

Tiered Environmental Assessment

***Tottenville Shoreline Protection Project***

EMN-2020-BR-063-0008

Staten Island, Richmond County, New York

*July 2023*



**FEMA**

**U.S. Department of Homeland Security  
Federal Emergency Management Agency Region 2  
26 Federal Plaza, New York, NY 10278**

## TABLE OF CONTENTS

1.0 INTRODUCTION .....	1
2.0 PURPOSE AND NEED.....	1
3.0 BACKGROUND .....	2
4.0 ALTERNATIVES.....	3
4.1 ALTERNATIVE 1: NO ACTION ALTERNATIVE.....	4
4.2 ALTERNATIVE 2: TOTTEVILLE SHORELINE PROTECTION PROJECT – PROPOSED ACTION.....	4
4.3 ALTERNATIVES CONSIDERED AND DISMISSED.....	7
4.4 SUMMARY OF ALTERNATIVES .....	8
5.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS.....	8
5.1 TOPOGRAPHY AND SOILS.....	9
5.1.1 Existing Conditions.....	9
5.1.2 Potential Impacts and Proposed Mitigation .....	10
5.2 AIR QUALITY.....	12
5.2.1 Existing Conditions.....	12
5.2.2 Potential Impacts and Proposed Mitigation .....	12
5.3 CLIMATE CHANGE.....	13
5.3.1 Existing Conditions.....	14
5.3.2 Potential Impacts and Proposed Mitigation .....	14
5.4 WATER QUALITY .....	15
5.4.1 Existing Conditions.....	15
5.4.2 Potential Impacts and Proposed Mitigation .....	16
5.5 WETLANDS.....	18
5.5.1 Existing Conditions.....	18
5.5.2 Potential Impacts and Proposed Mitigation .....	18
5.6 FLOODPLAINS .....	21
5.6.1 Existing Conditions.....	21
5.6.2 Potential Impacts and Proposed Mitigation .....	21
5.7 COASTAL RESOURCES .....	22
5.7.1 Existing Conditions.....	23
5.7.2 Potential Impacts and Proposed Mitigation .....	23
5.8 VEGETATION.....	24
5.8.1 Existing Conditions.....	25
5.8.2 Potential Impacts and Proposed Mitigation .....	26
5.9 WILDLIFE AND FISH.....	27
5.9.1 Existing Conditions.....	27
5.9.2 Potential Impacts and Proposed Mitigation .....	30
5.10 THREATENED AND ENDANGERED SPECIES .....	32
5.10.1 Existing Conditions .....	32
5.10.2 Potential Impacts and Proposed Mitigation .....	34
5.11 MIGRATORY BIRDS .....	35

*Tiered Environmental Assessment  
Tottenville Shoreline Protection Project*

5.11.1	<i>Existing Conditions</i> .....	35
5.11.2	<i>Potential Impacts and Proposed Mitigation</i> .....	36
5.12	BALD AND GOLDEN EAGLES .....	37
5.12.1	<i>Existing Conditions</i> .....	37
5.12.2	<i>Potential Impacts and Proposed Mitigation</i> .....	37
5.13	ESSENTIAL FISH HABITAT .....	38
5.13.1	<i>Existing Conditions</i> .....	38
5.13.2	<i>Potential Impacts and Proposed Mitigation</i> .....	38
5.14	MARINE MAMMALS.....	39
5.14.1	<i>Existing Conditions</i> .....	39
5.14.2	<i>Potential Impacts and Proposed Mitigation</i> .....	39
5.15	CULTURAL RESOURCES .....	40
5.15.1	<i>Existing Conditions</i> .....	41
5.15.2	<i>Potential Impacts and Proposed Mitigation</i> .....	42
5.16	ENVIRONMENTAL JUSTICE .....	43
5.16.1	<i>Existing Conditions</i> .....	44
5.16.2	<i>Potential Impacts and Proposed Mitigation</i> .....	44
5.17	NOISE .....	44
5.17.1	<i>Existing Conditions</i> .....	45
5.17.2	<i>Potential Impacts and Proposed Mitigation</i> .....	46
5.18	TRANSPORTATION.....	46
5.18.1	<i>Existing Conditions</i> .....	46
5.18.2	<i>Potential Impacts and Proposed Mitigation</i> .....	47
5.19	PUBLIC SERVICES AND UTILITIES .....	47
5.19.1	<i>Existing Conditions</i> .....	47
5.19.2	<i>Potential Impacts and Proposed Mitigation</i> .....	48
5.20	PUBLIC HEALTH AND SAFETY.....	48
5.20.1	<i>Existing Conditions</i> .....	49
5.20.2	<i>Potential Impacts and Proposed Mitigation</i> .....	49
5.21	HAZARDOUS MATERIALS.....	50
5.21.1	<i>Existing Conditions</i> .....	50
5.21.2	<i>Potential Impacts and Proposed Mitigation</i> .....	50
5.22	CUMULATIVE IMPACTS.....	51
5.22.1	<i>Conclusion</i> .....	52
6.0	PERMITS AND PROJECT CONDITIONS.....	52
7.0	AGENCY COORDINATION AND PUBLIC INVOLVEMENT .....	53
8.0	LIST OF PREPARERS.....	55
9.0	SUMMARY OF IMPACTS .....	56
10.0	REFERENCES .....	58

**LIST OF TABLES**

TABLE 5.1: IMPACT SIGNIFICANCE AND CONTEXT EVALUATION CRITERIA FOR POTENTIAL IMPACTS..... 8  
TABLE 5.2: ELIMINATED RESOURCE TOPICS ..... 9  
TABLE 5.3: SOIL TYPES WITHIN THE PROJECT AREA ..... 9  
TABLE 5.4: ENVIRONMENTAL JUSTICE DEMOGRAPHICS ..... 44  
TABLE 9.1: SUMMARY OF IMPACTS ..... 56

**APPENDICES**

APPENDIX A: Figures

- Figure 1 – Project Vicinity
- Figure 2 – Project Area
- Figure 3 – Tottenville Shoreline Protection Project: Earthen Berm
- Figure 4 – Tottenville Shoreline Protection Project: Wetland Eco-Revetment
- Figure 5 – Tottenville Shoreline Protection Project: Hybrid Dune-Revetment
- Figure 6 – Tottenville Shoreline Protection Project: Surf Avenue Eco-Revetment
- Figure 7 – Tottenville Shoreline Protection Project: Raised Edge
- Figure 8 – Tottenville Soils Map
- Figure 9 – Tottenville Wetlands Map
- Figure 10 – Tottenville Flood Zones
- Figure 11 – Project Area and Surrounding Parks
- Figure 12 – Public Health and Safety Facilities Map
- Figure 13 – Living Breakwaters Map

APPENDIX B: Documents

- Document 1 – Eight-Step Floodplain Review
- Document 2 – List of Native Plant Species Eligible for Restoration Use

## **LIST OF ABBREVIATIONS**

APE – Area of Potential Effects  
BMP – Best Management Practice  
BRIC – Building Resilient Infrastructure and Communities  
CEHA – Coastal Erosion Hazard Area  
CEQ – Council on Environmental Quality  
CFR – Code of Federal Regulations  
CWA – Clean Water Act  
CY – Cubic Yards  
CZMP – Coastal Zone Management Plan  
dBA – A-weighted Decibels  
EFH – Essential Fish Habitat  
ESA – Endangered Species Act  
EIS – Environmental Impact Statement  
EO – Executive Order  
EPA – U.S. Environmental Protection Agency  
FDNY – Fire Department of the City of New York  
°F – degrees Fahrenheit  
FEMA – Federal Emergency Management Agency  
FONSI – Finding of No Significant Impact  
GHG – Greenhouse Gas  
GOSR – Governor’s Office of Storm Recovery  
IPaC – Information for Planning and Consultation  
Ldn – Day-night Noise Level  
LPC - New York City Landmarks Preservation Commission  
MBTA – Migratory Bird Treaty Act  
MMPA – Marine Mammal Protection Act  
NAAQS – National Ambient Air Quality Standards  
NEPA – National Environmental Policy Act  
NHPA – National Historic Preservation Act  
NMFS – National Marine Fisheries Service  
NPDES – National Pollutant Discharge Elimination System  
NRHP – National Register of Historic Places  
NYC Parks – New York City Department of Parks and Recreation  
NYCDEP – New York City Department of Environmental Protection  
NYCRR – New York Code, Rules, and Regulations  
NYFD – Fire Department of the City of New York  
NYPD – New York Police Department  
NYRCR – New York Rising Community Reconstruction  
NYS – State of New York

*Tiered Environmental Assessment  
Tottenville Shoreline Protection Project*

NYSDEC – New York State Department of Environmental Conservation  
NYSDOS – New York State Department of State  
NYSDOT – New York State Department of Transportation  
OSHA – Occupational Safety and Health Administration  
PCB – Polychlorinated Biphenyl  
PEA – Programmatic Environmental Assessment  
PM – Particulate Matter  
SHPO – State Historic Preservation Office  
SMCBM – Stockbridge-Munsee Community Band of Mohicans  
SPDES – State Pollutant Discharge Elimination System  
SWPPP – Stormwater Pollution Prevention Plan  
TEA – Tiered Environmental Assessment  
TSPP – Tottenville Shoreline Protection Project  
USACE – U.S. Army Corps of Engineers  
U.S.C. – United States Code  
USDA – U.S. Department of Agriculture  
USFWS – U.S. Fish and Wildlife Service

## **1.0 INTRODUCTION**

The New York City Department of Parks and Recreation (NYC Parks) proposes to implement coastal flood reduction measures along the south shore of Staten Island in Richmond County, New York. NYC Parks applied to the Federal Emergency Management Agency (FEMA) through the Governor’s Office of Storm Recovery (GOSR) (the Applicant) for a Building Resilient Infrastructure and Communities (BRIC) grant. The BRIC program is authorized under Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 United States Code (U.S.C.) 5133, as amended by the Disaster Recovery Reform Act of 2018. Under the BRIC program, FEMA provides technical and financial assistance to state, local, and tribal governments to assist in the implementation of cost-effective hazard mitigation measures designed to reduce injuries, loss of life, and damage and destruction of property; this includes damage to critical services and facilities resulting from natural disasters.

FEMA prepared this Tiered Environmental Assessment (TEA) in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and the Council on Environmental Quality regulations implementing NEPA (Title 40 Code of Federal Regulations [CFR] Sections 1500–1508). In accordance with the above-referenced regulations, FEMA Directive 108-1, and FEMA Instruction 108-1-1, during decision-making, FEMA is required to evaluate and consider the environmental consequences of major federal actions it funds or undertakes. In July 2020, FEMA prepared the *Programmatic Environmental Assessment for Stream and Shoreline Stabilization in New York and New Jersey* (PEA) (FEMA 2020) to facilitate and streamline compliance with NEPA for streambank and shoreline stabilization projects in the states of New York and New Jersey. The scope of the Proposed Action exceeds the limits set within the PEA; therefore, FEMA is required to prepare a TEA. FEMA intends to use this TEA to (1) analyze potential environmental impacts of the Proposed Action and alternatives, including a No Action alternative, that may be beyond the scope covered in the PEA, and (2) determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). The proposed project is part of a larger flood reduction initiative called the Coastal and Resiliency Initiatives for the Tottenville Shoreline. GOSR completed an Environmental Impact Statement (EIS) in August 2018 for the project (GOSR 2018). However, the Proposed Action was not fully covered by the EIS analysis, and therefore, will be covered in this TEA.

## **2.0 PURPOSE AND NEED**

FEMA’s BRIC program provides grants to eligible state, territory, and local governments and federally recognized tribes to implement natural hazard mitigation projects. The objective of the BRIC program is to shift the federal focus away from reactive disaster spending and toward research-supported, proactive investment in community resilience to reduce overall risk to the population and structures from future hazard events. This has the added benefit of reducing reliance on federal funding during future disasters. The purpose of the Proposed Action is to reduce

future coastal flood risks associated with wave action specifically at a regional recreational park and community assets within the Tottenville neighborhood. Current conditions include flooding, erosion, damages to structures, interruption of jobs, interruption of transportation, injuries, and loss of life resulting from tidal surges and wave impacts. The project is needed to minimize future injuries, eliminate loss of life, reduce damage to structures and erosion, protect jobs, and facilitate transportation and access to the Tottenville neighborhood from extreme wave action and coastal flooding that occurs during hurricanes and other severe coastal storm events. These storm-related effects are expected to worsen from climate change-related sea level rise and increased storm frequency and intensity.

### **3.0 BACKGROUND**

The proposed project is situated along the south shore of Tottenville, a neighborhood within the borough of Staten Island in Richmond County, New York (**Appendix A, Figure 1**). The project area spans the south Tottenville shoreline, originating at Conference House Park on the western end and terminating at Butler Manor Wood on the eastern side, as shown in **Appendix A, Figure 2**. Conference House Park contains numerous amenities and attractions, including grassy and densely wooded areas, historic architectural resources, a visitor's center, a playground, multiuse trails, and more. The shoreline is fringed by a sand and cobble beach. A human-made temporary dune, installed following Superstorm Sandy and composed of sand-filled barrier bags, currently provides interim erosion control and coastal flood risk reduction for approximately 2,450 feet of the shore from Swinnerton Street to Loretto Street. There are some sporadically placed stone revetments, which are impact-resistant facing materials applied to a bank or wall to absorb the energy of incoming water, along the shoreline east of Sprague Avenue. Sprague Avenue terminates at the shoreline (Sprague Plaza), where there is an existing wall with an outfall that drains into the ocean. Other streets that terminate along the shoreline, including Brighton Street and Loretto Street, also have outfalls that drain into the ocean. Inland from Conference House Park, the area is residential in nature, characterized by single-family houses, small businesses, and parks.

The project area is exposed to extreme wave action and coastal flooding during hurricanes and other severe storm events because of its location at the mouth of the New York Bight. The New York Bight funnels storm-driven waves into New York Harbor, Raritan Bay, and the shoreline of Staten Island and creates storm surges that are much greater in force and height than in neighboring areas (GOSR 2014). Wave action and rising sea levels have eroded natural coastal flood defenses along the south shore of Staten Island, making the area more prone to coastal flooding (GOSR 2014). Climate change is expected to intensify these risks in the future, as coastal flood events will increase because of sea level rise, and storm events will increase in frequency and intensity (Horton et al. 2014). Global sea levels are projected to rise between 1 and 4 feet by the year 2100, and sea level rise along most of the coastal Northeast is expected to exceed the global average rise because of local land subsidence. A sea level rise of 2 feet would more than triple the frequency of dangerous coastal flooding throughout most of the Northeast (Horton et al. 2014).



In 2012, Superstorm Sandy brought unprecedented storm surge and flooding to the Tottenville shoreline. During the storm, the area experienced tidal surges as high as 16 feet and waves exceeding 6 feet. The storm's impact on Staten Island residents and businesses included damage or destruction to housing units and infrastructure, and weeks- to months-long power outages resulting in the interruption of an estimated 9,500 jobs , and the loss of 23 lives (GOSR 2014). One of the main factors that enabled the severe flooding that occurred in Tottenville as a result of Superstorm Sandy was the lack of adequate coastal flood protection in the south shore region (GOSR 2014). Since 2012, several recovery and reconstruction programs have been implemented throughout New York to repair damage sustained by communities affected by Superstorm Sandy and create more resilient infrastructure to prepare for future storm events.

The Proposed Action, the Tottenville Shoreline Protection Project (TSPP), proposes new shoreline protection features as a coastal resiliency strategy for the Tottenville area. The Proposed Action was conceived through the New York Rising Community Reconstruction Program (NYRCR) . The NYRCR program is a planning and implementation process announced by Governor Cuomo in April 2013 and was established to provide rebuilding and resiliency assistance to communities severely damaged by Hurricane Irene, Tropical Storm Lee, and Superstorm Sandy. NYRCR communities, such as the one created in Staten Island, were led by the NYRCR Planning Committee composed of local residents, business owners, and civic leaders. Throughout the planning process, planning communities were supported by staff from GOSR, the New York State Department of State (NYSDOS), and the New York State Department of Transportation (NYSDOT).

The TSPP is one of two projects proposed to protect the Tottenville shoreline. The other project, the Living Breakwaters Project, is also included in the Coastal and Resiliency Initiatives for the Tottenville Shoreline EIS (GOSR 2018). The Living Breakwaters Project includes the installation of an ecologically enhanced breakwater system designed to reduce wave energy at the shoreline and prevent or reverse shoreline erosion while creating structured marine habitat. Although the two projects work as a layered approach to address wave action, impacts of coastal flooding, and event-based and gradual shoreline erosion while restoring and enhancing ecosystems, both can function independently to benefit the Tottenville community. The Living Breakwaters Project will be discussed in more detail in Section 5.22, Cumulative Impacts.

#### **4.0 ALTERNATIVES**

FEMA and NYC Parks considered alternatives to fulfill the purpose and need for this proposed project based on engineering constraints, environmental impacts, and available property. Budgetary constraints were included but were not the primary factor.

Additionally, a No Action alternative, also known as the “Future Without Federal Project Condition,” is included in the analysis. This section discusses the No Action alternative and

feasible alternatives to satisfy the purpose and need (including the Proposed Action) as well as alternatives that were considered but dismissed from further analysis.

#### **4.1 Alternative 1: No Action Alternative**

Under the No Action alternative, there would be no federal financial assistance provided for the mitigation of coastal risks in the project area. Event-based and gradual shoreline erosion would continue to occur, and the Tottenville neighborhood would continue to be at risk from coastal flooding during storm events and hurricanes. Buildings and other structures would continue to be inundated by floodwaters during severe coastal storm events, posing risks to property, infrastructure, and public safety. These risks would be increased from existing conditions because of expected sea level rise; in a 2019 report, the New York City Panel on Climate Change projected up to 30 inches of sea level rise for New York City by the 2050s (Gornitz et al. 2019). Temporary dunes constructed as storm surge protection measures by NYC Parks would remain in place. This alternative would not meet the overall purpose and need.

#### **4.2 Alternative 2: Tottenville Shoreline Protection Project – Proposed Action**

The Proposed Action would consist of five project elements that include an earthen berm, a wetland eco-revetment, a hybrid dune-revetment, an eco-revetment, and a raised edge (**Appendix A, Figure 2**). The raised edge component of the project would be funded independently through the New York City Raised Shorelines Program. The fifth element is a connected action that does not have independent utility, and it will be evaluated in this TEA with the BRIC-funded components. The project area extends approximately 5,400 feet, which exceeds the 1-mile limit for projects covered under the PEA.

The first project component, the earthen berm, would extend approximately 948 feet from Carteret Street to Brighton Street (**Appendix A, Figure 3**). The berm would be 25 feet wide and reach an elevation ranging from 12 to 13 feet above mean sea level (between 1 and 7.5 feet higher than the existing ground surface) and would be stabilized by a stone core. The stone core would consist of a 2.5-foot-thick layer of armor stone with a median weight of 258 pounds and a 1.5:1 width-to-height ratio slope on top of a 12-inch-thick layer of under stone with a median weight of 0.6 pounds and a 1.5:1 width-to-height slope. A 3:1 width-to-height vegetated slope would be constructed on top of the stone core. The vegetated slope would consist of at least 18 inches of topsoil and be planted with a woodland mix of native plants, including slender rush (*Juncus tenuis*), Virginia wildrye (*Elymus virginicus*), sweet woodreed (*Cinna arundinacea*), white snakeroot (*Ageratina altissima altissima*), white avens (*Geum canadense*), and blue wood aster (*Symphotrichum cordifolium*). A 3-inch layer of fine sandy material would be compacted over the stone core to minimize percolation of topsoil material from the vegetated slope into the armor stone top layer.

The second project component, the wetland eco-revetment, would be 46 feet wide and extend approximately 338 feet from the eastern terminus of the earthen berm at Brighton Street to

Manhattan Street, adjacent to an existing wetland (**Appendix A, Figure 4**). The structure would feature two rows of sheet pile with concrete caps, an 8-inch-thick concrete deck, and a 3:1 width-to-height vegetated slope covering a stone layer on the landward side of the wetland eco-revetment. The vegetated slope would be planted with a back dune mix of American beachgrass (*Ammophila breviligulata*) and annual sand bean (*Strophostyles helvola*). A concrete gravity wall would separate the 8-foot-wide concrete pathway from the vegetated slope on the landward side. A concrete sheet pile wall with a railing would also separate the concrete pathway from the wetland on the seaward side. The temporary berm would be regraded to an approximate pre-Superstorm Sandy elevation of 6.5 feet above mean sea level; the height of the wetland eco-revetment crest would then be constructed to an elevation of 13 feet above mean sea level.

This project component and the hybrid dune-revetment would require the placement of 1,176 cubic yards of sand, rock, concrete, and path material over 0.14 acre within the delineated wetland. The Brighton Outfall, an existing 18-inch pipe and riser structure that outfalls from Brighton Street to the existing wetland, would be removed and replaced with a new curb cut leading to a new inlet structure. Runoff would then be piped from the new inlet structure, through the wetland eco-revetment, and onto a new riprap pad in the existing wetland. The existing wetland would be regraded to a bench elevation of 2.5 feet above mean sea level and planted with a combination of wetland high marsh, wetland scrub shrub, and wetland/swale mix vegetation. A 9.25-foot-wide staircase would be constructed from the pathway to the beach at the terminus of Manhattan Avenue.

The third project component, the hybrid dune-revetment, would extend approximately 937 feet along the shoreline from Manhattan Street to Loretto Street (**Appendix A, Figure 5**). It would consist of a stone core dune capped with sand and planted with native beach grasses. The width of the hybrid dune-revetment would range from 70 to 90 feet with an elevation of approximately 14 feet above mean sea level, which is approximately 1 foot higher than the existing temporary dune. The seaward side of the dune would have a slope of 5:1 width-to-height and would slope down to a bench at a 6.5-foot elevation above mean sea level. Then it would continue down to an elevation of 5 feet above mean sea level to the beach nourishment area constructed by the Living Breakwaters Project. The landward side of the dune would have a slope of 3:1 width-to-height and would slope down to an elevation of 9 feet above mean sea level, where a 6-foot-wide bench would be constructed with topsoil to serve as a buffer between the dune-revetment and a bioswale.

The dune-revetment would also cross the Loretto Outfall, a 13- by 5-foot rectangular culvert buried with compacted fill and covered with large stones near its outfall. The compacted fill would be replaced with a fine aggregate and topped with larger armored stone. The new Loretto access ramp would be constructed at the eastern terminus of the hybrid dune-revetment at Loretto Street and serve as an access route for the New York City Department of Environmental Protection (NYCDEP) to access the Loretto Outfall. The access ramp would be a 15-foot-wide structure constructed of 2- by 5-foot flat-laid stone blocks and set at a 4:1 width-to-height slope.

The fourth project component, the Surf Avenue eco-revetment, would be constructed to the east of the hybrid dune-revetment and would extend approximately 396 feet from Loretto Street to Sprague Avenue (**Appendix A, Figure 6**). It would be approximately 60 feet wide and consist of vegetated planters backed by an armored stone revetment on the seaward side and a curb wall on the landward side. The curb wall would separate the vegetated area from an 8-foot-wide paved pathway. The stone revetment would consist of a 12-inch-thick layer of underlayer stone topped with a 2-foot-thick layer of armor stone, and the crest of the stone revetment would have an elevation of 12.5 feet above mean sea level, approximately 2 feet to 3 feet above existing grade. The plant containers would be planted with a perennial and wetland swale mix. The existing wall at Sprague Plaza at an elevation of 9 feet above mean sea level would be replaced with a wall at an elevation of 12.5 feet above mean sea level that would wrap around the plaza until it transitions into stairs and a stone revetment with a crest 12.5 feet above mean sea level. At Sprague Plaza, the stone revetment would consist of a 1.25-foot-thick base of underlayer stone topped with a 4.5-foot-thick layer of armor stone. Sand excavated from the project area would be added to bury the stone toe of the revetment.

The fifth project component, the raised edge not funded by FEMA, would be approximately 2,536 feet long and extend from Sprague Avenue to 600 feet east of Page Avenue (**Appendix A, Figure 7**). It would consist of a stone revetment supported on its landward side by a concrete curb wall approximately 5 feet above mean sea level. The concrete curb wall would separate the stone revetment from the 8-foot-wide concrete trail. A bioswale with a slope of 3:1 width-to-height and an approximate width of 5 feet would be constructed on the landward side of the concrete trail. The elevation of the revetment would range from 8 feet above mean sea level (the same elevation as the proposed pathway) to 12.5 feet above mean sea level (approximately 0 to 4.5 feet higher than existing conditions). A new sheet pile wall with concrete cap would be constructed in front of the existing wall at the terminus of Joline Avenue. A set of stairs would be installed leading from the pathway to the beach at the terminus of Joline Avenue. The unpermitted segment of stone revetment at Tricia Way would be removed and replaced with the raised edge, resulting in the removal of approximately 2,290 cubic yards of fill. An access ramp similar to the Loretto access ramp described above would be constructed adjacent to the Bedell Avenue Outfall.

Selected trees along the northern portion of the project area where excavation would occur would be removed. Those trees would be chipped on site and the chips would be used as protection for the remaining trees within the project area that do not require removal. Equipment expected to be used to complete the Proposed Action would include excavators, front-end loaders, bulldozers, trucks, vibratory hammers, and impact hammers. Construction of all components would be expected to take 24 months. Work would occur on or landward of mean high water and no nighttime work would be anticipated. Stockpiles would be located between Manhattan Street and Yetman Avenue, along Surf Avenue, immediately east of Sprague Avenue, immediately east of Joline Avenue, at the terminus of Bedell Avenue, between Bedell Avenue and Page Avenue, and

immediately east of Page Avenue. Multiple staging areas are proposed throughout the project area at the following locations:

- At the terminus of Chelsea Street
- South of the terminus of Chelsea Street approximately 80 feet from mean high water line
- Immediately east of the terminus of Manhattan Street
- Immediately east of the terminus of Rockaway Street
- Approximately 160 feet east of the terminus of Sprague Avenue
- Immediately east of Joline Avenue
- Between Bedell Avenue and Page Avenue
- Immediately east of Page Avenue

Access routes to the project area would include Main Street, Chelsea Street, Billop Avenue, Swinnerton Street, Manhattan Street, Yetman Avenue, Rockaway Street, Loretto Street, Sprague Avenue, Joline Avenue, Bedell Avenue, and Page Avenue. Trucks would travel along New York City Department of Transportation–designated truck routes, such as Hylan Boulevard and Amboy Road (New York City 2022), before accessing the project area via the local roads identified above. Where required, fill material would be sourced within the project area that have been previously excavated.

