attached or need additional information or assistance.

Respectfully,

Susan

Susan G. Miller, M.A., RPA

Archaeologist & Tribal Liaison

Norfolk District, U.S. Army Corps of Engineers



**DEPARTMENT OF THE ARMY  
US ARMY CORPS OF ENGINEERS  
NORFOLK DISTRICT  
FORT NORFOLK  
803 FRONT STREET  
NORFOLK VA 23510-1011**

APRIL 20, 2023

SUBJECT: Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106 Initiation

Ms. Katie Legg  
County Administration Representative  
Gloucester County Historical Committee  
County Office Bldg 2  
6489 Main Street  
Gloucester County, VA 23061

Dear Ms. Legg:

The Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula State Park (MPSP) along the York River in Gloucester County, Virginia. We are inviting the Gloucester County Historical Committee to be a consulting party in the Section 106 compliance process for this project.

The project would remove the derelict timber groins and degrading bulkhead, grade the existing topography into a natural sloping shoreline, install an offshore reef structure, and restore the wetland and marsh areas on the eastern and western extents of the property (Figure 1). The project is on State property and is authorized by Section 510 of the Water Resources Development Act of 1996, as amended, within the Chesapeake Bay Environmental Restoration and Protection Program. The Section 510 program contributes to achieving protection and restoration goals established by the 2009 Executive Order 13508 and the 2014 Chesapeake Bay Program Agreement by restoring clean water, recovering habitat, and sustaining fish and wildlife.

The MPSP is not currently open to the public but is planned to open for recreation accessible by land and the York River. The project is needed to address failing timber groins and bulkhead walls that pose a safety hazard to recreational use of the shoreline and are no longer effective at reducing erosion along the riverbank. The proposed action is the removal of the timber groins and bulkhead, grading the riverbank, native plantings, and placement of reef structures below the low-tide level near shore. The No Action alternative would not remove the failing shoreline erosion structures and replace them with nature-

based shoreline restoration and reefs that reduce shoreline erosion. The No Action alternative would potentially lead to more erosion that could adversely impact historic properties.

The undertaking consists of demolition and removal of the existing groins and bulwark, grading a slope along the riverbank, placing artificial reefs on the river bottom, planting vegetation, upgrading the existing access road with gravel and using a construction equipment staging area. The archaeological APE as defined by 36 CFR 800.16(d) is approximately 10.8 acres (see Figure 1). Historic data indicates the archaeological APE has had previous residences, outbuildings, agricultural use including recently plowed fields, and above- and below-ground utilities. Demolition of the groins and bulwark will pull them down and cut any remaining portions 1-2 feet deep. The grading and graveling of the existing road would extend a maximum 2 foot deep. Creating the slope along the shore will involve removing vegetation and organics up to a foot deep. The oyster reef will be placed on the water bottom with no excavation, with minimal settlement.

The architectural APE for above ground cultural resources is the area within which physical and visual impacts to historic properties could occur if present in the APE (Figure 1). The architectural APE is a buffer within approximately ¼ mile of the area of direct effects (69.5 acres) and is defined in part based on Department of Historic Resource's (DHR) guidance "Assessing Visual Effects on Historic Properties".

The Virginia Cultural Resources Information System (VCRIS) provided online by DHR was checked for information on previously completed surveys and documented sites in the APE by persons meeting or exceeding the Secretary of the Interior Professional Qualification Standards at 36 CFR 61 on February 6 and 27, 2023. Six Phase I archaeological surveys described in Table 1 have been previously completed in the archaeological APE (Figure 2). Three known sites are within the archaeological APE and are shown in Figure 3.

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shovel testing through the center of the current APE. The survey did not meet current standards with 75 foot spacing and had varied spacing in some areas. The survey documented site 44GL0286 as an Early to Late Woodland temporary camp, indicating multiple artifacts were seen at low tide along the beach. JRIA recommended Phase II testing. Site 44GL0287 was recorded as an 18<sup>th</sup>-century artifact scatter on a farmstead/plantation and subsurface features in the northeast part of site also recommended for Phase II testing. No boundary for the survey is provided in VCRIS or the report.

| <b>DHR Survey #</b> | <b>Report</b>   | <b>Sites in the APE &amp; NRHP Eligibility</b>   |
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| GL-021              | Hodges, Charles, C. Hudgins, R. Hunter, and M. McCartney.<br>1988. George P. Coleman Bridge York River Crossing Study Land Based Technical Report Phase 1B Historic and Archaeological Resources. James River Institute for Archaeology Inc. DHR Report #GL-21.                             | 44GL0286 Early to Late Woodland and 44GL0287 18 <sup>th</sup> -Century domestic/plantation recommended for Phase II testing. No mapping of survey boundaries available.              |
| GL-022              | Koski-Karell, Daniel<br>1988. George P. Coleman Bridge York River Crossing Study Underwater Archaeology Technical Report. Karell Archaeological Services. DHR Report #GL-022.   | 44GL0302 magnetic anomaly unevaluated  |
| YO-62               | Higgins, T., R. Hunter, Jr., C. Downing, G. Robinson, M. Brown III, and F. White.<br>1989. Phase II Evaluation of Cultural Resources within the Proposed York River Crossing Alternatives Appendix B: Vol. 3. College of William and Mary Archaeological Project Center. DHR Report #YO-62. | Phase I testing under current guidelines at 44GL0286 and 44GL0287. Both sites recommended eligible for the NRHP.   |

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| GL-103 | Harpole, Thane, David Brown and Anna Hayden.<br>2013. Middle Peninsula State Park Archaeological Survey: 2012 Summary Report. The Fairfield Foundation. DHR Report #GL-103.      | 44GL0286: 32 judgmental shovel tests plotted on unscaled maps. Multi-component Middle to Late Woodland prehistoric occupation with a small 18 <sup>th</sup> -century historic component. Recommended expanding site boundary and additional Phase II testing. Recommended eligible for the NRHP. Still unevaluated in VCRIS. |
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USACE proposes a qualified consultant meeting the Secretary of the Interior’s Professional Qualifications (36 CFR 61) conduct a Phase I archaeological survey, a Phase I historic architectural reconnaissance survey and historic properties visual impact survey in accordance with the Secretary of Interior’s *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), DHR’s *Guidelines for Conducting Historic Resources Survey in Virginia* (2017) and any subsequent updates, and DHR’s guidance “Assessing Visual Effects on Historic Properties”.

The Phase I archaeological survey would be in the entire archaeological APE to provide systematic subsurface testing. Previous investigations in the shoreline area of previously identified sites 44GL0286 and 44GL0254 were mainly surficial and did not adequately assess site extent into the tidal area.

Thank you in advance for letting us know if the Gloucester County Historical Committee would like to be a consulting party in the Section 106 compliance process for this project. Your reply by May 20, 2023, would be greatly appreciated. Please contact me at (757) 630-9074 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

MILLER.SUSAN.  
GLENETTE.1364  
984355

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Susan G. Miller, M.A., R.P.A  
District Archaeologist/Tribal Liaison

Attachments

## **Appendix A-1 Environmental: Area of Potential Effects**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**Area of Potential Effects**

**November 2024**



**US Army Corps  
of Engineers®**  
Norfolk District

## Miller, Susan G CIV USARMY CENAO (USA)

---

**From:** Mcmillan, Lauren (DCR) <Lauren.McMillan@dcr.virginia.gov>  
**Sent:** Thursday, May 2, 2024 4:07 PM  
**To:** Miller, Susan G CIV USARMY CENAO (USA)  
**Subject:** [Non-DoD Source] Re: MPSP Living Shoreline - Cultural Visual Assessment Methodology

Hello Susan,

Sorry, I left Monday night and got back just a little while ago from some site visits.

I looked at the map and I agree, no adverse effect. Thank you!

**Lauren McMillan, PhD, RPA**  
**Cultural Resource Manager**  
Virginia State Parks  
Virginia Department of Conservation and Recreation  
804-584-0429 | [lauren.mcmillan@dcr.virginia.gov](mailto:lauren.mcmillan@dcr.virginia.gov)

Virginia State Parks Mission Statement:

*"To conserve the natural, scenic, historic and cultural resources of the Commonwealth and provide recreational and educational opportunities consistent with the good stewardship of these lands, waters and facilities that leaves them unimpaired for future generations."*

---

**From:** Miller, Susan G CIV USARMY CENAO (USA) <Susan.G.Miller@usace.army.mil>  
**Sent:** Thursday, May 2, 2024 1:57 PM  
**To:** Mcmillan, Lauren (DCR) <Lauren.McMillan@dcr.virginia.gov>  
**Subject:** MPSP Living Shoreline - Cultural Visual Assessment Methodology

Hello Lauren,

Please find attached a description of the methodology used to conduct the visual impact assessment. We will include this in the EA/Chief's Report in the cultural section.

Regards,

Sue

Susan G. Miller, M.A., RPA  
Archaeologist & Tribal Liaison  
Norfolk District, U.S. Army Corps of Engineers  
Planning and Policy Branch  
Environmental Analysis Section  
803 Front Street  
Norfolk, Virginia 23510  
(757) 201-7008

## Miller, Susan G CIV USARMY CENAO (USA)

---

**From:** Mcmillan, Lauren (DCR) <Lauren.McMillan@dcr.virginia.gov>  
**Sent:** Thursday, June 13, 2024 12:38 PM  
**To:** Miller, Susan G CIV USARMY CENAO (USA)  
**Subject:** [Non-DoD Source] Re: MPSP Draft SHPO APE Update Ltr review

Thank you, Susan. I don't have any comments. This all makes sense to me. Thank you for keeping me in the loop.

Lauren

**Lauren McMillan, PhD, RPA**  
**Cultural Resource Manager**  
Virginia State Parks  
Virginia Department of Conservation and Recreation  
804-584-0429 | [lauren.mcmillan@dcr.virginia.gov](mailto:lauren.mcmillan@dcr.virginia.gov)



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**From:** Miller, Susan G CIV USARMY CENAO (USA) <Susan.G.Miller@usace.army.mil>  
**Sent:** Friday, June 7, 2024 11:50 AM  
**To:** Mcmillan, Lauren (DCR) <Lauren.McMillan@dcr.virginia.gov>  
**Subject:** MPSP Draft SHPO APE Update Ltr review

Happy Friday Lauren,

Please find attached for your review and comments the draft SHPO letter and supporting figures/documents for updating the APE. The Yorktown Cheatham Annex of the Navy is in the viewshed of the project so the visual APE was expanded to include that area. I spoke with their archaeologist who expressed I should formally consult with their leadership which I will do – trying to get the contact information to do that now. As you are aware, the project is only visible from the tree-top level at the base, but we will have to carry the visual impact assessment further through the process.

Once we get responses on the APE I will send out the draft PA for review.

Please feel free to contact me with any questions or concerns. If you could reply ASAP it would be greatly appreciated.

Thank you,

Sue

Susan G. Miller, M.A., RPA  
Archaeologist & Tribal Liaison  
Norfolk District, U.S. Army Corps of Engineers  
Planning and Policy Branch



**DEPARTMENT OF THE ARMY  
US ARMY CORPS OF ENGINEERS  
NORFOLK DISTRICT  
FORT NORFOLK  
803 FRONT STREET  
NORFOLK VA 23510-1011**

June 20, 2024

SUBJECT: Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106 Compliance, APE Update DHR# 2023-3373

Samantha Henderson, Archaeologist  
Division of Review and Compliance  
Virginia Department of Historic Resources  
2801 Kensington Avenue  
Richmond, VA 23221-2470

Dear Ms. Henderson:

As you are aware, the Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula Unit of Machicomoco State Park along the York River in Gloucester County, Virginia. The project would remove the derelict timber groins and degrading bulkhead; grade the existing topography into a natural sloping shoreline; install an offshore reef structure; and restore the wetland and marsh areas on the eastern and western extents of the property (Figure 1). USACE initiated the Section 106 process for the undertaking by letter to your office on April 19, 2023, including a description of the undertaking and definition of the area of potential effects (APE). Since then, proposed measures have expanded and consequently the APE has changed. Please review the following and provide any comments or concerns.

