

Statement of Findings for Floodplains and Wetlands

for Proposed Riverwalk & Shoreline Stabilization

Colonial National Historical Park
Yorktown, Virginia

Recommended: _____

Superintendent, Colonial National Historical Park

Date

Concurred: _____

Water Resources Division

Date

Approved: _____

Northeast Regional Director

Date

Introduction

The Colonial National Historical Park (Colonial NHP) has prepared and made available a Draft Environmental Assessment (EA) for a proposed Riverwalk and shoreline stabilization along the Yorktown, Virginia waterfront.

Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) require the NPS and other federal agencies to evaluate the likely impacts of actions in floodplains and wetlands. NPS Director's Order #77-1: Wetland Protection and Procedural Manual #77-1 provide NPS policies and procedures for complying with E.O. 11990, and NPS Special Directive 93-4 (Floodplain Management Guideline) provides NPS procedures for complying with E.O. 11988. This Statement of Findings (SOF) documents compliance with these NPS wetland protection and floodplain management procedures.

Proposed Action

The preferred alternative (Figure 1) includes a Riverwalk extending from the Watermen's Museum to the Yorktown Victory Center and two offshore breakwaters.

The Riverwalk would run west from the museum across a small piece of NPS parkland, over the mouth of Yorktown Creek, and follow the shoreline along Water Street. The Riverwalk would diverge from Water Street and continue along the York River Cliffs and past Fusiliers Redoubt before turning back toward the Yorktown Victory Center. The culverts directing Yorktown Creek beneath Mathews and Water Streets would also be replaced, and a small pocket of wetlands between the streets would be restored. Of 2,250 linear feet of walkway, approximately 1,250 linear feet would be placed at grade within the 100-year flood zone, totaling approximately 0.23 acre. The walkway would also traverse 35 linear feet (400 square feet) of the 500-year flood zone just east of the Ferris house. The proposed Riverwalk would not adversely impact any wetland areas. In fact, 0.05 acre of vegetated tidal wetlands would be restored by the culvert improvements on Yorktown Creek.

In addition, two stone breakwaters, beach nourishment, and vegetative plantings are proposed for shoreline stabilization along the NPS property and Water Street. To address bank slumping along the York River Cliffs, an armor stone revetment would be constructed between Yorktown Creek and the beginning of the NPS revetment near Fusiliers Redoubt. The breakwaters and revetment would impact 1.23 acres of subtidal habitat and 1.03 acres of non-vegetated tidal wetlands (intertidal beach). However, approximately 0.48 acre of subtidal habitat (sand and rock substrate) and 0.77 acre of non-vegetated wetlands (estuarine intertidal beach) would be created. In addition, 0.20 acre of vegetated wetlands and 0.10 acre of intertidal vegetated wetlands would be created with marsh and dune grass plantings shoreward of the structures.

Site Description

Floodplains

Elevations in the immediate vicinity of the project area range from near sea level to approximately 50 feet at the Yorktown Victory Center. The terrain along the York River is low and nearly level trending westward from the Watermen's Museum and in the Yorktown Creek marsh, but there is a dramatic increase in elevation between the York River and the land surface in the area of the Ferris house and the York River Cliffs.

Due to the low topography, the areas between the Watermen's Museum and Yorktown Creek, along Water Street to the Ferris house, and within the Yorktown Creek marsh are within the 100-year flood zone and are subject to inundation during extreme storm events.

Wetlands

Vegetated Wetlands

All wetlands within the study area are estuarine, tidal systems with salinity ranging from 15 to 22 parts per thousand (ppt). Based on the Cowardin et al (1979) classification system, an estuarine, intertidal, irregularly exposed, herbaceous marsh (E2EM1M) associated with Yorktown Creek is present south of Water Street. This system contains a low marsh, dominated by salt marsh cordgrass (*Spartina alterniflora*) with occurrences of black needlerush (*Juncus roemerianus*), rose mallow (*Hibiscus moscheutos*), and marsh elder (*Iva frutescens*). The slightly higher elevations of this marsh are considered the backshore marsh (high marsh) distinguishable by the presence of salt hay grass (*Spartina patens*), spike grass (*Distichlis spicata*), and salt marsh aster (*Aster tenuifolius*). The portion of Yorktown Creek between Mathews and Water Streets is ditched and supports a very small, sparse fringe of salt marsh cordgrass.

Non-vegetated Wetlands

The shoreline of the York River contains an estuarine, intertidal, unvegetated, sand beach and splash zone (E2USN) with a very narrow fringe of salt hay grass at the upper edge of the wave splash zone. The intertidal flats of mud and/or sand common along the entire length of the shoreline are typically flooded and exposed to air twice a day. Macro and microalgae and phytoplankton are abundant in these environments. Other species that this intertidal area supports include mollusks, crustaceans, and shorebirds.