### **4.3 Alternatives Considered and Dismissed**

Additional alternatives that were considered and dismissed included replacement of the existing temporary dune with a hybrid dune system consisting of a sand cap on top of a stone core and installation of a hardened floodwall. Construction of a series of dunes from Brighton Street to Joline Avenue would reduce wave impacts and flooding associated with coastal storms and hurricanes; however, it was determined that there was not enough space on the beach between Loretto Street and Sprague Avenue to construct the dune. Further analysis indicated that the primary risks posed to the residential community and the segment of shoreline between Sprague Avenue and Joline Avenue were shoreline erosion and sea level rise rather than wave action. Therefore, construction of a hybrid dune system would not appropriately address the coastal hazards and would also be impracticable.

The second additional alternative considered was a hardened floodwall with a 10-foot-wide crest and a seaward width-to-height slope of 2.5:1. The floodwall would have an elevation of approximately 23 feet above mean sea level, and it would reduce wave impacts and coastal flooding; however, it would restrict shoreline access for the community and impact the visual quality and aesthetics of the shoreline. Therefore, the hardened flood wall was dismissed as impracticable.

#### **4.4 Summary of Alternatives**

Four alternatives were considered by NYC Parks for the mitigation of coastal flooding and erosion in the Tottenville neighborhood on Staten Island. Two alternatives, replacement of the existing temporary dune and hardened floodwall, were eliminated based on impracticability. The alternatives evaluated in this TEA are:

- 1) No Action alternative
- 2) Tottenville Shoreline Protection Project – Proposed Action

#### **5.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS**

The following sections discuss the potential environmental impacts and proposed mitigation measures associated with the No Action alternative and the Proposed Action. When possible, FEMA considers quantitative information to establish potential impacts; the significance of potential impacts is evaluated based on the criteria presented in **Table 5.1**. The potential cumulative environmental impacts are discussed in Section 5.22.

**Table 5.1: Impact Significance and Context Evaluation Criteria for Potential Impacts**

<b>Impact Scale</b>	<b>Criteria</b>
No Impact	The resource area would not be affected and there would be no impact.
Negligible	Changes would either be nondetectable or, if detected, would have impacts that would be slight and local. Adverse impacts would be well below regulatory standards, as applicable.
Minor	Changes to the resource would be measurable, but the changes would be small and localized. Adverse impacts would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse impacts.
Moderate	Changes to the resource would be measurable and have either localized or regional scale impacts. Adverse impacts would be within or below regulatory standards, but historical conditions would be altered on a short-term basis. Mitigation measures would be necessary, and the measures would reduce any potential adverse impacts.
Major	Changes to the resource would be readily measurable and would have substantial consequences on regional levels. Adverse impacts would exceed regulatory standards. Mitigation measures to offset the adverse impacts would be required to reduce impacts, though long-term changes to the resource would be expected.

The resources listed in **Table 5.2** would not be affected by either the No Action alternative or the Proposed Action because they do not exist in the project area, or the alternatives would have no effect on the resource. These resources were removed from further evaluation in this TEA.

**Table 5.2: Eliminated Resource Topics**

Topic	Reason
Geology	None of the alternatives would impact any surficial and bedrock deposits or geologic features.
Farmland Policy Protection Act	The entirety of Staten Island is designated as an incorporated urban area by the U.S. Census Bureau; therefore, the Farmland Protection Policy Act does not apply (U.S. Census Bureau 2010).
Sole Source Aquifers	The project area is not over a sole source aquifer (U.S. Environmental Protection Agency [EPA] 2022e). Therefore, review under Section 1424(e) of the Safe Drinking Water Act governing sole source aquifers is not required.
Coastal Barrier Resources Act	The project area is not near any areas designated for protection under the Coastal Barrier Resources Act or Otherwise Protected Areas.
Wild and Scenic Rivers	The project area is on Staten Island where there are no designated wild and scenic rivers. The closest wild and scenic river is the Musconetcong River, which is approximately 33 miles to the northwest of the project area. Hence, there would be no impact on wild and scenic rivers from any of the alternatives.
Land Use and Planning	None of the alternatives would require a change in zoning designations nor would they prevent the intended use of zoned land during or after construction.

## 5.1 Topography and Soils

### 5.1.1 Existing Conditions

The project area is within the Coastal Plain physiographic region (National Park Service 2017) and consists of unconsolidated deposits of clay, silt, and sand (Soren 1988). The south shores of Staten Island generally are characterized by gently sloping sandy beaches with some natural and built dunes, as well as discrete areas containing elevated bluffs (New York City 2013). A temporary dune constructed after Superstorm Sandy in 2013 consists of sand-filled barrier bags and extends approximately from Swinnerton Street to Sprague Avenue. The temporary dune has an elevation of approximately 13 feet above mean sea level. **Table 5.3** lists the approximate distribution of soil types within the project area (**Appendix A, Figure 8**) (U.S. Department of Agriculture [USDA] 2022).

**Table 5.3: Soil Types Within the Project Area**

Soil Type	Symbol	Acreage
Fortress fine sandy loam, 0 to 3 percent slopes	FrA	7.5
Sand beaches	Bs	7.2
Greenbelt-Urban land complex, 0 to 3 percent slopes	GUA	3.1
Greenbelt-Urban land complex, 3 to 8 percent slopes	GUB	1.9
Westbrook mucky peat, sandy substratum, 0 to 1 percent slopes, very frequently flooded	WbA	1.4
Boonton loam, 0 to 3 percent slopes	BtA	1.3

<b>Soil Type</b>	<b>Symbol</b>	<b>Acreage</b>
Urban land-Laguardia complex, 0 to 3 percent slopes	ULA	1.3
Haledon-Hasbrouck complex, 0 to 3 percent slopes, frequently ponded	HHA	0.5
Area covered in water	W	0.4
Urban land-Greenbelt complex, 0 to 3 percent slopes	UGA	0.1
Preakness mucky silt loam, 0 to 3 percent slopes	PkA	0.0

During project development, 18 soil borings were completed from 2016 to 2017: two near the wetlands delineated close to the wetland eco-revetment component and 16 at other locations in the project area (NYC Parks 2020). The borings showed that subsurface conditions near the wetlands generally consist of fill overlying interbedded layers of peat, clay, and sand (NYC Parks 2020). Subsurface conditions near the wetland were found not suitable for subgrade compaction (the process by which soils are graded prior to placement of pavement) and would therefore require either construction on piles or over-excavation to remove the poor soils (NYC Parks 2020). Borings at other locations in the project area indicate subsurface conditions are sand ranging from fine to coarse, with trace amounts of gravel (NYC Parks 2020).

### **5.1.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Under the No Action alternative, construction to reduce coastal hazards would not occur. Continued flooding from hurricanes, severe coastal storm events, and wave action could result in inland erosion and lead to topographic changes and soil losses. Topographic changes and soil losses could result in the loss of habitat (Sections 5.8 to 5.11), reduction in wetland area (Section 5.5), and shoreline retreat that could potentially threaten residential structures. Coastal erosion would continue as a result of climate-change-related sea level rise, which would increase the frequency and intensity of coastal erosion from the frequency and magnitude of storm surges. Therefore, the No Action alternative would have minor to moderate long-term adverse impacts on soils and topography from continued erosion due to storm-related flooding and surge.

#### **Alternative 2: Proposed Action**

Potential short-term construction-related impacts on topography and soils under the Proposed Action would be consistent with the scope of impacts evaluated in the PEA. As stated in the PEA, construction activities for all project elements, including excavation and grading, would result in ground disturbance and topographic changes. As noted in the PEA, construction effects would be temporary, and, as required by the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (Section 5.4), NYC Parks would implement a site-specific erosion control plan in accordance with the New York State (NYS) Standards and Specifications for Erosion and Sediment Control (New York State Department of Environmental Conservation [NYSDEC] 2016b). Erosion control measures would include silt



fencing, surface stabilization, inlet protection, installation of sediment traps, installation of compost filter sock, and stabilization of construction entrances.

On March 24, 2021, the U.S. Army Corps of Engineers (USACE) issued an Individual Permit to NYC Parks for the discharge of fill material into waters of the U.S. (NAN-2017000296-ESW) (USACE 2022). This permit would allow the placement of approximately 10,600 cubic yards (CY) of material over 1.3 acres below the plane of the Spring High Water elevation, including the discharge of approximately 1,550 CY of fill material into 0.14 acres of wetland and the removal of 90 CY of fill from the wetland. On January 21, 2022, USACE issued a modified Individual Permit to NYC Parks (NAN-2017-00296-M1) that increased the amount of fill permitted. The modified permit would allow for the placement of approximately 11,218 CY of material over approximately 1.3 acres below the plane of the Spring High Water elevation.

Fill would be both removed and added as a result of the Proposed Action and the impacts would extend beyond the scope of the PEA. An existing sand bridge that was previously constructed without authorization within the delineated wetland would be removed. This would result in the removal of up to 90 CY of previously unpermitted fill within the delineated wetland. Approximately 2,290 CY of riprap and soil near Tricia Way would be removed, including 280 CY below the mean high water line and 2,010 CY within the NYSDEC Tidal Wetlands Adjacent Area (GOSR 2018). A Tidal Wetlands Adjacent Area is defined as the area up to 150 feet landward of the most landward boundary of a tidal wetland (6 New York Code, Rules, and Regulations [NYCRR] 661.4). Use of any removed fill materials to construct project components would be in accordance with a Beneficial Use Determination (6 NYCRR 360.13).

A combination of underlayer stone, armor stone, and topsoil would be used to construct the earthen berm. Construction of the wetland eco-revetment and the hybrid dune-revetment would require the placement of approximately 1,550 CY of fill within the delineated wetland including armor stone, bedding stone, and earthen fill (GOSR 2018). Construction of the Surf Avenue eco-revetment and the raised edge would require the placement of underlayer stone, armor stone, topsoil, and sand. Fill material would be sourced from previous excavations in the project area and would not require material from off-site. No fill material would be placed below mean high water or Spring High Water (GOSR 2018). Therefore, there would be minor short-term adverse impacts on topography and soils from construction activity, specifically from the removal and placement of fill during the construction of the Proposed Action.

In the long term, the Proposed Action components would reduce the risk of flooding and erosion. There would be a permanent change to the topography in the area owing to the increased height, slope change, and shoreline hardening measures added to the five components of the Proposed Action. Soils would be protected with the inclusion of erosion resistant native vegetation and soil compaction. As noted in the PEA, vegetation used in combination with structural methods would mitigate impacts on topography and soils. Therefore, the Proposed Action would have a long-term

moderate beneficial impact on topography and soils by reducing soil loss from wave action, flooding, and inland erosion.

## **5.2 Air Quality**

The Clean Air Act of 1970 (42 U.S.C. 7401–7661 [2009]) requires EPA to establish National Ambient Air Quality Standards (NAAQS) for six pollutants harmful to human and environmental health: lead, nitrogen dioxide, ozone, carbon monoxide, sulfur dioxide, and particulate matter (PM) (including both PM less than 10 micrometers in diameter, referred to as PM<sub>10</sub>, and fine particulate matter less than 2.5 micrometers in diameter, referred to as PM<sub>2.5</sub>). Air quality can also be affected by fugitive dust, which is considered a component of PM. Fugitive dust is released into the air by wind or human activities, such as construction, and can have human and environmental health impacts. Federally funded actions in nonattainment and maintenance areas for these pollutants are subject to general conformity regulations (40 CFR Parts 51 and 93) to ensure emissions of air pollutants from planned federally funded activities would not cause any violations of the NAAQS, increase the frequency or severity of NAAQS violations, or delay timely attainment of the NAAQS or any interim milestone.

### **5.2.1 Existing Conditions**

Nonattainment and maintenance areas are periodically updated through EPA’s Green Book. As of December 31, 2022, the Green Book classified Richmond County as a severe nonattainment area for 8-hour ozone under the 2008 rule and a moderate nonattainment area for 8-hour ozone under the 2015 rule (EPA 2022a). Richmond County is in attainment for all other criteria pollutants (lead, nitrogen dioxide, carbon monoxide, sulfur dioxide, and PM) (EPA 2022a).

### **5.2.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Under the No Action alternative, construction activities and associated construction-related emissions related to coastal hazard reduction would not occur. However, there would be periodic coastal flood events that could result in road closures and damage to infrastructure. Road closures would result in the diversion of vehicles away from flooded areas, which could cause an increase in vehicle-related emissions, especially if the detour route is longer than the original route. However, this is a coastal area away from any major roadway artery at the southwestern tip of Staten Island. Because of the location, any rerouting of traffic would be local only and distance changes would be minimal. Additionally, emergency response vehicles and construction equipment would be required to repair damage from the repeated flood events. Emissions from vehicles and equipment used to repair flood damage and additional vehicle emissions generated by flood-related road detours could result in a negligible increase in emissions of criteria pollutants. The frequency and duration of flooding is expected to increase as a result of sea level

rise and climate change (EPA 2021), which could further increase traffic and repair-related emissions. However, future emissions would likely not result in a NAAQS exceedance or conflict with local air quality plans. Therefore, the No Action alternative would result in negligible periodic short-term adverse impacts on air quality as a result of emissions related to continued flooding and associated detours and repairs.

### **Alternative 2: Proposed Action**

The Proposed Action would result in temporary emissions from construction activity that would be consistent with the scope of impacts evaluated in the PEA. Construction of the Proposed Action may require excavators, front-end loaders, bulldozers, and trucks. These have the potential to produce airborne dust, a source of PM, from ground-disturbing activities, as well as pollutants from diesel equipment emissions (EPA 2022b). Best management practices (BMPs) would be in place to manage fugitive dust produced by construction activities, such as covering soils and truck beds, watering exposed soils, and tire washing. The diesel exhaust emissions from this equipment would include PM, carbon monoxide, and nitrogen oxides. Nitrogen oxides are a precursor for the production of ozone and therefore would contribute to the nonattainment status for ozone in the area (EPA 2004). However, construction activity would be temporary and follow all local, state, and federal regulations. In the long-term, the Proposed Action would reduce flooding and flood-related damage, leading to fewer flood-related roadway detours and reduced need for flood-related repairs that would use construction vehicles and equipment, resulting in fewer air pollutant emissions. Therefore, the Proposed Action would have minor short-term adverse impacts on air quality from construction vehicles, construction equipment, and vehicle detours and a negligible long-term beneficial impact on air quality, similar to the impacts described in the PEA.

### **5.3 Climate Change**

Climate change refers to changes in the Earth's climate caused by a general warming of the atmosphere. Its primary cause is emissions of greenhouse gases, including carbon dioxide and methane. Climate change can affect species distribution, temperature fluctuations, and weather patterns. The Council on Environmental Quality's *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* recommends that (1) agencies quantify the projected direct and indirect greenhouse gas (GHG) emissions of the proposed action, taking into account available data and GHG quantification tools that are suitable for the proposed agency action; (2) agencies use projected GHG emissions (to include, where applicable, carbon sequestration implications associated with the proposed agency action) as a proxy for assessing potential climate change effects when preparing a NEPA analysis for a proposed agency action; and (3) where agencies do not quantify a proposed action's projected GHG emissions because tools, methodologies, or data inputs are not reasonably available to support a quantitative analysis, that

a qualitative analysis be included in the NEPA document with an explanation of the basis for determining that quantification is not reasonably available (CEQ 2021).

### **5.3.1 Existing Conditions**

The global annual average temperature increased approximately 1.5 degrees Fahrenheit (°F) from 1880 to 2012 (Walsh et al. 2014); from 1895 to 2011, the annual average temperature in the Northeast region of the United States increased nearly 2°F (Horton et al. 2014). Depending on the level of future GHG emissions, the average annual temperature in the Northeast is projected to increase by another 3°F to 10°F by the 2080s (Horton et al. 2014). From 1900 to 2010, global mean sea level increased at an average rate of 0.5 to 0.7 inches per decade, while from 1900 to 2013, sea level rise in New York City increased an average of 1.2 inches per decade (Horton et al. 2015a). Sea level rise can be attributed to a number of factors, from thermal expansion to land-based ice loss. In New York City, approximately 40 percent of sea level rise can be attributed to land subsidence and the remaining approximately 60 percent to climate-related factors (Horton et al. 2015b). According to NYSDEC, sea level rise projections for the 2080s around New York City and the Lower Hudson Region range from a 13-inch to 58-inch increase in sea level relative to the average level of tidal waters between 2000 and 2004 (6 NYCRR 490). A 2015 report by the New York City Panel on Climate Change found that hurricanes and intense precipitation events will become more frequent in the region (Horton et al. 2015b). The heat index, short-duration droughts, and downpours are also expected to increase in the New York City metropolitan region because of climate change (Horton et al. 2015b).

### **5.3.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Under the No Action alternative, construction of measures to reduce the coastal hazards of wave action and flooding from severe coastal storms and hurricanes would not occur and there would be no construction-related GHG emissions. Periodic flood repairs and the potential for an increase in traffic-related emissions because of flood-related road closures would continue and could increase over time, resulting in an increase in GHG emissions. Therefore, the No Action alternative would have negligible intermittent long-term adverse impacts on GHG emissions and, indirectly, on the climate and would leave the coast vulnerable to the future impacts of climate change.

#### **Alternative 2: Proposed Action**

Under the Proposed Action, there would be a temporary short-term increase in GHG emissions from construction equipment and vehicles. These emissions would not increase GHGs to the extent that the Proposed Action would contribute to measurable levels of regional climate change. Therefore, the Proposed Action would have a short-term negligible adverse impact on the climate.

The Proposed Action would likely decrease the number of flood-related repairs and reduce vehicle emissions from rerouting traffic because of flood-related road closures. This would reduce the amount of GHG emissions from these sources, resulting in a negligible long-term benefit to climate change. The Proposed Action would mitigate climate-related coastal hazards, including the potential for damage from sea-level-rise-related wave action and an increased number and intensity of severe storms.

## **5.4 Water Quality**

The Clean Water Act (CWA) of 1977, as amended, regulates the discharge of pollutants into water with sections falling under the jurisdiction of USACE and EPA. Section 404 of the CWA establishes USACE permit requirements for discharging dredged or fill materials into waters of the U.S. NYSDEC administers Section 401 of the CWA and issues water quality certifications for proposed discharges into waters of the U.S. Under Section 402 of the CWA, which establishes the National Pollution Discharge Elimination System (NPDES), EPA regulates both point and nonpoint pollutant sources, including stormwater and stormwater runoff. Activities that disturb one or more acres of ground are required to have an SPDES General Permit for Stormwater Discharges from Construction Activity through NYSDEC, as authorized under the NPDES program.

Relevant state regulations include the Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations (NYCRR 703). This regulation controls pollution to maintain the quality of ground and surface waters.

### **5.4.1 Existing Conditions**

The project area is in the Raritan Bay-Lower Bay watershed, hydrologic unit code 0203010404, and Staten Island East-Raritan Bay subwatershed, hydrologic unit code 020301040404. The project area is along the northern shores of the Raritan Bay West Reach, which is listed as impaired because of fish consumption advisories for polychlorinated biphenyls (PCBs) and other toxics (NYSDEC 2020b). Sources of pollution for the Raritan Bay West Reach include toxic and contaminated sediment from past historical discharges, combined sewer overflows, and pathogens from urban and stormwater runoff (NYSDEC 2016a). Waterbodies in New York are assigned classifications based on whether they are freshwater or saline, as well as on their best use (NYSDEC 2022f). The Raritan Bay West Reach is classified as Class SB (6 NYCRR 890.6) for primary and secondary contact recreation and fishing, and it is suitable for fish and wildlife propagation and survival (6 NYCRR 701.11). Class SB indicates that Raritan Bay is a saline (marine) surface water with a best use of swimming or other contact recreation, but is not for consumption (NYSDEC 2022f, 2022g). Primary contact recreation includes activities such as swimming, and secondary contact recreation includes activities such as boating, where contact with the water is minimal and where ingestion of the water is not probable (6 NYCRR 700.1).

Unlike other Class SB waters, Raritan Bay West Reach is not suitable for shellfishing (NYSDEC 2016a).

The Raritan Bay West Reach is also part of the New York–New Jersey Harbor estuary. Section 320 of the CWA established the National Estuary Program, which identifies New York–New Jersey Harbor as a priority estuary (33 U.S.C. 1330). A Comprehensive Conservation and Management Plan for the New York–New Jersey Harbor Estuary Program was published in 1996 and outlines impairments threatening the harbor, including habitat loss and degradation, toxics, pathogens, floating debris, and nutrients and organic enrichment (NYS et al. 1996). A 2018 New York–New Jersey Harbor Estuary Program report found that, in the long term, water quality indicators such as dissolved oxygen, nitrogen, PCBs, polycyclic aromatic hydrocarbons, and dioxin in sediments were improving, and Raritan Bay showed significant decreases in mercury and lead concentrations (Hudson River Foundation 2018).

Within the project area, groundwater was measured at 4.6 feet below ground surface in the delineated wetland and at 4 to 6 feet below ground surface at other soil boring locations around the project area (NYC Parks 2020). The project area contains four existing outfalls that discharge into Raritan Bay and that cross the project area. These outfalls are at Loretto Street, Sprague Avenue, Joline Avenue, and Bedell Avenue.

#### **5.4.2 Potential Impacts and Proposed Mitigation**

##### **Alternative 1: No Action**

Under the No Action alternative, no construction activities related to shoreline protection would occur and there would be no short-term construction-related impacts on water quality. In the long term, the No Action alternative would not reduce the risk of wave action and inland flooding in the Tottenville area, which would result in continued erosion and sedimentation. Eroded soils and sedimentation could transport pollutants into Raritan Bay, that could degrade water quality. Floodwaters could also transport pollutants from the Tottenville area into the bay. Climate change is expected to increase the intensity and frequency of heavy precipitation as well as the frequency of intense hurricanes, which could increase the amount of stormwater runoff entering Raritan Bay. Intermittent construction activities for flood-related repairs could increase in frequency, potentially adding construction-related runoff. However, any impact on water quality would be minimal given the size of the bay. Therefore, the No Action alternative would have a negligible long-term adverse impact on water quality in Raritan Bay.

Pollutants in groundwater could increase with floodwater inundation and intermittent construction-related runoff from repairs. Because the groundwater is close to the surface, there could be a localized increase in water contamination. Therefore, the No Action alternative would have a minor adverse impact on groundwater quality.

## **Alternative 2: Proposed Action**

Construction activities associated with the Proposed Action would be consistent with the scope of impacts evaluated in the PEA, having the potential to affect water quality in the short-term during construction, site preparation, and excavation. Construction could result in accidental releases of hazardous waste from unknown underground sources or minor leaks from construction equipment (Section 5.21) and could cause sediment mobilization, resulting in minor short-term adverse impacts on water quality if not managed properly.

NYC Parks has obtained an Individual Permit from USACE for the discharge of fill materials into waters of the U.S. (Section 5.1). NYC Parks would also be required to obtain an SPDES General Permit for Stormwater Discharges from Construction Activity, which requires a stormwater pollution prevention plan (SWPPP) for construction activities. The SWPPP would include BMPs to reduce impacts on water quality from construction-related runoff and would require NYC Parks to conform to the NYS Standards and Specifications for Erosion and Sediment Control from November 2016 (NYSDEC 2016b). Erosion and sediment control BMPs could include silt fencing, inlet protection devices, filter bags, and turbidity curtains. Construction site access points would have stone pads to prevent track-out of mud and dirt onto adjacent streets (NYC Parks 2020). A sump pump would be used for temporary dewatering to avoid ponding of groundwater during excavation. The sump pit would be filled with 12 inches of aggregate and include a 24-inch-diameter standpipe constructed of perforated corrugated or polyvinyl chloride pipe wrapped with filter cloth. The standpipe would extend 12 to 18 inches above the rim of the pit, and the pit surrounding the pipe would be backfilled with aggregate. Dewatering activities would adhere to appropriate control measures, as required by the SPDES General Permit for Stormwater Discharges from Construction Activity. Therefore, with adherence to permit requirements, there would be a short-term minor adverse impact on water quality as a result of construction activities.

In the long term, the Proposed Action would reduce coastal erosion and wave impacts, mitigating the impact of inland coastal flooding. The Proposed Action would reduce the risk of floodwaters and eroded soils transporting pollutants into surface and ground waters. The wetland eco-revetment, hybrid dune-revetment, Surf Avenue eco-revetment, and raised edge would include natural features, such as bioswales and rain gardens, to treat stormwater runoff and filter pollutants from surface waters. The native vegetation planted for the TSPP would reduce the overall volume of stormwater runoff and reduce contaminants that could infiltrate into groundwater.

The Proposed Action would result in a reduction of the existing tidal wetland within the project area by approximately 0.14 acre. Wetlands improve water quality by filtering out sediments, nutrients, trace metals, and organic materials (Carter 1999). To offset the reduction in wetland area, NYC Parks would implement a variety of wetland enhancement activities, including removing Phragmites and improving tidal connectivity in the remaining wetland, resulting in a healthier wetland with greater potential to improve water quality (Section 5.5). Therefore, the

Proposed Action would result in a minor long-term benefit to water quality as a result of a reduction in flooding, water quality improvement features, and wetland enhancement activities.

## **5.5 Wetlands**

Executive Order (EO) 11990, Protection of Wetlands, requires federal agencies to avoid funding activities that directly or indirectly support occupancy, modification, or development of wetlands whenever there are practicable alternatives; in addition, all practicable measures to minimize harm to wetlands that may result from such use must be included in the proposal. FEMA uses the eight-step decision-making process to evaluate potential effects and mitigate impacts on wetlands in compliance with EO 11990. NYSDEC administers and regulates wetlands in NYS under the Freshwater Wetlands Act (Article 24 of Environmental Conservation Law) and the Tidal Wetlands Act (Article 25 of Environmental Conservation Law). Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the U.S., including wetlands.