New measures developed include installing breakwaters, sills or vegetated slopes that would be visible above the mean lowest low water level, and toe protection to the marshes. In addition, permanent access roads and an equipment staging area are proposed to facilitate construction. The new entire direct APE encompasses 18.46 acres (Figure 2).

USACE used Geographic Information System (GIS) and mapping tools to develop an updated viewshed, as new proposed structures would be visible above the water. The GIS indicates the new viewshed extends to the south shore of the York River, on the US Navy Yorktown Cheatham Annex (Figure 3). However, the project would only be visible from the tree-top level. USACE has coordinated with the Navy and has invited them to participate in the Section 106 process for this project.

The Virginia Cultural Resources Information System (VCRIS) provided online by DHR was checked for information on previously completed surveys and documented sites in the new areas of the direct APE by persons meeting or exceeding the Secretary of the Interior Professional Qualification Standards at 36 CFR 61 on May 22, 2024. No previous surveys or sites have been identified within the expanded direct APE beyond those identified in our April 2023 letter.

VCRIS was also checked June 5 and 6, 2024 for previously completed Phase 1 archaeological surveys and known sites in the viewshed APE at the Navy Yorktown Cheatham Annex (Table 1, Figures 4 and 5). Most of the viewshed has had previous Phase I and limited Phase II archeological survey. Table 1 and Figure 5 show nine sites have been previously recorded within the viewshed APE. Of these, three are eligible for the National Register of Historic Places (NRHP), two are not eligible, and four are unevaluated.

USACE proposes a qualified consultant meeting the Secretary of the Interior's Professional Qualifications (36 CFR 61) conduct a Phase I archaeological survey, a Phase I historic architectural reconnaissance survey and historic properties visual impact survey in accordance with the Secretary of Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), DHR's *Guidelines for Conducting Historic Resources Survey in Virginia* (2017) and any subsequent updates, and DHR's guidance "Assessing Visual Effects on Historic Properties". The Phase I archaeological survey would be in the entire direct APE to provide systematic subsurface testing. Previous investigations in the shoreline area of previously identified sites 44GL0286 and 44GL0254 were mainly surficial and did not adequately assess site extent into the tidal area.

USACE proposes a Programmatic Agreement be developed for the undertaking under 36 CFR § 800.14(b)(1)[ii] that allows federal agencies to fulfill their obligations under Section 106 through the development and implementation of programmatic agreements when effects on historic properties cannot be determined prior to approval of an undertaking. We propose to defer the inventory, evaluation, finding of effects, and treatment of historic properties within the direct and indirect APEs to the Design and Implementation phase of the project, after the NEPA decision has been made. Proposed signatories are USACE, SHPO, and invited signatory VDCR. If DHR concurs with this approach, we will invite the Advisory Council on Historic Preservation to participate in development of the PA.

USACE invited the Delaware Nation, the Pamunkey Indian Tribe, the Rappahannock Tribe, Inc., and the Upper Mattaponi Tribe to be consulting parties in the Section 106 process for this undertaking in late April 2023, and the Delaware Nation and Upper Mattaponi Tribe have accepted, the Rappahannock Tribe, Inc. has declined, while the Pamunkey Indian Tribe did not respond. We also invited the Gloucester County Historical Committee and the Rosewell/Fairfield Foundations to consult in April 2023 and the Rosewell/Fairfield Foundations have accepted but



the Gloucester County Historical Committee did not respond. USACE also invited the US Navy Yorktown Cheatham Annex as a consulting party under Section 106 but have not yet received a response. USACE is concurrently coordinating with the parties that accepted our invitation on the updated APEs and inviting their participation as concurring parties to the proposed PA.

USACE is also proposing that after construction of the Project, subsequent operations and maintenance undertakings associated with it would be considered separate undertakings with regard to Section 106.

Thank you in advance for your review. Please contact me at (757) 201-7008 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

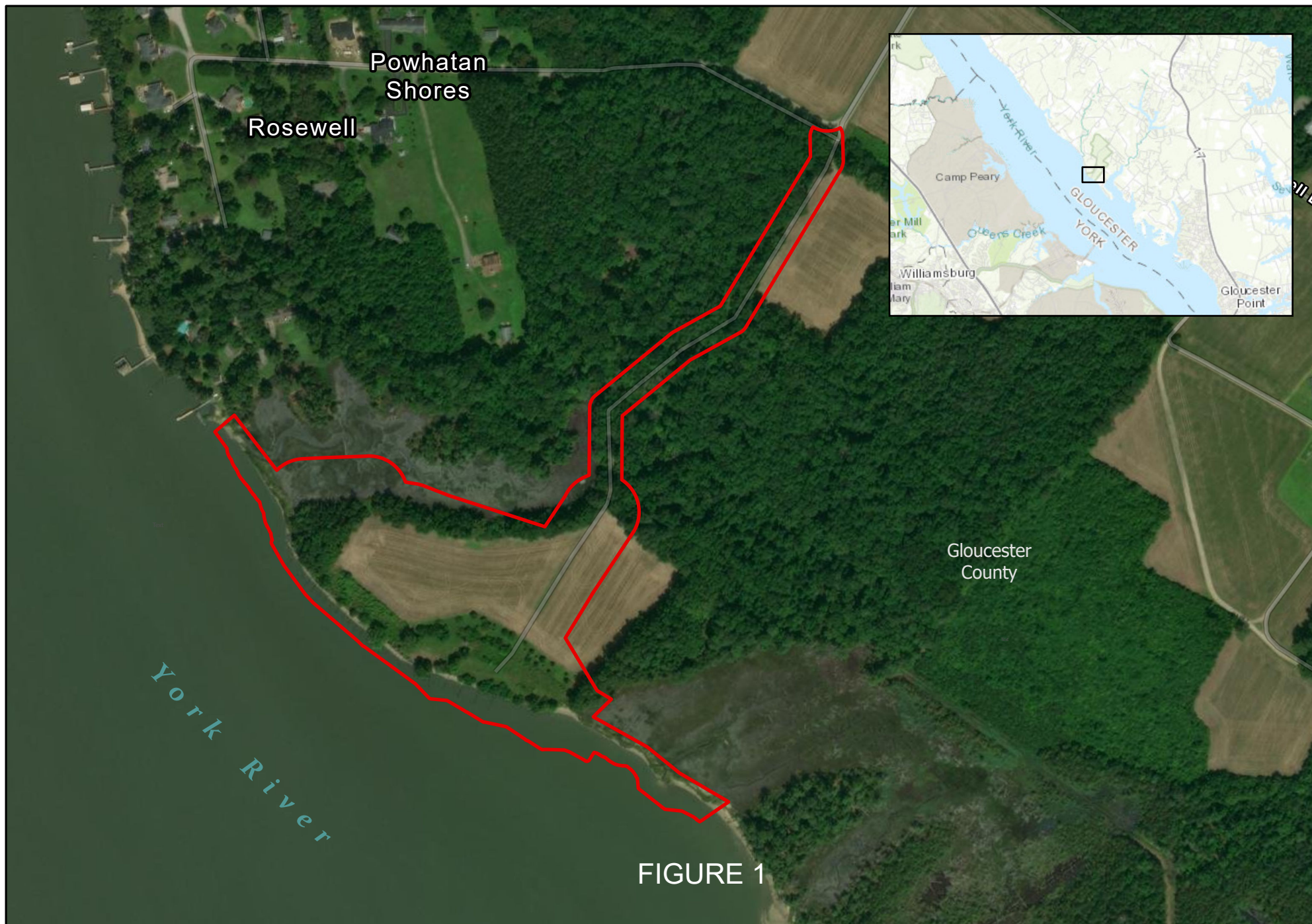
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Susan G. Miller, MA, RPA  
Norfolk District Archaeologist/Tribal Liaison

CC: Lauren McMillan, Virginia State Parks  
Attachments







Clay Bank, VA Quadrangle, Virginia (2023)  
USGS 7.5 minute series topographic  
quadrangle. United States Department of the  
Interior, United States Geologic Survey.

FIGURE 2

## Legend

Area of Potential Effects (APE)

0 1000 2000

0.5 inch = 1,000 Feet  
Developed By: Tammy Younkins  
Date of Map: 1/24/2023

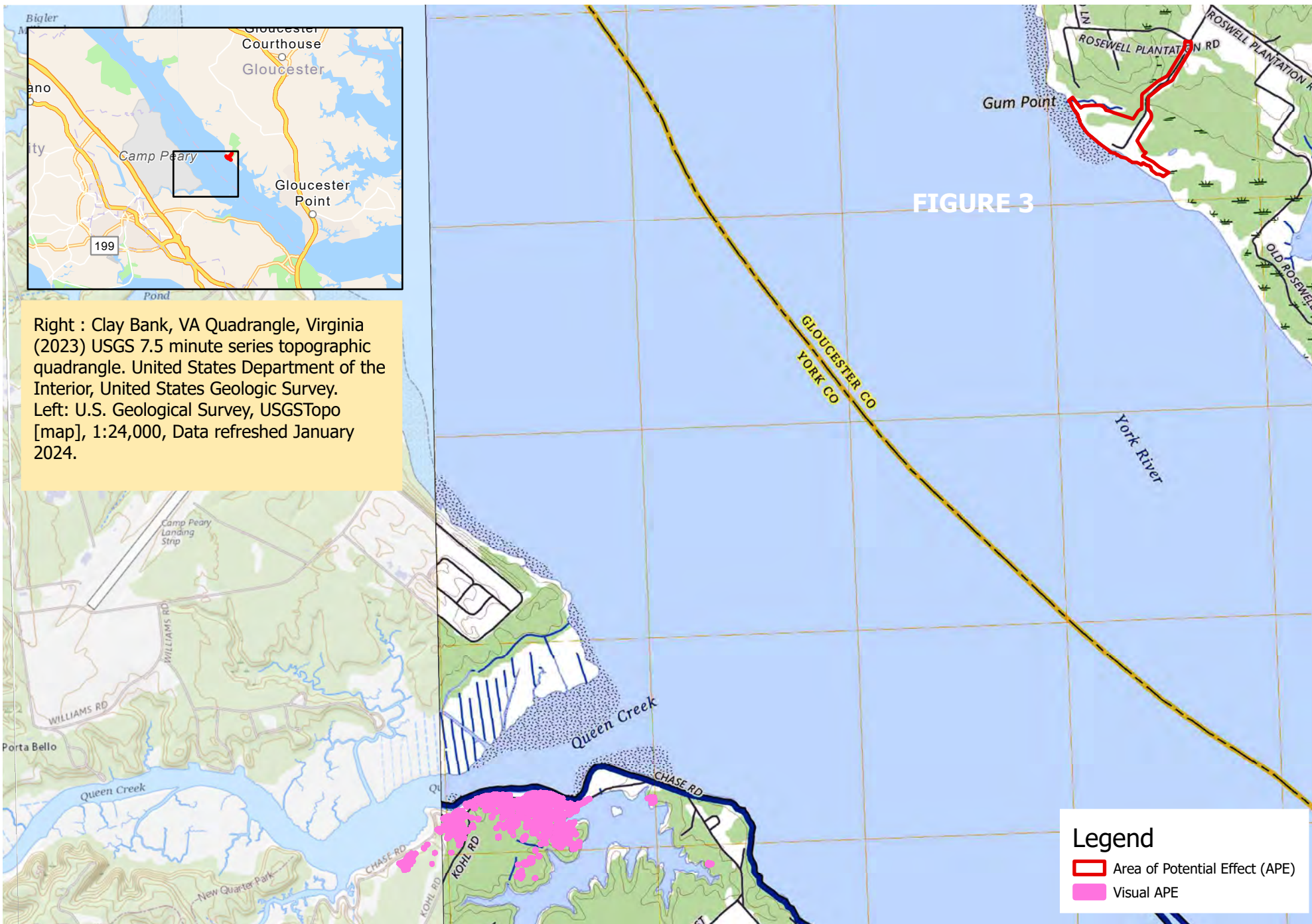


US Army Corps  
of Engineers  
Norfolk District

Middle Peninsula State Park  
Gloucester County, Virginia

Direct Area of Potential Effects





Right : Clay Bank, VA Quadrangle, Virginia (2023) USGS 7.5 minute series topographic quadrangle. United States Department of the Interior, United States Geologic Survey. Left: U.S. Geological Survey, USGTopo [map], 1:24,000, Data refreshed January 2024.

