

ENVIRONMENTAL ASSESSMENT

Federal Financial Assistance Grant Number: 44068
Somers Point Resiliency and Embankment Project, Somers Point, Atlantic County, New Jersey

Prepared as Part of the National Fish and Wildlife Foundation
Hurricane Sandy Coastal Resiliency Competitive Grant Program

Prepared by



U.S. Department of the Interior

In Partnership With

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And

The City of Somers Point

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This Environmental Assessment becomes a Federal document when evaluated and signed by the responsible Federal Official.

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1.0 INTRODUCTION

The Hurricane Sandy Coastal Resiliency Competitive Grant Program (Program) supports projects that reduce communities' vulnerability to the growing risks from coastal storms, sea level rise, flooding, erosion, and associated threats through strengthening natural ecosystems that also benefit fish and wildlife. Funding for the Program is administered by the National Fish and Wildlife Foundation (NFWF) through the U.S. Department of the Interior (Department of DOI) Hurricane Sandy disaster relief appropriation (Disaster Relief Appropriations Act of 2013).

On June 16, 2014, the Department announced the award of 54 grants totaling \$102.75 million. In addition, the grantees committed over \$55 million in additional funding and in-kind contributions, for a total conservation investment of over \$158 million. Grants were awarded to projects that assess, restore, enhance, or create wetlands, beaches, and other natural systems to help better protect communities and to mitigate the impacts of future storms and naturally occurring events on fish and wildlife species and habitats. Projects are located in the region affected by Hurricane Sandy: Connecticut, Delaware, the District of Columbia, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Virginia, and West Virginia. Each of these states officially declared a natural disaster as a result of the 2012 Hurricane Sandy storm event.

The DOI, as lead federal agency, and its partner, the City of Somers Point, are proposing the Somers Point Resiliency and Embankment Project (Project) to provide protection against tidal flooding and restore and enhance marsh habitat.

The city of Somers Point, New Jersey, originally known as Somerset Plantation, is the oldest settlement in Atlantic County and is located in the southeastern portion of the county in what was once known as Great Egg Harbor (City of Somers Point 2018a). The city is surrounded by water—the Great Egg Harbor Bay, the Great Egg Harbor River, and Patcong Creek—on three sides, making it particularly vulnerable to flooding from wave action, storm events, and rising sea levels (Figure 1-1), which, for coastal New Jersey, are estimated to be rising about 1 inch every 6 years. This increase is more rapid along the New Jersey shore than in other coastal areas because the land is also sinking. If the oceans and atmosphere continue to warm, the sea levels are likely to rise 18 inches to 4 feet along the New Jersey shore in the next century.

During Hurricane Sandy, many areas within Somers Point were severely flooded (Figure 1-2) and experienced extensive damage. Many of the properties that were damaged during Hurricane Sandy are located along Somers Point-Mays Landing Road (Polistina Associates and Rutala Associates 2017). Due to the existing topography, this area is also prone to tidal flooding and is within the limits of moderate wave action.

The Somers Point-Mays Landing Road separates residences on the south side of the road from marsh on the north side. A narrow, linear growth of invasive plant species separates the marsh from the road, which has degraded the overall ecosystem in the area. Stormwater runoff from the road currently moves toward the marsh, into Patcong Creek, which flows into the Great Egg Harbor Bay and finally into the Atlantic Ocean.

After Hurricane Sandy, the city received two grants—a Post-Sandy Planning Grant of \$30,000 and a Phase 2 Post-Sandy Planning Assistance Grant of \$330,000—from the New Jersey Department of Community Affairs as part of the federal Community Development Block Grant-Disaster Recovery Fund (New Jersey Future 2013). These grants were used to re-examine the city’s master plan, revise zoning ordinances, create design standards for redevelopment of the Bay Avenue waterfront district and historic district, make infrastructure improvements, and fund a design and market study (City of Somers Point 2014a).

In addition to the NFWF Program and federal Community Development Block Grant-Disaster Recovery Fund grant, Somers Point also obtained funding through the U.S. Fish and Wildlife Service (USFWS) Wildlife and Sport Fish Restoration (WSFR) Program, and from the city itself for the following activities in Somers Point:

1. Dredging of the Higbee Marina pier site;
2. Installation of a living shoreline embankment along the north side of Somers Point-Mays Landing Road;
3. Upgrading the Higbee Marina facility;
4. Parking lot improvements at Gateway Marina.

Figure 1-3 shows the locations of these activities. Actions funded under the DOI/NFWF Program grant include the Higbee Marina dredging (partial funding), and the living shoreline embankment. The City of Somers Point is also funding part of the Higbee Marina dredging. Items 3 and 4 above are being funded and permitted separately and are addressed in this Environmental Assessment (EA) under Section 5, Cumulative Effects.

For the purposes of this EA, the Project area encompasses the city of Somers Point. The analysis of specific resources uses the site footprints of the two actions, as discussed below:

1. The Higbee Marina pier site is located in and along the navigation channel (labeled as “Shipping Channel” on figures) within Great Egg Harbor Bay, approximately 2,000 feet northeast of the Route 52 bridge, at 198 Higbee Avenue in the city of Somers Point, Atlantic County, New Jersey. The marina at Higbee Avenue was purchased by the City of Somers Point in 1993. It was in disrepair at the time of purchase and has not been renovated. The water is extremely shallow; only pontoon boats are able to use the facility.
2. The living shoreline embankment site is located along the north side of Somers Point-Mays Landing Road (County Road 559) between the Patcong Creek Bridge on the west and Garden State Parkway on the east. The area is prone to tidal flooding and is located partially in a flood zone and in the limits of moderate wave action,¹ which has impacted commercial and residential properties in the area.

This EA further analyzes the potential impacts these alternatives may have on the natural and human environment. This EA has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality

¹ The limit of moderate wave action is the inland limit of the area expected to receive 1.5-foot or greater breaking waves during the 1-percent-annual-chance flood event.

(CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and DOI regulations (43 CFR Part 46), policy, and guidance.

1.1 Purpose and Need

The purpose of the Program is to undertake a variety of actions to restore wetlands and other natural areas, better manage stormwater using green infrastructure, and assist states, tribes, and local communities in protecting themselves from future storms. Overall, the Program goals relate to coastal resiliency and ecosystem enhancement. The Program provides funding for projects in five categories, including Project Planning and Design, Coastal Resiliency Assessments, Restoration and Resiliency Projects, Green Infrastructure, and Community Coastal Resiliency Planning.

The Program provides technical and financial assistance to identify, protect, conserve, manage, enhance, or restore habitat and infrastructure on both public and private lands that have been negatively impacted by Hurricane Sandy.

The Project meets the purpose and need of the Restoration and Resiliency category by improving protection and resiliency against nuisance flooding, wave action, and sea level rise and to enhance existing marsh habitat. Creation of the living shoreline embankment would demonstrate the beneficial reuse of dredged material and reduce tidal flooding along Somers Point-Mays Landing Road. In addition, the living shoreline embankment would create an environmental uplift by removing invasive, non-native plant species and replacing them with native pollinator species. The Project is needed to offset the continued loss of coastal land and marsh habitat and increase resiliency of coastal communities in this area to sea level rise.

Figure 1-1 General Vicinity Map for City of Somers Point, New Jersey

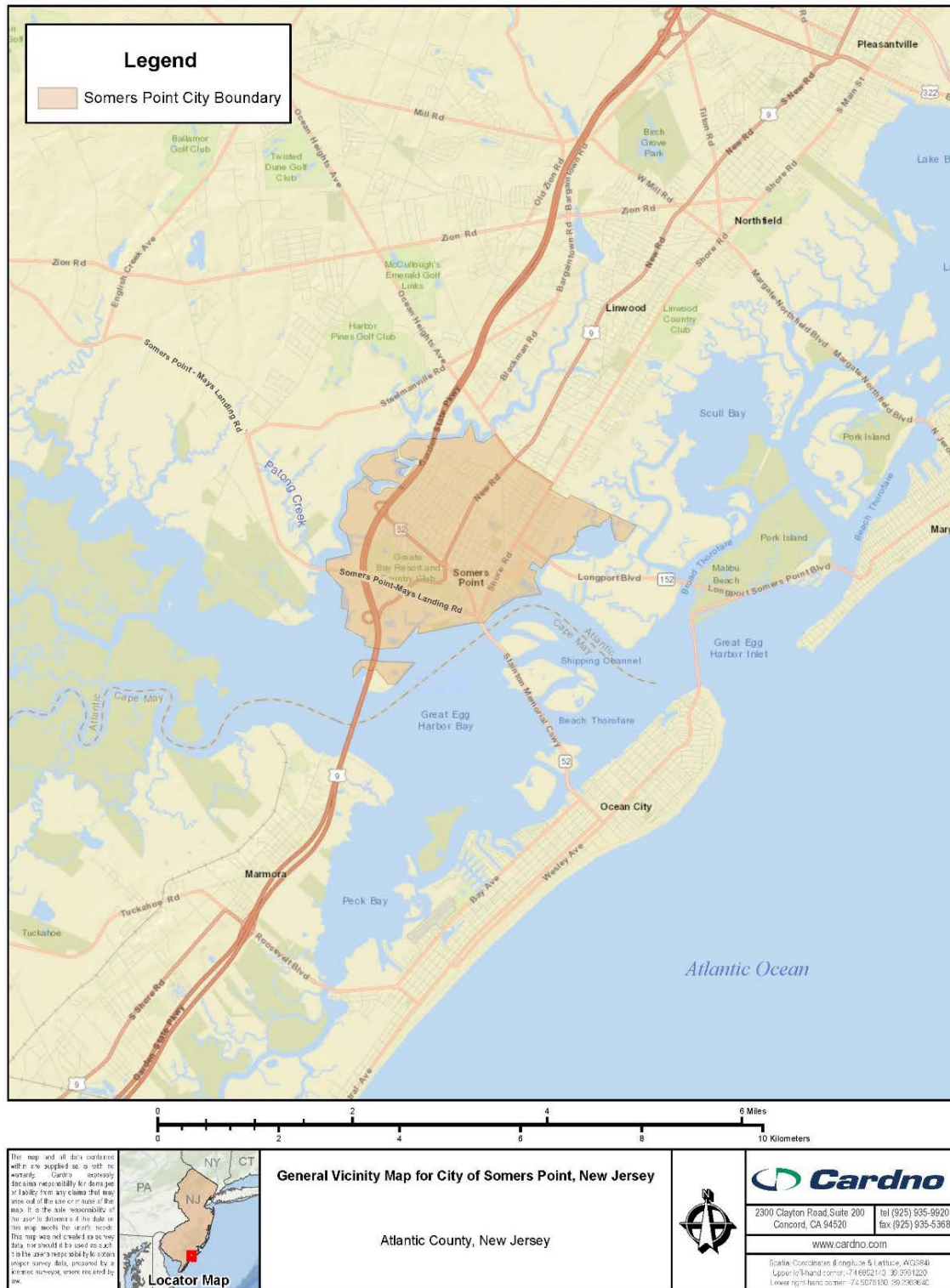
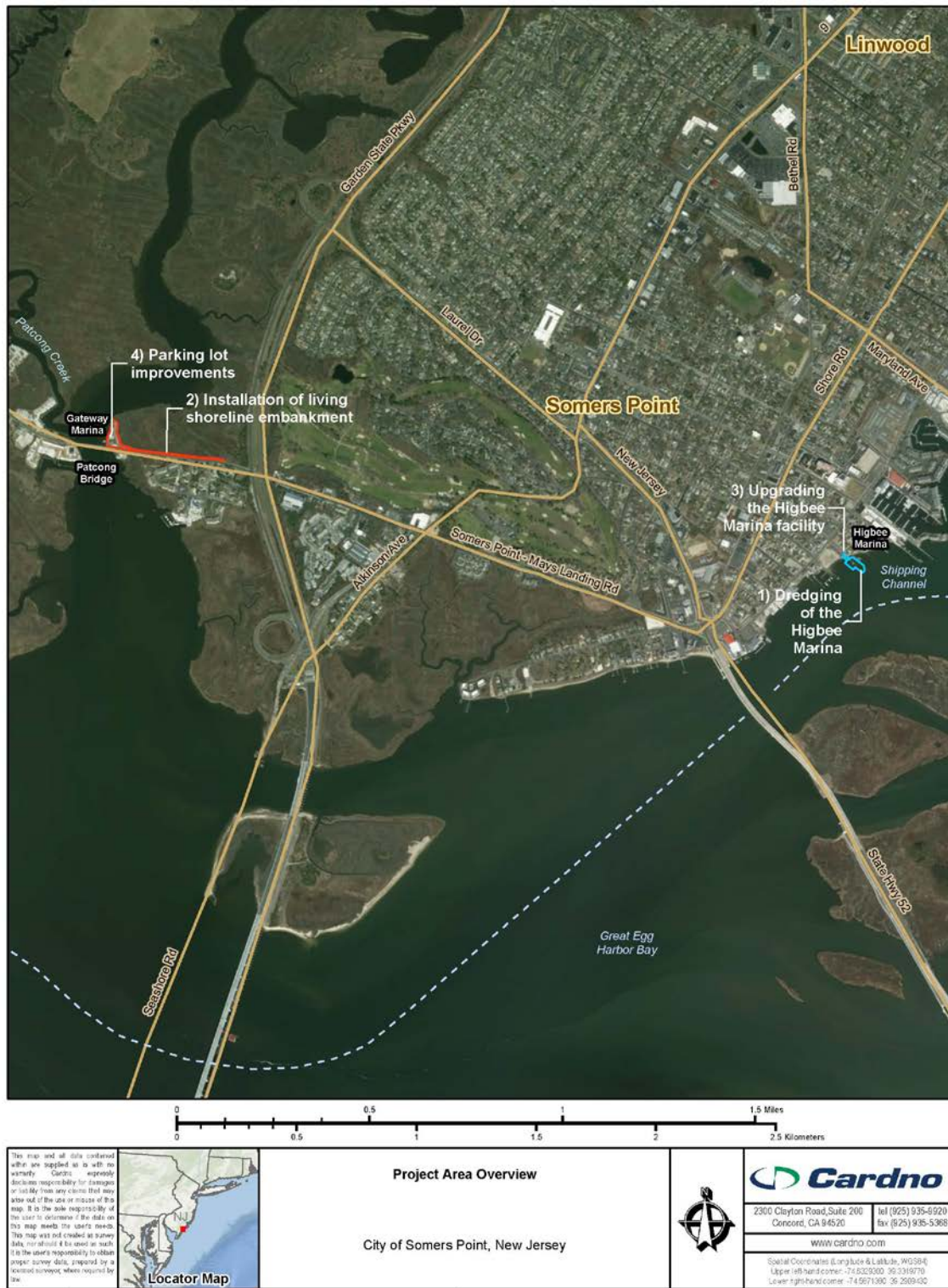