### **5.5.1 Existing Conditions**

According to a review of the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory, three estuarine intertidal wetlands with unconsolidated shores occur within the project area (USFWS 2022c). These wetlands mapped under the National Wetlands Inventory do not meet the characteristics of wetland soils, hydrology, or hydrophytic vegetation to be under federal jurisdiction of the USACE as wetlands and therefore are only regulated as waters of the U.S. (GOSR 2018). However, a wetland delineation conducted on August 10, 2016, identified an approximate 0.8-acre tidal wetland south of the terminus of Brighton Street and Surf Avenue, west of Manhattan Street, east of Chelsea Street, and north of the beach (GOSR 2018) (**Appendix A, Figure 9**). Connectivity between the tidal wetland and Raritan Bay is currently limited by several factors, including the temporary dune and a sand bridge of unpermitted fill that bisects the wetland (GOSR 2018). The temporary dune is between the tidal wetland and Raritan Bay and serves as a physical barrier to the provision of water and sediment from the Bay to the wetland. According to the wetland delineation, no state-regulated wetlands are within 100 feet of the project area and the project area does not intersect any freshwater wetlands regulated by NYSDEC or their buffer zones (GOSR 2018). Therefore, no impacts on state-regulated freshwater wetlands would occur, and state-regulated wetlands will not be discussed further.

### **5.5.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Under the No Action alternative, there would not be any construction related to flood-reduction measures; therefore, there would not be any direct construction-related impacts on the tidal wetlands in the project area. However, the risk of flooding from wave action and storm surge would not be reduced and flooding of inland areas and shoreline erosion would result in wetland



impacts associated with sedimentation and pollutant inputs. Continued flooding could also increase erosion of wetlands that could result in loss of wetland area and this potential impact could worsen with sea level rise (Liu et al. 2021). The temporary dune and existing sand bridge would not be removed, reducing the opportunity to improve the health and function of the tidal wetland and its connectivity with Raritan Bay. Existing stands of Phragmites, an invasive plant, would not be removed and no planting of native plants would occur. Therefore, the No Action alternative would have minor long-term adverse impacts on wetlands in the project area as a result of continued flooding and non-removal of invasive plants and features impacting tidal connectivity.

### **Alternative 2: Proposed Action**

Construction of the Proposed Action could adversely impact the tidal wetlands through increased turbidity or accidental releases of hazardous materials or pollutants associated with construction equipment. Construction impacts could also lead to inadvertent loss of wetland habitat. During construction, a 25-foot protective buffer would be established around the tidal wetland to minimize encroachment of silt and other debris. Construction impacts would be mitigated through use of marsh mats or low-ground-pressure equipment and implementation of erosion and sediment control BMPs that conform to the NYS Standards and Specifications for Erosion and Sediment Control, as required by the SPDES General Permit for Stormwater Discharges from Construction Activity. Erosion control measures would include silt fencing, surface stabilization, inlet protection, installation of sediment traps, installation of compost filter sock, and stabilization of construction entrances. Potential repairs to portions of the tidal wetland disturbed by construction activity would include repair of ruts and stabilization of soil. The SPDES General Permit for Stormwater Discharges from Construction Activity would also require NYC Parks to maintain water quality during construction and would not permit the increase of turbidity or suspended solids, or the release of oil or grease (NYSDEC 2020a). Therefore, with adherence to erosion and sediment control BMPs, the Proposed Action would have a minor short-term adverse impact on wetlands due to construction activity.

The wetland eco-revetment would be constructed through the northern edge of the existing 0.8-acre tidal wetland, impacting approximately 5,640 square feet of the wetland (**Appendix A, Figure 4**). The hybrid dune-revetment would impact 630 square feet of the existing wetland (**Appendix A, Figure 5**), resulting in a total loss of approximately 6,270 square feet or 0.14 acre of wetland. This includes the placement of 1,176 CY of fill into the tidal wetland for the hybrid dune-revetment and wetland eco-revetment project components. NYC Parks has obtained a CWA Section 404 permit from USACE authorizing this fill in the tidal wetland. NYC Parks would adhere to all conditions in the 404 permit to avoid, minimize, and mitigate impacts on these wetlands. In addition, NYC Parks would be required to purchase mitigation credits from the Saw Mill Creek Mitigation Bank to offset the impacts on 0.14 acre of wetland.

To avoid disrupting the hydrologic connectivity between the tidal wetland and the area landward of the wetland eco-revetment component that currently drains into the tidal wetland, a curb cut would be constructed at the terminus of Brighton Street to convey flow to a new inlet structure that would be installed on the landward side of the wetland eco-revetment. The flow from the inlet structure would then be piped through the wetland eco-revetment directly onto a new riprap pad in the tidal wetland. A series of channels would be constructed through the tidal wetland to facilitate both tidal and stormwater flow.

The Proposed Action would improve the tidal exchange within the eastern portion of the wetland through the removal of an existing sand bridge that currently runs north to south through the wetland. Removal of the temporary dune between the wetland and Raritan Bay and regrading of the wetland to an elevation of 2.5 feet above mean sea level and the beach to an elevation of approximately 6.5 feet above mean sea level would remove physical barriers that currently prevent a free exchange of water supply between the wetland and Raritan Bay. An existing nonfunctioning pipe that connects the wetland to Raritan Bay would be removed and replaced with a tidal conduit that would extend from the wetland to offshore past mean low water out to a similar distance as the existing pipe. The tidal conduit would further facilitate the exchange of water and nutrients between the wetland and Raritan Bay.

The hybrid dune-revetment, the Surf Avenue eco-revetment, and the raised edge would be constructed within NYSDEC Tidal Wetlands Adjacent Areas resulting in an impact of 4.8 acres (GOSR 2018). NYSDEC requires Tidal Wetland Permits for almost any activity that would impact tidal wetlands and their adjacent areas, including placement of fill and construction of berms (6 NYCRR 661.5). NYC Parks would obtain a Tidal Wetland Permit administered by NYSDEC under the authority of the Tidal Wetlands Act.

The Proposed Action would enhance the remaining 0.66 acre of the existing wetland through removal of Phragmites and planting of native saltmarsh plants, such as broadleaf cattail (*Typha latifolia*) and saltmeadow cordgrass (*Spartina patens*). Increased tidal connectivity, described above, would also increase the salinity of the wetland, thereby creating a more suitable habitat for native saltmarsh plants and making the wetland less suitable habitat for Phragmites. Therefore, the Proposed Action would result in a minor long-term benefit to wetlands as a result of improved connectivity, removal of invasive plant species, and planting of native wetland vegetation.

FEMA completed an eight-step checklist for the Proposed Action, which concluded that implementation of this project would have more beneficial than detrimental impacts on wetlands and that there is no practicable alternative to conducting the project within wetlands. The eight-step checklist is provided in **Appendix B, Document 1**.

## **5.6 Floodplains**

Executive Order 11988, Floodplain Management, requires that federal agencies avoid direct or indirect support of development within the floodplain whenever there is a practicable alternative. FEMA uses Flood Insurance Rate Maps to identify floodplains for the National Flood Insurance Program. Federal actions within the 100-year floodplain require the federal agency to conduct an eight-step process. This process, like NEPA, requires the evaluation of alternatives before funding the action. FEMA's regulations on conducting the eight-step process are contained in 44 CFR Part 9.

FEMA uses the 1-percent floodplain as the minimal area for floodplain impact evaluation. FEMA defines a 1-percent-annual-chance floodplain (i.e., 100-year floodplain) as an area subject to inundation from a flood that has a 1-percent chance of being equaled or exceeded in any given year. The elevation of the surface water resulting from a flood that has a 1-percent chance of equaling or exceeding that level in any given year is known as the Base Flood Elevation.

### **5.6.1 Existing Conditions**

The project area includes FEMA Special Flood Hazard Areas Zones AE and X, and Coastal High Hazard Area Flood Zone VE, as shown on Flood Insurance Rate Map Panels 3604970451F and 3604970313F (**Appendix A, Figure 10**). Flood Zone AE are areas with a 1-percent chance of being inundated within any given year and where a base flood elevation has been determined, Flood Zones X are areas of minimal flood hazard, and Flood Zones VE are flood zones with additional hazards associated with storm waves (FEMA 2022). Flooding in Tottenville and the surrounding area occurs as a result of both heavy precipitation and storm surge events, which may be exacerbated by sea level rise (NYRCR 2014).

### **5.6.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Under the No Action alternative, construction activities for shoreline stabilization would not occur, resulting in no short-term construction-related impacts on floodplains. However, in the long term, residential and commercial properties surrounding the project area and in the Tottenville neighborhood, and the people who occupy them, would continue to be at risk of loss of life and property damage from wave action and inland flooding that result from future storm events. Without the proposed improvements, the amount of land subject to inland flooding in and around the project area would likely increase in future years because of increased storm frequency and intensity, as well as sea level rise (Section 5.3). Because flooding is expected to increase as a result of climate change and sea level rise, the No Action alternative would have a moderate long-term adverse impact on people and property within the floodplain.

## **Alternative 2: Proposed Action**

Construction of the Proposed Action would be consistent with the scope of impacts evaluated in the PEA, affecting the floodplain through the potential release of hazardous waste and sediments and with temporary fills. Construction could result in accidental releases of hazardous waste from previously unknown underground sources or minor leaks from construction equipment (Section 5.21). Ground disturbance could cause sediment to run off into the floodplain and result in minor adverse impacts on water quality and aquatic life. NYC Parks would implement a SWPPP in accordance with the SPDES General Permit for Stormwater Discharges from Construction Activity (Section 5.4). These measures required by state and local permits for construction would avoid and minimize potential impacts. Therefore, construction of the Proposed Action would have negligible short-term adverse impacts on the floodplain.

The Proposed Action would place permanent fill in and alter the topography of the floodplain, resulting in a more stable shoreline, which would reduce erosion and inland flooding. The stone revetment components of the wetland eco-revetment and the Surf Avenue eco-revetment would provide a hard limit to coastal erosion. Although the vegetated slope on top of the stone core of the earthen berm would be susceptible to erosion, it would be protected by vegetation. The hybrid dune-revetment would also be susceptible to erosion, but it would be constructed further inland than the existing temporary dune to mitigate the risk of erosion. The stone core of the hybrid dune-revetment would also provide structural stability. Native plantings on the earthen berm, wetland eco-revetment, and hybrid dune-revetment would increase shoreline stability and result in a more resilient shoreline during high tides and storm surges. The five project components combined would reduce the risk of inland flooding by reducing wave impacts associated with hurricanes and severe coastal storm events and would also improve shoreline stability. Therefore, the Proposed Action would have a moderate long-term benefit on floodplains.

FEMA completed an eight-step checklist for the Proposed Action, which concluded that implementation of this project would have more beneficial than detrimental impacts on floodplains and that there is no practicable alternative to conducting the project within the floodplain. The eight-step checklist is provided in **Appendix B, Document 1**.

## **5.7 Coastal Resources**

The Coastal Zone Management Act is administered by states with coastal shorelines to manage coastal development with a coastal zone management plan (CZMP). Federal agencies must evaluate actions within designated coastal zones to ensure they are consistent with the CZMP. Projects receiving federal assistance must follow the procedures outlined in 15 CFR 930.90 – 930.101 for federal coastal zone consistency determinations. To guide development and resource management within New York’s coastal area, 44 policies have been identified and promulgated by the NYSDOS and NYSDEC to promote the beneficial use of coastal resources, prevent their impairment, or address major activities that substantially affect numerous resources (NYSDOS

2020). The Coastal Erosion Hazard Law (Environmental Conservation Law 34) empowers NYSDEC to identify and map coastal erosion hazard areas and to adopt regulations (6 NYCRR Part 505). The Coastal Erosion Hazard Area (CEHA) Permit Program manages regulated activities or land disturbance on properties within coastal erosion hazard areas.

### **5.7.1 Existing Conditions**

The project area is within the coastal zone boundary and elements of the project (a portion of the eastern end of the hybrid dune-revetment, the Surf Avenue eco-revetment, and the raised edge) would be located within a CEHA zone. Consultation with NYSDOS and the New York City Department of City Planning was completed via submittal of the New York City Waterfront Revitalization Program Consistency Assessment Form on June 1, 2018.

### **5.7.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Under the No Action alternative, construction activities related to shoreline stabilization would not occur and there would be no short-term construction-related impacts on coastal resources. In the long term, the No Action alternative would be inconsistent with a number of NYS's Coastal Management Policies. The No Action alternative would not be consistent with Policy 7, which calls for the protection, preservation, and restoration of significant coastal fish and wildlife habitats, because continued flooding could result in the transport of pollutants and sediments that would adversely impact fish habitat (Section 5.9). The No Action alternative would not be consistent with Policy 19, which calls for an increase in the level of access to public water-related recreation resources, because it would not result in the construction of a continuous Tottenville shoreline trail, nor any access points to improve beach access. The No Action alternative would not be consistent with Policy 44, which calls for the preservation and protection of tidal and freshwater wetlands, as the current wetlands would continue to have connectivity issues with Raritan Bay and no action would be taken to enhance the existing wetland (Section 5.5). Therefore, the No Action alternative would result in a minor, long-term, adverse impacts on coastal resources as a result of the failure to promote these NYS's Coastal Management Policies.

#### **Alternative 2: Proposed Action**

The construction of the earthen berm, wetland eco-revetment, hybrid dune-revetment, Surf Avenue eco-revetment, and raised edge would result in minor short-term adverse impacts on coastal resources within the project area. Under the Proposed Action, construction would temporarily impact shoreline access and use of existing trails. Because the Proposed Action would take 24 months to construct, there could be potential impacts on coastal resources as a result of coastal storms or hurricanes during the construction period that would not be mitigated by the incomplete project components. To maximize protection against coastal flooding during the construction period, the temporary dune would be removed only after the earthen berm had been constructed.

Because a portion of the eastern end of the hybrid dune-revetment, the Surf Avenue eco-revetment, and the raised edge are within a CEHA, a Coastal Erosion Management Permit would be required and all conditions within the permit would be followed. Thus, the Proposed Action would result in a minor, short-term, adverse impact on coastal resources as a result of construction activities.

The Proposed Action would be consistent with a number of NYS's Coastal Management Policies.

- Policy 7, which calls for the protection and restoration of the viability of fish and wildlife habitats, because both terrestrial and aquatic habitats would be enhanced (Section 5.9).
- Policy 12, which calls for the protection of natural protective features that minimize flooding, because the existing coastal bluffs would be hardened through implementation of the Proposed Action.
- Policy 13, which calls for the construction of erosion protection structures that will control erosion for at least 30 years, because the Proposed Action is designed with a 50-year service life.
- Policy 19, which calls for activities to increase access to public water-related recreation resources because the Proposed Action would create the Tottenville Shoreline trail and several new access points.
- Policy 20, which calls for the provision of access to publicly owned foreshore, because the Proposed Action would provide a variety of ways to access the shore.
- Policy 44, which calls for the protection and preservation of tidal wetlands, because the Proposed Action would implement a number of wetland enhancement activities, including the removal of Phragmites and the improvement of tidal connectivity (Section 5.5).

Therefore, the Proposed Action would have a moderate long-term benefit on coastal resources because it would support and advance several of the relevant NYS Coastal Management Policies.

## **5.8 Vegetation**

Executive Order 13112, Invasive Species, requires federal agencies, to the extent practicable, to prevent the introduction of invasive species and provide for their control to minimize the economic, ecological, and human health impacts that invasive species cause. Invasive species prefer disturbed habitats and generally possess high dispersal abilities, enabling them to out-compete native species. Part 575 of the CRR-NY establishes a list of invasive species regulated and prohibited by the state to help control invasive species statewide by reducing new infestations and the spread of existing populations.

Section 193.3 of the CRR-NY, Protected Native Plants, establishes four lists of state-protected plants (endangered, threatened, rare, and exploitably vulnerable) and renders it a violation to collect or destroy listed plants without the consent of the owner.

### 5.8.1 Existing Conditions

The Tottenville shoreline contains large areas of natural open space comprising city- and state-owned areas, such as Conference House Park and Hybrid Oak Woods Park, which are within the project area, and Butler Manor Woods, which borders the eastern terminus of the project area (**Appendix A, Figure 11**). These open spaces contain upland forest and estuarine and freshwater wetland systems that support numerous species of native plants and animals. The shoreline is fringed by a sand and cobble beach. Vegetation surveys of the project area were conducted in 2015 for the Coastal and Social Resiliency Initiatives for Tottenville Shoreline EIS (GOSR 2018). These surveys identified four vegetation communities in the project area: maritime beach, maritime dunes, mowed lawn with trees, and successional southern hardwoods (GOSR 2018).

The maritime beach community is located along the shoreline of Conference House Park. It is sparsely vegetated with invasive common reed (*Phragmites australis*) and American beachgrass (*Ammophila breviligulata*) scattered across the landscape. The maritime dunes community, which occurs in the project area in the dunes of Conference House Park, comprises a mosaic of herbaceous and shrubland vegetation patches that include seaside goldenrod (*Solidago sempervirens*), poison ivy (*Toxicodendron radicans*), common reed, Japanese knotweed (*Polygonum cuspidatum*), and northern bayberry (*Myrica pensylvanica*). Mowed lawn with trees is present near buildings within Conference House Park; common plant species in this community include Kentucky bluegrass (*Poa pratensis*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), crabgrass (*Digitaria* spp.), common plantain (*Plantago major*), and English plantain (*Plantago lanceolata*). The successional southern hardwoods communities located inland from the beach and dunes (where the raised edge, earthen berm, and eco-revetments are proposed) are made up of trees including eastern cottonwood (*Populus deltoids*), American hackberry (*Celtis occidentalis*), black cherry (*Prunus serotina*), pin oak (*Quercus palustris*), gray birch (*Betula populifolia*), black locust (*Robinia pseudoacacia*), and tree of heaven (*Ailanthus altissima*); shrubs dominated by false indigo (*Amorpha fruticosa*); and herbaceous plants including Japanese knotweed, common mugwort (*Artemisa vulgaris*), and seaside goldenrod (GOSR 2018).

Invasive plants are common in the project area and include two regulated invasive species (Norway maple [*Acer platanoides*] and black locust) and six prohibited invasive species (garlic mustard [*Alliaria petiolate*], autumn olive [*Elaeagnus umbellate*], common reed, Japanese knotweed, multiflora rose [*Rosa multiflora*], and wineberry [*Rubus phoenicolasius*]) (GOSR 2018).

One state-listed endangered species (seaside goldenrod), three state-listed threatened species (yellow giant-hyssop [*Agastache nepetoides*], dune sandspur [*Cenchrus tribuloides*], and northern gamma grass [*Tripsacum dactyloides*]), and two exploitably vulnerable native plant species (flowering dogwood [*Cornus florida*] and eastern prickly pear [*Opuntia humifisa*]) were found in the project area (GOSR 2018; 6 CRR-NY 193.3).

## **5.8.2 Potential Impacts and Proposed Mitigation**

### **Alternative 1: No Action**

Under the No Action alternative, there would be no construction of shoreline protection measures; therefore, no vegetation removal or revegetation with native plants would occur in the project area and there would be no short-term impacts on vegetation. However, the project area would remain susceptible to coastal flooding. Floodwaters could cause soil erosion and result in the deposition of debris and sediments on the ground surface that could physically damage soil and smother and kill vegetation. Continued erosion and sedimentation may lead to the spread of invasive species such as common reed and Japanese knotweed, which are typically better able to recolonize disturbed areas than native species. Additionally, construction may be required to address future flood damage, which could result in additional temporary impacts on vegetation. Therefore, the No Action alternative would have minor intermittent adverse impacts on vegetation in the long term.

### **Alternative 2: Proposed Action**

Under the Proposed Action, existing vegetation would be removed to construct components of the shoreline protection project. The proposed project would affect approximately 5.4 acres of the maritime beach and maritime dunes communities, and approximately 0.6 acre of successional southern hardwoods community. The maritime dunes community and the successional southern hardwoods community support a state-listed plant species that would likely be impacted by construction (i.e., seaside goldenrod). NYC Parks would coordinate with the NYS Natural Heritage Program to develop a protection program (e.g., transplant, seed collection, and propagation) for the population of seaside goldenrod that would have the potential to be affected by construction of the project. Although the project components, specifically the earthen berm component, have been sited to minimize tree removal and other disturbances to the woodland area of Conference House Park, some tree removal would be required. As described in the PEA, actions such as the Proposed Action that require vegetation clearing would have impacts on terrestrial vegetation and habitats. However, the successional southern hardwoods community that would be impacted by construction activities is relatively common throughout the region and the loss of this habitat in the project area would not have a measurable effect on this ecological community as a whole throughout the region. Invasive plant species would be identified and removed manually or via herbicide application, adhering to the conditions laid out in the Invasive Species Management Plan and any relevant permits. Additionally, the contractor would be required to adhere to the tree protection BMPs presented in the design plans and NYC Park's Tree Protection Best Practices and Protocol (NYC Parks 2022). Therefore, the Proposed Action would have minor short-term adverse impacts on vegetation.

Following construction, native coastal vegetation would be planted on the earthen berm, the hybrid dune-revetment, and within portions of the eco-revetments and raised edge. Consistent with the



analysis in the PEA, these plantings would be locally sourced, and species would be selected to retain the ecological function of each vegetation community; affected state-listed species would be selected for replanting where possible. **Appendix B, Document 2** contains a list of eligible plant species that could be used to replant each vegetation community and the replanting plan (GOSR 2020). Although trees would be replanted within the successional southern hardwoods community, it would take many years for new trees to reach the same maturity of those removed. However, there is an abundance of available mature trees and similar habitat in the area and the temporal loss of mature trees within the project area would be a negligible impact.

A thick layer of topsoil would be added to each of the constructed components to promote root establishment for plantings. Any other areas disturbed by construction activities would be restored to their pre-construction conditions. As described in the PEA, revegetation with native plants that are appropriate for the site conditions would reduce the likelihood of site colonization by invasive species and would improve opportunities for ground cover to successfully establish.

Therefore, the Proposed Action would have minor long-term benefits related to vegetation communities in the project area.

## **5.9 Wildlife and Fish**

NYSDEC is responsible for managing and protecting New York's wildlife populations. To do this, NYSDEC conserves crucial habitats and sets regulations and policies that protect plant and animal resources. Section 182.2 of 6 NYCRR Part 182 lists species identified by the State of New York (NYS) as endangered, threatened, special concern, and high-priority species of greatest conservation need (NYSDEC 2022a). Specific species are also protected by federal laws, such as the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act, Magnuson-Stevens Fishery Conservation and Management Act, and Marine Mammal Protection Act (MMPA).

Potential impacts on common and state-listed terrestrial and aquatic wildlife species are evaluated in this section. Additional potential impacts on fish and wildlife are evaluated as follows: federally listed threatened and endangered species - Section 5.10, migratory birds -Section 5.11, bald and golden eagles -Section 5.12, essential fish habitat (EFH) -Section 5.13, and marine mammals - Section 5.14.

### **5.9.1 Existing Conditions**

#### **Terrestrial Resources**

Terrestrial habitats within the project area include coastal woodlands, dunes, sandy/gravelly beach, and tidal wetland areas. Terrestrial wildlife present in the project area includes many species of birds that use these habitats for nesting and foraging, as described in Section 5.11.

## **Mammals and Insects**

With the exception of muskrats (*Ondatra zibethicus*), mammals within the project area occupy terrestrial habitats. Mammals that are typical of coastal dunes and woodlands in New York are considered likely to occur within the project area. These include the woodland vole (*Microtus pinetorum*), white-footed mouse (*Peromyscus leucopus*), meadow vole (*Microtus Pennsylvanicus*), white short-tailed shrew (*Blarina brevicauda*), masked shrew (*Sorex cinereus*), raccoon (*Procyon lotor*), Norway rat (*Rattus norvegicus*), gray squirrel (*Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), white-tailed deer (*Odocoileus virginianus*), and domestic cat (*Felis catus*). Although not in the project area, the freshwater pond and wetlands within Conference House Park provides suitable habitat for muskrats to occur (GOSR 2018; Ekernas and Mertes 2006). Multiple common species of bats pass through the project area during their long-distance migrations. These include little brown bats (*Myotis lucifugus*), a high priority species of greatest conservation need, and big brown bats (*Eptesicus fuscus*) that may inhabit the project area's woodlands during the breeding season (GOSR 2018). Additionally, the freshwater pond and wetlands nearby within Conference House Park provide suitable habitat for aquatic mammals; namely, muskrats (*Ondatra zibethicus*).

In 2020, the spotted lanternfly (*Lycorma delicatula*) was discovered in Staten Island (NYS Department of Agriculture and Markets 2020). The spotted lanternfly is considered a destructive invasive species that feeds on more than 70 plant species, including tree of heaven and maple trees, both of which are present in the project area (NYSDEC 2022d). NYSDEC is currently working with the NYS Department of Agriculture and Markets and USDA to address the spotted lanternfly infestation, which includes conducting extensive trapping surveys throughout high-risk areas and inspecting imports (NYSDEC 2022d).

## **Aquatic Resources**

As described in Section 5.5, the proposed project area does not intersect any freshwater wetlands regulated by NYSDEC or their buffer zones; however, there are freshwater streams and wetland habitats near the project area. Within the project area, there is a tidal wetland that currently has limited connectivity with the open waters of Raritan Bay because of the presence of the temporary dune and a section of unpermitted fill that has formed a sand bridge across the wetland (GOSR 2018). Raritan Bay makes up the marine habitat near the project area. Raritan Bay is part of the Lower New York Bay Complex (a complex of connected estuaries where freshwater mixes with saltwater) within the New York–New Jersey Harbor. The Lower Bay Complex includes the Lower Bay, Raritan Bay, and Sandy Hook Bay, which are all connected. Raritan Bay is shallow, with water depths generally less than 18 feet except for a small area at the eastern end of the bay and within the dredged channels (GOSR 2018).