## Miller, Susan G CIV USARMY CENAO (USA)

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**From:** Henderson, Samantha (DHR) <samantha.henderson@dhr.virginia.gov>  
**Sent:** Friday, August 2, 2024 2:55 PM  
**To:** Miller, Susan G CIV USARMY CENAO (USA)  
**Cc:** Harr, Richard M CIV USARMY CENAO (USA); Mowery, Peyton CIV USARMY CENAO (USA); Mcmillan, Lauren (DCR)  
**Subject:** [Non-DoD Source] RE: Middle Peninsula State Park Living Shoreline APE Update DHR# 2023-3373

Dear Ms. Miller:

DHR understands that the Area of Potential Effects (APE) for this undertaking has been modified since the original correspondence in April 2023. DHR supports the recommendation for a Phase I Cultural resources survey of the entire APE. DHR will work with the US Army Corps of Engineers (Corps) and the Department of Conservation and Recreation (DCR) to develop a programmatic agreement for this undertaking, understanding that funding to conduct the historic properties identification cannot be allocated until the Design and Implementation phase of the undertaking. We look forward to consulting with the Corps and DCR further on this undertaking.

Regards,



**Samantha Henderson**

*Project Review Archaeologist*

*Department of Historic Resources*

Email [samantha.henderson@dhr.virginia.gov](mailto:samantha.henderson@dhr.virginia.gov)

Phone 804-482-6088



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2801 Kensington Ave, Richmond, VA 23221

[www.dhr.virginia.gov](http://www.dhr.virginia.gov)

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**From:** Miller, Susan G CIV USARMY CENAO (USA) <Susan.G.Miller@usace.army.mil>  
**Sent:** Thursday, June 20, 2024 11:11 AM  
**To:** Henderson, Samantha (DHR) <samantha.henderson@dhr.virginia.gov>  
**Cc:** Harr, Richard M CIV USARMY CENAO (USA) <Richard.M.Harr@usace.army.mil>; Mowery, Peyton CIV USARMY CENAO (USA) <Peyton.J.Mowery@usace.army.mil>; Mcmillan, Lauren (DCR) <Lauren.McMillan@dcrr.virginia.gov>  
**Subject:** Middle Peninsula State Park Living Shoreline APE Update DHR# 2023-3373

Hello Samantha,

Please find attached my letter requesting your review and comment to a change in the direct and indirect/visual area of potential effects for the subject project located in Gloucester County. The Virginia Department of Conservation and Recreation is the non-federal sponsor for the project and is a consulting party. Also attached is Table 1 referred to in the letter and supportive mapping. We are also consulting with the US Navy Yorktown Cheatham Annex in the expanded visual APE, as well as the Upper Mattaponi Tribe, Delaware Nation, and the Rosewell-Fairfield Foundation.

Please feel free to contact me with any questions and let me know you received this – I know you are limited to 10 mb!  
Thank you,

Sue

Susan G. Miller, M.A., RPA



**DEPARTMENT OF THE ARMY**  
**US ARMY CORPS OF ENGINEERS**  
**NORFOLK DISTRICT**  
**FORT NORFOLK**  
**803 FRONT STREET**  
**NORFOLK VA 23510-1011**

June 20, 2024

SUBJECT: USACE Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106 Compliance, APE Update DHR# 2023-3373

Ms. Katelyn Lucas  
Delaware National Historic  
Preservation Officer  
31064 State Highway 281  
Anadarko, OK 73005

Dear Ms. Lucas:

As you are aware, the Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula Unit of Machicomoco State Park along the York River in Gloucester County, Virginia. The project would remove the derelict timber groins and degrading bulkhead; grade the existing topography into a natural sloping shoreline; install an offshore reef structure; and restore the wetland and marsh areas on the eastern and western extents of the property (Figure 1). USACE initiated the Section 106 process for the undertaking with the Tribe on April 20, 2023, including a description of the undertaking and definition of the area of potential effects (APE) as well as to the State Historic Preservation Officer (SHPO) and other potential consulting parties. The Nation accepted our invitation to be a consulting party on May 5, 2023. Since then, proposed measures have expanded and consequently the APE has changed, expanding potential visual impacts to the US Navy Yorktown Cheatham Annex. Please review the following and provide any comments or concerns.

New measures developed include installing breakwaters, sills or vegetated slopes that would be visible above the mean lowest low water level, and toe protection to the marshes. In addition, permanent access roads and an equipment staging area are proposed to facilitate construction. The new entire direct APE encompasses 18.46 acres (Figure 2).

USACE used Geographic Information System (GIS) and mapping tools to develop an updated viewshed for the project, as new proposed structures would now be visible above the water. The GIS indicates the new viewshed extends to the south shore of the York River, on the US Navy Yorktown Cheatham Annex (Figure 3). However, the project would only be visible from the tree-top level.

The Virginia Cultural Resources Information System (VCRIS) provided online by the Department of Historic Resources was checked for information on previously completed surveys and documented sites in the new areas of the direct APE by persons meeting or exceeding the Secretary of the Interior Professional Qualification Standards at 36 CFR 61 on May 22, 2024. No previous surveys or sites have been identified within the expanded direct APE beyond those identified in our April 2023 letter.

VCRIS was also checked June 5 and 6, 2024 for previously completed Phase 1 archaeological surveys and known sites in the viewshed APE at the Navy Yorktown Cheatham Annex (Table 1 and Figures 4 and 5). Most of the viewshed has had previous Phase I and limited Phase II archeological survey. Table 1 and Figure 5 show nine sites have been previously recorded within the viewshed APE. Of these, three are eligible for the National Register of Historic Places (NRHP), two are not eligible, and four are unevaluated.

USACE proposes a qualified consultant meeting the Secretary of the Interior's Professional Qualifications (36 CFR 61) conduct a Phase I archaeological survey, a Phase I historic architectural reconnaissance survey and historic properties visual impact survey in accordance with the Secretary of Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), DHR's *Guidelines for Conducting Historic Resources Survey in Virginia* (2017) and any subsequent updates, and DHR's guidance "Assessing Visual Effects on Historic Properties". The Phase I archaeological survey would be in the entire direct APE to provide systematic subsurface testing. Previous investigations in the shoreline area of previously identified sites 44GL0286 and 44GL0254 were mainly surficial and did not adequately assess site extent into the tidal area.

USACE proposes a Programmatic Agreement be developed for the undertaking under 36 CFR § 800.14(b)(1)[ii] that allows federal agencies to fulfill their obligations under Section 106 through the development and implementation of programmatic agreements when effects on historic properties cannot be determined prior to approval of an undertaking. We propose to defer the inventory, evaluation, finding of effects, and treatment of historic properties within the direct and indirect APEs to the Design and Implementation phase of the project, after the NEPA decision has been made. Proposed signatories are USACE, the Virginia State Historic Preservation Officer (SHPO), and invited signatory VDCR. If the SHPO concurs with this approach, we will invite the Advisory Council on Historic Preservation to participate in development of the PA.

USACE invited the Delaware Nation, the Pamunkey Indian Tribe, the Rappahannock Tribe, Inc., and the Upper Mattaponi Tribe to be consulting parties in the Section 106 process for this undertaking in late April 2023, and the Delaware Nation and Upper Mattaponi Tribe have accepted, the Rappahannock Tribe, Inc. has declined, while the Pamunkey Indian Tribe did not respond. We also invited the Gloucester County Historical Committee and the Rosewell/Fairfield

Foundations to consult in April 2023 and the Rosewell/Fairfield Foundations have accepted but the Gloucester County Historical Committee did not respond. USACE is concurrently coordinating with the parties that accepted our invitation on the updated APEs and inviting their participation as concurring parties to the proposed PA. We welcome the Nation to continue being a consulting party and concurring party to the PA.

USACE is also proposing that after construction of the Project, subsequent operations and maintenance undertakings associated with it would be considered separate undertakings with regard to Section 106.

Thank you in advance for your comments. We would appreciate your response by July 20, 2024. Please contact me at (757) 201-7008 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

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Susan G. Miller, MA, RPA  
Norfolk District Archaeologist/Tribal Liaison

CC:

Lauren McMillan, Archaeologist Virginia State Parks  
Douglas Makin, Archaeologist WPNSTA Yorktown

Attachments





**DEPARTMENT OF THE ARMY**  
**US ARMY CORPS OF ENGINEERS**  
**NORFOLK DISTRICT**  
**FORT NORFOLK**  
**803 FRONT STREET**  
**NORFOLK VA 23510-1011**

June 20, 2024

SUBJECT: USACE Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106 Compliance, APE Update DHR# 2023-3373

Mr. Leigh Mitchell  
Environmental and Cultural  
Protection Director  
Upper Mattaponi Tribe  
13476 King William Road  
King William, VA 23086

Dear Mr. Mitchell:

As you are aware, the Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDNR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula Unit of Machicomoco State Park along the York River in Gloucester County, Virginia. The project would remove the derelict timber groins and degrading bulkhead; grade the existing topography into a natural sloping shoreline; install an offshore reef structure; and restore the wetland and marsh areas on the eastern and western extents of the property (Figure 1). USACE initiated the Section 106 process for the undertaking with the Tribe on April 20, 2023, including a description of the undertaking and definition of the area of potential effects (APE) as well as to the State Historic Preservation Officer (SHPO) and other potential consulting parties. The Tribe accepted our invitation to be a consulting party on May 16, 2023. Since then, proposed measures have expanded and consequently the APE has changed, expanding potential visual impacts to the US Navy Yorktown Cheatham Annex. Please review the following and provide any comments or concerns.

New measures developed include installing breakwaters, sills or vegetated slopes that would be visible above the mean lowest low water level, and toe protection to the marshes. In addition, permanent access roads and an equipment staging area are proposed to facilitate construction. The new entire direct APE encompasses 18.46 acres (Figure 2).

USACE used Geographic Information System (GIS) and mapping tools to develop an updated viewshed for the project, as new proposed structures would now be visible above the water. The GIS indicates the new viewshed extends to the south shore of the York River, on the

US Navy Yorktown Cheatham Annex (Figure 3). However, the project would only be visible from the tree-top level.

The Virginia Cultural Resources Information System (VCRIS) provided online by the Department of Historic Resources was checked for information on previously completed surveys and documented sites in the new areas of the direct APE by persons meeting or exceeding the Secretary of the Interior Professional Qualification Standards at 36 CFR 61 on May 22, 2024. No previous surveys or sites have been identified within the expanded direct APE beyond those identified in our April 2023 letter.

VCRIS was also checked June 5 and 6, 2024 for previously completed Phase 1 archaeological surveys and known sites in the viewshed APE at the Navy Yorktown Cheatham Annex (Table 1 and Figures 4 and 5). Most of the viewshed has had previous Phase I and limited Phase II archeological survey. Table 1 and Figure 5 show nine sites have been previously recorded within the viewshed APE. Of these, three are eligible for the National Register of Historic Places (NRHP), two are not eligible, and four are unevaluated.

USACE proposes a qualified consultant meeting the Secretary of the Interior's Professional Qualifications (36 CFR 61) conduct a Phase I archaeological survey, a Phase I historic architectural reconnaissance survey and historic properties visual impact survey in accordance with the Secretary of Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), DHR's *Guidelines for Conducting Historic Resources Survey in Virginia (2017)* and any subsequent updates, and DHR's guidance "Assessing Visual Effects on Historic Properties". The Phase I archaeological survey would be in the entire direct APE to provide systematic subsurface testing. Previous investigations in the shoreline area of previously identified sites 44GL0286 and 44GL0254 were mainly surficial and did not adequately assess site extent into the tidal area.

USACE proposes a Programmatic Agreement be developed for the undertaking under 36 CFR § 800.14(b)(1)[ii] that allows federal agencies to fulfill their obligations under Section 106 through the development and implementation of programmatic agreements when effects on historic properties cannot be determined prior to approval of an undertaking. We propose to defer the inventory, evaluation, finding of effects, and treatment of historic properties within the direct and indirect APEs to the Design and Implementation phase of the project, after the NEPA decision has been made. Proposed signatories are USACE, the Virginia State Historic Preservation Officer (SHPO), and invited signatory VDCR. If the SHPO concurs with this approach, we will invite the Advisory Council on Historic Preservation to participate in development of the PA.