Figure 1-2 City of Somers Point Flooding during Hurricane Sandy



Source: City of Somers Point 2018b

Figure 1-3 Project Area Overview



2.0 ALTERNATIVES

An alternatives analysis was performed to determine the most feasible and prudent means of achieving the defined Project's purpose and need. The ability to provide protection against flooding, wave action, and sea level rise and to enhance existing marsh habitat was evaluated under each alternative. Two alternatives were analyzed: a No Action Alternative and the Proposed Action Alternative, as described below.

2.1 No Action Alternative

Under this alternative there would be no dredging of the Higbee Marina pier and no beneficial reuse of dredged material to create a living shoreline embankment. Under this alternative, there would be no elevation increase or improvement of marsh habitat and no increased resiliency sea level rise, wave action and flooding. For these reasons, the No Action Alternative would not meet the Program and Project's purpose and need.

2.2 Proposed Action Alternative

The Proposed Action Alternative involves dredging the Higbee Marina pier site and using the dredged material to create a living shoreline embankment, as described in more detail below. The Project is anticipated to begin in November 2018 and be completed in February 2019.

2.2.1 Dredging at Higbee Marina Pier

The Higbee Marina pier site has been dredged previously and the proposed maintenance dredging would be of a slightly smaller length and width than previous dredging operations. The historical maintenance dredge area was determined by using a 1987 aerial photograph that shows the approximate area of the existing marina at that time to be 300 feet long by 130 feet wide (Figure 2-1). The City of Somers Point proposes to dredge an area of approximately 150 feet long and 135 feet wide, and 125 feet long and 86 feet wide (Figure 2-1).

Dredging is proposed to be completed by mechanical (bucket) dredging. Mechanical dredges work by mechanically digging or gathering sediment from the bottom surface of a body of water, typically through use of a bucket. Mechanical dredging would take place at the shoreline using a long reach excavator or by working off of a barge.

A maximum total of 6,896 cubic yards (cy) of material would be dredged from a maximum area of approximately 0.9 acre, to a maximum depth of 6 feet below mean low water (−8 feet North American Vertical Datum of 1988 [NAVD 88]). Dredging is anticipated to take 1 month working daily during standard Monday-to-Friday weeks. The dredged material has been characterized as approximately 40 percent sand, with the remainder being fine-grained or silty in nature. During dredging, turbidity concentrations would be minimized through the use of silt curtains (i.e., a floating barrier to control the silt and sediment in a body of water). Dredging would not be conducted between March 1 and June 30 to minimize affecting spawning and migration of anadromous fish.

The dredged material would be moved to a staging area in the adjacent city-owned William Morrow public beach parking lot using a long reach excavator or barge. The dredged materials

would be contained by Jersey barriers² and silt fencing that would be placed around the perimeter of the staging/dewatering area. Once dewatered (i.e., no free water), dredged material would be transported via tarped dump trucks to the two beneficial reuse sites. The parking lot staging area and any other areas affected by Project operations would be cleaned and restored to original conditions or better. Part of the dredged material would be used to create a living shoreline embankment at Somers Point-Mays Landing Road (described below in Section 2.2.2); the remainder would be used for structural fill to raise the existing Gateway Marina parking lot along Patcong Creek by approximately 3.5 feet above the existing grade (see Section 5).

2.2.2 Installation of a Living Shoreline Embankment

The City of Somers Point proposes to install a living shoreline embankment along Somers Point-Mays Landing Road (Figure 2-2). A living shoreline embankment is a sloped, erosion control technique built using natural materials and vegetation to protect an upland area. It provides increased opportunities for species diversity and productivity; provides protection from coastal storms and associated flooding; and can serve to improve water quality and ecological integrity of the area.

The length of the embankment would be 1,600 linear feet along the fringe of the existing marsh. No material would be placed within the marsh itself. However, dredged material would be placed within the 50-foot riparian zone, which was determined from the mean high water line according to New Jersey Administrative Code (N.J.A.C.) 7:13-1.2. The embankment would have a 1-foot-wide top (at various elevations) and a 2 to 1 slope (height to width). The living shoreline embankment has been designed to mitigate tidal flooding up to elevation 5 feet (NAVD 88) and provide erosion protection for the road.

Prior to dredge material placement, approximately 16,600 square feet (0.38 acre) of the living shoreline embankment site that is currently overrun with invasive common reed (*Phragmites australis*) and Japanese knotweed (*Polygonum cuspidatum*) species would be removed at 6 inches below the ground at the root system. A permeable fabric would be installed below the embankment to help prevent the invasive species from returning.

The living shoreline embankment would be created using 2,411 cy of dredged sediments transported from the Higbee Marina staging area via tarped dump trucks after sufficient dewatering. A maximum of five dump trucks and 50 truckloads would operate per day, for up to 10 days. Dredged and dewatered material would be placed using two bulldozers. Silt fences would be installed along the marsh edge to contain the material and prevent erosion. The living shoreline embankment site would then be graded as needed. Placement and grading of the embankment is anticipated to take 1 month, with an additional month for planting. Hours of operation for the living shoreline embankment work would be 8 a.m. until 5 p.m. daily.

² A Jersey barrier is a concrete or plastic barrier used to limit soil erosion and escape.

Figure 2-1 Historical and Proposed Dredging Areas



After material placement and grading, topsoil would be applied to a uniform depth of 4 inches. Permanent stabilization of the embankment would be conducted by applying lime and fertilizer into the topsoil with a disc, springtooth harrow,³ or other suitable equipment. Native vegetation would be planted on the prepared embankment in containers or plugs. Plant species have been selected to benefit pollinators, butterflies, and terrapins. Native plant species recommended by the Partnership for the Delaware Estuary include: Saltmeadow cordgrass (*Spartina patens*), Seashore saltgrass (*Distichlis spicata*), Seaside goldenrod (*Solidago sempervirens*), Eastern baccharis (*Baccharis halimifolia*), High-tide bush (*Iva frutescens*), and Saltmarsh rush (*Juncus sp.*).

Planting will commence as soon as practical once site preparation is completed in late 2018 or early 2019. Saltmeadow cordgrass and seashore saltgrass 2-inch plugs would be installed at 12-inch centers within the proposed living shoreline embankment area between elevation 1.47 feet (mean high water) and 2.25 feet (mean high water). Containers (18 to 24 inches in diameter) of seaside goldenrod, eastern baccharis, high-tide bush, and saltmarsh rush would be planted at 5-foot centers above elevation 2.25 feet (mean high water). Herbaceous plantings would be installed during low tide events using a spade or dibble⁴ between April 15 and May 15, and woody species would be installed by hand with a shovel or gas-powered handheld auger between April 15 and June 15 or between September 15 and October 15.

The plantings would be monitored by the City of Somers Point or its contractor for 3 years after installation and dead or diseased plantings would be replaced. The proposed embankment would also be monitored for infestation of non-native common reed, and there may be subsequent manual application/treatment with herbicide to remove invasive vegetation with a product approved for wetlands application. Application of herbicide would be conducted during the appropriate time of year (i.e., September to October is typically best for translocation of the pesticide from the foliage down through the rhizomes) by a licensed applicator with an Aquatic Pesticide Permit. Herbicides would be applied to any common reeds that have emerged yearly for 3 years after completion of the Project.

During installation of the living shoreline embankment, the shoulder of Somers Point-Mays Landing Road (Figure 1-3) would be closed. Traffic control would conform to the Federal Highway Administration's *Manual on Uniform Traffic Control Devices* (MUTCD), which defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel (Federal Highway Administration 2018).

2.2.3 Proposed Action Summary

The Proposed Action meets the Project's purpose and need as it would provide protection against flooding, wave action, and sea level rise, increase the resiliency of coastal communities, and enhance existing marsh habitat. The Proposed Action is the preferred alternative for this EA.

³ A piece of farm equipment with many flexible teeth mounted in rows used to loosen soil before planting.

⁴ A dibble is a pointed wooden stick used for making holes in the ground.

Figure 2-2 Living Shoreline Embankment Site



3.0 AFFECTED ENVIRONMENT

3.1 Introduction – Scope of Resources Evaluated

The environmental resources identified and analyzed in this document are listed below along with descriptions of the existing environment. Environmental effects resulting from implementing the Proposed Action for each alternative are evaluated in Section 4.

3.2 Soils, Sediment, and Topography

Sediment samples were taken from within the proposed dredging area and geochemically analyzed to determine presence or absence of contaminated materials. The results of the tests indicate that the proposed dredged material does not exceed the ecological screening criteria for any analyte (Calmar Associates LLC 2016). Dredged sediment samples were also analyzed to determine their sediment and silt compositions, which are shown in Table 3-1. The dredged material has been characterized as approximately 40 percent sand, with the remainder being fine-grained or silty in nature.

Table 3-1 Composition of Dredge Materials

Sample ID	Percentage Sand	Percentage Silt
HB-1	55.7	44.3
HB-2	24.3	75.7
HB-3	41.5	58.5
HB-C	40.8	59.2

Source: Appendix A

Soils are classified based on their properties by the Natural Resources Conservation Service of the United States Department of Agriculture. Soils in the living shoreline embankment site consist of the following soil types and qualities, as shown in Figure 3-1:

- TrkAv – Transquaking mucky peat, 0 to 1 percent slopes, very frequently flooded;
- PstAt – Psammaquents, sulfidic substratum, 0 to 3 percent slopes, frequently flooded; and
- GamB – Galloway loamy sand, 0 to 5 percent slopes.

These soil types are typical of the North Atlantic Coastal Plain, in areas of tidal flats, filled marshlands, and depressions, flats, and terraces.

All of Atlantic County’s coastal municipalities are susceptible to coastal erosion to some degree. The shorelines of Somers Point are not directly on the Atlantic Ocean but rather are large backbay areas located on Great Egg Harbor Bay consisting primarily of swamp lands and tidal river estuaries. Approximately 22 percent of the total number of structures (buildings) in the city of Somers Point are located in the high-risk flood zone (Atlantic County 2010). Flooding and storm surge impact roadways by weakening or eroding the soil and culverts that support roads and bridges (USEPA 2018a). For example, the English Creek Bridge along Somers Point-Mays Landing Road was closed for 4 years, from 2011 to 2015 following structural damage from Tropical Storm Irene floodwaters in August 2011 (The Current 2015).

