

**Draft Final Integrated Interim Response
Feasibility Report and Environmental
Assessment for Actionable Elements**

**NEW YORK-NEW JERSEY
HARBOR AND TRIBUTARIES
COASTAL STORM RISK MANAGEMENT
FEASIBILITY STUDY**

**APPENDIX A-1B
OAKWOOD BEACH
ACTIONABLE ELEMENT SITE
ENDANGERED SPECIES ACT – NOAA
NMFS**

March 2026

Table of Contents

1	Introduction	4
1.1	Project Purpose and Need	4
1.2	1.2 Coordination and Consultation History	5
2	Study Area	7
2.1	Comprehensive Plan	7
2.2	Actionable Element Site – Oakwood Beach	8
3	Oakwood Beach Actionable Element Site	10
3.1	Project Description	10
3.2	Actionable Element Project Objectives	11
3.3	Existing Conditions Summary	12
3.4	Effects and Consequences Summary	16
3.5	Potential Stressors Likelihood of Effect Assessment	17
4	List of Preparers and Contributors	21

Note: this Actionable Element Site has not been recommended as part of this Final Integrated Interim Response FR/EA; however, this Appendix has been updated with the optimized plan features detailed in Chapter 6 of the Main Report. Refer to the Draft Report appendices for pre-optimization plan features of which are documented in Chapters 1-5 of the Main Report. Any additional comments received on this Actionable Element Site will be incorporated in the future if authorized for further study.

1 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), New York District (District), has prepared this assessment to evaluate Federally-listed threatened and endangered species for the New York New Jersey Harbor and Tributaries (NYNJHAT) Coastal Storm Risk Management (CSRM) Feasibility Study, Integrated Interim Response Feasibility Report and Environmental Assessment on Actionable Elements.

The NYNJHAT Study was authorized as a result of the findings in the January 2015, USACE North Atlantic Coast Comprehensive Study (NACCS) which identified high-risk areas on the Atlantic Coast for warranting further investigation of flood and coastal storm risk management solutions including the NYNJHAT study. In February 2019, a NYNJHAT Feasibility Study Interim Report (Interim Report) was completed to document existing information and assumptions about the future, and to identify knowledge gaps that warranted further investigation because of their potential to affect plan selection. The Interim Report states the impacts from Hurricane Sandy highlighted the National need for a comprehensive and collaborative evaluation to manage risk to vulnerable populations within the North Atlantic region. In September 2022, a Draft Integrated Feasibility Report and Tier 1 (Programmatic) Environmental Impact Statement for the Comprehensive Plan was released detailing the additional analyses conducted following the Interim Report (2019) and what additional information was needed in the future for the remainder of Tier 1 and Tier 2 of the programmatic process.

The Endangered Species Act (ESA) of 1973 was passed to protect and recover imperiled species and the ecosystems upon which they depend. The ESA is administered by the USFWS and the National Marine Fisheries Service (NMFS). Under the ESA, species may be listed as either endangered or threatened, whereby species are either in danger of extinction through all, or a significant portion, of its range (endangered) or are species that are likely to become endangered within the foreseeable future (threatened). The ESA prohibits the “take” of protected species, including harassment, hunting, capturing, collecting, or killing.

Consultation with USFWS and NMFS is required for any Federal action that may adversely affect ESA species. An adverse effect includes direct or indirect physical, chemical, or biological alterations to waters or substrate, species and their habitat, other ecosystem components, supportive of listed species.

This document focuses on the Oakwood Beach Actionable Element Site, comprised of a CSRM-focused NBS wetland enhancement, dune restoration, and offshore rock reef creation as a complimentary feature to the NYNJHAT Study Comprehensive Plan. This document further serves as a mechanism for coordination.

1.1 PROJECT PURPOSE AND NEED

Storms have historically severely impacted the New York New Jersey Harbor region, including Hurricane Sandy most recently, causing loss of life and extensive economic damages.

In 2012, Hurricane Sandy caused considerable loss of life, extensive damage to property, and massive disruption to the North Atlantic Coast. The effects of this storm were particularly severe because of its tremendous size and the timing of its landfall during high tide. Twenty-six states were impacted by Hurricane Sandy, and disaster declarations were issued in 13 states. NY and NJ were the most severely impacted states, with the greatest damage and most fatalities in the NY Metropolitan Area. For example, a storm surge of 12.65 feet above normal high tide was reported at Kings Point on the western end of Long Island Sound and 9.4 feet at the Battery on the southern tip of Manhattan. Flood depths due to the storm tide were as much as nine feet in Manhattan, Staten Island, and other low-lying areas within the NY Metropolitan Area. The storm exposed vulnerabilities associated with inadequate coastal storm risk management (CSRM) measures and lack of defense to critical transportation and energy infrastructure.