USACE invited the Delaware Nation, the Pamunkey Indian Tribe, the Rappahannock Tribe, Inc., and the Upper Mattaponi Tribe to be consulting parties in the Section 106 process for this

undertaking in late April 2023, and the Delaware Nation and Upper Mattaponi Tribe have accepted, the Rappahannock Tribe, Inc. has declined, while the Pamunkey Indian Tribe did not respond. We also invited the Gloucester County Historical Committee and the Rosewell/Fairfield Foundations to consult in April 2023 and the Rosewell/Fairfield Foundations have accepted but the Gloucester County Historical Committee did not respond. USACE is concurrently coordinating with the parties that accepted our invitation on the updated APEs and inviting their participation as concurring parties to the proposed PA. We welcome the Tribe to continue being a consulting party and concurring party to the PA.

USACE is also proposing that after construction of the Project, subsequent operations and maintenance undertakings associated with it would be considered separate undertakings with regard to Section 106.

Thank you in advance for your comments. We would appreciate your response by July 20, 2024. Please contact me at (757) 201-7008 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

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Susan G. Miller, MA, RPA  
Norfolk District Archaeologist/Tribal Liaison

CC: Chief W. Frank Adams, Upper Mattaponi Tribe  
Ellen Chapman, Cultural Heritage Partners  
Elizabeth Horton, Cultural Heritage Partners  
Marion Werkheiser, Cultural Heritage Partners  
Lauren McMillan, Archaeologist Virginia State Parks  
Douglas Makin, Archaeologist WPNSTA Yorktown

Attachments



**DEPARTMENT OF THE ARMY**  
**US ARMY CORPS OF ENGINEERS**  
**NORFOLK DISTRICT**  
**FORT NORFOLK**  
**803 FRONT STREET**  
**NORFOLK VA 23510-1011**

June 20, 2024

SUBJECT: USACE Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106 Compliance, APE Update DHR# 2023-3373

CAPT Daniel A. Patrick  
Commanding Officer  
US Naval Weapons Station Yorktown  
BLDG 1959  
160 Main Road  
Yorktown, VA 23691

Dear CAPT Patrick:

The Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula Unit of Machicomoco State Park along the York River in Gloucester County, Virginia. The project would remove the derelict timber groins and degrading bulkhead; grade the existing topography into a natural sloping shoreline; install an offshore reef structure; and restore the wetland and marsh areas on the eastern and western extents of the property (Figure 1). USACE initiated the Section 106 process for the undertaking on April 20, 2023, including a description of the undertaking and definition of the area of potential effects (APE) to the State Historic Preservation Officer (SHPO) and potential consulting parties. Since then, proposed measures have expanded and consequently the APE has changed, expanding potential visual impacts to the US Navy Yorktown Cheatham Annex. Please review the following and provide any comments or concerns.

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the tree-top level. USACE invites your agency to participate in the Section 106 process for this project.

The Virginia Cultural Resources Information System (VCRIS) provided online by the Department of Historic Resources was checked for information on previously completed surveys and documented sites in the new areas of the direct APE by persons meeting or exceeding the Secretary of the Interior Professional Qualification Standards at 36 CFR 61 on May 22, 2024. No previous surveys or sites have been identified within the expanded direct APE beyond those identified in our April 2023 letter.

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undertaking in late April 2023, and the Delaware Nation and Upper Mattaponi Tribe have accepted, the Rappahannock Tribe, Inc. has declined, while the Pamunkey Indian Tribe did not respond. We also invited the Gloucester County Historical Committee and the Rosewell/Fairfield Foundations to consult in April 2023 and the Rosewell/Fairfield Foundations have accepted but the Gloucester County Historical Committee did not respond. USACE is concurrently coordinating with the parties that accepted our invitation on the updated APEs and inviting their participation as concurring parties to the proposed PA. We welcome the Navy to be a consulting party and concurring party to the PA.

USACE is also proposing that after construction of the Project, subsequent operations and maintenance undertakings associated with it would be considered separate undertakings with regard to Section 106.

Thank you in advance for your comments. We would appreciate your response by Thursday July 18, 2024. Please contact me at (757) 201-7008 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

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Susan G. Miller, MA, RPA  
Norfolk District Archaeologist/Tribal Liaison

CC: Lauren McMillan, Archaeologist Virginia State Parks  
Douglas Makin, Archaeologist WPNSTA Yorktown

Attachments



**DEPARTMENT OF THE ARMY  
US ARMY CORPS OF ENGINEERS  
NORFOLK DISTRICT  
FORT NORFOLK  
803 FRONT STREET  
NORFOLK VA 23510-1011**

June 20, 2024

SUBJECT: USACE Section 510 Middle Peninsula State Park Living Shoreline, Virginia, Section 106 Compliance, APE Update DHR# 2023-3373

Dr. David Brown, Co-Director  
Fairfield Foundation  
P.O. Box 157  
White Marsh, VA 23183

Dear Dr. Brown:

As you are aware, the Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula Unit of Machicomoco State Park along the York River in Gloucester County, Virginia. The project would remove the derelict timber groins and degrading bulkhead; grade the existing topography into a natural sloping shoreline; install an offshore reef structure; and restore the wetland and marsh areas on the eastern and western extents of the property (Figure 1). USACE initiated the Section 106 process for the undertaking by letter to your organization on April 20, 2023, including a description of the undertaking and definition of the area of potential effects (APE). Since then, proposed measures have expanded and consequently the APE has changed. Please review the following and provide any comments or concerns.

New measures developed include installing breakwaters, sills or vegetated slopes that would be visible above the mean lowest low water level, and toe protection to the marshes. In addition, permanent access roads and an equipment staging area are proposed to facilitate construction. The new entire direct APE encompasses 18.46 acres (Figure 2).

USACE used Geographic Information System (GIS) and mapping tools to develop an updated viewshed, as new proposed structures would be visible above the water. The GIS indicates the new viewshed extends to the south shore of the York River, on the US Navy Yorktown Cheatham Annex (Figure 3). However, the project would only be visible from the tree-top level. USACE has coordinated with the Navy and has invited them to participate in the Section 106 process for this project.

The Virginia Cultural Resources Information System (VCRIS) provided online by DHR was checked for information on previously completed surveys and documented sites in the new areas of the direct APE by persons meeting or exceeding the Secretary of the Interior Professional Qualification Standards at 36 CFR 61 on May 22, 2024. No previous surveys or sites have been identified within the expanded direct APE beyond those identified in our April 2023 letter.

VCRIS was also checked June 5 and 6, 2024 for previously completed Phase 1 archaeological surveys and known sites in the viewshed APE at the Navy Yorktown Cheatham Annex (Table 1 and Figures 4 and 5). Most of the viewshed has had previous Phase I and limited Phase II archeological survey. Table 1 and Figure 5 show nine sites have been previously recorded within the viewshed APE. Of these, three are eligible for the National Register of Historic Places (NRHP), two are not eligible, and four are unevaluated.

USACE proposes a qualified consultant meeting the Secretary of the Interior's Professional Qualifications (36 CFR 61) conduct a Phase I archaeological survey, a Phase I historic architectural reconnaissance survey and historic properties visual impact survey in accordance with the Secretary of Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716), DHR's *Guidelines for Conducting Historic Resources Survey in Virginia* (2017) and any subsequent updates, and DHR's guidance "Assessing Visual Effects on Historic Properties". The Phase I archaeological survey would be in the entire direct APE to provide systematic subsurface testing. Previous investigations in the shoreline area of previously identified sites 44GL0286 and 44GL0254 were mainly surficial and did not adequately assess site extent into the tidal area.

USACE proposes a Programmatic Agreement be developed for the undertaking under 36 CFR § 800.14(b)(1)[ii] that allows federal agencies to fulfill their obligations under Section 106 through the development and implementation of programmatic agreements when effects on historic properties cannot be determined prior to approval of an undertaking. We propose to defer the inventory, evaluation, finding of effects, and treatment of historic properties within the direct and indirect APEs to the Design and Implementation phase of the project, after the NEPA decision has been made. Proposed signatories are USACE, the Virginia State Historic Preservation Officer (SHPO), and invited signatory VDCR. If the SHPO concurs with this approach, we will invite the Advisory Council on Historic Preservation to participate in development of the PA.

USACE invited the Delaware Nation, the Pamunkey Indian Tribe, the Rappahannock Tribe, Inc., and the Upper Mattaponi Tribe to be consulting parties in the Section 106 process for this undertaking in late April 2023, and the Delaware Nation and Upper Mattaponi Tribe have accepted, the Rappahannock Tribe, Inc. has declined, while the Pamunkey Indian Tribe did not respond. We also invited the Gloucester County Historical Committee and the Rosewell/Fairfield



Foundations to consult in April 2023 and the Rosewell/Fairfield Foundations have accepted but the Gloucester County Historical Committee did not respond. USACE also invited the US Navy Yorktown Cheatham Annex as a consulting party under Section 106 but have not yet received a response. USACE is concurrently coordinating with the parties that accepted our invitation on the updated APEs and inviting their participation as concurring parties to the proposed PA.

USACE is also proposing that after construction of the Project, subsequent operations and maintenance undertakings associated with it would be considered separate undertakings with regard to Section 106.

Thank you in advance for your comments. We would appreciate your response by Thursday July 20, 2024. Please contact me at (757) 201-7008 or [susan.g.miller@usace.army.mil](mailto:susan.g.miller@usace.army.mil) if you need additional information or assistance.

Sincerely,

MILLER.SUSAN.GL  
ENETTE.13649843

Digitally signed by  
MILLER.SUSAN.GLENETTE.1364  
984355

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Date: 2024.06.20 09:52:31  
-04'00'

Susan G. Miller, MA, RPA  
Norfolk District Archaeologist/Tribal Liaison

CC: Lauren McMillan, Virginia State Parks  
Attachments

**Appendix A-1 Environmental: Advisory Council on Historic Preservation Consultation  
Documentation**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**Advisory Council on Historic Preservation Consultation Documentation**

**November 2024**



**US Army Corps  
of Engineers®**  
Norfolk District

## Miller, Susan G CIV USARMY CENAO (USA)

---

**From:** Miller, Susan G CIV USARMY CENAO (USA)  
**Sent:** Wednesday, September 4, 2024 3:59 PM  
**To:** e106@achp.gov  
**Cc:** Henderson, Samantha; klucas@delawarenation-nsn.gov; Leigh Mitchell; Fairfield Foundation; Lauren McMillan; Harr, Richard M CIV USARMY CENAO (USA); Mowery, Peyton CIV USARMY CENAO (USA)  
**Subject:** Middle Peninsula State Park Shoreline Restoration Invitation to Consult  
**Attachments:** Mid Penin 106 Initiation Coordination.zip; MPSP APE Update Coordination.zip; USACE MPSP e106 form.docx

Good afternoon,

Please find attached a completed e106 form to invite the ACHP to participate in the Section 106 process for the subject undertaking, with accompanying supportive maps and documents. Please review the attached and contact me should you need any additional information. The USACE Norfolk District is the lead federal agency for Section 106 on the proposed shoreline restoration along the York River shoreline of the Middle Peninsula State Park in Gloucester County, Virginia. The Virginia Department of Commerce and Recreation is the nonfederal sponsor. We are inviting the Council to participate in the development of a Programmatic Agreement in accordance with 36 CFR 800.14(b) (1) (ii) when effects to historic properties cannot be fully determined prior to approval of an undertaking. The copied individuals are the consulting parties including the Virginia SHPO and others that accepted our invitation to participate in the Section 106 process for this undertaking.

The supportive documentation is provided organized in two compressed files covering the Section 106 initiation coordination and then the following update to the area of potential effects coordination.

Please let me know if you have any difficulty opening the attached and confirm your receipt. If you have difficulty receiving zipped or larger file sizes, please let me know and I can place them on our DODSAFE website for you to download at your convenience.