Wetlands Functional Values Assessment

A functional values assessment was performed on the tidal marsh and beach within the study area using the methodology described in *Evaluation for Planned Wetlands*

(Environmental Concern, Inc. 1994). The purpose of the assessment was to determine the relative ability of each wetland to protect/enhance the environment by calculating a qualitative measure of the wetland functions. In general, scores are provided between 0 (not applicable) and 1.0 (highest ability). The following functions were considered:

- Shoreline bank stabilization
- Sediment stabilization
- Water quality
- Wildlife habitat
- Fisheries habitat
- Uniqueness/heritage

Two wetland types were assessed for these functions: tidal marsh with mud flats and the shoreline beach. Table 1 summarizes the results of the assessment.

Table 1 – Wetland Functions

Wetland	WETLAND FUNCTIONS					
	Shoreline Bank Stabilization	Sediment Stabilization	Water Quality	Wildlife Habitat	Fisheries Habitat	Uniqueness/Heritage
Tidal marsh w/ mudflats	0.625	1.0	0.96	0.122	0.875	1.0
Shoreline beach	NA	0.52	0.29	0.095	0.61	1.0

The intertidal zone is important for nursery and feeding grounds for commercially important fisheries and crustaceans and for the species that prey on them. The marsh system ranks very high in all scores with the exception of wildlife habitat. Wildlife habitat received a low score because the model places high value on the presence of multiple vegetative layers (woody and herbaceous), interspersions of the various layers, shape of the wetland edge (irregular vs. smooth), wildlife attractors (snags, brush piles, or artificial structures), and the presence of open water. The Yorktown Creek marsh contains few of these conditions, which would be attractive to a wide variety of birds and animals. Nevertheless, the U.S. Fish and Wildlife Service, in particular, places great emphasis on the importance of these habitats, not only for fisheries, but also for its contributions to water quality and the overall health of the Chesapeake Bay. Additionally, the Yorktown Creek marsh scores high on uniqueness/heritage due to the wetland being associated with a park, as well as its use for scientific study by students with the Virginia Institute of Marine Science (VIMS).

The tidal beach ranks relatively low in all categories with the exception of fisheries habitat. A “not applicable” ranking is given to shoreline bank stabilization because the model does not consider a beach with a gradual slope to be a shoreline bank that

has high potential for erosion compared to a bank which is dramatically higher in elevation than the water with the potential for deep undercutting. Additionally, the lack of vegetation severely limits the beach from carrying out other important functions such as sediment stabilization, water quality filtration, and wildlife habitat. The beach area does support the production of shorebirds (Boesch 1978), and received a high score for uniqueness/heritage due to its being part of a park or sanctuary.

Justification for Use of the Floodplain and Wetlands

The purposes of the project are to provide a clear pedestrian connection between the NPS Visitor Center and the Yorktown Victory Center and to stabilize the shoreline west of the Coleman Bridge along Water Street. Stabilization would require construction along the shoreline and therefore would occur within non-vegetated wetlands (estuarine intertidal beach and mudflats), a narrow fringe of vegetated wetlands at the upper edge of the wave splash zone (estuarine intertidal emergent wetland), and the subtidal zone paralleling the shoreline (deepwater habitat). Appropriate permits (see Compliance Section) would be obtained for this construction; however, these activities are commonly permitted to correct erosional hazards and property loss and are consistent with the three phases of shoreline stabilization previously installed along the Yorktown Waterfront.

The Riverwalk would be routed along the York River, partially within the flood zone. In order to provide a connection between the NPS Visitor Center and the Victory Center, as well as scenic views of the river and interpretation of natural and cultural resources along the way, the Riverwalk must be routed through the floodplain. Scenic overlooks and foot trails such as this are among activities typically allowed in floodplains by NPS regulations (NPS 1993). Because they do not reduce flood storage capacity, no mitigation is required.

There would be no adverse impacts to vegetated wetlands other than the narrow fringe of salt hay grass at the upper edge of the wave splash zone. This narrow fringe will be compensated for by created emergent marsh behind the proposed breakwater structures as discussed in the "Wetland Mitigation" section.