Figure 3-1 Living Shoreline Embankment Site Soil Map



3.3 Water Resources and Wetlands

3.3.1 Flood Zones

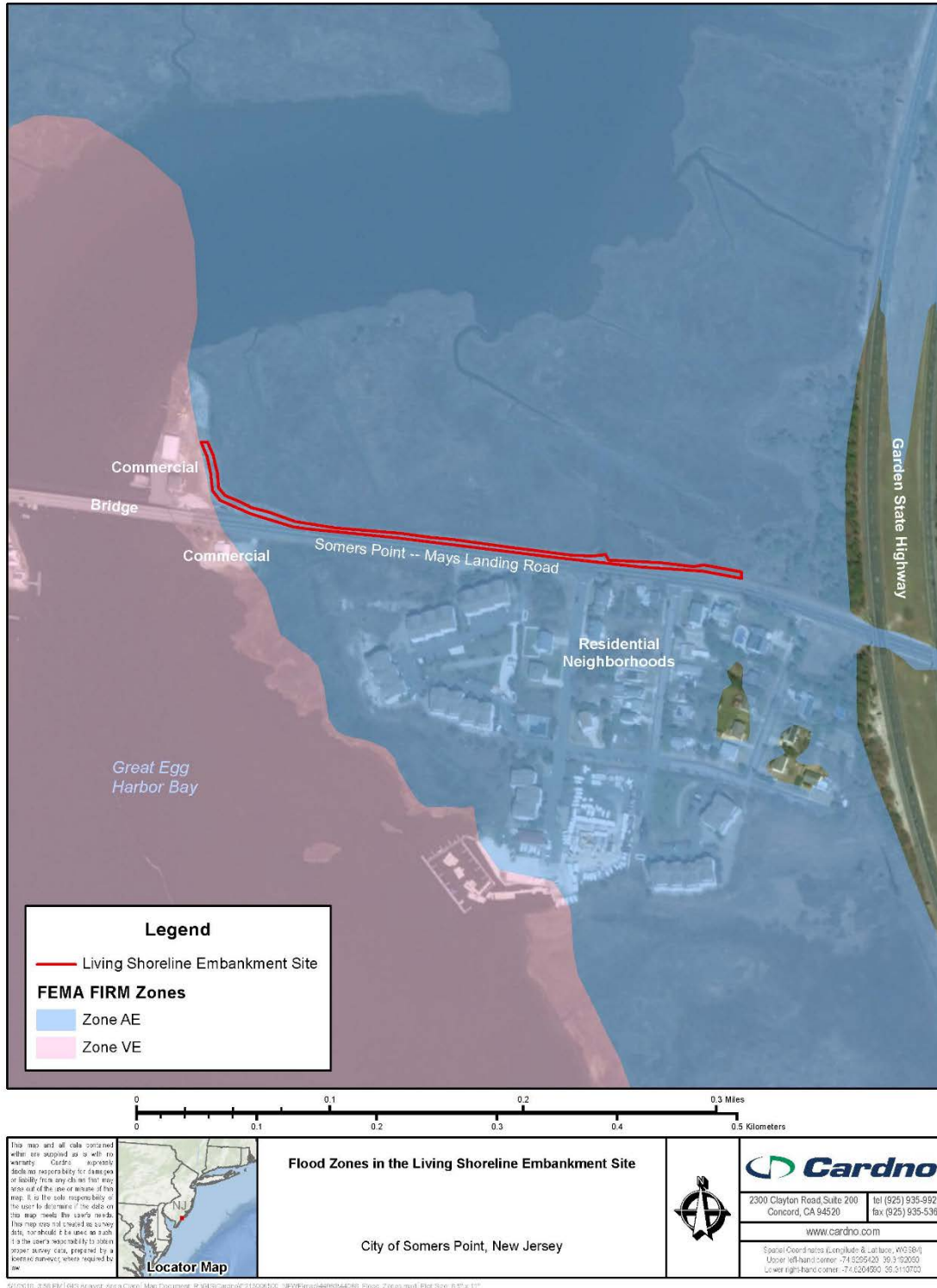
The Higbee Marina dredging site is located within open water and is not within a flood hazard area. The living shoreline embankment site is designated as flood zones AE and VE (Figure 3-2). The Federal Emergency Management Agency (FEMA) defines floodplains as any land area susceptible to being inundated by floodwaters from any source, and defines flood zones, a commonly used term in floodplain management, as geographic areas reflecting the severity or type of flooding in the area. Special Flood Hazard Areas (SFHAs) refer to flood zones with a 1 percent or greater chance of flooding in any given year and are further differentiated by zones (FEMA 2017). Areas in Zone AE have had base flows determined, and areas in Zone VE are defined as coastal flood zones with velocity hazard, in which the base flood may be accompanied by waves of 3 feet or higher (e.g., wave action) (Atlantic County 2010; FEMA 2017). The living shoreline embankment site is prone to tidal flooding and within the limits of moderate wave action.

Executive Order (EO) 11988, *Floodplain Management* (1977), states that when considering the potential impacts of federal actions on flooding, the geographic extent of a floodplain should be established based on the type of action and whether the action is critical (i.e., an activity for which even a slight chance of flooding would be too great).

Flooding currently impacts Somers Point-Mays Landing Road and the residential neighborhoods along its southern edge (Figure 1-3). Flooding also impacts commercial uses at the western end of the living shoreline embankment site, which is a repetitive loss property. FEMA defines a repetitive loss property as any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program within any rolling 10-year period, since 1978 (FEMA 2005).

FEMA released revised preliminary flood insurance rate maps for communities in coastal New Jersey and New York after Hurricane Sandy. There were 299 properties within Somers Point that were added to the A zone, meaning that base flood flows have been determined for these areas, including 218 properties west of Route 9 and 81 properties along Bay Avenue. In addition, 26 properties in Somers Point were added to the V (velocity hazard) zone including 9 properties on Broadway, 14 properties along Bay Avenue, and 3 properties along Patcong Creek and Somers Point-Mays Landing Road (City of Somers Point 2014b). Flooding in the Project area occurs with a recurrence interval of 1.67 years for flooding over 3.7 feet (NAVD 88) in height.

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3.3.2 Surface Water and Hydrology

Surface water at the dredging site was sampled and tested for contaminants, and no exceedances were recorded.

Hydrology at the living shoreline embankment site is dominated by tidal inundation resulting from extreme high tides and via overland sheet flow of precipitation accumulated on Somers Point-Mays Landing Road. Existing topography of the living shoreline embankment site indicates that stormwater flows to Patcong Creek, which flows into the Great Egg Harbor Bay and finally into the Atlantic Ocean (Figure 1-1). Stormwater runoff from the road may include trash (such as fast-food wrappers, cigarette butts, styrofoam cups), toxins, and other pollutants (such as gas, motor oil, antifreeze, fertilizers, pesticides, and pet droppings).

The Proposed Action is subject to review by the U.S. Army Corps of Engineers (USACE) under Section 10 of the Rivers and Harbors Act (33 U.S. Code [USC] 403) and Section 404 of the Clean Water Act (CWA; 33 USC 1344), which govern work or structures in navigable waters of the United States and/or the discharge of dredged or fill material into waters of the United States, including their adjacent wetlands. The City of Somers Point applied for a USACE permit on May 30, 2017.

3.3.3 Wetlands

There are no wetlands present at the dredging site as it is open water. Wetlands in proximity to the living shoreline embankment site include mapped coastal wetland (marsh). The existing wetland is often subjected to storm surges and serves an important role in protecting the shoreline from water level fluctuations as well as providing important habitat for wildlife.

The predominant vegetation in the living shoreline embankment site is salt hay (*Spartina patens*), glasswort (*Salicornia virginica*), and groundsel bush (*Baccharis halimifolia*). All three are hydrophytic species. A band of invasive plant species, including common reed and Japanese knotweed, is established between the coastal wetlands and the road (Figure 3-3). The area is highly disturbed and the salt hay is routinely mowed.

Within the living shoreline embankment site, most dredged material would be placed above the elevation of the high tide line outside of existing wetlands. However, some dredged material would be placed below the elevation of the high tide line in an area covering 5,557 square feet (0.13 acre) within the 50-foot riparian zone. The USACE retains jurisdiction of tidally influenced coastal wetlands, including the riparian area proposed for disturbance at the living shoreline embankment site; thus, the Project requires review by the USACE under Section 404 of the CWA. The City of Somers Point submitted an application for a Department of the Army permit on May 30, 2017 (Appendix B).

Figure 3-3 View of the Marsh near the Living Shoreline Embankment Site



Note: Area is dominated by salt hay, and a band of invasive common reed is visible between the marsh and Somers Point-Mays Landing Road—at the right in this image.

Source: Appendix A

3.4 Biological Resources and Vegetation

3.4.1 Common Flora and Fauna

The Great Egg Harbor region is a productive coastal ecosystem supporting diverse aquatic and terrestrial habitats and species. It provides important habitat for anadromous fish populations, nesting and wintering raptors, colonial nesting waterbirds, migrating and wintering waterfowl, wetland communities, plants, and invertebrates. The dredging site is located within Great Egg Harbor and the living shoreline embankment site is located within Patcong Creek, which is part of the Great Egg Harbor estuary.

The dredging site is very shallow (<6 feet) and has not been dredged in decades. At low tide, much of the surrounding mud flat is exposed. Very little submerged aquatic vegetation is present. The nearest mapped regulated submerged aquatic vegetation is approximately 0.84 mile (1.36 kilometers [km]) to the northeast in Steelman Bay and approximately 0.85 mile (1.38 km) to the south near the Rainbow Islands (NJDEP 1979). Birds that regularly breed in the Great Egg Harbor Bay complex include American oystercatcher (*Haematopus palliatus*), black skimmer (*Rynchops niger*), osprey (*Pandion haliaetus*), clapper rail (*Rallus crepitans*), American black duck (*Anas rubripes*), seaside sparrow (*Ammodramus maritimus*), marsh wren (*Cistothorus palustris*), and willet (*Tringa semipalmata*). It is also an important foraging and breeding area for

common tern (*Sterna hirundo*), yellow-crowned and black-crowned night-heron (*Nyctanassa violacea* and *Nycticorax nycticorax*), tricolored and little blue herons (*Egretta tricolor* and *Egretta caerulea*), whimbrels (*Numenius phaeopus*), and northern harrier (*Circus cyaneus*) (New Jersey Audubon 2018). Benthic invertebrates in the bay include hard substrate shellfish such as mussels and barnacles, epibenthic crabs and amphipods, and benthic polychaete worms and crustaceans (USFWS 1997).

The living shoreline embankment site is within the Patcong Creek drainage, which is part of the Great Egg Harbor estuary. The marsh of Patcong Creek provides habitat for juvenile and adult blue crabs. Many species of birds inhabit the marsh, including multiple species of herons, egrets, gulls, hawks, seabirds, and waterfowl. At least 41 species of fish occur in the Great Egg Harbor estuary. Some of the most common species in Patcong Creek include Atlantic silverside (*Menidia menidia*), Atlantic menhaden (*Brevoortia tyrannus*), bay anchovy (*Anchoa mitchilli*), alewife (*Alosa pseudoharengus*), hogchoker (*Trinectes maculatus*), white perch (*Morone americana*), white catfish (*Ameiurus catus*), bluefish (*Pomatomus saltatrix*), striped bass (*Morone saxatilis*), and oyster toadfish (*Opsanus tau*) (Patcong Creek Foundation 2018). Terrestrial mammals, including red fox (*Vulpes vulpes*), white-tailed deer (*Odocoileus virginianus*), eastern cottontail rabbit (*Sylvilagus floridanus*), and woodchuck (*Marmota monax*), can also be found in the marsh along Garden State Parkway near Patcong Creek (Patcong Creek Foundation 2018). In addition, northern diamondback terrapins (*Malaclemys terrapin terrapin*) inhabit the marsh and are often killed crossing Somers Point-Mays Landing Road.

In its current condition, the living shoreline embankment site along Somers Point-Mays Landing Road consists of invasive species and is frequently cut. . The predominant vegetation in the marsh is salt hay, glasswort, and groundsel bush. Other species found in the marsh include smooth cordgrass (*Spartina alterniflora*), narrow-leaved cattail (*Typha angustifolia*), big cordgrass (*Spartina cyosuroides*), and Olney three-square bulrush (*Scirpus americanus*) (Patcong Creek Foundation 2018). A narrow linear growth of predominantly common reed, Japanese knotweed, and other invasive species separates the marsh from the road. The common reed responds well to habitat and soil disturbances, thrives in edge conditions, often outcompetes native marsh vegetation, and provides little or no food or shelter for most marsh-dependent wildlife. Japanese knotweed can exacerbate flooding by decreasing water flow through stream channels and, once established, is extremely persistent (Snyder and Kauffman 2004). Japanese knotweed emerges in early spring with dense growth that prevents indigenous species from establishing, reducing species diversity and wildlife habitat.

3.4.2 Special-Status Species

The Great Egg Harbor estuary is home to state- and federally listed plant and animal species (Patcong Creek Foundation 2018). Special-status species include those federally listed as threatened or endangered, or those considered candidate species, by the USFWS or the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA). Special-status species also include species protected under the Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act, and those species listed as threatened or endangered by the NJDEP.

3.4.2.1 Federally Listed Species

Endangered Species Act

A species list was generated on March 19, 2018, using the USFWS online Information for Planning and Consultation (IPaC) system (Appendix C). Six federally listed threatened or endangered species may occur within the Project area: northern long-eared bat (*Myotis septentrionalis*), red knot (*Calidris canutus rufa*), Knieskern's beaked-rush (*Rhynchospora knieskernii*), seabeach amaranth (*Amaranthus pumilus*), sensitive joint-vetch (*Aeschynomene virginica*), and swamp pink (*Helonias bullata*). No critical habitat for any federally listed species was identified in the Project area. The USFWS reviewed the Project and determined that there are no federally listed species within or nearby the Project areas (Appendix F).