Regards,

Susan

Susan G. Miller, M.A., RPA  
Archaeologist & Tribal Liaison  
Norfolk District, U.S. Army Corps of Engineers  
Planning and Policy Branch  
Environmental Analysis Section  
803 Front Street  
Norfolk, Virginia 23510  
(757) 201-7008



**Advisory Council on Historic Preservation  
Electronic Section 106 Documentation Submittal System (e106) Form  
*MS Word format***

**Send to: *e106@achp.gov***

**Please review the instructions at [www.achp.gov/e106-email-form](http://www.achp.gov/e106-email-form) prior to completing this form. Questions about whether to use the e106 form should be directed to the assigned ACHP staff member in the Office of Federal Agency Programs.**

**I. Basic information**

**1. Purpose of notification.** Indicate whether this documentation is to:

- ☒ Notify the ACHP of a finding that an undertaking may adversely affect historic properties
- ☒ Invite the ACHP to participate in a Section 106 consultation
- ☐ Propose to develop a project Programmatic Agreement (project PA) for complex or multiple undertakings in accordance with 36 C.F.R. 800.14(b)(3)
- ☐ Supply additional documentation for a case already entered into the ACHP record system
- ☐ File an executed MOA or PA with the ACHP in accordance with 800.6(b)(iv) (where the ACHP did not participate in consultation)
- ☒ Other, please describe  
Notice that USACE will prepare a Programmatic Agreement that takes into account effects on historic properties during the Design and Implementation phase, as time and budget constraints, and the maturity of design needed will not allow these studies prior to the approval of the undertaking, per 36 CFR 800. 14(b)(1)[ii].

**2. ACHP Project Number** (If the ACHP was previously notified of the undertaking and an ACHP Project Number has been provided, enter project number here and skip to Item 7 below): [Click here to enter text.](#)

**3. Name of federal agency** (If multiple agencies, list them all and indicate whether one is the lead agency):

U.S. Army Corps of Engineers, Norfolk District Lead Agency

**4. Name of undertaking/project** (Include project/permit/application number if applicable):

Middle Peninsula State Park Section 510, Chesapeake Bay Environmental Restoration and Protection Program.

**5. Location of undertaking** (Indicate city(s), county(s), state(s), land ownership, and whether it would occur on or affect historic properties located on tribal lands):

The undertaking is located in Gloucester County, Virginia on Middle Peninsula State Park lands and would not involve any tribal land or have the potential to impact historic properties on tribal land.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

401 F Street NW, Suite 308 ☐ Washington, DC 20001-2637

Phone: 202-517-0200 ☐ Fax: 202-517-6381 ☐ [achp@achp.gov](mailto:achp@achp.gov) ☐ [www.achp.gov](http://www.achp.gov)

**6. Name and title of federal agency official and contact person for this undertaking, including email address and phone number:**

Susan Miller Norfolk District Archaeologist/Tribal Liaison, USACE

[Susan.g.miller@usace.army.mil](mailto:Susan.g.miller@usace.army.mil)

(757) 201-7008

**II. Information on the Undertaking\***

**7. Describe the undertaking and nature of federal involvement** (if multiple federal agencies are involved, specify involvement of each):

Norfolk District of the U.S. Army Corps of Engineers (USACE) and Non-Federal Sponsor Virginia Department of Conservation and Recreation (VDCR) are preparing a National Environmental Policy Act (NEPA) Environmental Assessment evaluating the potential environmental effects of restoring approximately 2,100 linear feet of shoreline across the Middle Peninsula Unit of Machicomoco State Park along the York River in Gloucester County, Virginia. The project would remove the derelict timber groins and degrading bulkhead by pulling them out; grade the existing topography into a natural sloping shoreline; install an offshore reef structure; and restore the wetland and marsh areas on the eastern and western extents of the property. Additional measures developed include installing breakwaters, sills or vegetated slopes that would be visible above the mean lowest low water level, and toe protection to the marshes. In addition, permanent access roads and an equipment staging area are proposed to facilitate construction. The project is being completed under USACE's Section 510 Program of the Water Resources Development Act of 1996, as amended, within the Chesapeake Bay Environmental Restoration and Protection Program. The Section 510 program contributes to achieving protection and restoration goals established by the 2009 Executive Order 13508 and the 2014 Chesapeake Bay Program Agreement by restoring clean water, recovering habitat, and sustaining fish and wildlife. The project would be completed with federal and state funds and permitting.

**8. Describe the Area of Potential Effects (APE):**

The direct APE expanded as the project concepts advanced in detail. The direct APE includes all areas where earth disturbance from construction would occur. The direct APE is approximately 18.46 acres and includes a graded gravel access road, actively cultivated agricultural fields, a prior home site with no above ground structures remaining, aerial and buried utilities, marshes, woodland, and shoreline. The park is not currently open to the public.

The visual/auditory APE for indirect effects from the undertaking has been preliminarily defined in a Geographic Information Systems analysis based on the structural portion of the project with the highest elevation. The visual/auditory APE expanded across the York River in the vicinity of the U.S. Navy Weapons Station Yorktown-Cheatham Annex, approximately at the top of trees level. A detailed visual effect to historic properties study will be completed in the Design and Implementation project phase.

**9. Describe steps taken to identify historic properties:**

Because of the time, budget, and design maturity limits of the Feasibility Study, USACE proposes efforts to identify all potential historic properties in the direct APE and visual/auditory APE will be completed in the future Design and Implementation phase. Pursuant to 36 CFR 800. 14(b)(1)[ii], USACE will develop a Programmatic Agreement that includes measures to take into account effects on historic properties, after

the approval of the undertaking (NEPA decision).

USACE proposes a qualified consultant meeting the Secretary of the Interior's Professional Qualifications (36 CFR 61) conduct a Phase I archaeological survey, a Phase I historic architectural reconnaissance survey and historic properties visual impact survey in accordance with the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716), DHR's Guidelines for Conducting Historic Resources Survey in Virginia (2017) and any subsequent updates, and DHR's guidance "Assessing Visual Effects on Historic Properties". The Phase I archaeological survey would be in the entire direct APE to provide systematic subsurface testing. Previous investigations in the shoreline area of previously identified sites 44GL0286 and 44GL0254 were mainly surficial and did not adequately assess site extent into the tidal area.

**10. Describe the historic property (or properties) and any National Historic Landmarks within the APE (or attach documentation or provide specific link to this information):**

See the attached USACE to SHPO letter dated April 19, 2023 describing six previous Phase I archaeological surveys and three known sites (44GL0254; 44GL0286, 44GL0287) in the direct APE. VCRIS was also checked June 5 and 6, 2024 for previously completed Phase I archaeological surveys and known sites in the viewshed APE at the Navy Yorktown Cheatham Annex (see attached USACE to SHPO letter dated June 20, 2024). Most of the viewshed has had previous Phase I and limited Phase II archaeological survey. Nine sites have been previously recorded within the viewshed APE. Of these, three are eligible for the National Register of Historic Places (NRHP) (44YO0059, 44YO1060, and 047-0002/099-5241), two are not eligible (44YO0149, 44YO1132), and four are unevaluated (44YO0121, 099-0105-0128, 99-0105-0124, 44YO0220).

**11. Describe the undertaking's effects on historic properties:**

Effects of the undertaking are unknown at this time. However, the types of proposed measures will cause earth disturbance and is likely to have physical and visual/auditory impacts to historic properties.

**12. Explain how this undertaking would adversely affect historic properties (include information on any conditions or future actions known to date to avoid, minimize, or mitigate adverse effects):**

Exact effects to historic properties are unknown at this time. However, based on the known sites in the direct APE, the preferred alternative has been modified to not require cutting back the shoreline. Slopes from the riverbank into the water would be created by placing sand at the existing bank and extending into the water. The timber embankment wall and groins will be pulled out to minimize potential effects to archaeological historic properties.

**13. Provide copies or summaries of the views provided to date by any consulting parties, Indian tribes or Native Hawai'ian organizations, or the public, including any correspondence from the SHPO and/or THPO.**

Attached are copies of correspondence to potentially interested tribes, the SHPO, the VDCR, and potentially interested consulting parties organized as Section 106 Initiation and 2024 APE Update. All responding parties concurred with the definition of the APE, acknowledged development of a Programmatic Agreement, and proposed Phase I survey methods/standards.

\* see *Instructions for Completing the ACHP e106 Form*

**III. Additional Information**

**14. Please indicate the status of any consultation that has occurred to date, including whether there are any unresolved concerns or issues the ACHP should know about in deciding whether to participate in consultation.** Providing a list of consulting parties, including email addresses and phone numbers if known, can facilitate the ACHP's review response.

See attached excel files with tribal and other consulting parties' contact information. USACE invited the Delaware Nation, the Pamunkey Indian Tribe, the Rappahannock Tribe, Inc., and the Upper Mattaponi Tribe to be consulting parties in the Section 106 process for this undertaking in late April 2023, and the Delaware Nation and Upper Mattaponi Tribe have accepted, the Rappahannock Tribe, Inc. has declined, while the Pamunkey Indian Tribe did not respond. We also invited the Gloucester County Historical Committee and the Rosewell/Fairfield Foundations to consult in April 2023 and the Rosewell/Fairfield Foundations have accepted but the Gloucester County Historical Committee did not respond. USACE also invited the US Navy Yorktown Cheatham Annex as a consulting party under Section 106 in June 2024 but have not yet received a response. USACE has worked closely with the Park archaeologist in definition of the APE, tribes and consulting parties' coordination, and draft SHPO consultation reviews. USACE contacted SHPO, the Delaware Nation, the Upper Mattaponi Tribe, Fairfield Foundation, and the Navy Yorktown Station Cheatham Annex about an update to the direct and visual/auditory APEs in June 2024, to which only the SHPO responded with their concurrence. Copies of all correspondence are attached. No unresolved concerns of note to the ACHP have been identified.

**15 Does your agency have a website or website link where the interested public can find out about this project and/or provide comments? Please provide relevant links:**

<https://www.nao.usace.army.mil/midpenstudy/>

**16. Is this undertaking considered a "major" or "covered" project listed on the Federal Infrastructure Projects Permitting Dashboard? If so, please provide the link:**

No

**The following are attached to this form (check all that apply):**

- ☒ Section 106 consultation correspondence
- ☒ Maps, photographs, drawings, and/or plans
- ☐ Additional historic property information
- ☒ Consulting party list with known contact information
- ☐ Other: [Click here to enter text.](#)

## **Appendix A-1 Environmental: Draft Programmatic Agreement**

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**MIDDLE PENINSULA STATE PARK  
CHESAPEAKE BAY ENVIRONMENTAL RESTORATION AND PROTECTION  
PROGRAM, SECTION 510**

**GLOUCESTER COUNTY, VIRGINIA**

**Draft Programmatic Agreement**

**November 2024**



**US Army Corps  
of Engineers®**  
Norfolk District



PROGRAMMATIC AGREEMENT AMONG THE UNITED STATES ARMY CORPS  
OF ENGINEERS, THE VIRGINIA STATE HISTORIC PRESERVATION OFFICE,  
AND THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION  
REGARDING THE SECTION 510 MIDDLE PENINSULA UNIT OF MACHICOMOCO  
STATE PARK LIVING SHORELINE PROJECT

**1. WHEREAS**, the U.S. Army Corps of Engineers, Norfolk District (hereinafter USACE) and the Virginia Department of Conservation and Recreation (hereinafter VDCR) are proposing to install a living shoreline along the Middle Peninsula Unit of the Machicomoco State Park on the York River in Gloucester County Virginia, authorized by Section 510 of the Water Resources Development Act of 1996, as amended, within the Chesapeake Bay Environmental Restoration and Protection Program (hereinafter Project), to be partly financed with federal funds and subject to federal permitting; and

**2. WHEREAS**, the Project involves removing existing timber groins and bulkheads, and constructing breakwaters, sand fill, vegetated slopes, marsh fringe enhancement with toe protection, or offshore reef structures; and

**3. WHEREAS**, the USACE has determined that the Project constitutes an undertaking, as defined in 36 C.F.R. § 800.16(y), and therefore, is subject to Section 106 of the National Historic Preservation Act of 1966 (hereinafter NHPA), 54 U.S.C. § 306108; and

**4. WHEREAS**, the USACE is the Lead Federal Agency for compliance with Section 106 of the NHPA for this Project pursuant to 36 C.F.R. § 800.2(a)(2); and