Investigation of Alternative Sites

In addition to the proposed action, three action alternatives and a no action alternative were considered. Alternative routings of the Riverwalk from Yorktown Creek to the Yorktown Victory Center were considered, and some would have greater impacts to wetlands on the south side of Water Street, as would shoreline stabilization alternatives including an additional breakwater or a seawall. Five alternatives were considered:

- *No Action.*
- *Lookout Loop Riverwalk with two breakwaters.* Proposed Action.
- *Lookout Loop Riverwalk with three breakwaters.* A third stone breakwater would be constructed between those in the Proposed Action at the mouth of Yorktown Creek. The subtidal habitat at the mouth of the creek would be lost, and there would be additional impacts to subtidal habitat and non-vegetated wetlands (E2USN) from placement of the third breakwater.
- *Water Street walkway with revetment.* The pedestrian walkway would follow the south side of Water Street and would encroach into the marsh approximately 20 feet. A riprap revetment would extend east and west from the mouth of Yorktown Creek, breaking where the creek enters the York River; however, much of the existing sandy beach and backshore area (E2USN) would be replaced with rock.
- *Marsh walk with revetment.* A marsh boardwalk would be constructed across the tidal emergent wetland south of Water Street and extend along Water Street to the Victory Center. A riprap revetment would extend east and west from the mouth of Yorktown Creek; however, the existing beach and backshore area (E2USN) would be replaced with rock.

The impacts of these alternatives to wetland areas are shown in Table 2. Routing the walkway as it is in the proposed alternative, along the north side of Water Street and across the uplands along the York River Cliffs, would avoid impacts to the Yorktown Creek marsh. The two breakwaters design for shoreline stabilization would minimize impacts at the mouth of the creek and would maintain the existing beach and backshore environment, as well as allowing for the establishment of vegetated wetlands and non-vegetated tidal wetlands in select locations (see Table 2). This, along with restoration of the vegetated wetland between Mathews and Water Streets, would produce a net increase in the amount of wetlands (+ 0.09 acre).

Mitigative Actions

Avoidance and minimization measures were applied throughout the project design to reduce impacts to sensitive wetland resources. General mitigative measures would also include sustainable design of the Riverwalk, breakwaters, and revetment and use of durable building materials; application of best management practices; and use of standard erosion and sediment control measures throughout the construction process.

Floodplain Mitigation

No action proposed in the floodplain would affect the flood storage capacity of the floodplain. There is therefore no effect on the natural floodplain value, and no mitigative measures are needed.

Wetland Mitigation

Grading the ditched banks of Yorktown Creek to create a bench for vegetation would serve as partial mitigation for the proposed project. Restoration of this vegetated wetland area (0.05 acre), in addition to marsh grass plantings along the shore (0.20 acre) and creation of 0.77 acre of estuarine intertidal beach behind the breakwater structures, would offset impacts to non-vegetated and vegetated wetlands from placement of the revetment, breakwaters, and beachfill. Areas of intertidal wetland vegetation (0.10 acre) would be created landward of the breakwaters. This addition would bring the wetland compensation ratio to greater than 1:1 for the preferred alternative (+ 0.09 acre). Although mitigation in some cases is out-of-kind, it would recreate habitat that has been lost (including intertidal beach and vegetated tidal wetlands) in this area over time due to erosion and increase the overall diversity of habitat.

Compliance

The Coastal Zone Management Act of 1972 requires that federal activities which affect land, water, or natural resources of Virginia's designated coastal resources management area be consistent with the enforceable policies of the Virginia Coastal Resources Management Program. A Federal Consistency Determination has found the project to be consistent to the maximum extent practicable with these policies, and in order to comply fully, permits will be obtained under the following regulations:

Clean Water Act Section 404

The proposed actions impact waters of the United States as defined by the Clean Water Act and are therefore subject to review by the U.S. Army Corps of Engineers (COE). The Clean Water Act Section 404 regulates the discharge of dredged or fill material into waters of the United States.

Rivers and Harbors Act Section 10

Section 10 of the Rivers and Harbors Act is also administered by the COE and regulates construction, filling, dredging, or excavation in navigable waters of the United States.

Subaqueous Lands Act (Section 62.1-3 Code of Virginia)

The Subaqueous Lands Act is administered by the Virginia Marine Resources Commission and applies to activities that encroach upon or over the beds of the bays and ocean, rivers, streams, and creeks in the state.

Virginia Water Protection Permit

The Virginia Department of Environmental Quality is responsible for review of projects that result in a significant discharge into state waters, which include wetlands. Before the COE can grant a 404 permit, the state must certify that the activity does not violate state water quality standards.

York County Tidal Wetlands Board

The York County Tidal Wetlands Board will review the project.

National Environmental Policy Act

The Environmental Assessment, Section 106 Compliance Review, this Statement of Findings for Executive Orders 11990 and 11988, and the Finding of No Significant Impact would complete the requirements for the National Environmental Policy Act for this project.