Federally protected marine species managed by NMFS would not be present at the living shoreline embankment site, but may be found at the dredging site. These include Atlantic sturgeon (Endangered; *Acipenser oxyrinchus oxyrinchus*) and four species of sea turtles: loggerhead (Threatened; *Caretta caretta*), green (threatened; *Chelonia mydas*), Kemp's ridley (Endangered; *Lepidochelys kempii*), and leatherback (Endangered; *Dermochelys coriacea*). No critical habitat is designated or proposed for these species at the dredging site.

Species of special concern in the Greater Atlantic Region that could occur in Great Egg Harbor include alewife (*Alosa pseudoharengus*) and blueback herring (*alosa aestivalis*), sand tiger shark (*Carcharias taurus*), and rainbow smelt (*Osmerus mordax*) (NOAA 2018).

The City of Somers Point requested that NOAA NMFS review the Proposed Action under ESA Section 7 on March 19, 2018. NMFS' response is discussed in Section 4.2 below.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act requires all federal agencies to consult with NMFS on all actions, or proposed actions, permitted, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH). NMFS designates EFH to protect and conserve the habitats of marine, estuarine, and anadromous finfish, mollusks, and crustaceans. EFH is broadly defined to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Habitat Areas of Particular Concern (HAPC) are a subset of EFH and represent habitat types or geographic areas identified as priorities for habitat conservation, management, and research. These areas play important roles in the life history of managed species and/or those that are especially vulnerable to degradation from human activities. The HAPC designation does not confer specific habitat protections, but can focus habitat conservation efforts (Mid-Atlantic Fishery Management Council 2016).

The NMFS Habitat Conservation Division EFH webpage's *Essential Fish Habitat (EFH) Mapper* was consulted to generate the list of designated EFH for federally managed species for the Project area. The EFH assessment listed EFH designated by the NMFS Mid-Atlantic Region, New England Region, and Atlantic Highly Migratory Species Management Division. The Project area does not contain EFH designated in the South Atlantic Region or HAPC. EFH designations for the Mid-Atlantic and New England Regions, and for the Atlantic Highly Migratory Species Division, are included in Appendix G.

An EFH assessment was completed on May 2, 2018, and consultation with NMFS regarding EFH occurred during the USACE permit process, discussed in Section 4 of the EA. An EFH field evaluation was performed at the project sites in March of 2018. Soils, aquatic characteristics, surrounding land use, vegetation communities, and ecotone areas were all assessed and findings were used to complete the *EFH Assessment Worksheet for Federal Agencies* (Appendix G). No HAPC were identified for the Project area.

Migratory Bird Treaty Act

Migratory birds are protected under the MBTA (40 Stat 755 as amended; 16 USC 703-712). The MBTA is a federal law making it unlawful to pursue, hunt, take, capture, kill, or sell birds listed therein. Nonnative species are not protected under the MBTA (USFWS 2017).

Migratory birds may use the Project area for breeding or overwintering, during migration, or may be present year-round. Marshes provide important foraging habitat for migrant shorebirds, especially in spring. During the winter months, thousands of migratory birds find refuge in marsh areas including bufflehead (*Bucephala albeola*), American black duck, horned grebe (*Podiceps auritus*), long-tailed duck (*Clangula hyemalis*), red-breasted merganser (*Mergus serrator*), common loon (*Gavia*), double-crested cormorant (*Phalacrocorax auritus*), and greater and lesser scaup (*Aythya marila* and *Aythya affinis*) (New Jersey Audubon 2018).

Bald and Golden Eagle Protection Act

In addition to the MBTA, the Bald and Golden Eagle Protection Act (16 USC 668-668c) prohibits take of bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles, including their parts, nests, or eggs. The definition also covers impacts that result from human-induced alterations initiated around a previously used nest site while eagles are not present (USFWS 2016b).

The New Jersey Bald Eagle Project maintains a staff of biologists and volunteers to observe and locate bald eagle nests and territories. In 2017, two nesting pairs of bald eagles were observed along Patcong Creek. Three bald eagles chicks survived and fledged during the summer from the Patcong Creek nests (NJDEP 2017a).

Fish and Wildlife Conservation Act

The 1988 amendment to the Fish and Wildlife Conservation Act mandates that the USFWS “identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the ESA of 1973.” These species are designated as Birds of Conservation Concern and include nongame birds; gamebirds without hunting seasons; and ESA candidate, proposed, or recently delisted species (USFWS 2015). USFWS Birds of Conservation Concern that may be present in the area of the living shoreline embankment site and/or the dredging site are included in Appendix C.

3.4.2.2 State-Listed Species

State-listed endangered species are defined as those species whose prospects for survival in New Jersey are in immediate danger due to loss or change of habitat, overexploitation, predation,

competition, disease, disturbance, or contamination. State-listed threatened species are defined as those that may become endangered if adverse conditions begin or continue to deteriorate.

Permit applications to NJDEP are reviewed by NJDEP Land Use Regulation Department biologists for potential impacts to state and federally listed species. In the event that a project has the potential to impact state- or federally listed species, NJDEP biologists coordinate with the New Jersey Division of Fish and Wildlife (NJDFW) or the USFWS, respectively. In this case, NJDEP biologists identified one state-listed species in proximity to the Project area: osprey. The Osprey Project in New Jersey reported 71 active osprey nests in 2017 for the Great Egg Harbor and Ocean City survey area, which produced 135 young (NJDEP 2017b). NJDEP reported an osprey nest within 300 feet of the Project area and imposed a timing restriction for the use of heavy equipment, as described in Section 4.4.2.3.

3.5 Human Health and Safety

From 2007 to 2012 several natural disasters, such as hurricanes and nor'easters, received federal declaration and substantially affected New Jersey's coasts. During Hurricane Sandy, many areas within Somers Point were severely flooded (Figure 1-2) and experienced extensive damage. A total of 83 properties incurred some damage, 7 structures were substantially damaged, and 1 bayfront business was entirely destroyed (City of Somers Point 2014c).

Flooding currently impacts Somers Point-Mays Landing Road, including residential neighborhoods and a commercial repetitive loss property. Floodwaters can damage foundations; water, sewer, electric, and gas utility lines; the structures themselves; and property inside, some of which may be irreplaceable to owners. Flood-affected properties can be hazardous to human health through contamination from sewage or household chemicals, and damaged structures or equipment that can fall or break.

After initial damages to property, a 2015 study funded by the New Jersey Department of Health found that residents of New Jersey affected by Hurricane Sandy continued to be affected by the storm in the form of unfinished repairs, disputed claims, and recurrent mold, which are associated with mental health distress, post-traumatic stress disorder (PTSD), and depression (New Jersey Environmental Justice Alliance 2015). Mold was associated with both asthma and with mental health distress. For New Jersey residents whose homes were damaged by Hurricane Sandy, 27 percent experienced moderate or severe mental health distress and 14 percent reported the signs and symptoms of PTSD even 2.5 years after the storm. Additionally, children in hurricane-damaged homes are at higher risk for mental health problems than children whose homes suffered no damage (New Jersey Environmental Justice Alliance 2015).

3.6 Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (36 CFR 800 outlines the process by which federal agencies are required to determine the effects of their undertakings on historic properties. The term "historic property" refers to cultural resources that have been determined eligible for listing, or are listed, in the National Register of Historic Places (NRHP). Historic properties may include archaeological sites, historic resources, or properties of traditional cultural or religious importance to tribes. Impacts to historic properties could occur

from a project if there were an alteration to the characteristics of a property that qualify it for inclusion in the NRHP.

The dredging location at the Higbee Marina pier is located offshore from the Bay Front Historic District in Somers Point (Figure 3-4). The Bay Front Historic District was listed in the NRHP in 1989 (National Register Reference #89000227). The Bay Front Historic District is significant under NRHP Criterion A due to its importance in the development of the town of Somers Point and South Jersey as a resort area. The historic district is also significant under NRHP Criterion C because it is a cohesive group of buildings built in the styles and types that were popular in resort areas between 1890 and 1935, a collection of which is unique in Atlantic County (Living Places 2017a; Thompson 1987). Most of the buildings are houses in cottage, bungalow, and vernacular modes typical of seaside colonies, in good condition and retaining their original fabric to a large degree. The district comprises 231 buildings, most of which are private residences. Forty-two of the buildings are non-contributing and do not qualify for NRHP eligibility on their own because they date from after the period of significance. Additionally, a few of the older buildings have undergone alterations to their qualifying characteristics (Thompson 1987). One contributing site in the district is the public beach, which enhances the waterfront section of the district, and also contains a contributing object (National Park Service [NPS] 1989; Thompson 1987). The contributing object is a war memorial honoring those who served in the War of 1812 (Thompson 1987). The memorial overlooks the beach at New Jersey Avenue, but nothing remains of the fort that once stood nearby. Within the district, there are more recent houses and the most prominent new buildings are the large commercial buildings on the east side of Bay Avenue. These are the major visual intrusions in the district, although their functions as marinas and yacht sales offices are compatible with the water-oriented nature of the entire district.

The extreme eastern limit of the living shoreline embankment site is located within the Garden State Parkway Historic District, which is listed in the New Jersey Register of Historic Places (ID #3874) but not the NRHP (Figure 3-5). Garden State Parkway opened in 1954, spans 173 miles from Cape May, New Jersey, to the New York State line (New Jersey Turnpike Authority 2013).

Consultation under the NHPA by the City of Somers Point and the DOI Office of Environmental Policy included the NJDEP Historic Preservation Office (HPO), the Delaware Nation, the Delaware Tribe Historic Preservation Office, Shawnee Tribe, and the Stockbridge Munsee Community Historic Preservation Office (See consolidated Appendices I through K). Consultation is summarized in Section 4.6.

3.7 Socioeconomics, Environmental Justice, and Protection of Children

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to examine proposed actions to determine whether they would have disproportionately high and adverse human health or environmental effects on minority or low-income populations.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, seeks to protect children from disproportionately incurring environmental health risks or safety risks that might arise as a result of federal policies, programs, activities, and standards. Environmental health risks and safety risks include risks to health and safety attributable to products or

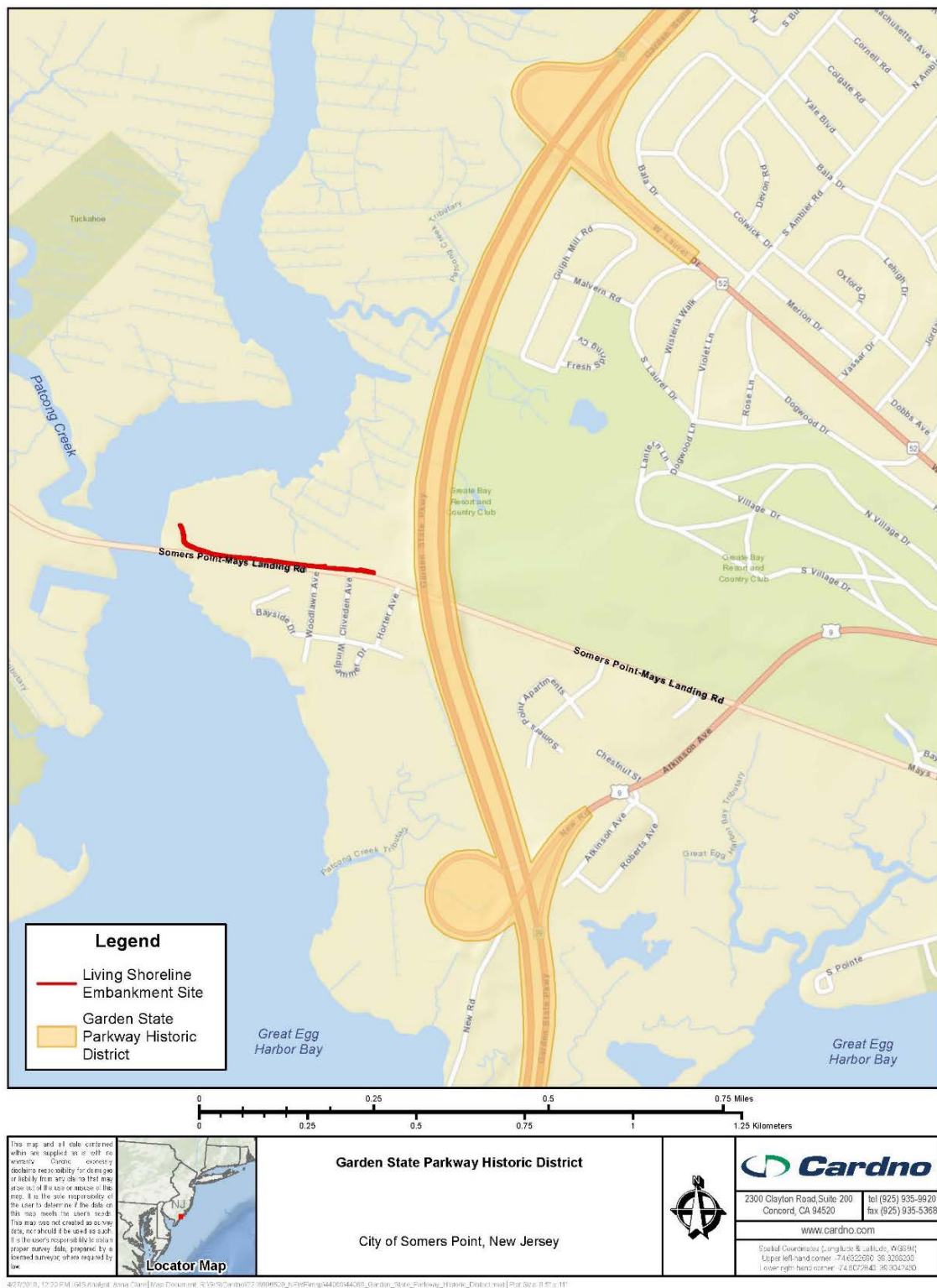
substances that a child is likely to come in contact with or ingest. For a project to affect environmental justice (EJ) populations or children, significant adverse environmental impacts must fall disproportionately upon EJ populations or children within the affected area.