## Reptiles and Amphibians

Although not all reptiles discussed below are fully aquatic, most reptiles and amphibians found in the project area rely at least in part on the non-marine aquatic habitats that are present in the vicinity and would be affected by changes to aquatic resources in the project area; therefore, all reptiles and amphibians will be discussed within the aquatic resources section. Based on a review of the NYSDEC Amphibian and Reptile Atlas Project surveys conducted from 1990 to 1999, NYSDEC's New York Nature Explorer, and habitat requirements and species' status on Staten Island, the aquatic reptiles and amphibians that have the potential to occur within freshwater habitats near the project area include the eastern mud turtle (*Kinosternon subrubrum*; NYS endangered), eastern fence lizard (*Sceloporus undulatus*; NYS threatened), snapping turtle (*Chelydra serpentina*), eastern box turtle (*Terrapene Carolina*), northern diamondback terrapin (*Malaclemys terrapin*), red-eared slider (*Trachemys scripta*), painted turtle (*Chrysemys picta*), northern water snake (*Nerodia sipedon*), northern brown snake (*Storeria dekayi*), common garter snake (*Thamnophis sirtalis*), northern ringneck snake (*Diadophis punctatus*), northern black racer (*Coluber constrictor*), spotted turtle (*Clemmys guttata*; NYS species of special concern), southern leopard frog (*Rana sphenocephala*; NYS species of special concern), red-spotted newt (*Notophthalmus viridescens*), red-backed salamander (*Plethodon cinereus*), northern two-lined salamander (*Eurycea bislineata*), Fowler's toad (*Bufo fowleri*), spring peeper (*Pseudacris crucifer*), bullfrog (*Rana catesbeiana*), and green frog (*Rana clamitans*) (GOSR 2018; NYSDEC 2007, 2022b). The species listed above are associated with either freshwater or slightly brackish habitats and are unlikely to exist in the tidal wetland present within the project area.

## Marine Fish and Invertebrates

The fish community of Raritan Bay and neighboring waters is diverse. Past surveys have identified more than 90 species in the area, including coastal, anadromous (species that migrate from the sea to freshwater to spawn), and catadromous (species that migrate from freshwater to the sea to spawn) species (GOSR 2018). Prey species such as bay anchovy (*Anchoa mitchilli*), Atlantic menhaden (*Brevoortia tyrannus*), and Atlantic silverside (*Menidia menidia*) provide forage for higher-level predators in the ecosystem, including species that support recreational and commercial fisheries including summer flounder (*Paralichthys dentatus*), striped bass (*Morone saxatilis*), winter flounder (*Pseudopleuronectes americanus*), and bluefish (*Pomatomus saltatrix*). The soft-bottom benthic community is dominated by polychaete and oligochaete worms, with amphipods and gastropods also present. Special-status fish species and designated EFH are discussed in more detail in Sections 5.10 and 5.13, respectively. The hard-bottom benthic community is dominated by gastropods, amphipods, and polychaete worms (GOSR 2018). Benthic species present in the New York–New Jersey Harbor are generally considered to be pollution-tolerant (Adams et al. 1998). Marine mammals that may occur in Raritan Bay are discussed in Section 5.14.

## **5.9.2 Potential Impacts and Proposed Mitigation**

### **Alternative 1: No Action**

#### **Terrestrial Resources**

##### ***Mammals and Insects***

Under the No Action alternative, there would be no construction of shoreline protection measures; therefore, there would be no short-term impacts on terrestrial mammals or insects in the project area. However, the project area would remain susceptible to coastal flooding, which could have negative impacts on terrestrial species that could include drowning, displacement, and habitat destruction. In the long term, construction could be intermittently required to repair damage caused by coastal flood events, which could result in some terrestrial species temporarily avoiding affected areas. However, flood damage repairs would likely be focused on the built environment and would affect only a small amount of natural habitat. Given the amount of natural habitat within the parks and shoreline of the project area, any displaced individuals would not be expected to have difficulty temporarily relocating to nearby habitat during construction. Any such temporary displacement because of repair activities would not significantly impact wildlife at the individual or population level. Therefore, the No Action alternative would have negligible to minor long-term adverse impacts on terrestrial wildlife as a result of future coastal flood events and subsequent repair activities.

#### **Aquatic Resources**

Because no construction of shoreline protection measures would occur, there would be no short-term impacts on non-marine or marine aquatic wildlife in the project area. However, the project area would remain susceptible to coastal flooding. The long-term impacts on non-marine aquatic and marine aquatic species as a result of future coastal flood events under the No Action alternative are discussed below.

##### ***Reptiles and Amphibians***

Floodwaters that inundate streets and residential areas have the potential to introduce pollutants such as chemicals, oils, debris/sediments, and sewage into the wetlands in the project vicinity. Pollutants carried into wetlands via floodwaters could degrade the water quality, and sediments could smother aquatic wildlife and habitats in wetlands. Additionally, intermittent construction activities could be required in or near the project area to repair damage caused by future flood events. Ground-disturbing repair activities that occur near wetlands could result in impacts on water quality from erosion of disturbed soils, reducing the quality of available habitat for non-marine aquatic wildlife and state-listed reptile and amphibian species. However, these impacts would be temporary and localized. Therefore, the No Action alternative would have minor, long-term, adverse impacts on non-marine aquatic species.

### ***Marine Fish and Invertebrates***

As discussed above, floodwaters that inundate streets and residential areas have the potential to introduce pollutants and sediments into the marine aquatic ecosystem (Raritan Bay) adjacent to the project area, which could degrade the Bay's water quality and smother benthic species and habitats. Intermittent construction activities could be required in or near the project area to repair damage caused by future coastal flood events. Ground-disturbing repair activities that occur near the bay could result in impacts on water quality from erosion. However, any impact on water quality would be minimal given the size of the bay. Therefore, the No Action alternative would have negligible, long-term, adverse impacts on marine aquatic species.

### **Alternative 2: Proposed Action**

#### **Terrestrial Resources**

##### ***Mammals and Insects***

Construction-related noise (Section 5.17) and activity would be short-term. Although construction is expected to last for a total of 24 months, construction would occur sequentially beginning at the western end of the project area and moving toward the eastern end; therefore, no portion of the project area would be under construction for the entirety of the 24 months. Terrestrial wildlife in the project area is relatively accustomed to noise and human activity given their habitats are amidst residential and recreational areas. However, the increase in noise and activity levels as a result of construction could cause direct harm, disturbance, and displacement of wildlife from use of heavy equipment in terrestrial habitats. Vegetation removal would reduce the amount of available terrestrial habitat within the project area until vegetation can be restored. As discussed in Section 5.9.1, there is an abundance of comparable terrestrial habitat adjacent and close to the project area that would reduce the impact of displacement and reduction in habitat because of vegetation removal. In the long term, removal of invasive plants and revegetation with native species would improve terrestrial habitats. These changes to vegetation composition within the project area are unlikely to increase the potential for the spotted lanternfly to be present in the project area. Therefore, implementation of the Proposed Action would have minor short-term adverse impacts and a minor long-term beneficial impact on terrestrial wildlife.

#### **Aquatic Resources**

Construction activities have the potential to increase noise and human activity near the non-marine aquatic habitats within and around the project area. This increase in noise and activity levels from use of heavy equipment could cause direct harm, disturbance, and displacement of the non-marine aquatic wildlife in and near the project area. Additionally, construction activities have the potential to degrade the water quality of both the non-marine and marine aquatic ecosystems in and near the project area, including the tidal wetland, by introducing pollutants such as sediments and oils. As discussed in the Terrestrial Resources section, vegetation removal would reduce the amount of available habitat available for reptiles and amphibians that rely in part on terrestrial resources

within the project area until vegetation can be restored. However, there is an abundance of comparable habitat adjacent to the project area that would reduce the impact of displacement and reduction in habitat because of vegetation removal. As discussed in Section 5.5, there are no state-regulated wetlands within 100 feet of the project area, and the project work would not intersect any freshwater wetlands regulated by NYSDEC or their buffer zones (GOSR 2018). With the implementation of a SWPPP and BMPs, and with adherence to the conditions stipulated in the required permits (i.e., the USACE permit, SPDES General Permit for Stormwater Discharges from Construction Activity, and the Tidal Wetland Permit), there would be negligible, short-term, adverse impacts on non-marine and marine aquatic species in and around the project area.

Following construction of the Proposed Action, the frequency of flood events that inundate streets and suburban areas would decrease, resulting in fewer pollutants being introduced into aquatic environments in and near the project area and a reduced need for future flood repair activities. Since the project area would not overlap with any freshwater wetlands, the construction of shoreline protection measures is not anticipated to alter freshwater habitat availability for the state-listed eastern mud turtle or the spotted turtle, a NYS species of special concern (GOSR 2018). The tidal wetland in the project area would benefit from the removal of Phragmites, planting of native vegetation, and increased tidal connectivity, increasing the quality of habitat. Therefore, the Proposed Action would have minor long-term benefits to aquatic species in and surrounding the project area.

## **5.10 Threatened and Endangered Species**

The ESA of 1973 provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead federal agencies for implementing ESA are USFWS and the National Marine Fisheries Service (NMFS). The law requires federal agencies to ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a “taking” of any listed species.

### **5.10.1 Existing Conditions**

Information on the presence of threatened and endangered species in the project area was obtained from the USFWS Information for Planning and Consultation (IPaC) system, accessed November 10, 2022 (USFWS 2022a); the NMFS Greater Atlantic Region ESA Section 7 Mapper (NMFS 2022a); and the findings of biological surveys conducted in the project area (GOSR 2018). The IPaC system reported two federally endangered species, the roseate tern (*Sterna dougalli dougalli*) and the northern long-eared bat (*Myotis septentrionalis*), and one federally threatened species, the piping plover (*Charadrius melodus*; Northeast Region population), as being potentially present in the general area (USFWS 2022a). Past consultation with USFWS indicated

that red knots (*Calidris canutus rufa*), a federally threatened species, have been documented on beaches and in coastal areas on Staten Island and in Jamaica Bay, New York, and therefore have the potential to occur within the project area as occasional transient individuals (GOSR 2018).

Roseate terns typically occupy coastal habitats and nest among colonies of common terns in densely vegetated or otherwise covered areas (USFWS 1998). Piping plovers are small migratory shorebirds that typically nest and feed along coastal sand and gravel beaches (USFWS 2022b). The *rufa* subspecies of the red knot is a migratory shorebird that migrates up to 30,000 miles round trip between its wintering grounds in South America and breeding grounds in the high arctic, and they are dependent on a superabundance of horseshoe crab (*Limulus polyphemus*) eggs at their refueling areas along the Atlantic coast to complete their migration (Baker et al. 2004; GOSR 2018).

Although there is habitat within the project area that could be suitable for the roseate tern, the breeding range of the species within New York is mostly limited to the coastlines of Long Island. Additionally, eBird's New York Breeding Bird Atlas Version 3 has only one recorded observation of the species in Richmond County since 2020, which was recorded approximately 7 miles east of the project area (eBird 2022). Similarly, the breeding range of piping plovers within New York is also limited to the coastlines of Long Island; piping plovers are not known to nest on Staten Island, and any potential occurrences of individuals within the project area would be limited to migrants passing through (GOSR 2018). Delaware Bay and Cape Cod, Massachusetts, are the most significant staging areas for migrating red knots along the Atlantic coast. Horseshoe crabs do not spawn in the numbers required to support migrating red knots within the project area (GOSR 2018). In addition, no recent sightings of red knots have been documented in the New York Breeding Bird Atlas Version 3, and the closest observed individual was seen approximately 2 miles east of the project area in 2021 (eBird 2022). Therefore, the species is not likely to be present in the project area, and any potential occurrences of red knots within the project area would likely be limited to migrants briefly passing through on their way to their breeding or wintering grounds.

Northern long-eared bats may be found roosting singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees during the summer and portions of the fall and spring. The species also uses forested areas for foraging and commuting between summer and winter habitats, which consist of caves or mines, called hibernacula (USFWS 2023). Because there are trees within the project area that may provide suitable roosting habitat, the species could be present within the project area during the spring, summer, and fall. No known winter hibernacula occur within or near the project area (USFWS 2023a).

Federally listed aquatic species that are considered by NMFS to have the potential to occur in Raritan Bay near the project area include the Atlantic sturgeon New York Bight distinct population segment (*Acipenser oxyrinchus*; endangered), north Atlantic right whale (*Eubalaena glacialis*; endangered), fin whale (*Balaenoptera physalus*; endangered), leatherback sea turtle (*Dermochelys*

*coriacea*; endangered), loggerhead sea turtle (*Caretta caretta*; threatened), green sea turtle (*Chelonia mydas*; threatened), and Kemp's ridley sea turtle (*Lepidochelys kempii*; endangered) (NMFS 2022a). The project area does not overlap with critical habitat for any listed species (USFWS 2022a; NMFS 2022b). The listed species regulated by NMFS that were identified to be potentially present near the project area typically prefer to occupy deeper offshore habitats and are only expected to occur as transients within Raritan Bay (GOSR 2018).

### **5.10.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Under the No Action alternative, construction activities related to shoreline protection would not occur and there would be no short-term construction-related impacts on threatened and endangered species. The roseate tern and piping plover do not nest in the project area and would occur only transiently. Tree removal would not occur under the No Action alternative, and storm surge would likely not cause the downing of trees large enough to provide northern long-eared bat roosting habitat. Similarly, federally listed marine species occur only transiently offshore, and the No Action alternative would have no effect on listed species under the jurisdiction of NMFS.

#### **Alternative 2: Proposed Action**

Individual roseate terns and piping plovers would be expected to spend very little time in the project area, would not nest in the area, and would be able to readily avoid disturbance from construction activities. To minimize impacts further, NYC Park will halt construction activities to avoid the May 1 through July 31 primary bird breeding season to the extent possible. As long as the minimization condition is followed, FEMA has determined that the proposed action “may affect, but is not likely to affect” roseate terns and piping plovers. Expected tree removal would reduce potential roosting habitat for the northern long-eared bat within the project area and could result in incidental take if trees occupied by the species are removed. If bats are encountered before or during construction, NYC Parks will notify FEMA and USFWS immediately for further guidance. As long as all conditions are followed, FEMA made a determination that the project “may affect, but not likely to affect” the northern long-eared bat. Because the Proposed Action is anticipated to go beyond April 1, 2024, the Interim Consultation Framework for the northern long-eared bat developed by USFWS cannot be used to address potential impacts on the species (USFWS 2023b). Therefore, FEMA consulted with USFWS on March 23, 2023, on several species and had a follow up meeting with USFWS on June 3, 2023. USFWS concurred on July 1, 2023, stipulating that there is no time of year restrictions for tree clearing in Richmond County for the Northern Long-eared Bat and no further action is required. For the Peak migratory seasons for the red knot are February 16 to June 1 and July 2 to November 15. A survey is required when working within the migratory season. During this time, a survey will be conducted not more than seven (7) days prior to the commencement of beach disturbance activities within the time period described



above. NYC Parks shall conduct and provide a red knot survey by a qualified biologist. The survey shall be conducted in the following manner:

- Inclement Weather: NYC Parks shall not conduct the survey in weather with strong winds (>24 mph), heavy fog (<200 m visibility), or steady rain.
- NYC Parks shall begin the survey of each area by indicating the start time on data sheets. NYC Parks shall count and identify red knot (and other bird species) in the survey area. This includes birds that enter or leave the survey area during the survey. For shorebirds to be considered "using" the survey area, the birds need to be on the ground within the defined survey area for at least part of the time it takes to do the survey. Shorebirds that fly over the survey area but do not land in it should NOT be counted. NYC Parks shall record numbers of birds throughout the survey period. The applicant shall complete surveys within the optimal 3-hour survey window around peak high tide. Once the area has been thoroughly searched and all birds seen have been recorded, the count is considered complete. At that point, NYC Parks shall note the end time on the datasheet. Data sheets will be submitted to FEMA Region 2 EHP and USFWS Long Island Field Office (Region 5) for record keeping purposes within 30 days of the survey taking place.

In the event that red knot are observed within this period or prior to the start of work, the applicant shall maintain a 500 meter buffer surrounding the location of the red knot and contact both FEMA Region 2 EHP, and the USFWS Long Island Field Office (Region 5) at (631) 286- 0485 for further consultation and instructions. Therefore, there would be a negligible effect on the roseate terns, piping plovers, and northern long-eared bat, and red knots as long as all minimization measures are followed.

There would be no construction in the marine environment, and construction would have no effect on the marine environment with implementation of the SWPPP and BMPs to avoid potential water quality impacts. Therefore, the Proposed Action would have no effect on federally listed aquatic species.

## **5.11 Migratory Birds**

The MBTA of 1918 provides a program for the conservation of migratory birds that fly through the United States. USFWS is the lead federal agency for implementing the MBTA, which makes it unlawful at any time, by any means, or in any manner to take any part, nest, or egg of migratory birds. Take is defined in 50 CFR 10.12 as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities.”

### **5.11.1 Existing Conditions**

There is the potential for many species of migratory birds to occur within the project area, as it is within the Atlantic Flyway and suitable nesting and foraging habitat is present. Although some

beach-nesting birds such as the piping plover, roseate tern, red knot, least tern (*Sterna antillarum*), common tern (*Sterna hirundo*), and American oystercatcher (*Haematopus palliatus*) occur in the project area, they are not known to nest in the segments of beach that exist within or near the study area, likely because the beach is too narrow and/or levels of human activity are too high (GOSR 2018). However, many species of passerines, wading birds, waterfowl, and other common birds likely use the woodlands, wetlands, and other habitats in the project area for nesting. These species would include the red-winged blackbird (*Agelaius phoeniceus*), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), sanderling (*Caliris alba*), Cooper's hawk (*Accipiter cooperii*), and many others (GOSR 2018). All bird species native to the United States in the project area are considered migratory birds. Non-native birds may be present that would not be protected by the MBTA.

### **5.11.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Under the No Action alternative, there would be no construction of shoreline protection measures and therefore no short-term impacts on migratory birds. The project area would continue to support habitat for migratory birds; however, continued coastal flooding and associated erosion and repairs of related flood damage could result in the removal of vegetation during the breeding season. Therefore, there is the potential that nests, eggs, or young could be impacted, and the No Action alternative could have a minor, long-term, adverse impact on migratory birds within the project area.

#### **Alternative 2: Proposed Action**

Construction of the Proposed Action has the potential to affect migratory birds if vegetation is removed during the migratory bird nesting season. If vegetation removal for construction were to occur during the nesting season, activities could result in the destruction of nests, eggs, or young birds in the nest. There would be no tree removal between April 1 and September 30 to protect the ESA-listed northern long-eared bat, which would have the effect of also protecting nesting birds in trees. In addition, NYC Parks would halt construction activities from early May through July to the extent practicable to minimize effects on migratory bird nests (as specified in the March 23, 2023, Section 7 ESA consultation). Therefore, there would be short-term, minor, adverse impacts on migratory birds if vegetation is removed during the migratory bird nesting season.

As discussed in the PEA, the removal of invasive plants and revegetation with native plants would improve available nesting habitat for migratory birds within the project area. Therefore, the Proposed Action would have a long-term minor benefit on migratory bird species.

## 5.12 Bald and Golden Eagles

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, provides for the protection of bald and golden eagles by prohibiting the take, possession, sale, purchase, barter, transport, export, or import of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. This act requires consultation with USFWS to ensure proposed federal actions do not adversely affect bald or golden eagles.

### 5.12.1 Existing Conditions

Bald eagles (*Haliaeetus leucocephalus*) typically breed and winter in forested areas adjacent to large bodies of water. Forested areas within Conference House Park, Hybrid Oak Woods Park, Butler Manor Woods, and Mount Loretto Unique Area could provide suitable habitat for nesting bald eagles. According to eBird's New York Breeding Bird Atlas Version 3, bald eagles are frequently observed by visitors of the project area. Approximately 0.5 mile east from the project area, a probable bald eagle nesting site was documented in 2021 and two confirmed sightings of recently fledged young were documented in July 2022 (eBird 2022).

Golden eagles (*Aquila chrysaetos*) typically inhabit sparsely populated areas of the western United States and are considered virtually extirpated east of the Mississippi River (NYSDEC 2022e). Although they have been sighted migrating through NYS, there is no suitable golden eagle roosting or foraging habitat within or near the project area. Therefore, golden eagles are not considered further.

### 5.12.2 Potential Impacts and Proposed Mitigation

#### **Alternative 1: No Action**

Under the No Action alternative, there would be no construction of shoreline protection measures and therefore no short-term impacts on bald eagles. The project area would continue to support habitat for bald eagles because there would be no changes to the habitat. Although no action would be taken to mitigate the risk of coastal flooding, future flood events are unlikely to impact bald eagles because they nest in tall trees and prey on a variety of both aquatic and terrestrial species. Therefore, the No Action alternative would have no impacts on bald eagles.

#### **Alternative 2: Proposed Action**

There are no known bald eagle nests in the project area and no suitable habitat (e.g., large trees) exists that would support a bald eagle nest. The nearest bald eagle nest is approximately 0.5 mile east of the project area. In compliance with the USFWS Bald Eagle Monitoring Guidelines (USFWS 2007), if a bald eagle nest were discovered within 660 feet of construction activity, work would stop, and NYC Parks would be required to coordinate with FEMA and USFWS to identify measures to avoid or minimize effects on the eagles. Therefore, there would be no short-term

impacts on bald eagles during construction of the Proposed Action as long as all guidelines are followed. Bald eagles are not likely to be impacted by flood events, as stated in the No Action alternative. Therefore, a reduction in the risk of coastal flooding, as a result of implementation of the Proposed Action, would have no impact on bald eagles.

### **5.13 Essential Fish Habitat**

The Magnuson-Stevens Fishery Conservation and Management Act is the primary law governing marine fisheries management in United States federal waters and designates NMFS as the lead federal agency responsible for its implementation. First passed in 1976, the act fosters the long-term biological and economic sustainability of our nation's marine fisheries. One primary provision of the act is the designation of EFH for all species managed under the act. All federal agencies are required to assess the potential effects of proposed actions and alternatives on EFH, and federal agencies are to consult on any actions that could adversely affect EFH.

#### **5.13.1 Existing Conditions**

Raritan Bay is designated EFH for winter flounder, little skate (*Leucoraja erinacea*), Atlantic herring (*Clupea harengus*), red hake (*Urophycis chuss*), windowpane flounder (*Scophthalmus aquosus*), winter skate (*Laucoraja ocellata*), clearnose skate (*Raja eglanteria*), longfin inshore squid (*Loligo pealeii*), bluefish, Atlantic butterfish (*Peprilus triacanthus*), and summer flounder. No Habitat Areas of Particular Concern (i.e., high-priority areas for EFH conservation) or EFH Areas Protected from Fishing are present within the project area or Raritan Bay (NMFS 2022c).

#### **5.13.2 Potential Impacts and Proposed Mitigation**

##### **Alternative 1: No Action**

Under the No Action alternative, there would be no construction of shoreline protection measures and therefore no short-term impacts on EFH. However, the risk of coastal flooding would not be mitigated, and coastal floodwaters would periodically inundate the project area, which could transport pollutants into EFH such as sediments, fuels, and trash. Construction activities needed to repair damage caused by future flood events could have temporary impacts on EFH species by temporarily increasing erosion resulting in more sediment entering the ocean and inadvertently releasing hazardous fuels, oils, and lubricants from equipment used near the ocean. Construction-related noise and vibration caused by potential in-water work could also disturb EFH species, causing them to temporarily move away from the area. However, these effects would be localized and would affect a small area relative to the amount of EFH near the project area. Therefore, in the long term, there would be a negligible adverse impact on EFH as a result of the No Action alternative.

## **Alternative 2: Proposed Action**

Construction of the Proposed Action has the potential to affect water quality in EFH by temporarily increasing erosion resulting in more sediment entering the ocean and also by inadvertently releasing hazardous fuels, oils, and lubricants from equipment used near the ocean. However, all construction would be done in accordance with a SWPPP and all other conditions stipulated in the SPDES General Permit for Stormwater Discharges from Construction Activity. No work or transportation of construction materials would be conducted in the marine environment, so there would be no noise or vibration impacts on EFH under the Proposed Action. With the implementation of the above-mentioned BMPs to avoid or reduce water quality impacts, construction of the Proposed Action would have a negligible short-term adverse impact on EFH.

Implementation of the Proposed Action would reduce coastal flooding and thereby reduce the amount of contaminants and debris that could enter EFH during these events. Any change in contaminant levels would affect a small area relative to the amount of EFH near the project area and would not be measurable; therefore, the Proposed Action would have a negligible long-term benefit on EFH.

### **5.14 Marine Mammals**

All marine mammals are protected under the MMPA. The MMPA prohibits, with certain exceptions, the take of marine mammals in U.S. waters and by U.S. citizens on the high seas. This includes prohibitions on harassment, hunting, capturing, collecting, or killing of marine mammals.

#### **5.14.1 Existing Conditions**

Marine mammals occur throughout the New York–New Jersey Harbor and occasionally come into Raritan Bay. The harbor seal (*Phoca vitulina*) is the most commonly observed marine mammal in the harbor. The gray seal (*Halichoerus grypus*) is less common in the harbor but occurs in similar locations as the harbor seal. Harp seals (*Pagophilus groenlandicus*) commonly occur on Sandy Hook, NJ, approximately 10 miles across Raritan Bay from the project area. Sightings of cetaceans in the harbor occur rarely (GOSR 2018). Although harbor seals can sometimes be seen hauling out along the Tottenville shoreline, they do so in small numbers (less than 10), and the area is not considered to be a major haul out site for any marine mammals.