**5. WHEREAS**, VDCR is the non-federal sponsor of the project, is a Consulting Party in the Section 106 process for the project, and is an Invited Signatory to this agreement; and

**6. WHEREAS**, the USACE and VDCR have consulted with the Virginia State Historic Preservation Office (hereinafter SHPO) within the Virginia Department of Historic Resources (DHR) pursuant to 36 CFR Part 800, the regulations implementing Section 106 of the NHPA (54 U.S.C. § 306108) (hereinafter Section 106); and

**7. WHEREAS**, the USACE, in consultation with the SHPO, has established the Project's direct Area of Potential Effects (hereinafter APE) as the areas where earth disturbance will take place and the indirect APE as the area within which there may be temporary or permanent visual and noise effects to historic properties associated with construction (Attachment A); and

**8. WHEREAS**, the indirect APE viewshed is at tree-top level and not visible from the ground level on the southern shore of the York River, and therefore the undertaking would have no adverse effect to historic properties; and

**9. WHEREAS**, previous archaeological surveys have been conducted within

portions of the Project's direct APE, and previously identified archaeological sites 44GL0254, 44GL0286, 44GL0287 and 44GL0302 are within the Project's direct APE, of which all are noted as unevaluated for the National Register of Historic Places (NRHP) in the Virginia Cultural Resources Information System (VCRIS); and

**10. WHEREAS** the USACE, in consultation with the SHPO, has determined that the Project has the potential to cause adverse effects to previously identified archaeological sites and unidentified archaeological sites in the direct APE which may be eligible for listing in the NRHP; and

**11. WHEREAS**, the USACE and VDCR have consulted with the SHPO, and the parties have agreed that after construction of the Project, subsequent operations and maintenance undertakings associated with it would be considered separate undertakings with regard to Section 106; and

**12. WHEREAS**, 36 CFR § 800.14(b)(1)[ii] allows federal agencies to fulfill their obligations under Section 106 through the development and implementation of programmatic agreements when effects on historic properties cannot be determined prior to approval of an undertaking; and

**13. WHEREAS**, in accordance with 36 CFR § 800.14(b), the USACE has notified the Advisory Council on Historic Preservation (hereinafter ACHP) of its intention to develop this programmatic agreement (hereinafter Agreement) pursuant to 36 CFR § 800.14(b)(1)[iii] (letter dated September 4, 2024), and the ACHP has not responded in the 15-day period specified in 36 CFR 800.6(a)(iii); and

**14. WHEREAS**, in accordance with 36 CFR § 800.14(b)(2)(i) the USACE has invited the Delaware Nation, the Pamunkey Indian Tribe, the Rappahannock Tribe, Inc., and the Upper Mattaponi Tribe to consult on and sign this Agreement as concurring parties and the Delaware Nation and Upper Mattaponi Tribe have accepted, the Rappahannock Tribe, Inc. has declined, while the Pamunkey Indian Tribe did not respond; and

**15. WHEREAS**, in accordance with 36 CFR § 800.2(c)(3) the USACE has invited the Gloucester County Historical Committee, the Rosewell/Fairfield Foundation, and the U.S. Navy Weapons Station Yorktown – Cheatham Annex to consult on and sign this Agreement as concurring parties and the Rosewell/Fairfield Foundations have accepted but the Gloucester County Historical Committee and the Navy did not respond; and

**16. WHEREAS**, in accordance with 36 CFR § 800.2(d) the USACE will be soliciting public comment on the Project through advertising the National Environmental Policy Act Environmental Assessment in local media and the USACE website;

**NOW, THEREFORE**, the USACE, the SHPO and VDCR (hereinafter Signatories) agree

that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on historic properties.

## **STIPULATIONS**

The USACE shall ensure that the following measures are carried out:

### **I. ARCHAEOLOGICAL RESOURCES**

#### **A. Identification**

1. The USACE and VDCR shall complete efforts to identify archaeological sites eligible for listing on the NRHP within the direct APE for the Project in accordance with 36 CFR §800.4(b) and SHPO's *Guidelines for Conducting Historic Resources Survey in Virginia* (2011, rev. 2017). The USACE shall conduct these identification efforts (Phase I survey) during the Design and Implementation phase of the project pursuant to the requirements of Stipulations VI.A and VI.B of this Agreement. Applicable permits from VDCR and DHR will be obtained by consultants for this work. Per Stipulation III.B of this Agreement, the USACE shall provide the Signatories the opportunity to review and concur, and the Concurring Parties the opportunity to review and comment on a report and its findings.

#### **B. Evaluation**

1. USACE shall determine NRHP eligibility based on applying the NRHP Criteria as specified in 36 CFR 60.4. Pursuant to Stipulation III.B, USACE shall provide the Signatories the opportunity to review and concur, and the Concurring Parties the opportunity to review and comment on USACE's determinations of eligibility.

2. If information developed from Phase I archaeological investigation is insufficient for determining NRHP eligibility of an archaeological site, USACE shall ensure a Phase II investigation will be completed in accordance with SHPO's *Guidelines for Conducting Historic Resources Survey in Virginia* (2011, rev. 2017), or subsequent revisions or replacements to the document. USACE will ensure a written Phase II testing plan will be completed in accordance with SHPO's guidance and shall provide the Signatories the opportunity to review and concur, and the Concurring Parties the opportunity to review and comment on the plan prior to implementation. Applicable permits from VDCR and DHR for this work would be obtained by consultants performing Phase II testing.

#### **C. Assessment of Effects**

If archaeological sites meeting the criteria for listing on the NRHP are identified as a result of the activities described in Paragraphs A.1 and A.2 of this Stipulation, the

USACE shall assess the effects of the Project on these properties in a manner consistent with 36 CFR 800.5 and submit its findings to the Signatories for its review and concurrence, and to the Concurring Parties for review and comment pursuant to Stipulation III.B. If the USACE, in consultation with the Signatories and the Concurring Parties, finds that an archaeological site eligible for listing on the NRHP will be adversely affected by the Project, the USACE in consultation with the Signatories shall determine whether avoidance or minimization of the adverse effects is practicable.

#### D. Treatment of Archaeological Sites Determined Eligible for Listing on the NRHP

If the adverse effects cannot be practicably avoided, the USACE, in consultation with the Signatories and the other Concurring Parties, shall develop a data recovery treatment plan for the archaeological site. In a manner consistent with Stipulation III.B of this Agreement, the USACE shall provide the Signatories the opportunity to review and concur with, and the Concurring Parties the opportunity to review and comment on the treatment plan. Consultants implementing the treatment plan shall obtain applicable permits from VDCR and DHR.

1. Any treatment plan the USACE develops for an archaeological property under the terms of this Stipulation shall be consistent with the requirements of Stipulation VI.A of this Agreement and shall include, at a minimum:

- (a) Information on the portion of the property where data recovery or controlled site burial, as appropriate, is to be carried out, and the context in which the property is eligible for the NRHP;
- (b) The results of previous research relevant to the project;
- (c) Research problems or questions to be addressed, with an explanation of their relevance and importance;
- (d) The field and laboratory analysis methods to be used, with a justification of their cost-effectiveness and how they apply to this particular property and the research needs;
- (e) The methods to be used in artifact, data, and other records management;
- (f) Explicit provisions for disseminating in a timely manner the research findings to professional peers;
- (g) Arrangements for presenting to the public the research findings, focusing particularly on the community or communities that may have interests in the results;
- (h) The curation of recovered materials and records resulting from the data recovery in accordance with 36 CFR Part 79; and
- (i) Procedures for evaluating and treating discoveries of unexpected archaeological remains during the course of the project, including necessary consultation with other parties.

2. The USACE shall ensure the treatment plan is implemented and that any agreed-upon data recovery field operations have been completed before ground-disturbing activities associated with the Project are initiated at or near the affected archaeological historic property. The USACE shall notify the Signatories once data recovery field operations have been completed. The proposed construction may proceed following this notification while the technical report is in preparation. The USACE shall ensure that the archaeological site form on file in the DHR's VCRIS is updated to reflect the implementation of the treatment plan for each affected site.

## **II. ARCHITECTURAL RESOURCES**

### **A. Identification**

1. Within the direct APE (Attachment A), USACE will ensure a Phase I architectural survey of all buildings and structures dating to 45 years before the year of the survey are recorded and evaluated for their eligibility for the NRHP in accordance with 36 CFR 800.4(b). The USACE shall conduct these identification efforts (Phase I survey) during the Design and Implementation phase of the project pursuant to the requirements of Stipulations VI.A and VI.B of this Agreement. USACE shall coordinate with the Signatories and Concurring Parties to determine the NRHP eligibility of all such unevaluated structures identified during these surveys. These surveys shall employ methods conforming to those described in the DHR's *Guidelines for Conducting Historic Resources Survey in Virginia* (2011, rev. 2017), or subsequent revisions or replacements to the document.

2. Within the indirect APE (Attachment A), USACE will ensure a selective reconnaissance survey of architectural or structural resources within the viewshed of the undertaking potentially affected by visual and audible elements of the undertaking will be completed in conformance with the DHR's *Virginia Department of Historic Resources Assessing Visual Effects on Historic Properties* guidance and other relevant accepted historic preservation publications and practices. The USACE shall conduct these identification efforts during the Design and Implementation phase of the project pursuant to the requirements of Stipulations VI.A and VI.B of this Agreement. USACE shall coordinate with the Signatories and Concurring Parties to determine the potential NRHP eligibility of unevaluated buildings and structures identified in the viewshed during these surveys.

### **B. Assessment of Effects**

1. If architectural districts, sites, buildings, structures, or objects, or cultural landscapes meeting the criteria for listing on the NRHP are identified in the direct APE as a result of the activities described in Paragraphs A.1 and A.2 of Stipulation II, the USACE shall assess the effects of the Project on these properties in a manner consistent with 36 CFR 800.5 and submit its findings to the Signatories for their review and concurrence, and to the Concurring Parties for review and comment pursuant to Stipulation III.B. If the USACE, in consultation with the Signatories and the Concurring Parties, finds that an architectural resource eligible for listing on the NRHP will be adversely affected by the Project, the USACE in consultation with the Signatories and

Concurring Parties, shall determine whether avoidance or minimization of the adverse effects is practicable.

2. If architectural districts, sites, buildings, structures, objects, or cultural landscapes listed in or eligible for the NRHP are within the indirect APE, potential visual and auditory impacts will be assessed by USACE in accordance with 36 CFR 800.5 and DHR's "*Virginia Department of Historic Resources Assessing Visual Effects on Historic Properties*" guidance. USACE will submit its findings to the Signatories for their review and concurrence and Concurring Parties for their review and comment pursuant to Stipulation III.B. If architectural historic properties would be adversely affected by visual or auditory elements of the Project, USACE will determine whether avoidance and minimization of the adverse effects is practicable in consultation with the Signatories and Concurring Parties.

### C. Treatment Plan

If adverse effects to architectural or structural historic properties are unavoidable, the USACE shall ensure a Treatment Plan is developed in consultation with the Signatories and Concurring Parties to resolve all adverse effects resulting from the Project, which would be appended to this Agreement without amending the Agreement. The Treatment Plan shall outline the minimization and mitigation measures necessary to resolve the adverse effects to historic properties. Proposed mitigation measures may include, but are not limited to, Historic American Building Survey (HABS)/Historic American Engineering Record (HAER) documentation, historic markers, interpretive brochures and publications, depending on their criterion for NRHP eligibility. Mitigation measures for adverse visual/auditory effects may include but are not limited to vegetative or other screening, interpretive signage, educational programs, informative web sites, donation of preservation easements, contributions to preservation funds, or combinations of any of these or other mitigations as agreed upon by USACE, the Signatories and Concurring Parties. Should the Signatories be unable to agree on a Treatment Plan, the Signatories shall proceed in accordance with Stipulation XI: Dispute Resolution.