Figure 3-4 Bay Front Historic District



Source: Living Places 2017b

Figure 3-5 Garden State Parkway Historic District



Source: Taintor & Associates, Inc. 2008

Somers Point is primarily a residential community with a population of approximately 10,686 (U.S. Census Bureau 2012–2016). According to the Rutgers School of Public Affairs and Administration (Hoopes Halpin 2013), Somers Point was one of six towns in Atlantic County that were listed as the top 100 hardest hit towns in New Jersey for household hardship as a result of Hurricane Sandy. The household hardship index measures the scope, severity, and resilience of households with income below the ALICE Threshold (Asset Limited, Income Constrained, Employed—i.e., the average income a household needs to afford a basic household survival budget). In addition to immediate damages and lost wages, residents could not afford insurance or costs to elevate homes to meet the new FEMA flood elevation guidelines.

Shore Medical Center is the city’s largest employer, providing approximately 1,500 jobs. Somers Point also has a large variety of small and large businesses located throughout the community, including many medical professional offices as a result of the proximity of Shore Medical Center (City of Somers Point 2018a). Higbee Marina is listed as an active marina with three piers and 35 boat slips. However, due to the extremely shallow waters, only pontoon boats can utilize the facility. Currently, a portion of one pier is leased to a commercial day fisher pontoon boat, known as the “Duke of Fluke.”

The median household income and median family income (2016 dollars) for residents of Somers Point were approximately \$51,752 and \$62,907 per year, respectively, with 12.8 percent of the population living below poverty level. For Atlantic County as a whole, the median household income and median family income (2016 dollars) were approximately \$55,456 and \$67,475 per year, respectively, with 15.5 percent of the population living below poverty level (U.S. Census Bureau 2012–2016). Household and family incomes for Somers Point are not meaningfully different than those of the county.

With regard to race, 78 percent of the residents of Somers Point identify as White; 14 percent as Black or African American; 4 percent as Asian; 3 percent as some other race; and 1 percent as two or more races. This equates to a minority population of approximately 22 percent, compared to Atlantic County with 33 percent (U.S. Census Bureau 2012–2016). Based on data from the U.S. Census Bureau’s American Community Survey, Somers Point would not be considered an EJ community based on minority or low-income populations.

Approximately 22 percent of the city’s population is under the age of 18. The nearest residence to the living shoreline embankment site is approximately 75 feet and the nearest residence to the dredging site is approximately 50 feet.

3.8 Land Use, Recreation, and Coastal Zone Management

3.8.1 Land Use and Recreation

The dredging site is located offshore, southeast of the city of Somers Point in the Great Egg Harbor River and Bay (Figure 1-3) and is zoned as “water” (Atlantic County 2006). As stated previously, a portion of the Higbee Marina pier is leased to a commercial pontoon boat.

The living shoreline embankment site is located to the southwest of the city and is zoned as “R-1” Single-Family Residential District (Atlantic County 2006), which permits residential development within Somers Point with sufficient controls to protect natural resources (City of

Somers Point 2018c). One private property is located within the area proposed for installation of the living shoreline embankment site. A right-of-way license and use and occupancy agreement would be required to install the living shoreline embankment in this area.

The Great Egg Harbor River is designated as a National Scenic and Recreational River and is protected under Section 7(a) of the Wild and Scenic Rivers Act (16 USC 1271-1287). The act safeguards the special character of these rivers, while also recognizing the potential for their appropriate use and development, and promotes public participation in developing goals for river protection (National Wild and Scenic Rivers System 2018a, b). Pursuant to Section 7(a) of the act: “No department or agency of the United States shall assist by loan, grant, license or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established.” The City of Somers Point consulted with the NPS regarding the proposed Project on January 11, 2018 (Appendix L).

Somers Point is located on the Great Egg Harbor River bayfront and is known for its marinas, boating, and restaurants. Numerous recreational and athletic facilities are located throughout the city including eight baseball/softball fields, one football field, two street hockey courts, various tennis and basketball courts, a bicycle path, boat ramps, and bathing beach. Privately owned facilities in Somers Point include a golf course and tennis club (City of Somers Point 2018d). The city holds several bay-focused events throughout the year such as Bayfest, Somers Point Crabbing Tournament, the Jersey Gumbo Cookoff, and the Somers Point Beach Concert Series (City of Somers Point 2014a).

3.8.2 Coastal Zone Management

The Coastal Zone Management Act (CZMA) of 1972 (16 USC 1451 et seq., as amended) provides assistance to states, in cooperation with federal agencies, for developing land and water use programs in coastal zones. Section 307 of the CZMA and 15 CFR 930 Subpart C stipulate that where a federal project initiates reasonably foreseeable effects on any coastal use or resource, the action must be consistent to the maximum extent practicable with enforceable policies of the affected state’s federally approved coastal management plan.

In response to the CZMA, New Jersey developed the New Jersey Coastal Management Program (NJCMP), which was approved by NOAA in 1980 and ensures coastal resources and ecosystems are conserved to enhance sustainable coastal communities. Subchapter 9 of the Coastal Zone Management rules outlines “special areas” (N.J.A.C. 7:7) found in the coastal zone that are regulated by NJDEP. These special areas are either naturally valuable, important to human use, hazardous, or sensitive to impacts. Any development within sites with special areas must demonstrate compliance with the special area rule.

The two sites in the Project area are located within the New Jersey coastal zone and would be subject to federal consistency review under the CZMA and NJCMP.

3.9 Air Quality and Noise

3.9.1 Air Quality

Air quality is defined by ambient air concentrations of specific pollutants determined by the USEPA to be of concern to the health and welfare of the general public and the environment and widespread across the United States. The primary pollutants of concern, called “criteria pollutants,” include carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), ozone, suspended particulate matter less than or equal to 10 microns in diameter (PM-10), fine particulate matter less than or equal to 2.5 microns in diameter (PM-2.5), and lead. These pollutants are subject to both primary and secondary National Ambient Air Quality Standards (NAAQS). Primary standards provide public health protection, including protecting the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. State air quality standards cannot be less stringent than the NAAQS.

The USEPA determines air quality attainment status based on whether the air quality in an area meets (attains) the NAAQS. Areas that violate NAAQS are designated as nonattainment areas for the relevant pollutants. Areas with insufficient data are designated as attainment/unclassified areas and are treated as attainment areas under the Clean Air Act. Areas that were previously designated nonattainment and have demonstrated compliance with a NAAQS are designated “maintenance” for 20 years after the effective date of attainment, assuming they remain in compliance with the standard.

The Project area is within Atlantic County, New Jersey, which is located in the Philadelphia-Wilmington-Atlantic City nonattainment area for the 2008 8-hour ozone standard; the area is also located in a maintenance area for the CO standard (USEPA 2018b). On October 1, 2015, the USEPA lowered the 8-hour ozone standard from 0.075 parts per million (ppm) to 0.070 ppm (USEPA 2016b). The NJDEP urged the USEPA to adopt a single nonattainment area encompassing New Jersey, Connecticut, southeastern New York, eastern Pennsylvania, Delaware, Maryland, District of Columbia, and northeastern Virginia for the 2015 8-hour ozone standard (NJDEP 2016). On December 20, 2017, the USEPA issued its preliminary intent to designate Atlantic County as part of the Philadelphia-Wilmington-Atlantic City nonattainment area for the 2015 ozone standard (USEPA 2017).

Furthermore, the entire state of New Jersey is in the Ozone Transport Region (OTR). States located in the OTR are required to implement additional requirements to control pollutants that form ozone, which include oxides of nitrogen (NO_x) and volatile organic compounds (VOCs).

3.9.2 Noise

Sound is mechanical energy transmitted by pressure waves in media such as air or water. When the sound level becomes excessive, annoying, or unwanted, it is referred to as “noise.” Noise may be continuous (constant noise at a steady level), steady (constant noise with a fluctuating level), impulsive (having a high peak of short duration), stationary (occurring from a fixed source), intermittent (at intervals of high and low levels), or transient (occurring at different levels).

Noise levels are quantified using decibels (dB), which are units of sound pressure. The A-weighted sound level, expressed as dBA, is an expression of the relative loudness of sounds in air as perceived by the human ear and is usually used to quantify audible sound and its effect on people. The State of New Jersey Noise Control Act of 1971 authorized the NJDEP to develop regulations related to noise control and abatement (N.J.A.C 7:29). Local noise ordinances cannot be less stringent than the state regulations, but local municipalities can make changes to the state ordinance and submit them for approval by NJDEP. NJDEP established outdoor sound level standards of 50 dBA during nighttime (10:00 p.m. to 7:00 a.m.) and 65 dBA during daytime (7:00 a.m. to 10:00 p.m.) for receiving residential properties. For commercial, public service, non-residential, and community service facilities, the receiving outdoor sound level standard is 65 dBA 24 hours a day (NJDEP 2014, 2016).

The City of Somers Point enacted additional noise ordinances in Municipal Code Section 188-5 B (12) for construction and demolition. It states that “it is prohibited to operate or permit to be operated, except for emergency repairs, any tools or equipment used in construction, drilling, excavating or demolition work between 9:00 p.m. in the evening and 7:00 a.m. (9:00 a.m. on Sundays) of the morning of the next day, when the sound therefrom creates a noise disturbance across a residential real property line. For commercial projects with a construction permit value exceeding \$200,000, the same prohibition applies, but the hours of prohibition, except for emergency repairs, are between 6:00 p.m. in the evening and 8:00 a.m. of the morning of the next day, and no work, except for emergency repairs, is permitted on Sundays.” As set out by Section 188-6, the city council can waive requirements of the noise ordinance if it declares by resolution that just and reasonable cause exists (City of Somers Point 2018e).

Existing ambient noise levels (background noise levels) are the sounds from natural and artificial sources present at the time a sound measurement is taken. The magnitude and frequency of background noise at any given location may vary considerably over the course of a day or night and throughout the year. The variations are caused in part by weather conditions, seasonal vegetative cover, and human activity. The Project area includes the Higbee Marina pier and an undeveloped area along the fringe of the marsh adjacent to Somers Point-Mays Landing Road. The land is classified as “water” and “single-family residential” (Atlantic County 2006). The USEPA estimates that the day-night average outdoor noise for the most relevant land use classifications are 39 dBA for “rural residential” and 51 dBA for “wooded residential” (USEPA 1978).

3.10 Sea Level Rise

The Project area is located along the Great Egg Harbor Bay shoreline in New Jersey and is vulnerable to future severe weather events, sea level rise, and other environmental risk factors resulting from climate change.

The historical rate of sea level rise along the New Jersey coast over the past half-century was 0.14 inch per year, while predicted future rates are expected to increase to 0.5 inch per year. By 2050, the sea level is expected to rise by approximately 1 foot along the New Jersey shore, and by 2100 it is projected to rise about 3 feet (City of Somers Point 2014c). The sea level is rising more rapidly along the New Jersey shore than in other coastal areas because the land is sinking (USEPA 2016a). Although Somers Point has intact marshlands in the floodplain, helping to

reduce the effects of flooding, the city will begin to experience more severe flooding complications along Somers Point-Mays Landing Road when the sea level rise reaches 2 feet (City of Somers Point 2014c).

In addition to rising sea level, the city is also vulnerable to several forms of storm-related flooding including coastal flooding, shallow flooding (ponding), and storm surge (City of Somers Point 2014a). Wave action will remain a frequent occurrence for the coastal flood hazard zones, and the probability of future occurrences is certain. The long-term rise in sea level can be expected to impact the occurrence and the damage caused by waves, because as sea levels rise, the areas exposed to waves are likely to expand inland, with an increasing amount of property becoming exposed to the hazard in developed shoreline areas in the future (Atlantic County 2010).