#### **5.14.2 Potential Impacts and Proposed Mitigation**

### **Alternative 1: No Action**

Under the No Action Alternative, no construction of shoreline protection measures would occur and there would be no short-term impacts on marine mammals as a result of construction. The risk of coastal flooding would remain unchanged from baseline conditions throughout the project area, although the frequency of flooding is expected to increase due to climate change. Coastal

floodwaters would periodically inundate the project area, which could degrade water quality for marine mammals in the marine environment. Intermittent construction in and near the project area would likely occur to repair damage from future coastal flood events. Noise and increased human activity associated with these repair activities and the potential introduction of pollutants, such as sediments and fuels, may result in temporary avoidance of the project area by marine mammals. However, given the amount of comparable terrestrial and aquatic habitat nearby, any temporary displacement from the project area would not measurably impact marine mammals at the individual or population level. Therefore, the No Action alternative would have negligible, long-term, adverse impacts on marine mammals.

### **Alternative 2: Proposed Action**

Construction of shoreline protection measures would not involve work or transportation of construction materials in the marine environment. However, construction activities would result in noise and increased human activity along the shoreline within the project area, which could result in the temporary avoidance of the area by marine mammals. Additionally, construction activities have the potential to introduce pollutants such as sediments and oils into the project area and the neighboring Raritan Bay. Because the project area is not known to support a large marine mammal population or a known haul-out site, these temporary effects would impact a small number of individuals, if any. Additionally, as discussed in Section 5.9, there is an abundance of comparable terrestrial and aquatic habitat nearby the project area that would support marine mammals if they were temporarily displaced from the project area. Therefore, with the implementation of a SWPPP, BMPs, and adherence to the conditions stipulated in the SPDES General Permit for Stormwater Discharges from Construction Activity, construction associated with the Proposed Action would have negligible, short-term, adverse impacts on marine mammals.

Implementation of the Proposed Action would reduce coastal flooding and thereby reduce the amount of contaminants and debris that would enter the project area and Raritan Bay during these events. However, any change in contaminant levels would affect a small area relative to the amount of available habitat for marine mammals near the project area and would not be measurable; therefore, the Proposed Action would have a negligible long-term benefit on marine mammals.

### **5.15 Cultural Resources**

In accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended and implemented by 36 CFR Part 800, FEMA must consider the potential effects of its funded actions upon cultural resources prior to engaging in any undertaking. The NHPA of 1966 defines a historic property as “any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on the National Register of Historic Places (NRHP), including artifacts, records, and material remains relating to the district, site, building, structure, or object.” Eligibility criteria for listing a property on the NRHP is detailed in 36 CFR Part 60.

Pursuant to 36 CFR 800.16(d), the Area of Potential Effects (APE) is defined as the geographic area(s) within which the undertaking may directly or indirectly affect cultural resources. FEMA evaluates impacts on cultural resources prior to the undertaking for both standing structures (above-ground resources) and archaeology (below-ground resources) within the APE. The Direct APE for FEMA's Proposed Action is defined as the area where subsurface work is anticipated to occur. The Indirect APE includes the area of land within potential visual range of the proposed shoreline protection measures.

### **5.15.1 Existing Conditions**

Prior to FEMA's involvement with the undertaking, Section 106 consultation was conducted by GOSR, acting as lead agency under the authority of the U.S. Department of Housing and Urban Development's Community Development Block Grant Disaster Recovery program. The results of the Section 106 coordination initiated in 2015 for the Coastal and Social Resiliency Initiative EIS (GOSR 2018) and subsequent analysis are presented here because the APE defined in the previous EIS included the Proposed Action evaluated in this TEA.

In January 2015, GOSR initiated the Section 106 consultation process for the Coastal and Social Resiliency Initiative with the New York State Historic Preservation Office (NY SHPO) under the Office of Parks, Recreation and Historic Preservation (OPRHP), the New York City Landmarks Preservation Commission (LPC), and interested Tribal Nations pursuant to Section 106 of the NHPA and Section 14.09 of the NYS Historic Preservation Act (GOSR 2018). In a comment letter dated May 1, 2015, the LPC requested that a Phase 1A Archaeological Documentary Study be prepared to assess the potential for the area to contain archaeological resources associated with pre-contact occupation of the area (GOSR 2018: Appendix F). In a comment letter dated August 20, 2015, the Tribal Historic Preservation Officer of the Stockbridge-Munsee Community Band of Mohicans (SMCBM) stated that they wished to serve as a consulting party for the project (GOSR 2018: Appendix F),

The findings of the Phase 1A study, as referenced in the EIS (GOSR 2018), concluded that intact archaeological deposits would not likely be found within the sandy beaches within the APE. However, limited portions of the upland areas were determined to possess moderate sensitivity for pre-contact archaeological resources and moderate sensitivity for historic period archaeological resources. A Phase 1B archaeological investigation was recommended for only those areas of archaeological sensitivity within the APE that would be directly impacted by the proposed project (AKRF 2017). GOSR submitted a final Phase 1A report for agency review in May 2017.

The final Phase 1A study, as referenced in the EIS (GOSR 2018), identified two historic architectural resources in the Indirect APE: the Henry Hogg Biddle House (USN 08501.001295) and the Rutan-Beckett House (USN 08501.003698), both of which are eligible for inclusion on the NRHP. The assessment for the Indirect (visual) APE, noted that the two historic architectural

resources are located significantly inland and that intervening landscaping elements and plantings further limit any contextual relationships between the architectural resources and the proposed shoreline protection measures. SHPO concurred with the conclusions of the Phase 1A report on June 7, 2017, regarding all historic resources and the recommendations proposed (GOSR 2018: Appendix F). The final Phase 1A report was accepted by SMCBM and the Delaware Nation in emails dated May 30, 2017, and by the Delaware Tribe of Indians in a comment letter dated June 15, 2017 (GOSR 2018: Appendix F). All three Nations indicated interest in continuing consultation.

In January 2019, the Phase 1B archaeological survey was completed and submitted for agency review (AKRF 2019). A total of 189 artifacts was recovered during the excavation of 102 shovel test pits throughout the APE. The distribution of artifacts appeared to be associated with the gradual deposition of household refuse on the ground surface related to the adjacent residential community, the former partial development of the APE, and the on-going active use of the coastline by area residents. The artifacts are not associated with any identifiable archaeological features, and therefore have no research value or archaeological significance. Because of the absence of significant artifact deposits or sensitive archaeological features, AKRF recommended that no additional fieldwork was warranted. In a letter dated January 17, 2019, the NY SHPO provided the opinion that no historic properties, including archaeological and/or historic resources, would be affected by the undertaking as currently designed (New York Office of Parks, Recreation, and Historic Preservation 2019). LPC reviewed the Phase 1B report and concurred with the report's findings on January 18, 2019, with no further concerns for the project area. The Phase 1B report was submitted to the Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Nation, and the SMCBM on January 10, 2019. The SMCBM commented on January 16, 2019, that the project would have no adverse effect on historic properties based on the lack of archaeological findings. The SMCBM requested further consultation in the case of inadvertent discoveries or changes to the project design. No response was received from the Delaware Nation, the Delaware Tribe of Indians, or the Shinnecock Nation.

### **5.15.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Under the No Action alternative, there would be no federal financial assistance provided for the mitigation of coastal risks in the project area; therefore, there would be no impact on historic properties, including standing structures or archaeological sites, from FEMA-funded grant activities. In the Section 106 consultations, the SHPO concurred that there are no historic properties within the project APE; therefore, under the No Action alternative, flooding of the Tottenville neighborhood during storm events would result in no impact on cultural resources within the project APE.



## **Alternative 2: Proposed Action**

Under Section 106 of the NHPA, consultation was conducted with the SHPO, LPC, and Tribal Nations with ancestral ties to Richmond County, and a No Historic Properties Affected determination was made for the proposed undertaking. Therefore, the proposed construction activities and long-term protection from flooding provided under the Proposed Action alternative would result in no impact on cultural resources within the project APE.

In accordance with Stipulation I.A.7. of the *Programmatic Agreement Among the Federal Emergency Management Agency, The NYS Historic Preservation Officer, the NYS Office of Emergency Management, the Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Nation, the Stockbridge-Munsee Community Band of Mohicans, the New York City Landmarks Preservation Commission, and the Advisory Council on Historic Preservation, as a result of Hurricane Sandy Programmatic Agreement*, FEMA has confirmed that the scope and effect of the Proposed Action has been reviewed by another federal agency within the past 5 years and that the undertaking has not changed. Additionally, FEMA verified that the SHPO/Tribal concurrence is documented and will archive these findings to the project files to confirm that the requirements of Section 106 have been satisfied. FEMA has no further Section 106 requirements.

### **5.16 Environmental Justice**

To promote the fair treatment of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires federal agencies to identify and address disproportionately high and adverse human health or environmental impacts that its activities may have on overburdened communities. Overburdened communities include minority, low-income, tribal, or indigenous populations or geographic locations that potentially experience disproportionate environmental harms and risks. CEQ defines the term “minority” as persons from any of the following groups: Black, Asian, Pacific Islander, American Indian, Alaskan Native, or Hispanic (CEQ 1997). EPA’s Environmental Justice Screening and Mapping Tool (EJScreen), which was used to complete this environmental justice analysis, uses U.S. Census Bureau data to identify low-income households as those in which the household income is less than or equal to twice the federal poverty level (EPA 2019).

Overburdened communities include minority and low-income populations and are defined as those that meet any of the following criteria:

- Populations within 0.5 mile of the project area contain 50 percent or more minority persons or low-income persons.
- Percentage of minority or low-income population within 0.5 mile of the project area is more than 50 percent greater than the average of the surrounding borough.

### 5.16.1 Existing Conditions

The EPA’s EJScreen tool was used to evaluate the demographic characteristics of the project area and surrounding community. The EJScreen analysis is based on the U.S. Census Bureau 2016 to 2020 American Community Survey 5-year summary data (EPA 2022c). The project area is located within two census block groups, 360850244021 and 360850244022. **Table 5.4** presents the environmental justice demographics of the block groups.

**Table 5.4: Environmental Justice Demographics**

Demographic Indicator	Block Group 360850244021 Population (%)	Block Group 360850244022 Population (%)	Richmond County Population (%)
Minority	7	9	40
Low-Income	4	11	23

Source: EPA 2022d

As presented in **Table 5.4**, neither of the block groups contains a minority or low-income population of 50 percent or greater. Both values are also well below the minority and low-income population levels in the surrounding county (EPA 2022c). Based on the criteria listed above, the project area would not be considered to contain an environmental justice minority or low-income population. A review of aerial imagery and housing prices near the project area supports this determination. Thus, environmental justice populations are not expected to be present in or near the project area.

### 5.16.2 Potential Impacts and Proposed Mitigation

#### Alternative 1: No Action

Under the No Action alternative, there would be no effect on overburdened populations because there are no environmental justice populations in or near the project area.

#### Alternative 2: Proposed Action

The Proposed Action would result in temporary construction-related impacts on residents in close proximity to the project area, including increased noise levels, construction-related emissions, and increased traffic from construction vehicles. However, because there are no environmental justice populations in or near the project area, the Proposed Action would have no disproportionately high and adverse impacts on minority or low-income populations.

### 5.17 Noise

The Noise Control Act of 1972 required EPA to create a set of noise criteria to protect the health and welfare of the population, particularly in urban areas. In response, EPA published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an

Adequate Margin of Safety in 1974 (EPA 1974), which explains the impact of noise on humans. The EPA report's conclusion was that keeping the maximum 24-hour day-night noise level (or Ldn, calculated by averaging the equivalent sound level over 24 hours) below 70 A-weighted decibels (dBA) would protect most people from hearing loss. The EPA recommends an outdoor Ldn of 55 dBA. According to published lists of noise sources, sound levels, and their effects, sound causes pain starting at approximately 120 to 125 dBA and can cause immediate irreparable damage at 140 dBA. The Occupational Safety and Health Administration (OSHA) has adopted a standard of 140 dBA for maximum impulse noise exposure for workers in a noisy environment. This regulation does not apply to adjacent properties or their occupants.

Sounds that disrupt normal activities or otherwise diminish the quality of the environment are considered noise. Assessment of noise impacts includes the proximity of noise producing activities to sensitive receptors. A sensitive receptor is defined as an area of frequent human use that would benefit from a lowered noise level. Typical sensitive receptors include residences, schools, churches, hospitals, nursing homes, and libraries.

Construction noise is regulated in Staten Island by the New York City Noise Control Code (Section 24-224), as amended by Local Law 113 in 2005, which defines "unreasonable and prohibited noise standards and decibel levels" for New York City. The code requires the development and implementation of site-specific construction noise mitigation plans, where appropriate, and requires that construction activities occur between 7 a.m. and 6 p.m. Monday through Friday. Construction noise that exceeds the ambient sound level by more than 10 decibels measured 15 feet from the source from inside any property or on a public street is prohibited under the New York City Noise Code (NYCDEP 2018a). Additionally, Title 15, Chapter 28 of the Rules of the City of New York prescribe citywide construction noise mitigation rules that detail the methods, procedures, and technology to be used at construction sites to achieve noise mitigation when certain equipment or activities are employed or performed.

### **5.17.1 Existing Conditions**

Existing noise levels were measured for 24 hours at the eastern terminus of the project area in August 2016 (GOSR 2018). At the measurement site, vehicular traffic was the dominant noise source with wave action also contributing to noise levels. The existing noise levels were relatively low, as the measured Ldn at the monitoring location was 59.1 dBA (GOSR 2018). The measured noise levels were relatively constant throughout the 24 hours. Sensitive receptors near the project area include residences and parks. The closest residence is approximately 100 feet away, and a portion of the project area is within designated parks.

### **5.17.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Construction of shoreline protection structures would not occur under the No Action alternative, resulting in no short-term adverse noise impacts. If coastal floodwaters inundate residential areas inland of the shoreline, mechanical equipment would be used to repair flood damage, which would temporarily increase noise levels in the immediate vicinity of the work. However, these repair activities would be completed in compliance with the relevant New York City noise regulations for construction activities. Additionally, road closures and detours may occur as a result of coastal flood events and could alter traffic patterns in or near the project area, resulting in higher levels of vehicular traffic noise in some places. Therefore, there would be intermittent, negligible, adverse noise impacts as a result of repair activities associated with future coastal flooding events in the long term.

#### **Alternative 2: Proposed Action**

The PEA does not directly address impacts related to noise. Under the Proposed Action, residents near the project area would likely experience a temporary increase in noise levels as a result of construction, as would visitors of the parks in and near the project area. A noise mitigation plan would be developed and implemented as required by Section 28-100, General Construction Noise Mitigation Plan, of the Rules of the City of New York. With implementation of the measures developed in the noise mitigation plan and with compliance with relevant regulations, the Proposed Action would have minor, short-term, adverse noise impacts in the project area.

The Proposed Action would not introduce any new permanent noise sources. However, implementation of the Proposed Action would reduce the risk of coastal flooding and subsequent inundation of the Tottenville neighborhood, resulting in a reduction of noise from repair activities and traffic detours. Therefore, the Proposed Action would have a negligible benefit by reducing the frequency of noise associated with repair construction and traffic detours.

## **5.18 Transportation**

### **5.18.1 Existing Conditions**

Roads used for immediate access to the project area include Chelsea Street, Billop Avenue, Swinnerton Street, Manhattan Street, Yetman Avenue, Rockaway Street, Loretto Street, Sprague Avenue, Joline Avenue, Bedell Avenue, and Page Avenue. In the event of coastal flooding, the southern portions of the above-listed streets would be impacted. The Metropolitan Transportation Authority provides bus service to the area with the nearest bus stops approximately 0.5 mile north of the project area along Hylan Boulevard (Metropolitan Transit Authority 2022).

## **5.18.2 Potential Impacts and Proposed Mitigation**

### **Alternative 1: No Action**

Under the No Action alternative, there would be no construction related to shoreline protection and thus no equipment or personnel would need to access the project area, potentially increasing traffic in the area. However, roads in the project area would continue to be flooded during storms that could become more frequent from climate change and sea level rise. Flooded roadways would require detours and closures until floodwaters recede, potentially increasing traffic along detour routes in the surrounding area. Additionally, construction activities to repair flood-related damage may result in negligible increases in traffic or minor road closures. Flooding would only impact local roads and would not affect any major highways or roadway arteries. Therefore, there would be an intermittent minor long-term adverse impact on transportation from periodic flooding that could worsen over time due to climate change and sea level rise.

### **Alternative 2: Proposed Action**

The PEA does not directly address impacts on transportation. Under the Proposed Action, construction personnel would access the project area and staging areas via existing roadways. While there would be some additional construction traffic on the roadways surrounding the project area, these impacts would be temporary and localized, affecting only the roadways offering immediate project area access. Because none of the surrounding roads are at capacity and road closures or detours are not anticipated, construction traffic would not create congestion or delays for other users of the roadways. Therefore, the Proposed Action is expected to have negligible short-term adverse impacts on transportation.

Implementation of the Proposed Action is not expected to measurably increase the number of visitors to the project area. Because the Proposed Action would construct shoreline protection structures that would reduce the risk of coastal flooding in the residential Tottenville neighborhood, the likelihood of future road closures caused by flooding and/or repairing flood damage would be reduced. Therefore, the Proposed Action would have minor long-term benefit on transportation near the project area.

## **5.19 Public Services and Utilities**

### **5.19.1 Existing Conditions**

NYCDEP manages New York City's water supply and provides sewer and stormwater management services to the city's residents (NYCDEP 2018b). The project area contains separate systems for sanitary sewage and stormwater. The portion of the project area east of Loretto Street relies on septic systems to dispose of sanitary sewage; west of Loretto Street, sanitary sewers discharge into interceptor sewers located on Main Street and Hylan Boulevard (GOSR 2018). Stormwater is conveyed in storm sewers that discharge into open channels, detention ponds, catch

basins, or into Raritan Bay via the various outfalls discussed in Section 3. Natural gas throughout the project area is provided by National Grid (National Grid 2022) and electricity is provided by Con Edison (Con Edison 2022).

### **5.19.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Under the No Action alternative, there would be no construction related to the installation of shoreline protection measures that could disrupt or increase demand on electric, gas, water, or wastewater services. Coastal flooding of the Tottenville neighborhood and areas within Conference House Park, which could become more frequent because of climate change and sea level rise, could continue to disrupt public services by damaging underground services through erosion exposure and saltwater intrusion. Flooding could also cause backups of the stormwater conveyance infrastructure. Flooding of ground level components of the electrical grid could also disrupt electrical service in the project area; however, most electric utilities in the area are elevated, which would minimize potential electrical outages from flooding. Therefore, there would be a minor, long-term, adverse impact on public services and utilities as a result of the No Action alternative.

#### **Alternative 2: Proposed Action**

The PEA does not directly address impacts on public services and utilities. The Proposed Action would include the construction or replacement of stormwater drainage infrastructure, such as outfalls and channels. No other utilities or public services would be disrupted or relocated during construction. Most of the construction equipment would be fueled by gasoline or diesel and would not require electricity or natural gas, and water required for construction activities would not disrupt water service to the surrounding area. Thus, the Proposed Action would have negligible, short-term, adverse impacts on drainage in the area and no impact on other utilities in and around the project area.

The Proposed Action would reduce the risk of coastal flooding in the Tottenville neighborhood, reducing the potential for disruption or loss of public services and utilities because of flood-related damage. The replaced drainage structures would help regulated the flow of rainwater and other floodwaters away from the Tottenville area. Therefore, the Proposed Action would have a minor long-term benefit on public services and utilities.

### **5.20 Public Health and Safety**

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, mandates that federal agencies identify and assess health and safety risks that may disproportionately affect children. Public health and safety are also related to accessibility to police, fire, medical services, and the response times for those providers to reach people in need.

### **5.20.1 Existing Conditions**

The Fire Department of the City of New York (FDNY) provides fire and medical services (FDNY 2022), and the New York Police Department (NYPD) provides police services in and around the project area (NYPD 2022). The nearest FDNY station is approximately 1 mile from the project area on Amboy Road; the nearest NYPD station is also approximately 1 mile from the project area on Main Street. The nearest hospital is the Staten Island University Hospital, approximately 10 miles east of the project area (**Appendix A, Figure 12**).

### **5.20.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

Under the No Action alternative, there would be no construction of shoreline protection measures; therefore, there would be no associated construction zone hazards for construction workers or the public. Flooding, which could worsen from climate change and sea level rise, would continue in the area, which could damage infrastructure and roads, potentially reducing the ability of police, fire, and medical personnel to respond in a timely manner to emergencies. As discussed in Section 5.18, flooded roadways could require detours and closures until floodwaters recede, which could block emergency access and excavation routes. Flooding could also cause public health and safety concerns including backup of sewer systems, disruption of utilities, and the need to evacuate the area. Therefore, the No Action alternative would have minor to moderate adverse effects on public health and safety.

#### **Alternative 2: Proposed Action**

All construction activities would be performed using qualified personnel trained in the proper use of the appropriate equipment, including all appropriate safety precautions, to minimize risks to safety and human health. All activities would be conducted in a safe manner in accordance with the standards specified in OSHA regulations. The city would place appropriate signage and barriers prior to construction activities to alert pedestrians and motorists of project activities. Work on the Proposed Action would occur mostly off-road. With these measures in place, construction activities associated with the Proposed Action would result in negligible, short-term, adverse impacts on public health and safety.

Implementation of the Proposed Action would reduce the risk of coastal flooding in the Tottenville neighborhood and therefore, reduce associated risks related to public health and safety such as backup of sewer systems, disruption of utilities, and the need to evacuate. Critical services, such as fire, police, and other first responders, would experience improved accessibility and emergency response times during storm events compared to existing conditions because fewer roadways would be flooded. Therefore, there would be a minor long-term beneficial impact from the reduced flooding and associated public health and safety concerns.

## **5.21 Hazardous Materials**

Hazardous materials and wastes are regulated under a variety of federal and state laws, including 40 CFR Part 260, the Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901 et seq.); the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq.); the Solid Waste Act; and the Toxic Substances Control Act. OSHA standards under the Occupational Safety and Health Act are intended to minimize adverse effects on worker health and safety (29 CFR 1926). In addition, NYSDEC issues permits for transportation and disposal of hazardous waste. Evaluations of hazardous substances and wastes must consider whether any hazardous material would be generated by the proposed activity and/or already exists at or in the general vicinity of the site (40 CFR 312.10).

### **5.21.1 Existing Conditions**

A Phase I soil investigation was performed in 2016 as part of the planning for this project (Preferred Environmental Services 2016). The assessment—which included a review of historical land use maps and aerial photographs, prior reports, and state and federal regulatory databases related to use, generation, storage, treatment, and/or disposal of hazardous materials—revealed there was no significant likelihood for subsurface hazardous materials to exist in the project area (GOSR 2018).

A search for hazardous waste facilities, water dischargers, toxin releases, Superfund sites, brownfields, and Toxic Substance Control Act sites was conducted using EPA’s NEPAassist website (EPA 2022d). According to this database, within a half mile of the project area, there are two facilities that generate, transport, treat, store, and/or dispose of hazardous waste; these facilities are within FEMA Flood Zone X, areas of minimal flood hazard. No Superfund sites are within a half mile of the project area (EPA 2022d).

### **5.21.2 Potential Impacts and Proposed Mitigation**

#### **Alternative 1: No Action**

No construction of shoreline protection measures would occur under the No Action alternative; therefore, there would be no short-term impacts related to hazardous materials. However, under this alternative, the risk of inundation of the residential Tottenville neighborhood and portions of Conference House Park as a result of coastal flood events would remain. In the event of coastal flooding, construction may be required to repair damage, and the use of construction equipment in the project area may inadvertently release fuels, oils, and lubricants into the project area through leaks and spills. Additionally, receding floodwaters could carry hazardous materials such as oil and pesticides into surface waters and into Raritan Bay. Therefore, there would be intermittent, negligible, long-term, adverse impacts from the potential release of pollutants and hazardous materials as a result of the No Action alternative.



## **Alternative 2: Proposed Action**

As described in the PEA, the Proposed Action would require the use of mechanical equipment such as excavators and trucks that could release fuels, oils, and lubricants through inadvertent leaks and spills. In accordance with the PEA, NYC Parks would ensure all equipment and project activities adhere to state and local regulations to reduce the risk of hazardous leaks and spills. Any spills that occur during construction would be contained and cleaned up. Although subsurface hazardous materials are not anticipated to be present, excavation activities could expose or otherwise affect previously undetected subsurface hazardous materials or wastes. Contractors would stop work and comply with relevant regulations if they were to discover unanticipated site contamination. Therefore, with implementation of the above BMPs and mitigation measures, there would be negligible short-term adverse impacts from use of vehicles and equipment or from the potential for inadvertent exposure to previously unknown hazardous materials.

In the long-term, the Proposed Action would reduce the risk of coastal flooding in the Tottenville neighborhood. A reduction in flood risk would reduce the risk of hazardous materials being transported via receding floodwaters and the risk of pollutants being released by construction equipment required to repair flood damage. Thus, the Proposed Action would result in a negligible long-term benefit related to hazardous materials.

### **5.22 Cumulative Impacts**

This TEA considers the overall cumulative impact of the Proposed Action and other actions that are related in terms of time or proximity. Cumulative effects represent the “impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.1).

In addition to NEPA, other statutes require federal agencies to consider cumulative effects. These include CWA Section 404(b)(1) guidelines and regulations implementing conformity provisions of the Clean Air Act, Section 106 of the NHPA, and Section 7 of the ESA.

Independent of the Proposed Action, the second component of the NYRCR in the Tottenville shoreline area is the Living Breakwaters Project, which is currently under construction. The Living Breakwaters will be in the waters of Raritan Bay, approximately 790 to 1,170 feet offshore of the TSPP, in water approximately 2 to 10 feet below mean low water level. The breakwaters will consist of nine rock and bioenhanced islands designed to attenuate storm waves and provide complex structured subtidal and intertidal habitats (**Appendix A, Figure 13**). The breakwater structures will result in the placement of 151,780 CY of rubble mound structures with a bedding layer, stone core, and outer layers consisting of armor stone or bioenhancing concrete armor units (bioenhanced concrete is cast with surface textures and shapes that allow marine life to attach to

the surface or find refugia and feeding opportunities). In the subtidal and intertidal areas, as much as one-third of the armor stone will be bioenhancing concrete units rather than stone, creating habitat surface for oysters. Certain breakwater segments will have a series of rocky protrusions or “reef ridges” that extend approximately 65 feet seaward, generally perpendicularly from the main breakwater, to add diversity in the habitats available within the intertidal and subtidal zones.