## III. PREPARATION AND REVIEW OF DOCUMENTS

### A. Technical Preparation

All archaeological and architectural studies, technical reports, and treatment plans prepared pursuant to this Agreement shall be consistent with the federal standards titled *Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (48 FR 44716- 44742, September 29, 1983), the DHR's *Guidelines for Conducting Historic Resources Survey in Virginia* (2011, rev. 2017), the SHPO's "*Virginia Department of Historic Resources Assessing Visual Effects on Historic Properties*", the ACHP's *Recommended Approach for Consultation on Recovery of*

*Significant Information from Archaeological Sites* (1999), the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, and the *Secretary of the Interior's Standards and Guidelines for Architectural and Engineering Documentation* (48 FR 44730- 44734, September 29, 1983) or subsequent revisions or replacements to these documents.

#### B. Review

The Signatories and Concurring Parties agree to provide comments to the USACE on all technical materials, findings, and other documentation arising from this Agreement within thirty (30) calendar days of receipt unless otherwise specified. If no comments are received from the SHPO, another Signatory, or a Concurring Party within the thirty (30) calendar-days review period, the USACE may assume that the non-responsive party has no comment. The USACE shall take into consideration all comments received in writing from the Signatories and Concurring Parties within the thirty (30)-calendar-day review period.

#### C. Physical Documents

The USACE shall provide the SHPO two (2) copies, one (1) hard copy on acid-free paper and one (1) in Adobe® Portable Document Format (.pdf) on a memory drive, of all final reports prepared pursuant to this Agreement. The USACE shall also provide any other Signatory or Concurring Party a copy in the format as requested by that party. Such requests must be received by the USACE in writing prior to the completion of construction of the Project.

### IV. CURATION STANDARDS

The USACE shall ensure that all original archaeological records (research notes, field records, maps, drawings, and photographic records) and all archaeological collections recovered from the USACE Project area produced as a result of implementing the Stipulations of this Agreement are provided to the DHR for permanent curation. In exchange for its standard collections management fee as published in the *Virginia Department of Historic Resources State Collections Management Standards* (2007, rev. 2017), or subsequent revisions or replacements to that document, the DHR agrees to maintain such records and collections in accordance with 36 CFR 79, *Curation of Federally Owned and Administered Archaeological Collections*.

### V. CHANGES IN PROJECT SCOPE

In the event of any changes to the Project scope that may alter the direct or indirect APE, the USACE shall consult with Signatories and the Concurring Parties pursuant to 36 CFR § 800.2 through § 800.5.

## **VI. STANDARDS AND QUALIFICATIONS**

### **A. Research and Professional Standards**

All work carried out pursuant to this Agreement shall meet the *Secretary of the Interior's Standards for Archaeology and Historic Preservation*, and *The Secretary of the Interior's Standards for the Treatment of Historic Properties - Technical Preservation Services (U.S. National Park Service) (nps.gov)*. The USACE shall ensure that all archaeological and architectural work carried out pursuant to this Agreement shall be done by or under the direct supervision of archaeology and historic architectural professionals who meet the *Secretary of the Interior's Professional Qualifications Standards*. The USACE shall ensure that consultants retained for services pursuant to this Agreement meet these standards.

## **VII. TREATMENT OF HUMAN REMAINS**

### **A. Coordination**

In the event human skeletal remains or burials are encountered during implementation of the Project, the USACE shall coordinate its compliance with Section 106 with other applicable federal, state, and local laws and reviews as appropriate.

### **B. Permits**

Historic and prehistoric human remains from non-federal, non-tribal and state lands are subject to protection under Virginia's burial/unmarked grave/cemetery law(s) which require a permit from the DHR before remains are removed. As such, if human remains are discovered during construction, work in that portion of the project shall stop immediately. The remains shall be covered and/or protected in place in such a way that minimizes further exposure of and damage to the remains and any associated funerary items, and the USACE shall immediately consult with the SHPO. If the remains are found to be Native American, in accordance with applicable law, a treatment plan shall be developed by USACE and SHPO in consultation with appropriate federally recognized Indian tribes. USACE shall ensure that any treatment and reburial plan is fully implemented. If the remains are not Native American, the appropriate local authority shall be consulted to determine final disposition of the remains. Avoidance and preservation in place are the preferred option for treating human remains.

### **C. Additional Procedures**

Additional procedures regarding the treatment of human remains are detailed in Attachment B of this Agreement.

## **VIII. POST-REVIEW DISCOVERIES**

If properties are discovered that may be historically significant or unanticipated effects on historic properties are found subsequent to the completion of surveys



under Stipulations I and II, the USACE shall implement the discovery plan included as Attachment B of this Agreement.

## **IX. COMMUNICATIONS**

Electronic mail (email) may serve as the official correspondence method for all communications regarding this Agreement and its provisions. See Attachment C for a list of contacts and email addresses. Contact information in Attachment C may be updated as needed without an amendment to this Agreement. It is the responsibility of each party to the Agreement to immediately inform the USACE of any change in name, address, email address, or phone number of any point-of-contact. The USACE shall forward this information to all Signatories and Concurring Parties by email.

## **X. MONITORING AND REPORTING**

Each year on the anniversary of the execution of this Agreement until it expires or is terminated, the USACE shall provide all parties to this Agreement a summary report detailing work undertaken pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in the USACE's efforts to carry out the terms of this Agreement. The reporting period shall be the fiscal year from October 1 to September 30.

## **XI. DISPUTE RESOLUTION**

Should any party to this Agreement object in writing at any time to any actions proposed under this Agreement, or the manner in which the terms of this Agreement are implemented, the USACE shall consult with the objecting party to resolve the objection. If the USACE determines that such objection cannot be resolved, the USACE will:

### **A. Documentation**

Forward all documentation relevant to the dispute, including the USACE's proposed resolution, to the ACHP. The ACHP shall provide the USACE with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the USACE shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, Signatories and Concurring Parties, and provide them with a copy of this written response. The USACE shall then proceed according to its final decision.

### **B. Resolution**

If the ACHP does not provide its advice regarding the dispute within the thirty (30) day period, the USACE may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the USACE shall prepare a written response that takes into account any timely comments regarding the dispute

from the Signatories and Concurring Parties to the Agreement and provide them and the ACHP with a copy of such written response.

#### **C. Continuity**

The USACE's responsibilities to carry out all other actions subject to the terms of this Agreement that are not the subject of the dispute remain unchanged.

### **XII. ANTI-DEFICIENCY ACT**

The USACE's obligations under this Agreement are subject to the availability of appropriated funds, and the Stipulations of this Agreement are subject to the provisions of the Anti-Deficiency Act. The USACE shall make reasonable and good faith efforts to secure the necessary funds to implement this Agreement in its entirety. If compliance with the Anti-Deficiency Act alters or impairs the USACE's ability to implement the stipulations of this agreement, the USACE shall consult in accordance with the amendment and termination procedures found at Stipulations XIII and XV of this Agreement.

### **XIII. AMENDMENTS**

This Agreement may be amended when such an amendment is agreed to in writing by all Signatories. The amendment shall be effective on the date a copy signed by all of the Signatories is filed with the ACHP. Attachment D is a template for amendments.

### **XIV. ADDING CONCURRING PARTIES**

Other Concurring Parties may be added to the Agreement after its execution without requiring an amendment to the Agreement. Agreement Signatories and Concurring Parties shall be notified by USACE of the additions and provided a copy of signature pages.

### **XV. TERMINATION**

If any Signatory to this Agreement determines that its terms are not or cannot be carried out, that party shall immediately consult with the other Signatories to attempt to develop an amendment per Stipulation XIII, above. If within thirty (30) days (or another time period agreed to by all Signatories) an amendment cannot be reached, any Signatory may terminate the Agreement upon written notification to the other Signatories.

Once the Agreement is terminated, and prior to work continuing on the Project, the USACE must either (a) execute another Agreement pursuant to 36 CFR § 800.14 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. The USACE shall notify the Signatories as to the course of action it will pursue.

## **XVI. DURATION**

Subsequent to its execution, this Agreement shall expire if its terms are not carried out within ten (10) years from the date of its execution by the Signatories. Six (6) months prior to such time, the USACE shall consult with the other Signatories and Concurring Parties to reconsider the terms of the Agreement and amend it in accordance with Stipulation XIII above, if necessary.

## **XVII. EXECUTION OF THIS AGREEMENT**

This Agreement may be executed in counterparts, with a separate page for each party. The USACE shall ensure that each party is provided with a copy of the fully executed Agreement.

Execution and submission of this Agreement, and implementation of its terms, evidence that the USACE has afforded the ACHP an opportunity to comment on the proposed undertaking and its effect on historic properties, and that the USACE has taken into account the effect of the undertaking on historic properties.

Attachment A – Area of Potential Effects

Attachment B – Procedures for Post-Review Discoveries

Attachment C – Contact Information

Attachment D – PA Amendment Template

**SIGNATORIES TO THE PROGRAMMATIC AGREEMENT REGARDING THE  
SECTION 510 MIDDLE PENINSULA STATE PARK UNIT OF MACHICOMOCO  
LIVING SHORELINE PROJECT**

**U.S. ARMY CORPS OF ENGINEERS, NORFOLK DISTRICT**

BY: \_\_\_\_\_  
Sonny B. Avichal, P.E.  
Colonel, U.S. Army  
Commanding

DATE: \_\_\_\_\_

DRAFT

**SIGNATORY:**

**VIRGINIA STATE HISTORIC PRESERVATION OFFICE**

BY: \_\_\_\_\_

Julie Langan, Director

Department of Historic Resources and State Historic Preservation Officer

DATE: \_\_\_\_\_

DRAFT

**INVITED SIGNATORY:**

**VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION**

BY: TBD

DATE: \_\_\_\_\_

DRAFT

**CONCURRING PARTY:**

**DELAWARE NATION**

BY: \_\_\_\_\_  
Katelyn Lucas, Tribal Historic Preservation Officer

DATE: \_\_\_\_\_

DRAFT

**CONCURRING PARTY:**

**THE UPPER MATTAPONI INDIAN TRIBE**

BY: TBD DATE: \_\_\_\_\_  
[Insert Name and title]

DRAFT



**CONCURRING PARTY:**

**FAIRFIELD FOUNDATION**

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
Dr. David Brown, Co-Director

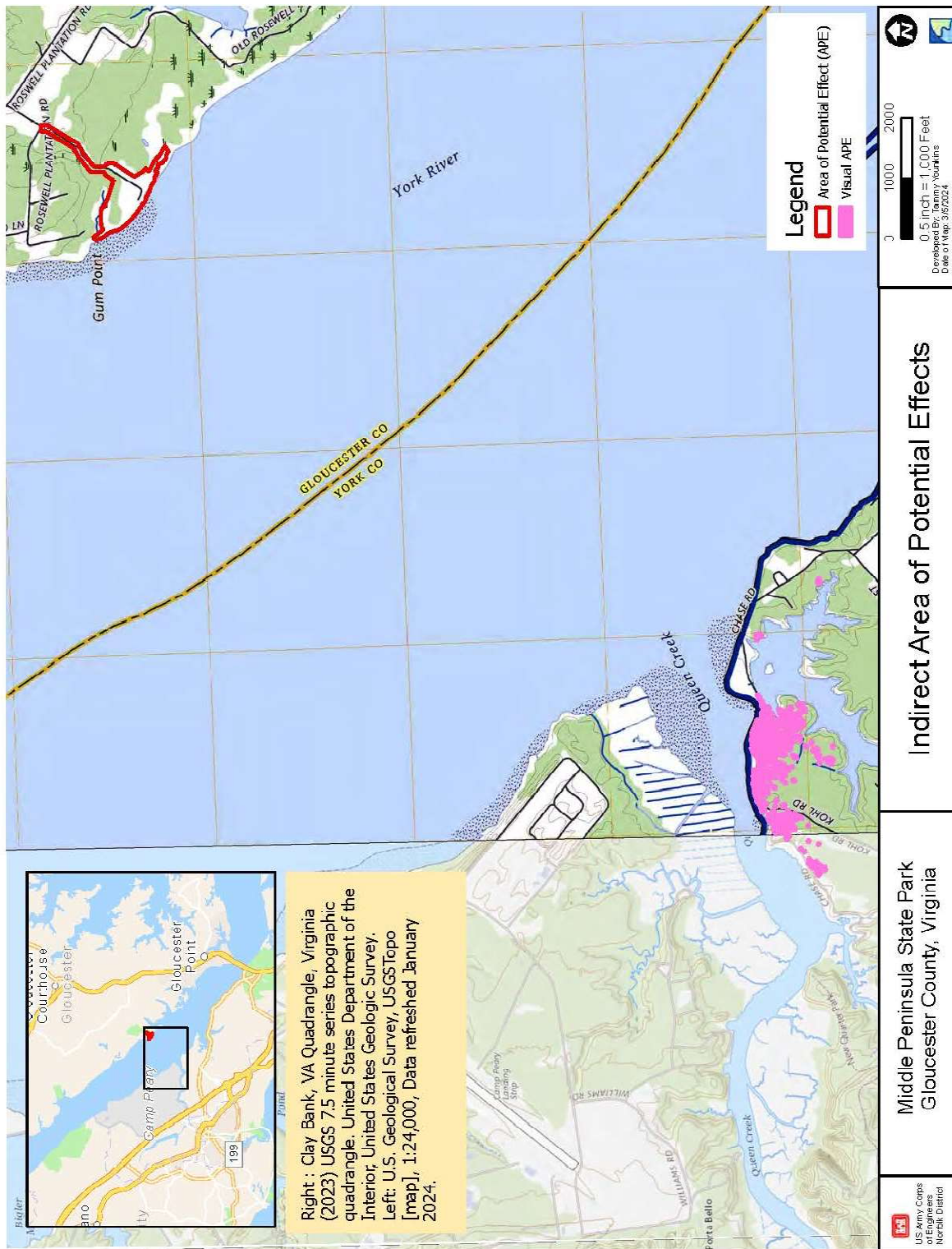
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# ATTACHMENT A