The average temperature in New Jersey has warmed by about 3 degrees Fahrenheit in the last century, and heavy rainstorms are more frequent. Average annual precipitation in New Jersey has increased 5 to 10 percent in the last century, and precipitation from extremely heavy storms has increased 70 percent in the northeastern United States since 1958 (USEPA 2016a). In the 1980s there were two major disaster declarations in New Jersey from events such as hurricanes and nor'easters, as compared to seven in the 1990s, eight between 2000 and 2009, and eleven to-date between 2010 and 2018 (FEMA 2018, Newark Water Group 2014). Climatologists predict that strong storms (such as Hurricane Sandy) will become more prevalent as a result of climate change (New York State Office of Parks, Recreation and Historic Preservation 2015).

Higher water levels associated with sea level rise are eroding beaches, submerging low lands, exacerbating coastal flooding, and increasing the salinity of estuaries and aquifers. In the coming decades, changes in the climate are likely to increase coastal and inland flooding, harm coastal and inland ecosystems, disrupt fishing and farming, and increase risks to human health (USEPA 2018b).

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction – Scope of Impacts Evaluated

Section 4 summarizes the environmental effects to each resource described in Section 3 under each alternative.

4.2 Soils, Sediment, and Topography

4.2.1 No Action Alternative

Under the No Action Alternative, there would be no immediate change to the soil classifications, sediment content, or topography in the Project area because no dredging or placement of dredged material would occur. Over time, the area along Somers Point-Mays Landing Road would continue to degrade and become even more susceptible to sediment erosion and flooding from storm events and sea level rise.

4.2.2 Proposed Action Alternative

Dredging and material placement would result in temporary minor adverse impacts to soil resources. During dredging operations, soils and sediments at the Higbee Marina pier site would be removed, resulting in deepening of the channel and a change in bathymetry in this area. The use of equipment in and along the shoreline of the marina could cause soil disturbance and compaction. The use of silt curtains would minimize sediment transport within the channel's disturbed area. The adjacent staging area would also have soil control measures, as required by the NJDEP Waterfront Development Permit and GP-24 Permit, which include the use of Jersey barriers and silt fencing around the perimeter of the dredged material dewatering area. All sediment barriers and other soil erosion control measures would be installed prior to Project implementation, and would be maintained in proper working condition throughout the entire duration of the Project (Appendices A and D).

Installation of the living shoreline embankment would result in the beneficial reuse of approximately 2,411 cy of dredged material. During Project implementation, soils and sediments would be temporarily disturbed while materials are placed along the shoreline. However, silt fences would be installed along the marsh edge to reduce soil and sediments escaping the area. Topography along approximately 1,600 linear feet of shoreline would be altered by the creation of the embankment by raising the height of the shoreline in this area. Native vegetation proposed to be planted along the embankment would stabilize the soil as it grows, resulting in reduced erosion in this area over the long term. The overall result of installation of the living shoreline would be to protect the upland area from further erosion and trap sediments from tidal waters. This would allow upland areas to grow in elevation as sea level rises, resulting in beneficial impacts to soils and sediments.

4.3 Water Resources and Wetlands

4.3.1 No Action Alternative

Under the No Action Alternative, the Project area would continue to flood during storm events. In the future, additional properties may be added to FEMA flood insurance rate maps,

particularly with accelerating rates of sea level rise. Under the No Action Alternative, untreated stormwater would continue to flow from the road into adjacent waterbodies, and water quality in the coastal wetlands (marsh) in proximity to the living shoreline embankment site may be reduced due to stormwater contamination from sewage or household chemicals during flood events.

Additionally, under the No Action Alternative, invasive plant species present at the living shoreline embankment site would likely persist, even with frequent cutting, resulting in continued degradation of the riparian area and overall marsh ecosystem.

4.3.2 Proposed Action Alternative

4.3.2.1 Flood Zones

Dredging of the Higbee Marina Pier site would have no impacts to flood zones. The creation of a living shoreline embankment would not affect the flood storage volume in the Project area since the site is located in a tidal flood hazard area and flood elevations are governed by the potential for tidally influenced flooding from the Atlantic Ocean. Flooding in a tidal flood hazard area may be influenced by stormwater runoff from inland areas; however, the depth of water generated by the tidal rise and fall of the Atlantic Ocean is far greater than stormwater runoff from inland sources. The Proposed Action would help to alleviate tidal flooding along Somers Point-Mays Landing Road during storm events by increasing the land elevation between the marsh and road/residences to provide for additional protection against large storm-induced waves. The NJDEP issued a GP-24 and Flood Hazard Area Individual Permit for installation of the living shoreline embankment on January 12, 2018 (Appendix A).

4.3.2.2 Surface Waters and Hydrology

Dredging and removal of approximately 2,411 cy of sediment and silt would result in temporary and localized turbidity at the site from resuspension of material while operations occur. The disturbed sediment would comprise sand, which is expected to settle rapidly, and sediments, which take longer to settle. Turbidity barriers would be used to limit turbidity during dredging operations, resulting in short-term and localized turbidity impacts to surface waters.

Special conditions in the NJDEP Waterfront Development Permit and Water Quality Certificate (Appendix D) stipulate that “prior to dredging, Jersey barriers and silt fencing shall be erected around the perimeter of the dredged material dewatering area. This soil control measure must be constructed before dredging operations commence and shall be secured into the ground and maintained during the entire dredging operation.” Implementation of these measures would reduce potential impacts to surface waters and prevent sediments and silts from entering nearby waterways during dewatering of the dredged material.

Installation of the living shoreline embankment may temporarily increase sediment entering the marsh area. However, silt fences would be installed along the marsh edge prior to Project implementation to reduce the amount of soil and sediment runoff into the marsh. No additional impervious coverage would be added to the living shoreline embankment site as a result of the Proposed Action. Stormwater would continue to drain into Patcong Creek and stormwater quality would be improved by the proposed installation of grass/vegetative swales along Somers

Point-Mays Landing Road. The living shoreline embankment would improve water quality in the marsh by filtering pollutants and nutrients from stormwater runoff, with greater filtration after the Project plantings have become well-established.

The Proposed Action was reviewed by the USACE and was granted a permit authorizing the Project under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act in June 2018 (Appendix B).

4.3.2.3 Wetlands

Dredging of the Higbee Marina Pier site would have no impacts to wetlands.

No impact would occur to the marsh wetlands within the living shoreline embankment area under the Proposed Action, as no dredge materials would be placed in areas containing wetlands. Approximately 5,557 square feet (0.13 acre) of the riparian zone would be disturbed from installation of the living shoreline embankment, although this area is currently disturbed by periodic mowing and invasive plant species management.

On June 29, 2018, the USACE granted a Department of the Army Permit under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act (Appendix B).

The riparian zone would be revegetated with native plant species and enhanced through management of invasive plant species for 3 years post-installation. The living -shoreline embankment would provide protection to the marsh from pollutants and debris from Somers Point-Mays Landing Road, resulting in long-term beneficial impacts to wetlands.

4.4 Biological Resources and Vegetation

4.4.1 No Action Alternative

Under the No Action Alternative, dredging of the Higbee Marina pier site would not occur, and the water would remain shallow. Sediments would not be disturbed and no impacts to aquatic flora or fauna would occur.

Under the No Action Alternative, the invasive plant species present at the living shoreline embankment site would not be replaced with native vegetation and would likely persist, even with frequent cutting. Invasive species can out-compete native species, contribute to species extinctions, alter the structure of natural plant communities, disrupt ecosystem functions, and degrade recreational opportunities (Snyder and Kaufman 2004).

4.4.2 Proposed Action Alternative

4.4.2.1 Common Flora and Fauna

Dredging at the Higbee Marina pier site would alter the underwater environment by removing existing sediments and creating a slightly deeper channel. Fish and other aquatic species would be temporarily disturbed by dredging activities. This would have a greater effect to migration of anadromous fish that require clear passage through migration pathways, and to spawning fish. Fish, terrapins, and other large aquatic species are highly mobile and capable of avoiding the work area. The NJDEP Waterfront Development Permit (Appendix D) includes a special

condition prohibiting dredging from March 1 through June 30 of any given year to minimize adverse effects to the spawning and migration of anadromous fish.

Increased suspension of sediments in the water column can alter fish and invertebrate behavior, clog respiratory structures, reduce feeding rates, interrupt spawning, and reduce hatching rates in fish; however, the area to be dredged is small (<1 acre), and it would be dredged to a maximum depth of 6 feet below mean low water. Existing sediment consists of 40 percent sand. The large sand particulates would settle quickly compared to finer grained silts. Turbidity from fine sediments would be minimized by the use of silt curtains. Little or no submerged aquatic vegetation is present in the marina dredging area; therefore, impacts to underwater flora would be minimal. Benthic fauna would be disturbed by dredging but would be expected to recolonize after dredging is completed. No impacts to benthic fauna are anticipated as a result of the living shoreline embankment as Project activities would occur above the mean high water (MHW) line.

Installation of the living shoreline embankment along Somers Point-Mays Landing Road would occur between the existing marsh and the road and would not include alterations to the marsh itself. The existing strip of invasive vegetation would be removed and replaced with native plant species following installation of the embankment (as stipulated in the NJDEP GP-24 permit, Appendix A). The inclusion of native plant species would have an overall positive effect on biodiversity and local fauna, including butterflies and other pollinators. Encouraging colonization by native plants supports the health of the coastline by preventing erosion and creating a buffer between impervious surfaces like roads and sensitive areas like marshes. Runoff from roads often contains pollutants that are harmful to plants and animals. In addition, herbicide and pesticide use to combat invasive species on the site would no longer be needed once native species have been established, thereby eliminating potential sources of pollution to the marsh. When pesticides leak into stormwater runoff and enter nearby waterbodies, the effect can be harmful algal blooms, which are detrimental to wildlife and humans (Saha 2017).

While no measures would be adopted specifically to provide habitat for northern diamondback terrapins, terrapins inhabiting the marsh may be discouraged from crossing Somers Point-Mays Landing Road due to the potential for improved nesting substrate through installation of the embankment. Female terrapins are often killed crossing roads while seeking suitable nesting substrates (Wnek et al. 2013). The living embankment would be constructed using dredged sand and silt from the Higbee Marina pier site, which could be suitable nesting substrate for terrapins once salt has eventually washed out (either by rinsing or allowing the substrate to age for a year) (Wnek et al. 2013). High salt content can impact embryo survival by altering soil moisture content and desiccating embryos (Wnek et al. 2013). To reduce potential impacts to terrapins from high-salt-content nesting habitat, it is recommended that the dredged material be rinsed prior to placement. In the event that the dredged material is not washed, short-term adverse impacts to nesting diamondback terrapins may occur (during the first year).

The removal of invasive common reed would result in more suitable soil conditions for nesting terrapins. Common reed stands are known to impact terrapin nesting success due to their thick root systems, which make it difficult for terrapins to dig nests and for hatchlings to emerge (Wnek et al. 2013).

While the vegetative cover and substrate of the living embankment would be appropriate for nesting after salt has washed out, the slope of the embankment would be approximately 50 percent (2 to 1 width to height), which is steeper than terrapins typically choose to nest in (Burger and Montevecchi 1975). Terrapins have been documented nesting in areas with up to 25 percent slope but exhibit a very strong preference for slopes between zero and 10 percent (Burger and Montevecchi 1975). To create more suitable nesting habitat for diamondback terrapins and reduce road crossings, a gentler slope (10–20 percent) could be created to encourage natural nesting by terrapins at the base of the living shoreline embankment. In the event that this is not possible, terrapin nesting boxes could be installed at the base of the living shoreline embankment to encourage terrapins to nest closer to Patcong Creek, prevent predation, and reduce the number of females crossing Somers Point-Mays Landing Road in search of suitable nesting substrate. With implementation of these suggested measures, installation of the living shoreline embankment would result in improved habitat for diamondback terrapins and reduction in road mortalities.

4.4.2.2 Federally Listed Species

The USFWS reviewed the Project and determined that for the species under their jurisdiction, “there are no federally listed species within or nearby the Project areas; therefore the project will have no adverse effects pursuant to the ESA.” (Appendix F).

Federally listed aquatic species, including sea turtles and Atlantic sturgeon which are under the jurisdiction of NOAA NMFS, and species of special concern, could be present at the dredging site. However, these aquatic species, along with most EFH species (with the exception of Atlantic surfclam), are highly mobile and would be expected to avoid the area of disturbance while dredging is being conducted. Atlantic surfclam would not be expected to occur in the shallow waters at the dredging site. Thus, adverse impacts to federally listed species from dredging are unlikely. NOAA NMFS reviewed the Project and stated in a letter dated March 21, 2018, that the Proposed Action is not likely to adversely affect any ESA-listed species or critical habitat under their jurisdiction (Appendix E).

On May 24, 2018, NOAA NMFS provided a federal interagency comment form stating that the Project could adversely affect EFH and gave the following recommendations as special conditions of the permit(s): All new structures will be made with non-polluting materials; Dredging is prohibited from March 1 to June 30 of any given year; Dredge depth should not exceed the depth of the adjacent channel; and, For the berm construction along the portion of Somers Point-Mays Landing Road and parking lot area, avoid fill in areas dominated by native marsh vegetation.