Approximately 115,990 CY of the breakwaters will be below the mean high-water line and 117,880 CY will be below mean Spring High Water. The breakwaters will convert approximately 11.4 acres of existing sand/gravel bottom habitat and approximately 115,990 CY of open water habitat below the mean high-water line in Raritan Bay to complex hard structure. A 7.1-acre portion of the breakwater segments will occupy NYSDEC littoral zone tidal wetlands (GOSR 2023).

### **5.22.1 Conclusion**

The Living Breakwaters project, in combination with the Proposed Action, may have a negligible impact on traffic in the area. Construction of the Proposed Action may occur concurrently with the Living Breakwaters project because work on the Living Breakwaters project started in August 2021 and is expected to conclude in fall 2024 (GOSR 2022). There would not be any additional construction-related impacts as the project sites do not overlap nor are they close enough to each other for there to be cumulative effects. There would be minor long-term flood mitigation benefits in the Tottenville neighborhood because the breakwaters are designed to attenuate wave action prior to reaching the shore and the proposed TSPP components would provide additional flood reduction and mitigation against erosion and overtopping by waves. There would be no other expected long-term impacts because the Proposed Action and the Living Breakwater project areas are not in close proximity to each other.

## **6.0 PERMITS AND PROJECT CONDITIONS**

NYC Parks is responsible for obtaining all applicable federal, state, and local permits and other authorizations for project implementation prior to construction, and for adherence to all permit conditions. Any substantive change to the approved scope of work will require reevaluation by FEMA for compliance with NEPA and other laws and EOs. NYC Parks must also adhere to the following conditions during project implementation and consider the conservation recommendations provided. Failure to comply with grant conditions may jeopardize federal funds.

### **Federal**

- NYC Parks will follow all conditions laid out in the Programmatic Environmental Assessment, Stream and Shoreline Stabilization in New York and New Jersey.
- NYC Parks will follow all conditions in the individual CWA permits NAN-2017-00296-ESW, issued March 21, 2021, and NAN-2017-00296-M1, issued January 21, 2022.

- Use of any removed fill materials to construct project components must be in accordance with a Beneficial Use Determination (6 NYCRR 360.13).
- NYC Parks will obtain an SPDES General Permit for Stormwater Discharges from Construction Activity from NYSDEC and comply with all permit conditions.
- In compliance with the USACE CWA permit conditions, NYC Parks will provide documentation of compliance with the wetland mitigation requirements to FEMA.
- A pre-construction field survey will be conducted for red knots during the peak migratory seasons (i.e., in spring from February 16 to June 1 and in fall from July 2 to November 15). If red knots are present during construction, work activities will not take place within 500 meters of red knots.
- NYC Parks will halt construction activities to avoid the May 1 through July 31 primary bird breeding season to the extent practicable.
- NYC Parks will comply with the Bald and Golden Eagle Protection Act if bald eagles roost or nest within 660 feet of project activities.
- All construction activities will be conducted in a safe manner in accordance with OSHA regulations.

#### **State**

- NYC Parks will obtain a Tidal Wetlands Permit from NYSDEC and comply with all permit conditions.
- NYC Parks will coordinate with the NYS Natural Heritage Program to develop a protection program (e.g., transplant, seed collection, and seed propagation) for the population of seaside goldenrod (state-listed as endangered) that would have the potential to be affected by construction of the project.

#### **Local**

- NYC Parks will follow all conditions laid out in the NYC Parks Tree Protection Best Practices and Protocol (NYC Parks 2022).
- Consistent with Section 28-100 of the Rules of the City of New York, General Construction Noise Mitigation Plan, NYC Parks will develop and implement a noise mitigation plan.

### **7.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT**

An earlier draft of the Proposed Action was included in an extensive public engagement process as part of the Coastal and Social Resiliency Initiatives for the Tottenville Shoreline EIS. The NEPA public comment period occurred over 45 days beginning March 24, 2017, and ending May 8, 2017. A public hearing was held at Public School 6, 555 Page Avenue, Staten Island, New York, on April 26, 2017 (GOSR 2017). The Joint Record of Decision and State Environmental Quality Review Act Findings Statement were issued on August 31, 2018.

This TEA will be made available for agency and public review and comment for a period of 30 days. The public information process will include a public notice with information about the Proposed Action in The Advocate. The TEA is available for download at <https://www.fema.gov/emergency-managers/practitioners/environmental-historic/nepa-repository> and <https://stormrecovery.ny.gov/environmental-docs>.

A hard copy of the TEA will be available for review at the following location:

Office of Resilient Homes and Communities  
60 Broad Street, 26th Floor  
New York, NY 10004

Interested parties may request an electronic copy of the TEA by emailing FEMA at [FEMAR2COMMENT@fema.dhs.gov](mailto:FEMAR2COMMENT@fema.dhs.gov). This TEA reflects the evaluation and assessment of the federal government, the decision-maker for the federal action; however, FEMA will take into consideration comments submitted during the 30-day public review period. The public is invited to submit written comments via email to [FEMAR2COMMENT@fema.dhs.gov](mailto:FEMAR2COMMENT@fema.dhs.gov) or via mail to:

Federal Emergency Management Agency Region 2  
Environmental Planning and Historic Preservation  
216 Federal Plaza, Suite 1802  
New York, NY 10278  
Attn: Tottenville Shoreline Protection Project TEA Comments

If FEMA receives no substantive comments from the public and/or agency reviewers, FEMA will adopt the TEA as final and will issue a FONSI. If FEMA receives substantive comments, it will evaluate and address comments as part of the FONSI documentation or in a Final TEA.

## **8.0 LIST OF PREPARERS**

### **CDM Smith**

- Aislinn McLaughlin (Environmental Scientist)
- Jenna Quan (Environmental Planner)
- Jennifer Jones (Biologist)
- Brandon Webb (Lead Environmental Planner)
- Kate Stenberg, PhD (Senior NEPA Specialist, Quality Assurance/Quality Control Reviewer)
- Lynn Alpert (RGA – Architectural Historian)

### **FEMA Region 2**

- John McKee (Regional Environmental Officer)
- Michael Audin (Deputy Regional Environmental Officer)
- David Conrad (Lead Environmental Specialist)
- Thomas Wilson (Historic Preservation Specialist)
- Alexandra Kirby (Historic Preservation Specialist)
- Allison McGovern (Historic Preservation Specialist)
- Mindy Yang (Environmental Specialist)
- Bessie Weisman (Environmental Specialist)
- Elaine Langer (Environmental Specialist)

## 9.0 SUMMARY OF IMPACTS

**Table 9.1** provides a summary of the potential environmental impacts from implementation of the No Action alternative and the Proposed Action.

**Table 9.1: Summary of Impacts**

<b>EA Section</b>	<b>Topic</b>	<b>No Action Alternative</b>	<b>Proposed Action: Short-Term / Temporary Impacts</b>	<b>Proposed Action: Long-Term / Permanent Impacts</b>
5.1	Topography and Soils	Minor to Moderate Adverse	Minor Adverse	Moderate Beneficial
5.2	Air Quality	Negligible Adverse	Minor Adverse	Negligible Beneficial
5.3	Climate Change	Negligible Adverse	Negligible Adverse	Negligible Beneficial
5.4	Water Quality	Negligible to Minor Adverse	Minor Adverse	Minor Beneficial
5.5	Wetlands	Minor Adverse	Minor Adverse	Minor Beneficial
5.6	Floodplains	Moderate Adverse	Negligible Adverse	Moderate Beneficial
5.7	Coastal Resources	Minor Adverse	Minor Adverse	Moderate Beneficial
5.8	Vegetation	Minor Adverse	Minor Adverse	Minor Beneficial
5.9	Wildlife and Fish	Negligible Adverse	Negligible to Minor Adverse	Minor Beneficial
5.10	Threatened and Endangered Species	No Impact	No Impact	No Impact
5.11	Migratory Birds	Minor Adverse	Minor Adverse	Minor Beneficial
5.12	Bald and Golden Eagles	No Impact	No Impact	No Impact
5.13	Essential Fish Habitat	Negligible Adverse	Negligible Adverse	Negligible Beneficial
5.14	Marine Mammals	Negligible Adverse	Negligible Adverse	Negligible Beneficial
5.15	Cultural Resources	No Impact	No Impact	No Impact
5.16	Environmental Justice	No Impact	No Impact	No Impact
5.17	Noise	Negligible Adverse	Minor Adverse	Negligible Beneficial

*Tiered Environmental Assessment  
Tottenville Shoreline Protection Project*

<b>EA Section</b>	<b>Topic</b>	<b>No Action Alternative</b>	<b>Proposed Action: Short-Term / Temporary Impacts</b>	<b>Proposed Action: Long-Term / Permanent Impacts</b>
5.18	Transportation	Minor Adverse	Negligible Adverse	Minor Beneficial
5.19	Public Services and Utilities	Minor Adverse	Negligible Adverse	Minor Beneficial
5.20	Public Health and Safety	Minor to Moderate Adverse	Negligible Adverse	Minor Beneficial
5.21	Hazardous Materials	Negligible Adverse	Negligible Adverse	Negligible Beneficial

## 10.0 REFERENCES

- Adams, D.A., J.S. O'Connor, and S.B. Weisberg. 1998. *Final Report: Sediment Quality of the NY/NJ Harbor System*. An Investigation under the Regional Environmental Monitoring and Assessment Program (R-EMAP). EPA/902-R-98-001. Accessed on November 23, 2022, <https://nepis.epa.gov/Exe/ZyPDF.cgi/P1001R1M.PDF?Dockey=P1001R1M.PDF>.
- AKRF, Inc., 2017. *Coastal and Social Resiliency Initiatives for the Tottenville Shoreline: Living Breakwaters and Tottenville Shoreline Protection Projects; Staten Island, Richmond County, New York: Revised Phase IA Archaeological Documentary Study*. Prepared for Governor's Office of Storm Recovery, New York, NY.
- \_\_\_\_\_. 2019. *Coastal and Social Resiliency Initiatives for the Tottenville Shoreline: Living Breakwaters and Tottenville Shoreline Protection Projects; Staten Island, Richmond County, New York: Phase 1B Archaeological Investigation Technical Report*. Prepared for Governor's Office of Storm Recovery, New York, NY.
- Baker, A.J., P.M. González, T. Piersma, L.J. Niles, I.L.S. do Nascimento, P.W. Atkinson, N.A. Clark, C.D.T. Minton, M.K. Peck, and G. Aarts. 2004. "Rapid population decline in red knot: Fitness consequences of decreased refueling rates and late arrival in Delaware Bay." *Proceedings of the Royal Society B* 25:125–129. Accessed on November 28, 2022, [https://www.nj.gov/dep/fgw/ensp/pdf/literature/rapid-pop-decline\\_red-knots.pdf](https://www.nj.gov/dep/fgw/ensp/pdf/literature/rapid-pop-decline_red-knots.pdf).
- Carter, V. 1999. *Wetland Hydrology, Water Quality, and Associated Functions*. U.S. Geological Survey Water Supply Paper 2425. Accessed on January 1, 2023, <https://water.usgs.gov/nwsum/WSP2425/hydrology.html>.
- Con Edison. 2022. Service Territory. Accessed on December 11, 2022, <https://www.coned.com/en/business-partners/service-territories>.
- Council on Environmental Quality (CEQ). 1997. *Environmental Justice, Guidance Under the National Environmental Policy Act*. Accessed on November 30, 2022, [https://www.energy.gov/sites/default/files/nepapub/nepa\\_documents/RedDont/G-CEQ-EJGuidance.pdf](https://www.energy.gov/sites/default/files/nepapub/nepa_documents/RedDont/G-CEQ-EJGuidance.pdf).
- \_\_\_\_\_. 2021. *Guidance on Consideration of Greenhouse Gases*. Accessed on July 12, 2022, [https://ceq.doe.gov/guidance/ceq\\_guidance\\_nepa-ghg.html](https://ceq.doe.gov/guidance/ceq_guidance_nepa-ghg.html).
- eBird. 2022. New York Breeding Bird Atlas 3. Accessed on November 14, 2022, <https://ebird.org/atlasny/home>.
- Ekernas, S.L., and K.J. Mertes. 2006. The influence of urbanization, patch size, and habitat type on small mammal communities in the New York Metropolitan Region. Accessed on



November 15, 2022,

[https://www.researchgate.net/publication/265657711\\_The\\_influence\\_of\\_urbanization\\_patch\\_size\\_and\\_habitat\\_type\\_on\\_small\\_mammal\\_communities\\_in\\_the\\_New\\_York\\_Metropolitan\\_Region](https://www.researchgate.net/publication/265657711_The_influence_of_urbanization_patch_size_and_habitat_type_on_small_mammal_communities_in_the_New_York_Metropolitan_Region).

Federal Emergency Management Agency (FEMA). 2020. *Programmatic Environmental Assessment, Stream and Shoreline Stabilization in New York and New Jersey*. Accessed on October 6, 2022, [https://www.fema.gov/sites/default/files/2020-10/fema\\_programmatic-environmental-assessment\\_stream-shoreline-stabilization.pdf](https://www.fema.gov/sites/default/files/2020-10/fema_programmatic-environmental-assessment_stream-shoreline-stabilization.pdf).

\_\_\_\_\_. 2022. Glossary. Accessed on December 11, 2022, <https://www.fema.gov/about/glossary>.

Fire Department of the City of New York (FDNY). 2022. NYC FDNY Map. Accessed on December 11, 2022, <https://www.arcgis.com/apps/View/index.html?appid=48bc6db70a48450482ffc92d98a4a7d6>.

Gornitz, V., M. Oppenheimer, R. Kopp, P. Orton, M. Buchanan, N. Lin, R. Horton, et al. 2019. “New York City Panel on Climate Change 2019 Report Chapter 3: Sea Level Rise.” *Annals of the New York Academy of Sciences*, 1439: 71–94. [\[https://doi.org/10.1111/nyas.14006\]](https://doi.org/10.1111/nyas.14006).

Governor’s Office of Storm Recovery (GOSR). 2014. *NY Rising Community Reconstruction Program: East & South Shores Staten Island NY Rising Community Reconstruction Plan*. Accessed on October 13, 2022, [https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/statenisland\\_nyr-cr-plan\\_20mb.pdf](https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/statenisland_nyr-cr-plan_20mb.pdf).

\_\_\_\_\_. 2015. Letter from Daniel Greene, Deputy General Counsel and Certifying Officer, GOSR, to Mitchell Silver, Commissioner, NYC Department of Parks and Recreation. Re: Lead Agency Designation for Environmental Review of Living Breakwaters and Tottenville Dune Projects (Richmond County, NY). Accessed on December 28, 2022. [https://stormrecovery.ny.gov/sites/default/files/uploads/nyc\\_dept\\_of\\_parks\\_rec.pdf](https://stormrecovery.ny.gov/sites/default/files/uploads/nyc_dept_of_parks_rec.pdf).

\_\_\_\_\_. 2017. Coastal and Social Resiliency Initiatives for Tottenville Shoreline, Staten Island, New York (Living Breakwaters and Tottenville Shoreline Protection Projects) Draft Environmental Impact Statement. Accessed on December 30, 2022, <https://stormrecovery.ny.gov/coastal-and-social-resiliency-initiatives-tottenville-shoreline-staten-island-new-york-living>.

- \_\_\_\_\_. 2018. Coastal and Social Resiliency Initiatives for Tottenville Shoreline. Final Environmental Impact Statement. Available at:  
<https://stormrecovery.ny.gov/environmental-docs>.
- \_\_\_\_\_. 2020. Tottenville Shoreline Protection Project 90% Design 1/12/20. Accessed on December 28, 2022,  
<https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/TSPP%20Complete%2090%25%20Design%20Plan%20for%20Website%2020200124.pdf>.
- \_\_\_\_\_. 2022. Living Breakwaters Construction Schedule. Accessed on December 30, 2022,  
<https://stormrecovery.ny.gov/living-breakwaters-construction-updates#schedule>.
- \_\_\_\_\_. 2023. Living Breakwaters Project Background and Design. Accessed March 31, 2023,  
<https://stormrecovery.ny.gov/living-breakwaters-project-background-and-design>
- Horton, R., G. Yohe, W. Easterling, R. Kates, M. Ruth, E. Sussman, A. Whelchel, D. Wolfe, and F. Lipshultz. 2014. “Chapter 16: Northeast.” In *Climate Change Impacts in the United States: The Third National Climate Assessment*, edited by J.M. Melillo, T.C. Richmond, and G.W. Yohe, U.S. Global Change Research Program, 371–395. Accessed on October 6, 2022,  
[https://nca2014.globalchange.gov/downloads/low/NCA3\\_Full\\_Report\\_16\\_Northeast\\_LowRes.pdf](https://nca2014.globalchange.gov/downloads/low/NCA3_Full_Report_16_Northeast_LowRes.pdf).
- Horton, R., D. Bader, C. Little, Y. Kushnir, R. Blake, and C. Rosenzweig. 2015a. “New York City Panel on Climate Change 2015 Report Chapter 1: Climate Observations and Projections.” *Annals of the New York Academy of Sciences*, 1336:18–35. Available at:  
[doi:10.1111/nyas.12586](https://doi.org/10.1111/nyas.12586).
- Horton, R., D. Bader, C. Little, V. Gornitz, and M. Oppenheimer. 2015b. “New York City Panel on Climate Change 2015 Report Chapter 2: Sea Level Rise and Coastal Storms.” *Annals of the New York Academy of Sciences*, 1336:36–44. Available at:  
[doi:10.1111/nyas.12593](https://doi.org/10.1111/nyas.12593).
- Hudson River Foundation. 2018. The State of the Estuary 2018. Accessed on November 10, 2022, <https://www.hudsonriver.org/NYNJHEPStateoftheEstuary.pdf>.
- Intergovernmental Panel on Climate Change. 2022. Glossary. Available at:  
<https://www.ipcc.ch/sr15/chapter/glossary/>.
- Liu, Z., S. Fagherazzi, and B. Cui. 2021. “Success of coastal wetlands restoration is driven by sediment availability.” *Communications Earth and Environment*, 2, no. 44 (February). Available at: [doi:10.1038/s43247-021-00117-7](https://doi.org/10.1038/s43247-021-00117-7).

Metropolitan Transportation Authority (MTA). 2022. Staten Island Bus Service Map. Accessed on December 11, 2022, <https://new.mta.info/map/5376>.

National Grid. 2022. National Grid Gas and Electric Service Areas. Accessed on December 11, 2022. Available at: [https://www9.nationalgridus.com/non\\_html/a2\\_map\\_usa.pdf](https://www9.nationalgridus.com/non_html/a2_map_usa.pdf).

National Marine Fisheries Service (NMFS). 2022a. ESA Section 7 Mapper Version 2.1 – NOAA Fisheries Greater Atlantic Region. Accessed on November 16, 2022, <https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=a85c0313b68b44e0927b51928271422a>.

\_\_\_\_\_. 2022b. ESA Critical Habitat Mapper. Accessed on November 16, 2022, <https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=68d8df16b39c48fe9f60640692d0e318>.

\_\_\_\_\_. 2022c. Essential Fish Habitat Mapper. Accessed on November 14, 2022, <https://www.habitat.noaa.gov/apps/efhmapper/efhreport/>.

National Park Service. 2017. Physiographic Provinces. Accessed on December 7, 2022. <https://www.nps.gov/subjects/geology/physiographic-provinces.htm>.

New York City. 2013. *A Stronger, More Resilient New York*. Accessed on November 7, 2022, <https://www.nyc.gov/site/sirr/report/report.page>.

New York City Department of Environmental Protection (NYCDEP). 2018a. A Guide to New York City’s Noise Code. Accessed on December 11, 2022, <https://www1.nyc.gov/assets/dep/downloads/pdf/air/noise/noise-code-guide-summary.pdf>.

\_\_\_\_\_. 2018b. City Begins \$46 Million Infrastructure Upgrade in Tottenville to Improve Drainage and Reduce Flooding. Accessed on December 11, 2022, [https://www1.nyc.gov/html/dep/html/press\\_releases/18-031pr.shtml#.Y5aiZIHMI2w](https://www1.nyc.gov/html/dep/html/press_releases/18-031pr.shtml#.Y5aiZIHMI2w).

New York City Department of Parks and Recreation (NYC Parks). 2020. *Tottenville Shoreline Protection Project*. Prepared by Stantec.

\_\_\_\_\_. 2022. Tree Protection Best Practices and Protocol. Accessed on December 15, 2022, <https://www.nycgovparks.org/trees/street-tree-planting/best-practices>.

New York Office of Parks, Recreation, and Historic Preservation. 2019. State Historic Preservation Office Concurrence Letter. Signed Olivia Brazee, Historic Site Restoration Coordinator. Dated January 17, 2019.

New York Police Department (NYPD). 2022. Find Your Precinct and Sector. Accessed on December 11, 2022, <https://www.nyc.gov/site/nypd/bureaus/patrol/find-your-precinct.page>.

New York Rising Community Reconstruction Staten Island East & South Shores Planning Committee (NYRCRC). 2014. East & South Shores Staten Island New York Rising Community Construction Plan. Accessed on November 15, 2022, [https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/statenisland\\_nyrcr\\_plan\\_20mb.pdf](https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/statenisland_nyrcr_plan_20mb.pdf).

New York State, New Jersey, and the U.S. Environmental Protection Agency (EPA). 1996. New York–New Jersey Harbor Estuary Program Final Comprehensive Conservation and Management Plan. Available at: <https://www.hudsonriver.org/wp-content/uploads/2018/10/full-ccmp.pdf>.

New York State Department of Agriculture and Markets. 2020. New York State Announces Confirmed Finding of Spotted Lanternfly on Staten Island. Accessed on February 1, 2023, Available at: <https://agriculture.ny.gov/news/new-york-state-announces-confirmed-finding-spotted-lanternfly-staten-island>.

New York State Department of Environmental Conservation (NYSDEC). 2022a. List of Endangered, Threatened, and Special Concern Fish & Wildlife Species of New York State. Accessed on November 28, 2022, <https://www.dec.ny.gov/animals/7494.html>.

\_\_\_\_\_. 2022b. New York Nature Explorer. Accessed on November 15, 2022, <https://www.dec.ny.gov/natureexplorer/app/>.

\_\_\_\_\_. 2022c. Environmental Resource Mapper. Accessed on November 22, 2022, <https://gisservices.dec.ny.gov/gis/erm/>.

\_\_\_\_\_. 2022d. Spotted Lanternfly. Accessed on December 15, 2022, <https://www.dec.ny.gov/animals/113303.html>.

\_\_\_\_\_. 2022e. Golden Eagle. Accessed on November 14, 2022, <https://www.dec.ny.gov/animals/7096.html>.

\_\_\_\_\_. 2022f. Protection of Waters Program. Accessed on December 27, 2022, <https://www.dec.ny.gov/permits/6042.html>.

\_\_\_\_\_. 2022g. Water Quality Standards and Classifications. Accessed on December 27, 2022, <https://www.dec.ny.gov/chemical/23853.html>.

- \_\_\_\_\_. 2020a. SPDES General Permit for Stormwater Discharges from Construction Activity. Accessed on November 12, 2022, [https://www.dec.ny.gov/docs/water\\_pdf/constgp020001.pdf](https://www.dec.ny.gov/docs/water_pdf/constgp020001.pdf).
- \_\_\_\_\_. 2020b. Final 2018 Section 303(d) List. Accessed on November 8, 2022, [https://www.dec.ny.gov/docs/water\\_pdf/section303d2018.pdf](https://www.dec.ny.gov/docs/water_pdf/section303d2018.pdf).
- \_\_\_\_\_. 2016a. Priority Waterbody List Factsheet. Raritan Bay, West (1701-0180). Accessed on November 10, 2022, <https://www.dec.ny.gov/data/WQP/PWL/1701-0180.pdf?req=89404>.
- \_\_\_\_\_. 2016b. New York State Standards and Specifications for Erosion and Sediment Control (Blue Book). Accessed on December 22, 2022, <https://www.dec.ny.gov/chemical/29066.html>.
- \_\_\_\_\_. 2007. Herp Atlas Project. Accessed on November 15, 2022, <https://www.dec.ny.gov/animals/7140.html>.
- New York State Department of State (NYS DOS). 2020. New York State Coastal Management Program and Final Environmental Impact Statement. Accessed on November 16, 2022, [https://dos.ny.gov/system/files/documents/2021/04/ny\\_cmp\\_dec2020\\_w-bookmarks\\_working\\_topost.pdf](https://dos.ny.gov/system/files/documents/2021/04/ny_cmp_dec2020_w-bookmarks_working_topost.pdf).
- Preferred Environmental Services. 2016. *Report on Soil Investigation: NYC Parks – Conference House Park Fill Area – Tricia Way, Staten Island, NY*.
- Soren, J. 1988. *Geologic and Geohydrologic Reconnaissance of Staten Island, New York*. U.S. Geological Survey Water Resources Investigations Report 87-4048. Accessed on October 14, 2022, <https://pubs.usgs.gov/wri/1987/4048/report.pdf>.
- U.S. Army Corps of Engineers (USACE). 2022. USACE Permit Finder. Accessed on December 5, 2022, <https://permits.ops.usace.army.mil/orm-public>.
- U.S. Census Bureau. 2010. Urbanized Area Reference Map: New York–Newark, NY–NJ–CT. Accessed on November 21, 2022, [https://www2.census.gov/geo/maps/dc10map/UAUC\\_RefMap/ua/ua63217\\_new\\_york--newark\\_ny--nj--ct/DC10UA63217.pdf](https://www2.census.gov/geo/maps/dc10map/UAUC_RefMap/ua/ua63217_new_york--newark_ny--nj--ct/DC10UA63217.pdf).
- U.S. Department of Agriculture (USDA). 2022. Web Soil Survey. Accessed on November 17, 2022, <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.
- U.S. Environmental Protection Agency (EPA). 2022a. Nonattainment Areas for Criteria Pollutants (Green Book). Accessed on November 20, 2022, <https://www.epa.gov/green-book>.