## Area of Potential Effects



PROGRAMMATIC AGREEMENT AMONG THE UNITED STATES ARMY CORPS OF ENGINEERS, THE VIRGINIA STATE HISTORIC PRESERVATION OFFICE, AND THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION REGARDING THE SECTION 510 MIDDLE PENINSULA UNIT OF MACHICOMOCO STATE PARK LIVING SHORELINE PROJECT



PROGRAMMATIC AGREEMENT AMONG THE UNITED STATES ARMY CORPS OF ENGINEERS, THE VIRGINIA STATE HISTORIC PRESERVATION OFFICE, AND THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION REGARDING THE SECTION 510 MIDDLE PENINSULA UNIT OF MACHICOMOCO STATE PARK LIVING SHORELINE PROJECT

# ATTACHMENT B

## Procedures for Post Review Discoveries

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PROGRAMMATIC AGREEMENT AMONG THE UNITED STATES ARMY CORPS OF ENGINEERS, THE VIRGINIA STATE HISTORIC PRESERVATION OFFICE, AND THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION REGARDING THE SECTION 510 MIDDLE PENINSULA UNIT OF MACHICOMOCO STATE PARK LIVING SHORELINE PROJECT

## PROCEDURES FOR POST REVIEW DISCOVERIES

### **Post Review Discoveries**

The USACE will ensure that construction documents contain the following provisions for the treatment of unanticipated discoveries:

“If previously unidentified historic properties or unanticipated effects to historic properties are discovered during contract activities, the contractor shall immediately halt all activity within a one hundred (100) foot radius of the discovery, notify the USACE Project Manager and the USACE Archaeologist of the discovery and implement interim measures to protect the discovery from looting and vandalism. Work in all other areas not the subject of the discovery may continue without interruption.”

Immediately upon receipt of the notification from the construction contractor (see subparagraph immediately above), the USACE Archaeologist shall:

1. Inspect the construction site to determine the extent of the discovery and ensure that the undertaking in that area has halted;
2. Clearly mark the area of the discovery;
3. Implement additional measures, as appropriate, to protect the discovery from looting and vandalism;
4. Determine the extent of the discovery and provide recommendations regarding its National Register of Historic Places (NRHP) eligibility and treatment; and
5. Notify the USACE Project Manager, the Signatories and other Concurring Parties of the discovery describing the measures that have been implemented to comply with this Stipulation.

Upon receipt of the information required in subparagraphs 1-5 above, the USACE shall provide the Signatories and other Concurring Parties with an assessment of the NRHP eligibility of the discovery and the measures proposed to resolve adverse effects. In making the evaluation, the USACE in consultation with the SHPO may assume the discovery to be eligible for the NRHP for the purposes of Section 106 pursuant to 36 CFR Part 800.13(c). The Signatories and other Concurring Parties shall respond to the USACE's assessment within forty-eight (48) hours of receipt.

The USACE shall take into account the Signatories' and Concurring Parties'



recommendations on eligibility and treatment of the discovery and shall provide the Signatories and Concurring Parties with a report on the actions when implemented. The undertaking may proceed in the area of the discovery, once the USACE has determined that the actions undertaken to address the discovery pursuant to this Stipulation are complete.

### **Treatment of Human Remains**

The USACE shall make all reasonable efforts to avoid disturbing gravesites, including those containing Native American human remains and associated funerary objects. If human remains and/or associated funerary objects are encountered during the course of the undertaking, USACE shall immediately halt the undertaking in the area and contact the USACE Archaeologist and the appropriate city Police Department.

The USACE shall treat all human remains in a manner consistent with the ACHP's Policy Statement on Burial Sites, Human Remains and Funerary Objects (March 1, 2023; <https://www.achp.gov/digital-library-section-106-landing/achp-policy-statement-burial-sites-human-remains-and-funerary>). The USACE shall make a good faith effort to ensure that the general public is excluded from viewing any Native American burial site or associated funerary objects. The Signatories and Concurring Parties to this PA agree to release no photographs of any Native American burial site or associated funerary objects to the press or general public. The USACE shall notify the Delaware Nation, the Upper Mattaponi Indian Tribe, and other appropriate federally recognized Tribe(s) if their interest(s) have been established, when Native American burials, human skeletal remains, or funerary objects are encountered during the undertaking. Following consultation in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA) by the USACE, the SHPO and identified Tribes with cultural affiliation, the USACE shall ensure that proper steps are taken regarding the remains. This could include the delivery of any Native American human skeletal remains and associated funerary objects recovered pursuant to this PA to the appropriate Tribe.

If the remains are determined to be historic and not Native American, USACE shall consult with the Signatories, and other appropriate Concurring Parties prior to any excavation by providing a treatment plan including the following information:

- The name of the property or archaeological site and specific location from which the recovery is proposed. If the recovery is from a known archaeological site, a state-issued site number must be included.
- Indication of whether a waiver of public notice is requested and why. If a waiver is not requested, a copy of the public notice to be published in a newspaper having general circulation in the Gloucester County area for a minimum of four weeks prior to recovery.
- A copy of the curriculum vitae of the human osteologist who will perform

the analysis of the remains.

- A statement that the treatment of human skeletal remains and associated artifacts will be respectful.
- An expected timetable for excavation, osteological analysis, preparation of final report, and final disposition of remains.
- A statement of the goals and objectives of the removal of human remains (to include both excavation and osteological analysis).
- If a disposition other than reburial is proposed, a statement of justification for that decision.

The USACE Archaeologist shall submit the draft treatment plan to the Signatories and appropriate Concurring Parties for review and comment. All comments received within thirty (30) calendar days shall be addressed in the final treatment plan. Upon receipt of final approval in writing from the USACE Archaeologist, the treatment plan shall be implemented prior to those undertaking activities that could affect the burial(s).

The USACE Archaeologist shall notify the USACE Project Manager, the Signatories, and the Concurring Parties in writing once the fieldwork portion of the removal of human remains is complete. The undertaking in the area may proceed following this notification while the technical report is in preparation. The USACE Archaeologist may approve implementation of the undertaking-related ground-disturbing activities in the area of the discovery while the technical report is in preparation. The USACE Archaeologist shall ensure that a draft report of the results of the recovery is prepared within one (1) year of the notification that archaeological fieldwork has been completed and submitted to the USACE, the Signatories and the Concurring Parties for review and comment. All comments received within thirty (30) calendar days of receipt shall be addressed in the final treatment plan. When the final report has been approved by the USACE Archaeologist, two (2) copies of the document, bound and on acid-free paper and one (1) electronic copy in Adobe® Portable Document Format (.pdf) shall be provided to the Signatories; and one (1) copy in an agreed upon format to each of the Concurring Parties.

The USACE Archaeologist shall notify the USACE Project Manager, the Signatories, and appropriate Concurring Parties within fifteen (15) calendar days of final disposition of the human remains.



# ATTACHMENT C

## Contact Information

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## CONTACT INFORMATION

### U.S. Army Corps of Engineers, Norfolk District

Susan G. Miller, M.A., RPA  
Archaeologist & Tribal Liaison  
US Army Corps of Engineers  
Norfolk District (NAO)  
803 Front Street  
Norfolk, VA 23510  
Office: 757-201-7008  
susan.g.miller@usace.army.mil

### Virginia Department of Historic Resources

Samantha Henderson, Archaeologist  
Department of Historic Resources  
Review and Compliance Division  
2801 Kensington Avenue  
Richmond, VA 23221  
Office: 804-482-6088  
samantha.henderson@dhr.virginia.gov

### Virginia Department of Conservation and Recreation

Dr. Lauren McMillan  
Cultural Resources Manager – Virginia State Parks  
600 East Main Street  
Richmond, VA 23219-2440  
lauren.mcMillan@dcr.virginia.gov  
Office: 804-584-0429

### Delaware Nation

Katelyn Lucas, Tribal Historic Preservation Officer  
P.O. Box 825  
Anadarko, OK 73005  
(405) 544-8115  
klucas@delawarenation-nsn.gov

Upper Mattaponi Indian Tribe

Andria Greene, M.S.  
Environmental & Cultural Protection Interim Director  
Upper Mattaponi Indian Tribe  
13476 King William Road  
King William, Virginia 23086  
(804) 535-0117  
andria.greene@umitribe.gov

Fairfield Foundation

Dr. David Brown, Co-Director  
P.O. Box 157  
White Marsh, Virginia 23183  
Fairfield@fairfieldfoundation.org  
(804) 815-4467

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# ATTACHMENT D

## PA Amendment Template

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PROGRAMMATIC AGREEMENT AMONG THE UNITED STATES ARMY CORPS OF ENGINEERS, THE VIRGINIA STATE HISTORIC PRESERVATION OFFICE, AND THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION REGARDING THE SECTION 510 MIDDLE PENINSULA UNIT OF MACHICOMOCO STATE PARK LIVING SHORELINE PROJECT

**Model MOA/Project PA Template Amendment:**  
AMENDMENT TO [INSERT FULL NAME OF THE AGREEMENT]

WHEREAS, the Agreement was executed on [insert month and year of execution];

WHEREAS, [insert a concise explanation of the reasons for the amendment];

WHEREAS, [insert the name of the federal agency] will send a copy of this executed amendment to the ACHP [Only use this whereas clause if the ACHP is not a Signatory to the Agreement];

NOW, THEREFORE, in accordance with Stipulation [insert the number of the amendment stipulation] of the Agreement, [insert the Signatories of the Agreement] agree to amend the Agreement as follows:

1. Amend Stipulation [insert the number of the stipulation to be amended] so it reads as follows:

[insert the amended text of the stipulation]

[AND/OR, if the amendment involves adding a new stipulation to the Agreement]

2. Add new Stipulation [insert the number of the new stipulation]: [insert the text of the new stipulation]

[AND/OR, if the amendment involves deleting a stipulation of the Agreement]

3. Delete Stipulation [insert the number of the stipulation to be deleted]. [Repeat #1, 2, and 3 as necessary]

[OR, if the amendments are so pervasive that it is easier to cut/paste a copy of the entire, amended Agreement]

1. Amend the Agreement so it reads as follows:

[attach the text of the entire, amended agreement]

[Insert signature and date lines for all Signatories. If the amendments add duties to a party that did not sign the Agreement, add a signature line for that party.]

PROGRAMMATIC AGREEMENT AMONG THE UNITED STATES ARMY CORPS OF ENGINEERS, THE VIRGINIA STATE HISTORIC PRESERVATION OFFICE, AND THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION REGARDING THE SECTION 510 MIDDLE PENINSULA UNIT OF MACHICOMOCO STATE PARK LIVING SHORELINE PROJECT