In addition, on June 29, 2018, the USACE granted a Department of the Army Permit under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, which stipulates that all dredging shall occur outside the period from March 1 through June 30 to protect migrating anadromous fish (Appendix B).

Activities at the living shoreline embankment site would occur above the MHW line. Therefore, the Proposed Action is not expected to impact spawning, larvae, foraging areas, or shelter areas of managed EFH species.

While no federally listed species occur at the living shoreline embankment site, bald eagles have been observed. Impacts to bald eagles would be limited to possible disturbance from Project activity noise while foraging. This impact would be minor as eagles would be expected to avoid areas of disturbance as needed.

A wide array of bird species protected under the MBTA could be present at the dredging site or living shoreline embankment site at different times of the year. These highly mobile birds would be expected to avoid areas of disturbance during dredging and installation of the living shoreline embankment, resulting in minor disturbance effects. The existing vegetation between the marsh and Somers Point-Mays Landing Road consisting primarily of invasive common reed provides acceptable nesting habitat for a variety of bird species (Kane 2001). However, native vegetation planted on the living shoreline embankment would provide higher quality nesting and foraging habitat for a wider variety of birds, resulting in beneficial impacts to birds protected under the MBTA.

4.4.2.3 State-Listed Species

NJDEP biologists identified an osprey nest located within 300 feet of the living shoreline embankment site and imposed a timing restriction in the NJDEP GP-24 permit for the use of heavy equipment from April 1 to August 31 to prevent potential noise and human disturbance to breeding osprey and their young. As such, no impacts are anticipated to occur to state-listed species from dredging and installation of the living shoreline embankment.

4.5 Human Health and Safety

4.5.1 No Action Alternative

Under the No Action Alternative, nuisance flooding from storm events would continue to affect residents along Somers Point-Mays Landing Road and may worsen with future sea level rise, resulting in increased risks to infrastructure and human health and safety.

4.5.2 Proposed Action Alternative

Under the Proposed Action, no contaminated materials are anticipated to be encountered during dredging and the dredged sediments are suitable for off-site beneficial reuse or disposal, resulting in no adverse impacts to human health.

In addition, as part of the Proposed Action, the living shoreline embankment would help to alleviate flooding following storm events. Marshes serve as a buffer for coastal communities during storm surges and floods. Ecosystem functions of marshes include increased buffering capacity against storm and flood damage and improved water quality. Installation of the living shoreline embankment would result in less damage to structures and infrastructure, lower costs of replacement, and reduce risk of harm to residents and owners, which would benefit the community and city. No contaminated materials would be encountered and no solid or hazardous wastes would be generated by creation of the living shoreline embankment. The living shoreline embankment would also provide long-term benefits with regard to water quality and overall greater resiliency of the site to future sea level rise, resulting in positive long-term benefits to human health.

4.6 Cultural Resources

4.6.1 No Action Alternative

Under the No Action Alternative, dredging of the Higbee Marina pier site and installation of the living shoreline embankment would not occur. Since there would be no ground disturbance under the No Action Alternative, there would no effect to archaeological or historic resources.

4.6.2 Proposed Action Alternative

The dredging location is located offshore from the Bay Front Historic District in Somers Point and would not result in changes to the visual context of the area, resulting in no impacts to the historic nature of the district. In addition, dredging at the Higbee Marina pier site is unlikely to disturb any archaeological resources since the site has been dredged numerous times in the past. The NJDEP HPO has determined that dredging of the Higbee Marina pier site is in conformance with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation and would not constitute an encroachment upon the Bay Front Historic District (Appendix H).

The extreme eastern limit of the living shoreline embankment site is located within the Garden State Parkway Historic District, but would have no visual effect on this elevated section of the parkway (Appendix H). In response to a request for Project review from the City of Somers Point the NJDEP HPO stated in a letter dated July 11, 2017 (Appendix H) that based on the tidal marsh setting, construction methods, and lack of archaeological evidence in an adjacent Phase I archaeological survey, the proposed Project has low potential to impact any terrestrial archaeological resources. The NJDEP HPO did not recommend the need for any architectural or archaeological surveys for this Project prior to permit issuance (Appendix H).

On March 23, 2018, the DOI Office of Environmental Policy and Compliance concurred with the determination that the Project "will not adversely affect historic properties" and requested that if previously unidentified archaeological resources are discovered, the grantee/contractor immediately halt all construction work involving subsurface disturbance in the area of the resource and in the surrounding area where further subsurface resources can reasonably be expected to occur and immediately notify the DOI and HPO of the discovery (Appendix I).

The City of Somers Point sent consultation requests and information on the proposed Project to the Delaware Nation, the Delaware Tribe Historic Preservation Office, and the Stockbridge Munsee Community Historic Preservation Office. The Delaware Nation responded, stating that they concurred with the proposed plan (Appendix J), and the Delaware Tribe stated that they had no objection to the proposed Project and would like to be consulted if any archaeological or cultural resources are found (Appendix K). Similarly, the Shawnee Tribe responded to the DOI Office of Environmental Policy and Compliance concurring that "no known historic properties will be negatively impacted." No response was received from the Stockbridge Munsee Community Historic Preservation Office.

In summary, the Proposed Action is not anticipated to result in adverse effects to archaeological or historic resources.

4.7 Socioeconomics, Environmental Justice, and Protection of Children

4.7.1 No Action Alternative

Under the No Action Alternative, nuisance flooding from storm events and sea level rise would continue to damage commercial and residential properties in proximity to the proposed living shoreline embankment site along Somers Point-Mays Landing Road, resulting in costs for repair and cleanup. Overall, the No Action Alternative may result in adverse impacts to local residents, including low income residents and those with children, as well as other users of Somers Point-Mays Landing Road.

4.7.2 Proposed Action Alternative

Dredging would allow use of the Higbee Marina pier by recreational boaters, some of whom would be visitors/tourists to the area, which would bring in additional income to city businesses from the purchase of goods and services, such as meals, events, and hotel rooms, and boating/fishing equipment, resulting in positive long-term benefits to socioeconomics. More commercial fishing boats would also be able to access the marina, allowing for additional benefits to the local economy.

Living shorelines provide natural resilience to communities near the waterfront and are an innovative and cost-effective technique for coastal management. Evidence shows that during major storms, a living, natural shoreline performs better than a hardened shoreline (NOAA 2017). Under the Proposed Action, the living shoreline embankment would help to alleviate damage to and flooding along Somers Point-Mays Landing Road, which will reduce the number of residences and businesses affected and costs for cleanup and repairs.

The number of temporary jobs created under the Proposed Action would be approximately four operators for 2 months, five truck drivers for 2 weeks, two surveyors for 1 week, and five laborers for 2 months. The jobs created would be a short-term benefit to the local community and contractors that are awarded the work, resulting in short-term beneficial impacts to socioeconomics. The living shoreline embankment would also provide long-term benefits with regard to water quality and overall greater resiliency of the site and its vicinity to future sea level rise, resulting in positive long-term benefits to socioeconomics.

4.8 Land Use, Recreation, and Coastal Zone Management

4.8.1 No Action Alternative

Under the No Action Alternative, there would be no change to land uses or zoning in the Project area, and no improvements to recreation would be realized. Access from the Higbee Marina pier into Great Egg Harbor and the navigation channel 400 feet away would continue to be impeded by the shallow water at the proposed dredging site, resulting in adverse impacts to water-based recreation. The No Action Alternative would not address vulnerabilities to sea level rise, flooding, habitat loss, and erosion, resulting in long-term negative impacts to the coastal zone.

4.8.2 Proposed Action Alternative

Dredging at the Higbee Marina pier would not change the land use zoning designation of “water,” but would result in increased use of the area from deepening of the waterway to allow

recreational boaters access to the site. Maintenance dredging of the marina pier would allow greater access to the existing navigation channel, 400 feet away, which would be beneficial for water-based recreation such as kayaking and fishing.

During dredging operations, which are expected to take approximately 1 month (with work occurring Mondays to Fridays), access to the Higbee Marina pier would be restricted. This would have short-term impacts to the commercial pontoon boat that leases a portion of the Higbee Marina pier on weekdays, but would not be expected to affect weekends when no dredging would occur. After dredging is complete, public access to lands and waters subject to public trust rights would be improved with implementation of the proposed Project.

Installation of the living shoreline embankment would not alter the current use of the site or its land use zone designation as “R-1 Single-Family Residential District,” which permits residential development with sufficient controls to protect natural resources. A right-of-way license and use and occupancy agreement was obtained for the property located at the west end of the proposed living shoreline embankment site in order to install the embankment, and to beneficially use the remainder of the dredged material to elevate the Gateway Marina parking lot in this area as discussed in Section 5. Installation of the living shoreline embankment would help to protect this private property and the single-family residences located to the south of the site (Figure 1-3) from tidally induced flooding and wave action, resulting in beneficial impacts to existing land use in this area. Over time, native vegetation planted at the site would grow and further strengthen the shoreline, which would help protect the land uses landward of the site against future sea level rise.

Since the Great Egg Harbor River is designated as a National Scenic and Recreational River and is protected under Section 7(a) of the Wild and Scenic Rivers Act, the City of Somers Point consulted with NPS on the proposed Project. On January 11, 2018, the City of Somers Point sent a letter with accompanying plans for the proposed living shoreline embankment for NPS review (Appendix L). NPS responded on January 25, 2018, that the proposed Project would not adversely impact the Great Egg Harbor River’s values (Appendix L).

Installation of the living shoreline embankment would add attractive, low-maintenance green space and focal points for people to gather and to attract wildlife. Living shorelines have aesthetic appeal and provide opportunities for recreation, resulting in positive impacts to recreation in this area.

The Project area is within the coastal zone and both Project sites are subject to federal consistency review under the CZMA and the NJCMP. In addition, the dredging site at the Higbee Marina pier is subject to a NJDEP Waterfront Development Permit and Water Quality Certificate. The City of Somers Point submitted a permit application and a Statement of Compliance with the New Jersey Coastal Zone Management rules on May 8, 2017. A permit and Water Quality Certificate were issued for the Higbee Marina on January 17, 2018, stating that the project activities were authorized under and in compliance with the New Jersey Coastal Management rules, N.J.A.C. 7:7, as amended through January 16, 2018, and conditions imposed on the permit have been incorporated in this EA.

The living shoreline embankment site disturbance would include a small riparian zone and flood hazard areas which are subject to review under a NJDEP Coastal General Permit 24 (GP-24) and a Flood Hazard Area Individual Permit. The City of Somers Point submitted permit applications to the NJDEP on May 24 and December 29, 2017, and a Statement of Compliance with the New Jersey Coastal Zone Management rules on May 8 and August 2, 2017. A permit was issued on January 12, 2018 which states that the proposed living shoreline embankment Project is in compliance with the New Jersey Coastal Zone Management rules (N.J.A.C. 7:7-1. et seq.), as amended on December 18, 2017, and the New Jersey Stormwater Management rules (N.J.A.C. 7:8) (Appendix D). Conditions imposed on the permit have been incorporated in this EA.

Activities under the Proposed Action would result in a more resilient coastal zone and greater capacity for the area to handle future storm events and sea level rise, resulting in beneficial long-term impacts to the coastal zone.

4.9 Air Quality and Noise

4.9.1 No Action Alternative

Under the No Action Alternative, no dredging or living shoreline embankment activities would occur and therefore, there would be no impacts to air quality or noise.

4.9.2 Proposed Action Alternative

Air quality impacts associated with Project activities would include emissions from fossil fuel-fired equipment and vehicles, and potential fugitive dust from ground disturbance and transportation. Fossil fuel-fired equipment is a source of combustion emissions, including NO_x, CO, VOCs, SO₂, PM-10, PM-2.5, greenhouse gases, and small amounts of hazardous air pollutants. Gasoline and diesel engines must comply with the USEPA mobile source regulations in 40 CFR Part 85 for on-road engines and 40 CFR Part 89 for non-road engines. These regulations are designed to minimize emissions and require a maximum sulfur content in diesel fuel of 15 ppm.

Fugitive dust is a source of respirable airborne particulate matter, including PM-10 and PM-2.5 that could result from ground disturbance activities and mobile source traffic on paved and unpaved roads. The amount of dust generated is a function of activity, silt and moisture content of the soil, wind speed, frequency of precipitation, vehicle traffic, vehicle types, and roadway characteristics. Fugitive dust is an air contaminant and may be considered air pollution if it unreasonably interferes with the enjoyment of life and/or property according to the air pollution regulations in N.J.A.C. 7:27-5.2. Pursuant to the NJDEP Waterfront Development Permit, all trucks used to transport dredged materials would be tarped, which would help prevent fugitive dust from escaping to the atmosphere (Appendix D). The generation of fugitive dust and combustion emissions would be minimal due to the small size of the vehicle and equipment fleet, short time required to implement Project activities, and compliance with applicable regulatory requirements and mitigation. Consequently, potential air impacts would be localized, minor, and temporary.