- \_\_\_\_\_. 2022b. About Diesel Fuels. Accessed on December 19, 2022, <https://www.epa.gov/diesel-fuel-standards/about-diesel-fuels>.
- \_\_\_\_\_. 2022c. EJScreen: EPA’s Environmental Justice Screening and Mapping Tool (Version 2.1). Accessed on November 30, 2022, <https://ejscreen.epa.gov/mapper/>.
- \_\_\_\_\_. 2022d. EPA NEPAassist Mapper Version 2020.05.002. Accessed on December 11, 2022, <https://nepassisttool.epa.gov/nepassist/nepamap.aspx>.
- \_\_\_\_\_. 2022e. Sole Source Aquifers. Accessed on January 2, 2023, <https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b>.
- \_\_\_\_\_. 2021. Climate Change Indicators: Coastal Flooding. Accessed on October 14, 2022, <https://www.epa.gov/climate-indicators/climate-change-indicators-coastal-flooding>.
- \_\_\_\_\_. 2019. EJScreen Environmental Justice Mapping and Screening Tool: Technical Document. Accessed on November 30, 2022, [https://www.epa.gov/sites/default/files/2021-04/documents/ejscreen\\_technical\\_document.pdf](https://www.epa.gov/sites/default/files/2021-04/documents/ejscreen_technical_document.pdf).
- \_\_\_\_\_. 2004. Final Rule for Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel. Accessed on December 19, 2022, <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-control-emissions-air-pollution-nonroad>.
- \_\_\_\_\_. 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Accessed on December 11, 2022, <https://nepis.epa.gov/Exe/ZyPDF.cgi/2000L3LN.PDF?Dockey=2000L3LN.PDF>.
- U.S. Fish and Wildlife Service (USFWS). 2023a. Northern Long-eared Bat. Accessed on April 4, 2023, <https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>.
- \_\_\_\_\_. 2023b. Interim Consultation Framework for the Northern Long-eared Bat. Accessed April 4, 2023, <https://www.fws.gov/library/collections/interim-consultation-framework-northern-long-eared-bat>
- \_\_\_\_\_. 2022a. Information for Planning and Consultation (IPaC). Accessed on November 10, 2022, <https://ipac.ecosphere.fws.gov/>.
- \_\_\_\_\_. 2022b. Piping Plover. Accessed on November 28, 2022, <https://www.fws.gov/species/piping-plover-charadrius-melodus>.

- \_\_\_\_\_. 2022c. National Wetlands Inventory. Surface Waters and Wetlands. Accessed on December 1, 2022, <https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>.
- \_\_\_\_\_. 2007. Bald Eagle Monitoring Guidelines (Revision of Bald Eagle Monitoring Guidelines Issued September 2006). Accessed on December 28, 2022, <https://www.fws.gov/sites/default/files/documents/bald-eagle-monitoring-guidelines-2007.pdf>.
- \_\_\_\_\_. 1998. Roseate Tern (*Sterna dougallii*) Northeastern Population Recovery Plan. First Update. Accessed on November 16, 2022, [https://ecos.fws.gov/docs/recovery\\_plan/981105.pdf](https://ecos.fws.gov/docs/recovery_plan/981105.pdf).
- Walsh, J., D. Wuebbles, K. Hayhoe, J. Kossin, K. Kunkel, G. Stephens, P. Thorne, R. Vose, M. Wehner, J. Willis, D. Anderson, S. Doney, R. Feely, P. Hennon, V. Kharin, T. Knutson, F. Landerer, T. Lenton, J. Kennedy, and R. Somerville. 2014. “Chapter 2: Our Changing Climate.” In *Climate Change Impacts in the United States: The Third National Climate Assessment*, edited by J.M. Melillo, T.C. Richmond, and G.W. Yohe, U.S. Global Change Research Program, 19–67. Available at: <https://www.nrc.gov/docs/ML1412/ML14129A233.pdf>.
- Zedler, J.B., and J.C. Callaway. 2001. “Tidal Wetland Functioning.” *Journal of Coastal Research*, 38–64. Available at: <http://www.jstor.org/stable/25736163>.