The January 2015, USACE North Atlantic Coast Comprehensive Study (NACCS) identified high-risk areas on the Atlantic Coast for warranting further investigation of flood risk management solutions. In February 2019, a

NYNJHAT Feasibility Study Interim Report was completed to document existing information and assumptions about the future conditions, and to identify knowledge gaps that warranted further investigation because of their potential to affect plan selection. The Interim Report states the impacts from Hurricane Sandy highlighted the national need for a comprehensive and collaborative evaluation to managing risk for vulnerable populations within the North Atlantic region. To address the impacts and concerns associated with devastating storms, the USACE New York District has proposed measures to manage coastal storm risk in the NYNJ Harbor and its tributaries.

In response, the USACE New York District is investigating measures to manage future flood and coastal storm risk in ways that support the long-term resilience and sustainability of the coastal ecosystem and surrounding communities, and reduce the economic costs and risks associated with flood and storm events for the NYNJHAT Study Area (USACE 2019). The alternative concepts proposed would help the region manage flood risk that is expected to be exacerbated by relative sea level rise.

The scope of the Interim Response Actionable Element builds upon the September 2022 Draft Integrated Feasibility Report (FR) and Tier 1 (Programmatic) Environmental Impact Statement (EIS), as an interim action while the overall Comprehensive Plan continues to be studied, subject to future funding and appropriations. This Report is an Interim Response to the Comprehensive Plan responsive to the larger Coastal Storm Risk Management (CSRM) authorization to assess a 2,500+ square mile radius in the New York-New Jersey Metropolitan Area. This interim response assesses the measures at a site-specific level, completing enough design maturity and analyses to disclose the potential effects of the Alternatives, and complete full environmental compliance. Interim responses often arise during the progress of a programmatic study, and in this case, to respond to an immediate CSRM need in the interim and corresponding with future legislative cycles (e.g. Water Resources Development Act (WRDA), while the more complex measures of the larger NYNJHAT Study require additional analysis, modeling, public engagement, and design maturity to complete. The purpose and need of this action is to manage risk to critical infrastructure in local areas of high susceptibility to storm surge and at-risk communities. This Interim Response action addresses a critical need for CSRM measures in Harlem River, New York, East Riser, New Jersey, and Oakwood Beach, New York.

1.2 1.2 COORDINATION AND CONSULTATION HISTORY

Coordination with stakeholders has been a critical component of the NYNJHAT study. Since early 2017. The USACE New York District held many workshops and meetings with Cooperating and Participating Agencies and other stakeholders to share information on the study scope and purpose and formulation of alternatives, and to exchange ideas and information on natural and marine resources within the Study Area.

The USACE New York District announced the preparation of an Integrated Feasibility Report/Tiered EIS for the NYNJHAT study feasibility in the February 13, 2018 Federal Register pursuant to the requirements of Section 102(2)(C) of NEPA. The NEPA scoping period initially spanned 45 days from July 6 – August 20, 2018, but was extended to 120 days due to numerous requests from the public. The USACE New York District held a total of nine public scoping meetings during the public scoping period. In 2019, four NYBEM workshops were held on January 3, March 11, June 6, and November 14 to help inform the NYBEM model set up to be used as a tool for assessing some direct and indirect effects of agency actions on regional ecosystems including the NYNJHAT Study, among others.

In February 2020, the NYNJHAT Study paused until October 2021 due to a lack of Federal funding. Following study resumption, the USACE New York District held several Cooperating Agency meetings to facilitate open communication, share study progress, status updates, and data as it became available, including an Engineering presentation on the study alternatives, a presentation on the TSP, and a presentation on the New York Bight Ecological Model (NYBEM) development progress. In September 2022, a Draft Integrated FR/Tier 1 (Programmatic) EIS was released for stakeholder, agency, and public review and comment. Following a substantial public review period of 175+ days, and approximately 2,700 comments received, many comments required a need for, among other requests, more consideration for Nature-Based Solutions to be incorporated

into the Study. Ultimately, these comments informed the future of the NYNJHAT Study, and introduced the need for further coordination with public and resource agencies as the Study progresses.

Given the schedule timeline following Study resumption, the New York District requested the USFWS advance the preparation of a Fish and Wildlife Coordination Act Report (FWCAR) instead of a PAL for the Actionable Element Sites. The FWCAR will be coordinated with the National Oceanic and Atmospheric Administration National Marine Fisheries Service, US Environmental Protection Agency (EPA), NYSDEC, NJDEP, and other agencies/organizations as appropriate, regarding the Interim Response Actionable Element area resources, potential project related impacts, and conservation recommendations to avoid, minimize, or compensate for impacts to fish and wildlife resources resulting from the Alternatives, including the Action Alternative. This Subappendix, as well as the Integrated Interim Response FR/EA will be updated with the FWCAR findings and recommendations for issuance of the Final Integrated Interim Response FR/EA.

Informal coordination was initiated with the NOAA NMFS in May 2025, and continued through Agency Coordination meetings, release of the Draft IFR/EA, and during two additional informational follow up discussions between the District and NOAA NMFS on September 22, 2025 and January 8, 2026. The District determined that the Actionable Element may affect but is not likely to adversely affect listed species, as documented herein.