Atlantic County, New Jersey, has been designated as ozone nonattainment and CO maintenance, and is also part of the OTR. Because of these designations and since the Proposed Action is a

federal action by the DOI, the General Conformity Regulations under 40 CFR 93 Subpart B would be applicable. Potential Project emissions are expected to be below the general conformity de minimis thresholds. Therefore, the proposed Project would not be subject to a conformity determination, and it would not be expected to have a negative impact on the State Implementation Plan and efforts to achieve or maintain the NAAQS.

Noise effects would result from the use of fossil fuel-fired vehicles and equipment used for dredging and installing the living shoreline embankment, which typically produce roughly 75 to 85 dBA of noise at 50 feet from the source (Federal Transit Administration 2006). This would result in an increase over the current baseline noise levels at the nearby residences (estimated at 39 to 51 dBA). However, these noise levels would be temporary and rarely steady, and would fluctuate depending on the number and type of equipment in use at any given time. At times no equipment would be operating and noise would be at or near existing ambient levels, and at other times multiple types of equipment may be operating, which would result in noise impacts. Although noise levels would increase for residences near the dredging and living shoreline embankment sites, the noise would occur over a short period of time (less than 3 months) and would be during daylight hours only (8 a.m. to 5 p.m.), excluding weekends. Pursuant to the NJDEP Waterfront Development Permit, appropriate measures to minimize noise would be employed as set out by N.J.S.A. 13:1G-1 et seq. and N.J.A.C. 7:29 (Appendix D). If nearby residences are affected by noise regardless of the work schedule, the use of mufflers or sound barriers could be employed. As a result, noise impacts from the Proposed Action would be intermittent and temporary for nearby receptors.

4.10 Sea Level Rise

4.10.1 No Action Alternative

Implementation of the No Action Alternative would not address the Project area's vulnerabilities to flooding, sea level rise, habitat loss, and erosion, resulting in long-term, negative impacts. Future storm events and flooding would likely cause damage to homes, businesses, and marinas, as well as weaken susceptible infrastructure, such as roads and bridges, leading to increased vulnerability to storm and tidal surge.

4.10.2 Proposed Action Alternative

Living shorelines provide natural resilience to communities near the waterfront and are an innovative and cost-effective technique for coastal management. Under the Proposed Action, the beneficial reuse of dredged material to create the living shoreline embankment would help to alleviate flooding along Somers Point-Mays Landing Road reducing the number of residences and businesses affected and costs for cleanup and repair. As a result, implementation of the Proposed Action would create long-term, beneficial impacts to the Project area, increasing the resiliency of the surrounding natural systems by enabling these systems and the existing community infrastructure to more effectively manage nuisance flooding, storm surge, and sea level rise.

5.0 CUMULATIVE EFFECTS

CEQ regulations stipulate that a cumulative effects analysis be conducted to consider the potential impacts to the environment potentially resulting from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). Three known actions in close proximity to the Project area that would occur during the same time period as the Proposed Action are upgrading the Higbee Marina facility, improving the Gateway Marina parking lot, and restoration and enhancement of Shooting Island, located in Great Egg Harbor.

Upgrades to the Higbee Marina would be funded by a grant from the USFWS' Boating Infrastructure Grant Program. This money is administered by the New Jersey Department of Transportation, Office of Maritime Resources, through its Marina Infrastructure Improvement Program. Upgrading Higbee Marina involves removing the existing "U-shaped" dock arrangement and approximately 48 12-inch piles and replacing these with 48 new pilings, floating dock systems, and a fixed pier to be used for water-dependent activities such as kayak rentals, bait sails, and fishing equipment rentals. Approximately 26 docking spaces for boats of 26 feet or more in length would be developed, of which 24 would be dedicated to use by transient boaters. The two other boat slips would be reserved for one pontoon-type "day fishing" boat and a water taxi. This project is anticipated to occur during a similar timeframe as the Proposed Action. The NJDEP issued a Waterfront Development Permit and Water Quality Certificate for the proposed marina work on January 17, 2018 (Appendix D).

Clearing and improvements for the Gateway Marina parking lot would be funded by the City of Somers Point. For the parking lot improvements, the city proposes to place dredged material from maintenance dredging at the Higbee Marina pier onto an existing parking lot at Gateway Marina along Patcong Creek (Figure 1-3) to elevate it by approximately 3.5 feet above grade. The parking lot is approximately 34,280 square feet and is located in an upland area. It currently contains two buildings on piles and is covered with stones. The stones would be removed and stockpiled for later use, and the buildings would remain. Approximately 4,485 cy of dredged material would be mixed with approximately 672 cy of Portland cement to obtain a maximum moisture content of 30 percent to provide structural stability. Material would be placed on the parking lot surface and underneath the buildings. During placement, the parking area would be contained by Jersey barriers and silt fencing. The stockpiled stones would then be placed back onto the surface of the parking lot. This area would continue to be used as a parking lot following these improvements. This project is anticipated to occur during a similar timeframe as the Proposed Action. The NJDEP issued a Waterfront Development Permit and Water Quality Certificate for the proposed parking lot improvements on January 17, 2018 (Appendix D) and a GP-24 and Flood Hazard Area Individual Permit on January 12, 2018 (Appendix A).

These projects and other past, present, and reasonably foreseeable future actions identified within, or in close proximity to, the Project area are shown in Table 5-1. Upgrading the Higbee Marina facility, improving the Gateway Marina parking lot, and the other actions shown in Table 5-1 were considered in the cumulative effects analysis.

Table 5-1 Projects Included in the Cumulative Effects Analysis

Project Name	Project Proponent(s)	Actions	Status
Upgrading the Higbee Marina facility	City of Somers Point (Grantee)	Removal of existing dock and piles and replacement with new pilings, floating dock systems, and a fixed pier. Approximately 26 docking spaces for boats of 26 feet or more in length.	In permitting
Gateway Marina Parking Lot Improvements	City of Somers Point (Grantee)	Placement of approximately 4,485 cy of dredged material to existing parking lot to elevate it by approximately 3.5 feet above grade.	In permitting
Dredging of Carnival Bayou	Ocean City	Hydraulic dredging of Carnival Bayou between W. 16th Street and W. 17th Street and removal of 17,430 cy of material. Dredging work began on Oct. 16, 2017, and was completed by early December 2017.	Complete
Placement of Dredged Material at Seaspray Road and 12th Street	Ocean City	Placement of 1.3 million cy of sand dredged from Carnival Bayou to beaches between Seaspray Road and 12th Street in Ocean City and stockpiling sand for the rebuilding of dunes in areas near Fifth Street and 10th Street. Work was completed in December 2017.	Complete
Rebuilding Sand Dunes at Fifth Street in Ocean City	Ocean City	Placement of dredged material to rebuild sand dunes at Fifth Street and in the area between 10th Street and 12th Street. Work is presently occurring.	Ongoing
Garden State Parkway Bridge Construction	New Jersey Turnpike Authority	Construction of a new Garden State Parkway Bridge spanning Great Egg Harbor between Somers Point and Upper Township, including a multi-use pathway. The southbound span of the bridge was finished in summer 2017. Rehabilitation of the northbound side is due to be completed in 2019.	Under construction
Route 52 Causeway Bridge Replacement	New Jersey Department Of Transportation	Replacement of the Route 52 causeway bridge and the roadway section between Somers Point and Ocean City, including the elimination of the Somers Point Circle. Construction began in 2006 and is complete.	Complete
Extension of Somers Point Bike Path	City of Somers Point (Grantee)	Construction of a section of bike path to connect the existing Somers Point Bike Path to the Route 52 causeway pedestrian and bike path.	Complete
New Hotel Development	Hilton Hotels	Development of a new 144-room Home2 Suites by Hilton hotel on Route 52/MacArthur Boulevard. Due to be completed by summer 2018.	Under construction
Reconstruction of the Gateway Playhouse	Theater Collaborative of South Jersey	Reconstruction of a theater for performing arts on 738 Bay Avenue, originally constructed in 1912.	Complete
Development of Living Shoreline in Atlantic City	Atlantic City	Development of living shoreline in Atlantic City adjacent to Gardners Basin to stabilize the shoreline, provide flood protection, and create wetlands habitat. This project is being funded by NFWF Grant Number 42279.	Completed
Atlantic Brigantine Boulevard Shoreline Stabilization	Atlantic City	Development of living shoreline along Brigantine Boulevard to increase coastal stabilization. This project is being funded by NFWF Grant Number 42279.	Completed

Sources: Bellano 2017; Brunetti 2015; DeAngelis 2017; Dhir 2017; Marino 2017; New Jersey Department of Transportation 2013; Ocean City 2017, 2018; Timpane 2017

The dredging projects, in combination with the Proposed Action, would result in improved navigation and boating access, which would benefit water-based recreation and local businesses that accommodate watersports and tourism, resulting in positive benefits to recreation and socioeconomics.

The material placement projects and living shoreline developments, in combination with the Proposed Action, would result in increased resiliency of this coastal area of New Jersey and more effective management of flooding, storm surge, and sea level rise, resulting in long-term benefits to local communities.

Construction of the Garden State Parkway Bridge is ongoing and is expected to be complete in 2019. Traffic detours and delays from this construction effort could occur at the same time as installation of the living shoreline embankment at Somers Point-Mays Landing Road, which would require closure of the road shoulder. These two projects could result in adverse cumulative traffic impacts to road users in the vicinity during installation of the living shoreline embankment, although this potential effect would be short term (approximately 1 month) and localized.

Construction of a new hotel on State Route 52, in combination with the Proposed Action, is not likely to result in adverse cumulative impacts since the hotel project is not in the immediate vicinity of either the living shoreline embankment or the Higbee Marina pier.

The Route 52 causeway bridge replacement, extension of the Somers Point Bike Path, and reconstruction of the Gateway Playhouse have all been completed. These projects, in combination with the Proposed Action, could result in positive impacts to recreation and tourism, as these are city attractions and local residents and tourists could more easily access the area by different means. In summary, long-term beneficial cumulative effects are expected as a result of the Proposed Action in combination with past, present, and reasonably foreseeable future actions. The Proposed Action is a part of a broader effort to develop cost-effective methodologies to restore and improve marsh elevations to promote and sustain healthy marsh vegetation composition and keep pace with sea level rise. The Proposed Action also fits into the vision for the city of Somers Point as a vibrant waterfront town (City of Somers Point 2012).

6.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

6.1 Agency Coordination

Representatives of the following federal, state, and local agencies, and project team members were consulted during Project planning and the development of this EA: USFWS, NOAA NMFS, USACE, NPS, NJDEP, Stevens Institute of Technology, Partnership for the Delaware Estuary, Barnegat Bay Partnership, Delaware Nation, Delaware Tribe, Shawnee Tribe, and the Stockbridge Munsee Community.

Letters of support for the Project have been submitted to DOI and NFWF by the following entities (Appendix M): NJDEP, Frank A. LoBiondo, Member of Congress, New Jersey Association for Floodplain Management, Jacques Cousteau National Estuarine Research Reserve, and Scheule Planning Solutions, LLC.

6.2 Public Involvement

The Project is undergoing local, state, and federal permitting processes, as described in Section 7 of this document. Each permit process requires extensive environmental and planning agency circulation, as well as ample public notice and involvement that provide opportunities for a wide variety of specialists, regulators, and residents to comment on and condition the Project's potential short-term and long-term impacts. For example, the USACE issued a public notice regarding issuance of a USACE permit pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the CWA on February 2, 2018, to solicit comments and recommendations from the public; federal, state, and local agencies and officials; Indian tribes; and other interested parties in order to consider and evaluate the impacts of the proposed Project. Comments received will be considered by the USACE in determining whether to issue, modify, condition, or deny a permit for the proposed Project (USACE 2018).

7.0 COMPLIANCE WITH FEDERAL, STATE, AND LOCAL LAWS

The Project has been evaluated for consistency with applicable federal, state, and local laws, regulations, and programs. In addition to this EA, the following permits and/or consultations are also required by local, state, and federal agencies:

- Coastal General Permit 24, Habitat Creation, Restoration, Enhancement, and Living Shorelines (NJDEP)
- Flood Hazard Area Individual Permit (NJDEP)
- Waterfront Development Permit (NJDEP)
- Water Quality Certificate (NJDEP)
- Coastal Zone Management Consistency Determination (NJDEP)
- State ESA Consultation (NJDEP)
- Department of Army Permit (USACE)
- NHPA Section 106 Consultation (NJDEP and Tribal HPOs)
- Federal ESA Consultation (USFWS and NOAA Office of Protected Resources)
- EFH Assessment/Consultation (NOAA NMFS)

Consultations with federal and state regulatory agencies and officials have been held to confirm the soundness of the Project and the ability to receive permits. Refer to Appendices A through M for agency consultation and permit authorizations received for this Project.

8.0 LIST OF PREPARERS

The following contributed to the development of this EA:

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Name	Role	Project Responsibility
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