Conclusion

The proposed actions were designed to avoid and minimize impacts to wetlands and to restore and create vegetated and non-vegetated wetland areas along Yorktown Creek and the shoreline as compensation for unavoidable wetland impacts associated with this project. There would be a net gain in total wetland area of 0.09 acre, and although some mitigation is out-of-kind, it will recreate habitat that has been lost (including intertidal beach and vegetated tidal wetlands) in this area due to erosion. Because the Riverwalk would not reduce flood storage capacity, there would be no effect on natural floodplain values.

Creation and restoration of wetland areas will be funded in part by a number of sources including TEA-21 Enhancement Grant funds, a revenue sharing program through the Virginia Department of Transportation, and the York County general fund. It is expected that the planted areas of emergent wetland grasses will take one to two growing seasons to fill in, but created backshore beach area will be functional upon placement. The planted areas will be monitored throughout the first two growing seasons to ensure that the plants are acclimating. No maintenance should be required once the breakwaters, fill, and plants are in place.

The NPS finds that this proposed action is consistent with the policies and procedures of NPS Special Directive 93-4 (Floodplain Management Guideline) and Director's Order #77-1: Wetland Protection, including the "no net loss of wetlands" policy.

References

- Boesch, D.F. 1971. *Benthic communities in a gradient estuary*. Ph.D. dissertation, College of William and Mary.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, D.C.
- Environmental Concern, Inc. 1994. *Evaluation for Planned Wetlands*.
- National Park Service, U.S. Department of Interior. 1993. *Special Directive 93-4: Floodplain Management Guideline*. Washington, D.C.
- National Park Service, U.S. Department of Interior. 1998. *Director's Order #77-1: Wetland Protection*. Washington, D.C.
- National Park Service, U.S. Department of Interior. 1998. *Procedural Manual #77-1: Wetland Protection*. Washington, D.C.

Table 2 – Wetlands Impact Summary

AFFECTED AREA	ALTERNATIVE				
Impact Type	A No Action	B Proposed Action	C	D	E
Non-vegetated Tidal Wetlands (Intertidal Beach)	C1	1.03	1.23	0.41	0.41
Vegetated Tidal Wetlands	C2	0.0	0.0	0.2	0.65 0.05 T
100-year Flood zone		0.23	0.23	0.24	0.26
500-year Flood zone		0.009	0.009	0.013	0.013
Created/Restored Area Type					
	A	B	C	D	E
Non-vegetated Tidal Wetlands (Intertidal Beach)	NA	0.77	1.12	0.0	0.0
Vegetated Tidal Wetlands (plantings between streets and behind breakwaters)	NA	0.20 0.05 R	0.30 0.05 R	0.01	0.01
Intertidal Vegetated Wetlands (plantings behind breakwaters)	NA	0.10	0.15	0.0	0.0
Net Result					
	A	B	C	D	E
Non-vegetated Tidal Wetlands (Intertidal Beach)	C1	(-) 0.26	(-) 0.11	(-) 0.41	(-) 0.41
Vegetated Tidal Wetlands	C2	(+) 0.25	(+) 0.35	(-) 0.19	(-) 0.64
Intertidal Vegetated Wetlands	C3	(+) 0.10	(+) 0.15	0.0	0.0
TOTAL ACREAGE	NA	(+) 0.09	(+) 0.39	(-) 0.60	(-) 1.05

Notes: Area of measurement is equal to acres.

"T" equals temporary impact.

"R" equals restored habitat.

No Action Alternative Comments:

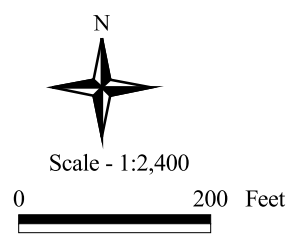
C1 - Non-vegetated intertidal wetlands would continue to persist, with a landward shift in location due to shoreline erosion trends, which are likely to increase due to decreased sand supply.

C2 - Vegetated tidal wetlands would remain fairly constant as there are none currently existing along the shoreline.

C3 - A narrow fringe of vegetated wetlands at the upper edge of the wave splash zone would remain sparse.



Source - York County GIS Department



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|----------------------|--------------------------------|--------------------------|--|
| Project Location | Riverwalk (8 ft.) | Sidewalk (6 ft.) | Beach Fill |
| Bank Grading | Revetment | Trolley Stop | Dune Vegetation Planting |
| Buildings | Pavement / Gravel | Individual Trees | Intertidal Wetland Vegetation Planting |
| Cemeteries | Tidal Marsh | Treeline | NPS Property Boundary |
| Archaeological Sites | Potential Archaeological Sites | Erosion Control Measures | |