## **Appendix A   Figures**



Tiered Environmental Assessment  
Tottenville Shoreline Protection Project

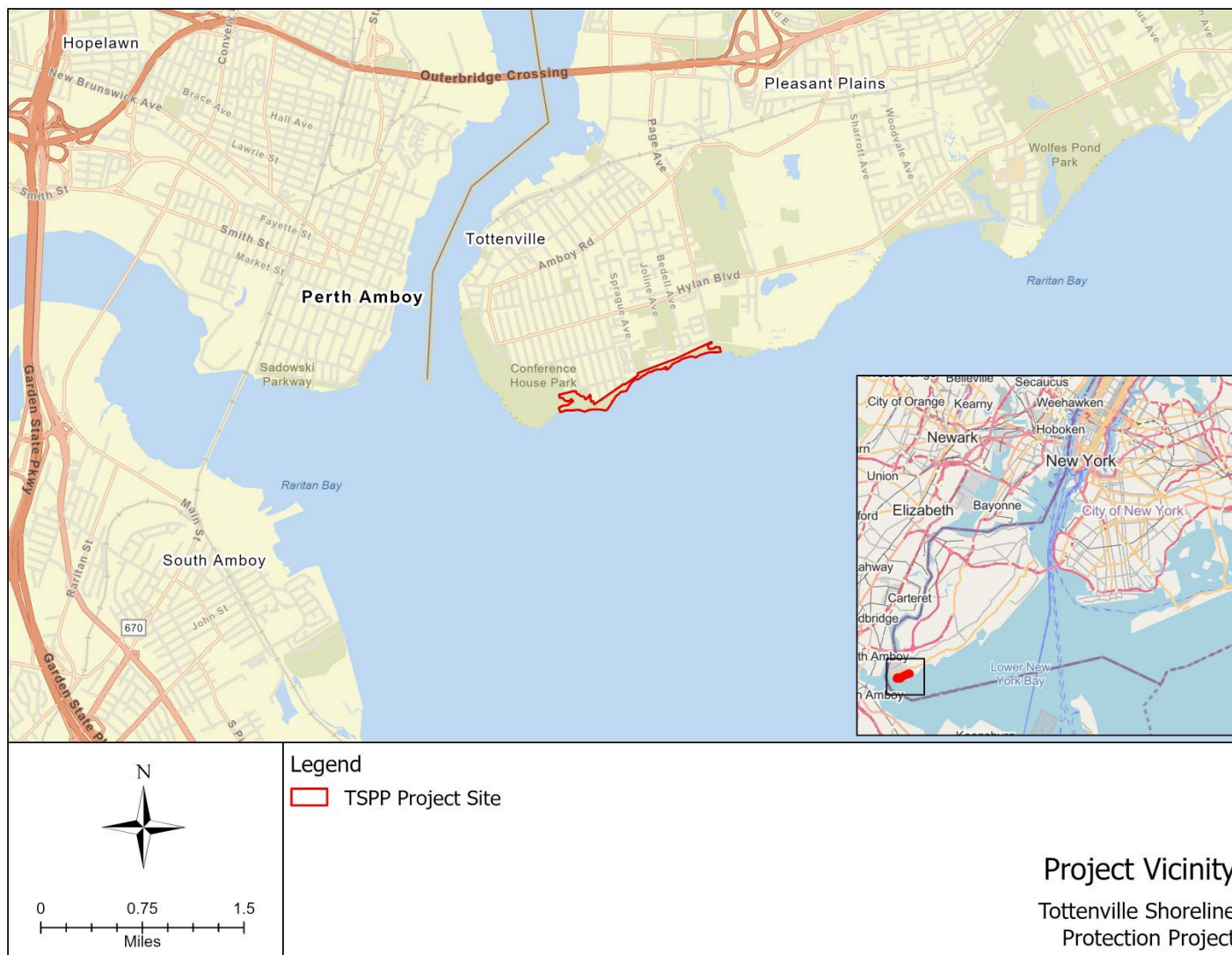


Figure 1: Project Vicinity

Tiered Environmental Assessment  
 Tottenville Shoreline Protection Project

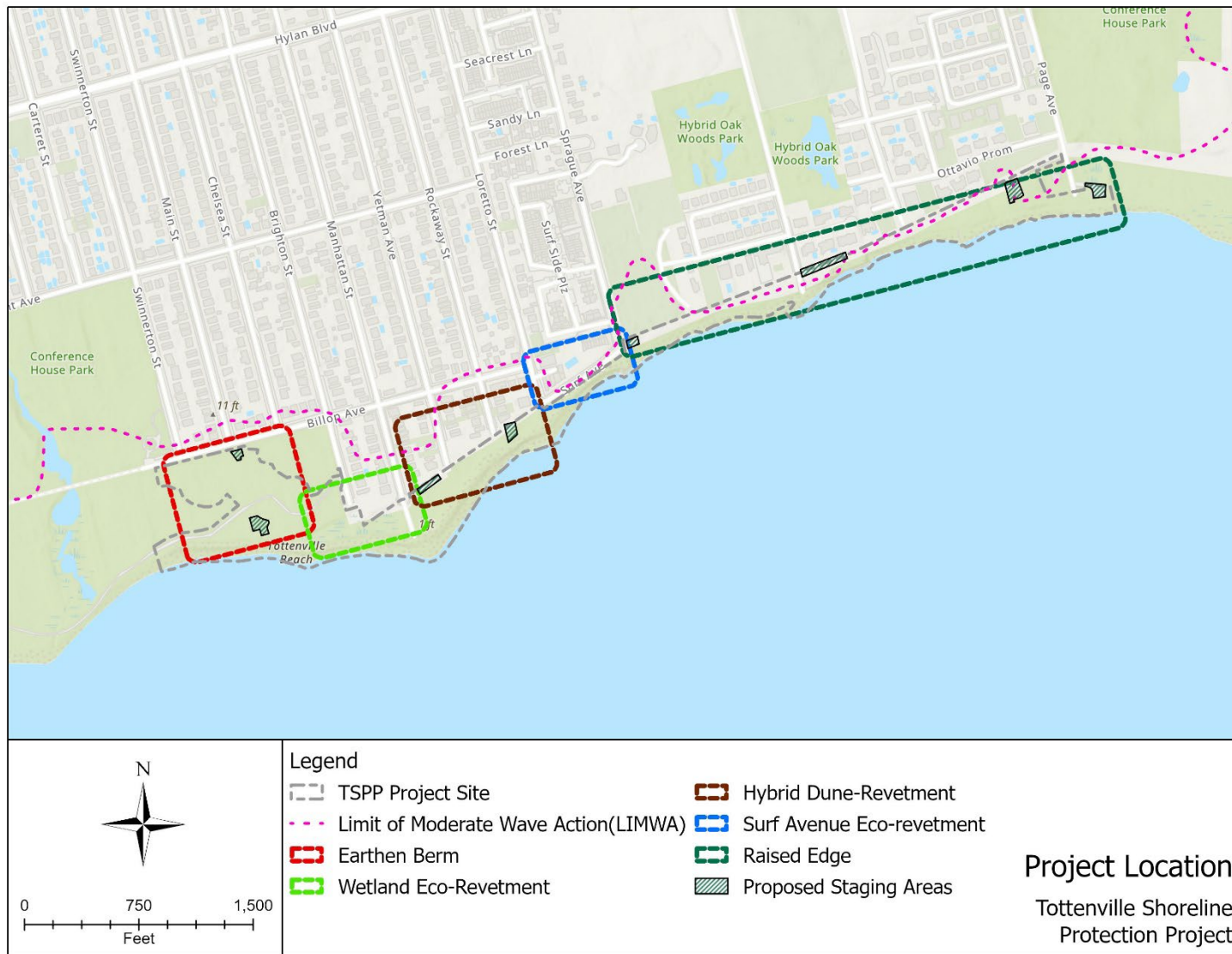


Figure 2: Project Location

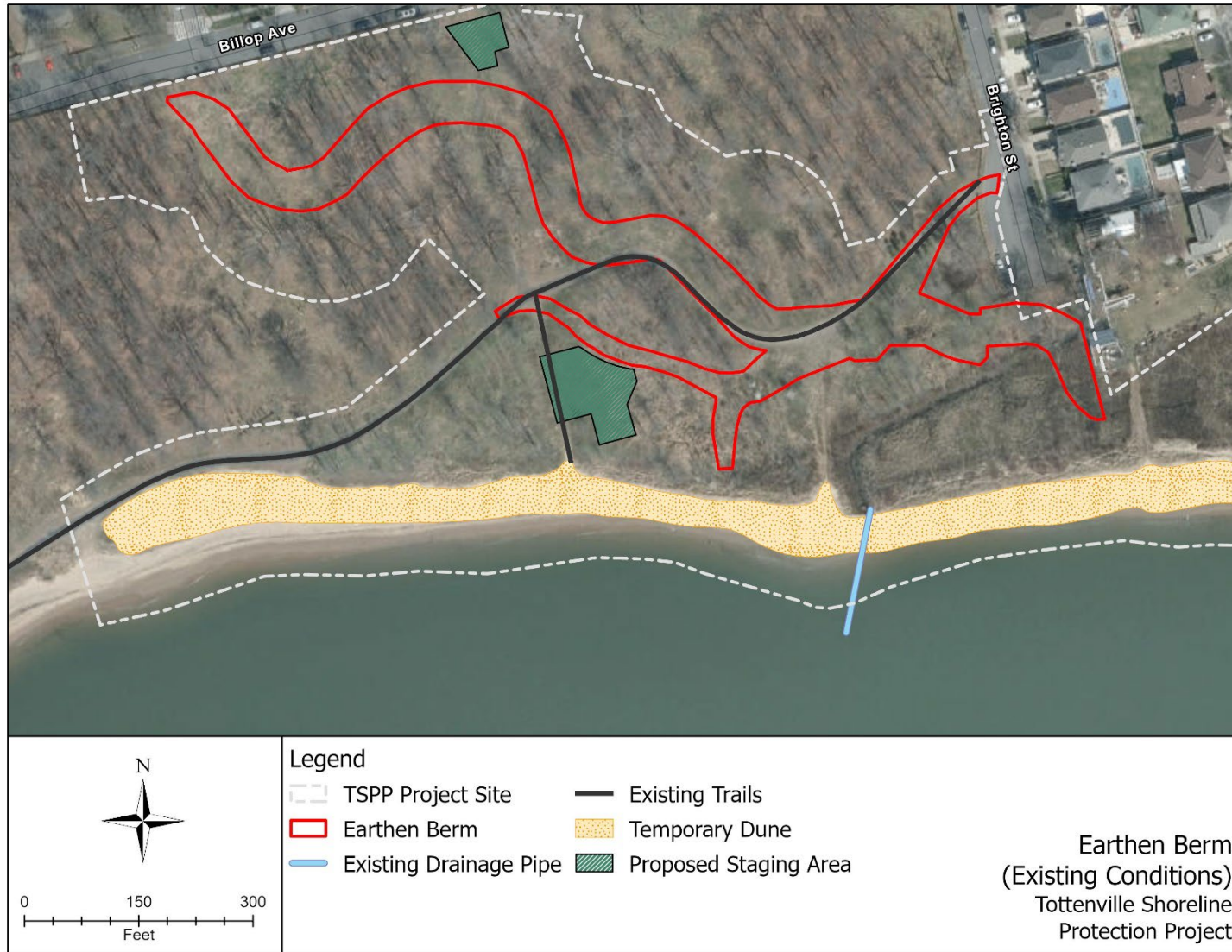


Figure 3: Earthen Berm

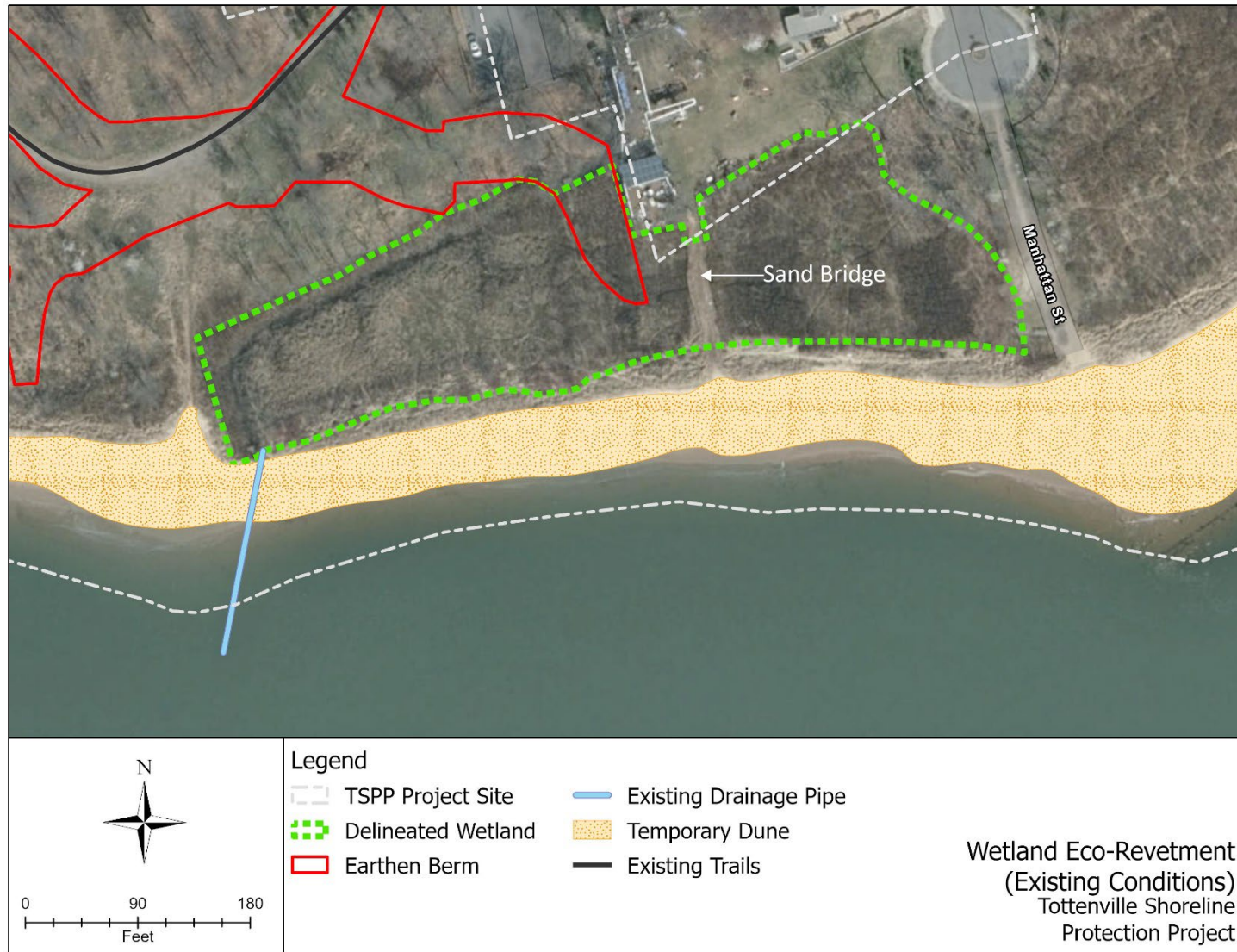


Figure 4: Wetland Eco-Revetment



Figure 5: Hybrid Dune-Revetment



Figure 6: Surf Avenue Eco-Revetment



**Figure 7: Raised Edge**

Tiered Environmental Assessment  
 Tottenville Shoreline Protection Project

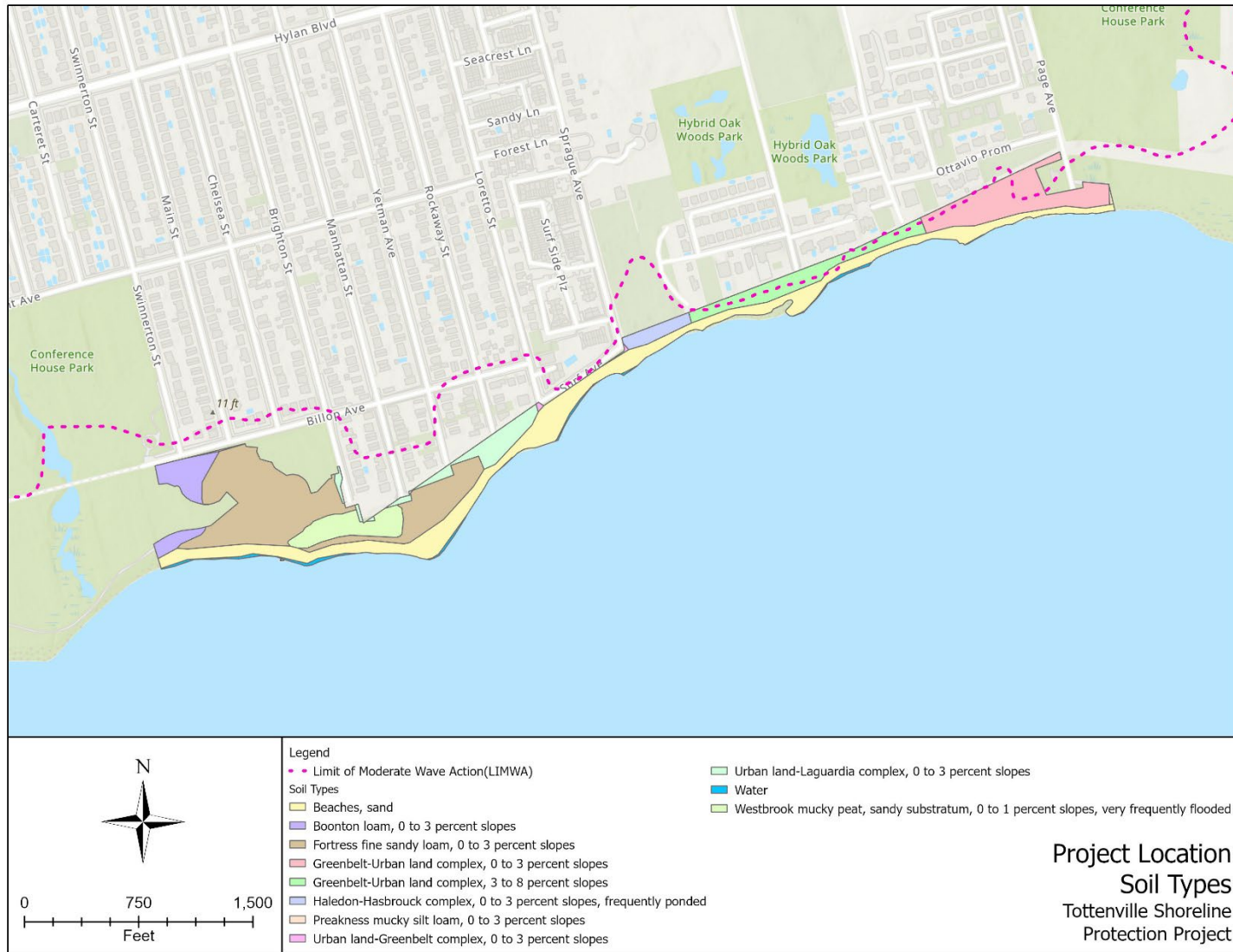


Figure 8: Tottenville Soils Map



Tiered Environmental Assessment  
 Tottenville Shoreline Protection Project

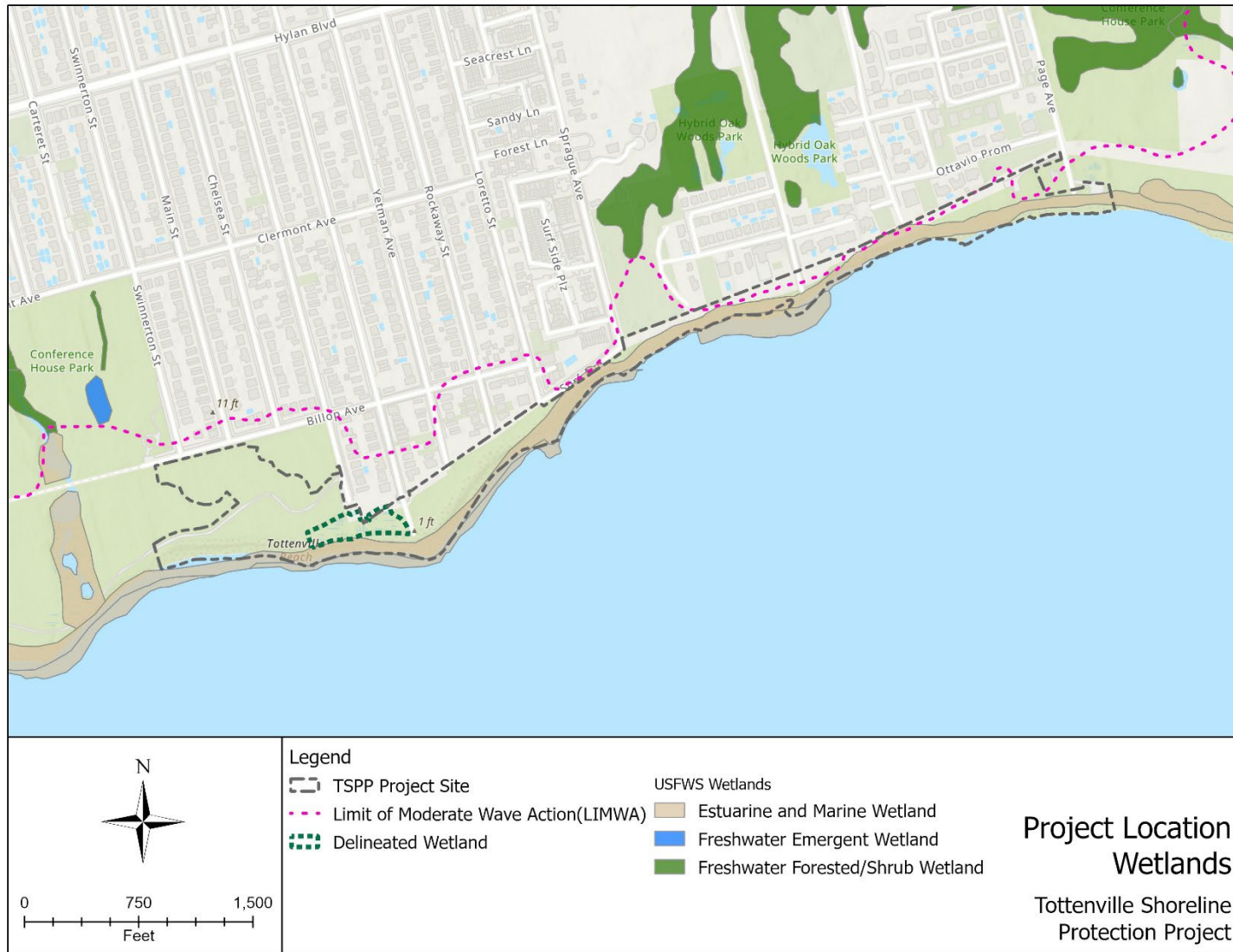


Figure 9: Tottenville Wetlands Map

Tiered Environmental Assessment  
 Tottenville Shoreline Protection Project

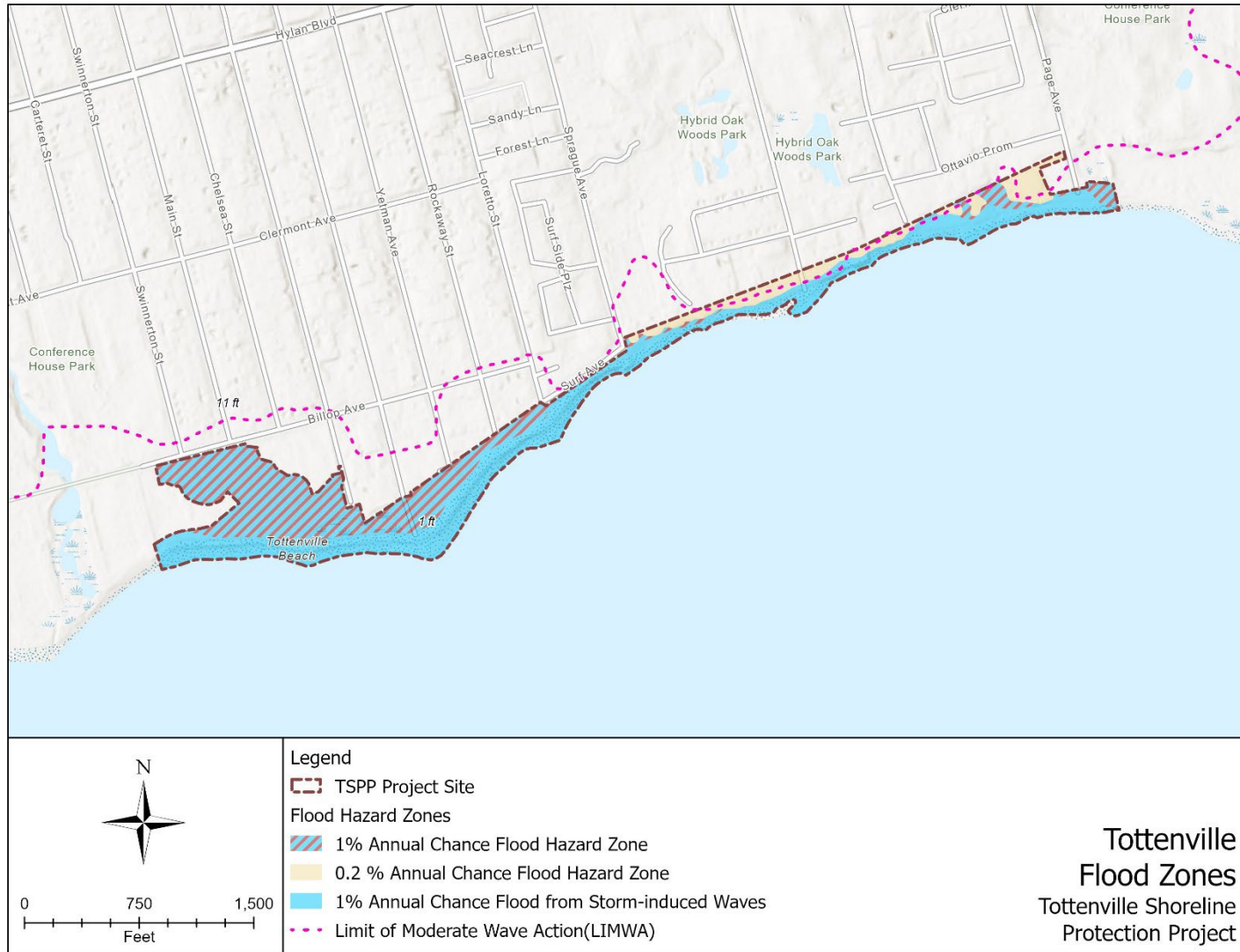


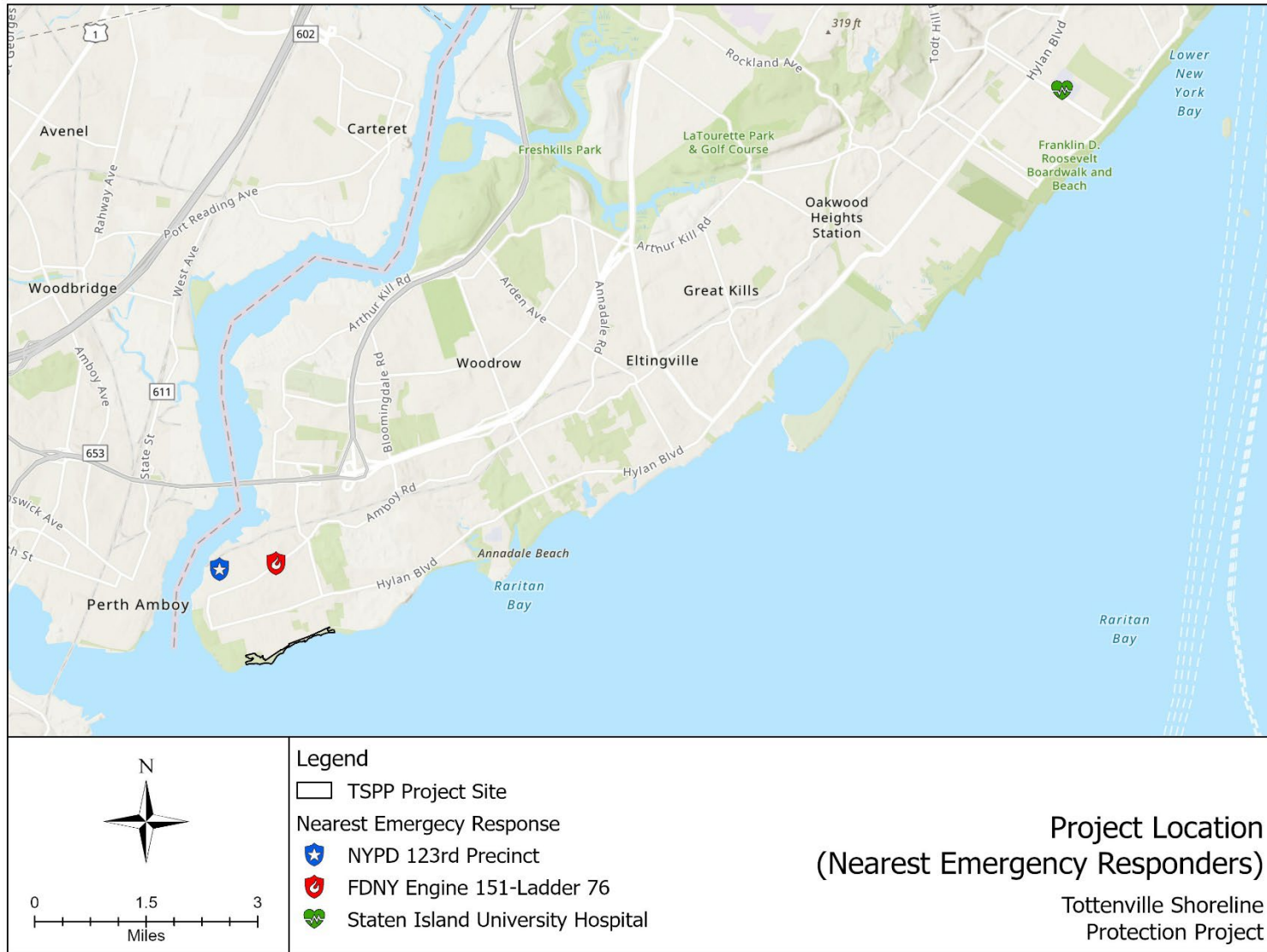
Figure 10: Tottenville Flood Zones

Tiered Environmental Assessment  
Tottenville Shoreline Protection Project



Figure 11: Project Location and Surrounding Parks

Tiered Environmental Assessment  
 Tottenville Shoreline Protection Project



**Figure 12: Public Health and Safety Facilities Map**



Figure 13: Living Breakwaters Map

## **Appendix B Documents**

## **Document 1 - Eight Step Floodplain Review**

**BRIC 2020 GOSR/NYCParks Tottenville Shoreline Protection Project  
Tottenville, Richmond County, New York NY  
EMN-2020-BR-063-0008**

Executive Order 11988 – FLOODPLAIN MANAGEMENT  
Executive Order 11990 – WETLAND PROTECTION

**8-STEP PROCESS SUMMARY**

**Date:** 06/14/2023

**Prepared By:** David Conrad, Environmental Protection Lead

**Project:** The Proposed Action is part of the wider Tottenville Shoreline Protection Project (TSSP). The TSSP aims to mitigate the risk of coastal flooding along the south shore of Staten Island. New York City has applied for funding from FEMA to cover four of the five major components of the TSPP. The project area spans the south Tottenville shoreline, originating at Conference House Park on the western end and terminating at Butler Manor Wood on the eastern side.

The Proposed Action includes four components:

1. An earthen berm that extends 948 feet from Carteret Street to Brighten Street. The berm would be 25 feet wide ranging 12 to 13 feet above mean sea level. A vegetated slope would be constructed on the earthen berm and be replanted with woodland mix of native plants.
2. A hybrid dune-revetment extending approximately 937 feet along the shoreline from Manhattan Street to Loretto Street. The hybrid dune-revetment (and the wetland eco-revetment) requires the placement of 1,176 cubic yards of sand, rock, concrete, and path material over 0.14 acre within the delineated wetland.
3. An eco-revetment, which would be constructed to the east of the hybrid dune-revetment and would extend approximately 396 feet from Loretto Street to Sprague Avenue. It would be approximately 60 feet wide and consist of vegetated planters backed by an armored stone revetment on the seaward side and a curb wall on the landward side. The curb wall would separate the vegetated area from an 8-foot-wide paved pathway. The plant containers would be planted with a perennial and wetland swale mix.
4. A 46 feet wide wetland eco revetment that extends 338 feet from the eastern terminus of the earthen berm at Brighten Street to Manhattan Street, adjacent to an existing wetland. The structure would feature two rows of sheet pile with concrete caps, an 8-inch-thick concrete deck, and a 3:1 width-to-height vegetated slope covering a stone layer on the landward side of the wetland eco-revetment

**STEP 1 - Determine whether the proposed actions are located in a wetland and or the 100-year floodplain (500-year floodplain for critical action [44 CFR 9.4]) or whether they have the potential to affect or be affected by a floodplain or a wetland (44 CFR 9.7).**

  X   The project site is located in relation to the floodplains as mapped by:

The Project Area is located within Flood Insurance Rate Map (FIRM) panel number 3604970451F and 3604970313F, in flood Zone AE, X, and VE.

  X   The Project is located in the wetland as identified by:



According to the National Wetlands Inventory (NWI), three estuarine intertidal wetlands with unconsolidated shores occur within the project area. However, these wetlands mapped under the NWI do not meet the characteristics to be under federal jurisdiction of the USACE as wetlands and therefore are only regulated as waters of the U.S., and are not discussed farther.

A wetland delineation conducted on August 10, 2016, identified an approximate 0.8-acre tidal wetland south of the terminus of Brighton Street and Surf Avenue, west of Manhattan Street, east of Chelsea Street, and north of the beach. Connectivity between the tidal wetland and Raritan Bay is currently limited by geographic factors, including the temporary dune and a sand bridge of unpermitted fill that bisects the wetland. According to the wetland delineation, no state-regulated wetlands are within 100 feet of the project area and the project area does not intersect any freshwater wetlands regulated by NYSDEC or their buffer zones. Therefore, no impacts on state-regulated freshwater wetlands would occur.

**STEP 2 - Notify the public at the earliest possible time of the intent to carry out an action in a floodplain or wetland and involve the affected and interested public in the decision-making process (see 44 CFR 9.8).**

Not applicable - Project is not located in a floodplain or wetland.

Applicable - Notice will be or has been provided by:

Public notice will be provided in the public comment period for the Environmental Assessment for this project.

**STEP 3 - Identify and evaluate practicable alternatives to locating the proposed action in a floodplain or wetland (including alternative sites, actions, and the “No Action” option) [see 44 CFR 9.9]. If a practicable alternative exists outside of the floodplain or wetland, FEMA must locate the action at the alternative site.**

Not applicable – Project is not located in a floodplain or in a wetland.

Applicable – Alternative identified in the EA Document or as described below:

**Alternative 1: No Action** – With the selection of the No Action Alternative, the Proposed Action would not be implemented, and current conditions and operations would generally continue in the Project Area. No Action alternative would not reduce the risk of wave action and inland flooding in the Tottenville area, which would result in continued erosion and sedimentation, degrading water quality locally. Intermittent construction activities for flood-related repairs stemming from the lack of a more permanent solution could increase in frequency, potentially adding construction-related runoff. However, any impact on water quality would be minimal given the size of the bay. Therefore, the No Action alternative would have a negligible long-term adverse impact on water quality in Raritan Bay. It should be noted that failure to provide the Project Area with additional protection from flooding would likely lead to increased and more frequent

damage to local infrastructure and property, direct harm to economic activity, and increased potential for human health effects.

**Alternative 2: Proposed Action impacts** – The Proposed Action, as part of the TSSP, Will reduce the level and duration of flood events that endanger human health and property in the Tottenville area. Given the geography of the area, this requires construction in or near waterbodies. Therefore, no practicable alternative exists for this project outside the floodplain and wetlands.

**STEP 4 - Identify the full range of potential direct or indirect impacts occupancy or modification of floodplains and wetlands and the potential direct and indirect support of floodplain and wetland development that could result from the proposed action (see 44 CFR 9.10).**

      Not applicable – Project is not located in a floodplain or in a wetland.

  **X**  Applicable – Alternative identified in the EA document or as described below:

**Floodplains**

Ground disturbance from construction could cause sediment to run off into the floodplain and result in minor adverse impacts on water quality and aquatic life. NYC Parks may implement a Stormwater Pollution Plan in accordance with the SPDES General Permit for Stormwater Discharges from Construction Activity. These measures required by state and local permits for construction would avoid and minimize potential impacts. Therefore, construction of the Proposed Action would have negligible short-term adverse impacts on the floodplain.

The Proposed Action would place permanent fill in and alter the topography of the floodplain, resulting in a more stable shoreline, which would reduce erosion and inland flooding. The stone revetment components of the wetland eco-revetment and the Surf Avenue eco-revetment would provide a limit to coastal erosion. Native plantings on the earthen berm, wetland eco-revetment, and hybrid dune-revetment would increase shoreline stability and result in a more resilient shoreline during high tides and storm surges. The five project components of the combined TSSP would reduce the risk of inland flooding by reducing wave impacts associated with severe coastal storm events and would also improve shoreline stability. Therefore, the Proposed Action would have a moderate long-term benefit on floodplains.

**Wetlands**

Construction of the Proposed Action could adversely impact the tidal wetlands through increased turbidity or accidental releases of hazardous materials or pollutants associated with construction equipment. Construction impacts could also lead to inadvertent loss of wetland habitat. During construction, a 25-foot protective buffer would be established around the tidal wetland to minimize encroachment of silt and other debris. Construction impacts would be mitigated through use of marsh mats or low-ground-pressure equipment and implementation of erosion and sediment control BMPs, as required by the SPDES General Permit for Stormwater Discharges from Construction Activity. Therefore, with adherence to erosion and sediment control BMPs, the Proposed Action would have a minor short-term adverse impact on wetlands due to construction activity.

The FEMA funded project components result in a total loss of approximately 6,270 square feet or 0.14 acre of tidal wetland. This includes the placement of 1,176 CY of fill into the tidal wetland. The subapplicant is responsible for adhering to all conditions in required permitting, including the 404 permit authorizing the fill of this wetland, and to purchase mitigation credits from the Saw Mill Creek Mitigation Bank as an impact offset. The remaining 0.66 acre wetland area will be enhanced through the removal of invasive species and planting of native saltmarsh plants. The area would also have increased tidal connectivity, which would create a more suitable habitat for native saltmarsh plants. Therefore, the Proposed Action would result in a minor long-term benefit to local wetlands.

The area of Tottenville protected by this project is already sustainably developed, there is little to no risk of additional development.

**STEP 5 - Minimize the potential adverse impacts and support to or within floodplains and wetlands to be identified under Step # 4, restore, and preserve the natural and beneficial values served by floodplains, and preserve and enhance the natural and beneficial values served by wetlands (see 44 CFR 9.11).**

Not applicable – Project is not located in a floodplain or in a wetland.

Applicable – Mitigation measures identified in the EA document or as described below:

Minimization of potential adverse impacts will be carried out through the permitting process and the measures discussed in the Environmental Assessment. See pages 19 and 22 for additional information.

**STEP 6 - Re-evaluate the proposed action to determine first, if it is still practicable in light of its exposure to flood hazards, the extent to which it will aggravate the hazards to others and its potential to disrupt floodplain and wetland values, and second, if alternatives preliminarily rejected at Step #3 are practicable in light of the information gained in Steps #4 and #5. FEMA shall not act in a floodplain or wetland unless it is the only practicable location.**

Not applicable – Project is not located in a floodplain or in a wetland.

Applicable – Action proposed is located in the only practicable location as described below:

The Proposed Action is the chosen practicable alternative based upon a review of possible adverse effects on the floodplain.

**STEP 7 - Prepare and provide the public with a finding and public explanation of any final decision that the floodplain or wetland is the only practicable alternative (see 44 CFR 9.12).**

Not applicable – Project is not located in a floodplain or in a wetland.

X  Applicable – Finding is or will be prepared as described below:

Step 7 requires that the FEMA provide the public with an explanation of any final decisions that the Proposed Action in a floodplain is the only practicable alternative, potential impacts of the Proposed Action on floodplains, and associated mitigation measures. In accordance with 44 CFR 9.12, FEMA will provide this notice with the notice of availability of the draft Environmental Assessment for public review and comment.

**STEP 8 - Review the implementation and post-implementation phases of the proposed action to ensure the requirements of the Order are fully implemented. Oversight responsibility shall be integrated into the existing process.**

      Not applicable – Project is not located in a floodplain or in a wetland.

  X  Applicable – Approval is conditioned on review of implementation and post-implementation phases to ensure compliance with the order(s).

The implementation and post-implementation phase of the proposed action will be reviewed to ensure that the requirement(s) stated in 44 CFR 9.11 are fully implemented.

## **Document 2 - List of Native Plant Species Eligible for Restoration Use, By Community Type**

Tiered Environmental Assessment  
Tottenville Shoreline Protection Project

Common Name	Scientific Name
<b>Dune Community</b>	
American beach grass	<i>Ammophila breviigulata</i>
Trailing wild bean	<i>Strophostyles helvola</i>
<b>Freshwater Swale Community</b>	
Swamp rose	<i>Rosa plustris</i>
Common Boneset	<i>Eupatorium perfoliatum</i>
Northern blue flag	<i>Iris versicolor</i>
Cardinal flower	<i>Lobelia cardinalis</i>
Blue vervain	<i>Verbena hastata</i>
New York ironweed	<i>Vernonia noveboracensis</i>
Porcupine sedge	<i>Carex hystricina</i>
Fox sedge	<i>Carex vulpinoidea</i>
Soft rush	<i>Juncus effesus</i>
Rice cutgrass	<i>Leersia oryzoides</i>
Wool grass	<i>Scirpus cyperinus</i>
Partridge pea	<i>Chamaecrista fasciculata</i>
Swamp rose mallow	<i>Hibiscus moscheutos</i>
Poverty rush	<i>Juncus tenuis</i>
American bugleweed	<i>Lycopus americanus</i>
<b>Maritime Grassland Community</b>	
Eastern red cedar	<i>Juniperus virginiana</i>
Grass-leaved goldenrod	<i>Euthamia graminifolia</i>
Woolly beachheather	<i>Hudsonia tomentosa</i>
Evening-primrose	<i>Oenothera biennis</i>
Canada goldenrod	<i>Solidago canadensis</i>
Seaside goldenrod	<i>Solidago sempervirens</i>
White heath aster	<i>Symphyotrichum ericoides</i>
Broomsedge bluestem	<i>Andropogon virginicus</i>
Pennsylvania sedge	<i>Carex pensylvanica</i>
Poverty oatgrass	<i>Danthonia spicata</i>
Indian hemp	<i>Apocynum cannabinum</i>
Purple lovegrass	<i>Eragrostis spectabilis</i>
Virginia wildrye	<i>Elymus virginicus</i>
Rabbit tobacco	<i>Pseudognaphalium obtusifolium</i>
Black-eyed Susan	<i>Rudbeckia hirta</i>
Early goldenrod	<i>Solidago juncea</i>
Frost aster	<i>Syphyotrichum pilosum</i>
Blue wood-aster	<i>Symphyotrichum cordifolium</i>

Tiered Environmental Assessment  
 Tottenville Shoreline Protection Project

Common Name	Scientific Name
<b>Maritime Shrubland Community</b>	
False indigo bush	<i>Amorpha fruticose</i>
<b>Maritime Upland Community</b>	
Boxelder maple	<i>Acer neacergundo</i>
Red maple	<i>Acer rubrum</i>
Silver maple	<i>Acer saccharinum</i>
Common serviceberry	<i>Amelanchier arborea</i>
Canadian serviceberry	<i>Amelanchier canadensis</i>
Sweet birch	<i>Betula lenta</i>
Gray birch	<i>Betula populifolia</i>
Common hackberry	<i>Celtis occidentalis</i>
Eastern redbud	<i>Cercis canadensis</i>
Common persimmon	<i>Diospyros virginiana</i>
Eastern black walnut	<i>Juglans nigra</i>
Eastern red cedar	<i>Juniperus virginiana</i>
Sweetgum	<i>Liquidambar styraciflua</i>
Tulip tree	<i>Liriodendron tulipifera</i>
Black gum	<i>Nyssa sylvatica</i>
American sycamore	<i>Platanus occidentalis</i>
Black cherry	<i>Prunus serotina</i>
White oak	<i>Quercus alba</i>
Swamp white oak	<i>Quercus bicolor</i>
Scarlet oak	<i>Quercus coccinea</i>
Pin oak	<i>Quercus palustris</i>
Red oak	<i>Quercus rubra</i>
Sassafras	<i>Sassafras albidum</i>
Red chokeberry	<i>Aronia arbutifolia</i>
Black chokeberry	<i>Aronia melanocarpa</i>
Sweet pepperbush	<i>Clethra alnifolia</i>
American strawberry bush	<i>Euonymus americanus</i>
American holly	<i>Ilex opaca</i>
Maleberry	<i>Lyonia ligustrina</i>
American black elderberry	<i>Sambucus canadensis</i>
Highbush blueberry	<i>Vaccinium corymbosum</i>
Arrowwood viburnum	<i>Viburnum dentatum</i>
White thoroughwort	<i>Eupatorium album</i>
White snakeroot	<i>Eupatorium rugosum</i>

<b>Common Name</b>	<b>Scientific Name</b>
Solomon's seal	<i>Maiathemum stellatum</i>
Sweet wood reed	<i>Cinna arundinacea</i>
White avens	<i>Geum canadense</i>
<b>Tidal Wetland Community</b>	
Saltgrass	<i>Distichlis spicata</i>
Saltmarsh cordgrass	<i>Spartina alterniflora</i>
Big cordgrass	<i>Spartina cynosuroides</i>
Saltmarsh hay	<i>Spartina patens</i>
Seedbox	<i>Ludwigia alternifolia</i>
Marsh Fleabane	<i>Pluchea odorata</i>
Bulrush	<i>Typha latifolia</i>
Eastern gamagrass	<i>Tripsacum dactyloides</i>
<b>Maritime Shrubland and Maritime Grassland Communities</b>	
Switchgrass	<i>Panicum virgatum</i>
Indiangrass	<i>Sorghastrum nutans</i>
Little bluestem	<i>Schizachyrium scoparium</i>
<b>Maritime Upland and Maritime Grassland Communities</b>	
Common milkweed	<i>Asclepias syriaca</i>
Butterfly weed	<i>Asclepias tuberosa</i>
Tall boneset	<i>Eupatorium altissimum</i>
Hyssop-leaf thoroughwort	<i>Eupatorium hyssopifolium</i>
Wavy hair grass	<i>Deschampsia flexuosa</i>
<b>Maritime Upland, Maritime Grassland, and Freshwater Swale Communities</b>	
Greene's rush	<i>Juncus greenei</i>
<b>Maritime Upland and Maritime Grassland Communities</b>	
Pitch pine	<i>Pinus rigida</i>
Eastern baccharis	<i>Baccharis halimifolia</i>
<b>Maritime Upland, Maritime Shrubland, and Maritime Grassland Communities</b>	
Winged sumac	<i>Rhus copallinum</i>
Smooth sumac	<i>Rhus glabra</i>
Common blackberry	<i>Rubus allegheniensis</i>
Black raspberry	<i>Rubus occidentalis</i>
<b>Maritime Upland, Maritime Shrubland, Maritime Grassland, and Dune Communities</b>	
Bayberry	<i>Myrica pensylvanica</i>
Beach plum	<i>Prunus maritima</i>
Carolina rose	<i>Rosa carolina</i>
Virginia rose	<i>Rosa virginiana</i>