2 STUDY AREA

2.1 COMPREHENSIVE PLAN

The Study Area of the NYNJHAT Study includes the NY Metropolitan Area, including New York City (NYC) which is the most densely populated city in the United States, and five of the six largest cities in New Jersey by population. The shorelines of some of the NYNJHAT Study Area is characterized by low elevation areas, developed with residential and commercial infrastructure, and is subject to tidal flooding during storms. The Study Area covers more than 2,150 square miles and comprises parts of 25 counties in New Jersey and New York, including Bergen, Passaic, Morris, Essex, Hudson, Union, Somerset, Middlesex, and Monmouth Counties in New Jersey; and Rensselaer, Albany, Columbia, Greene, Dutchess, Ulster, Putnam, Orange, Westchester, Rockland, Bronx, New York, Queens, Kings, Richmond, and Nassau Counties in New York.

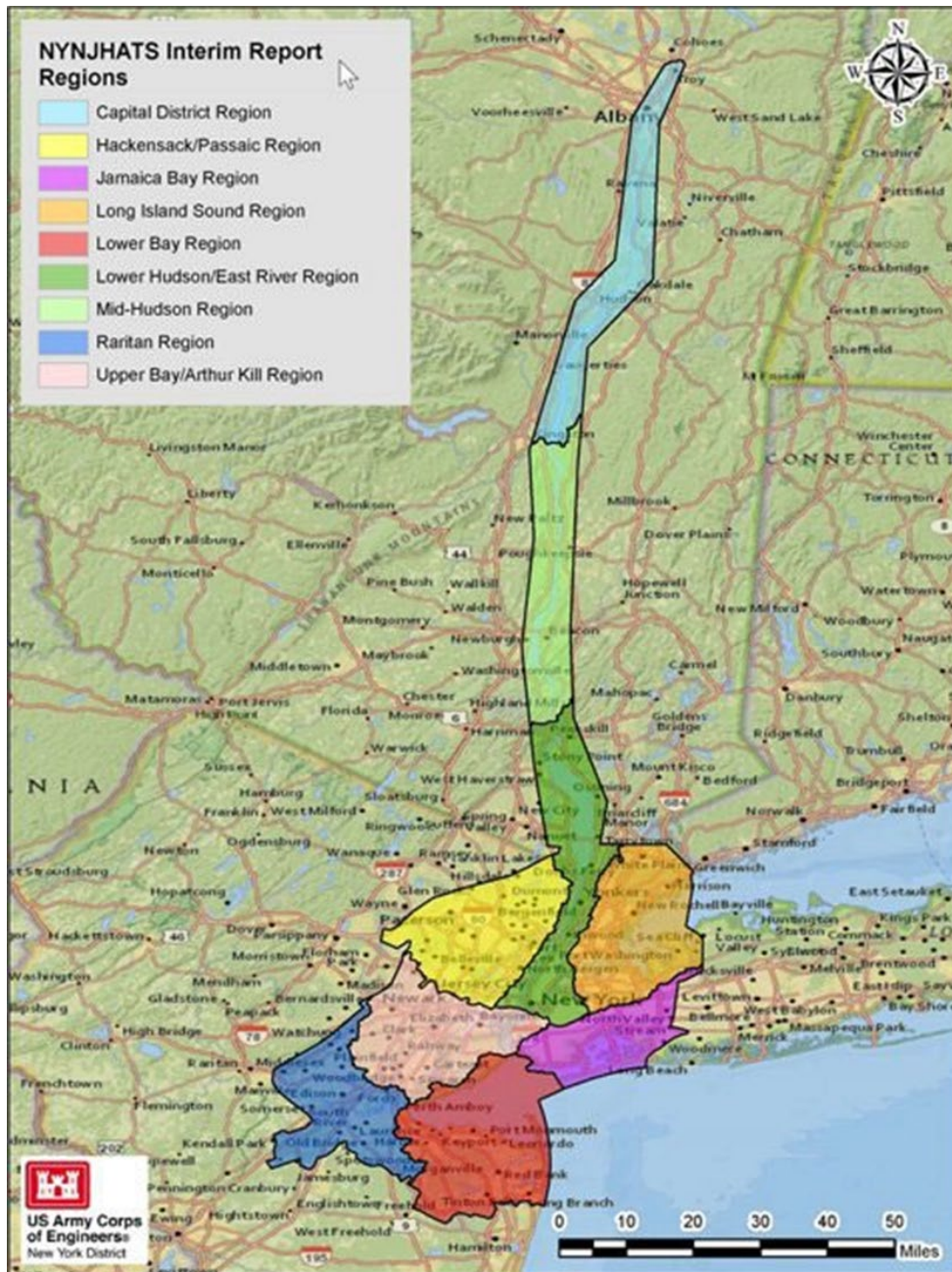


Figure 1. NYNJHAT Study Area

2.2 ACTIONABLE ELEMENT SITE - OAKWOOD BEACH

The Actionable Element Site identified within the Study Area is identified as Oakwood Beach, located in Richmond County, Staten Island, New York and a part of Great Kills Park, under the National Park Service jurisdiction Gateway National Recreation Area. This Actionable Element Site is located within the Lower Bay Planning Region of the overall Comprehensive Plan.

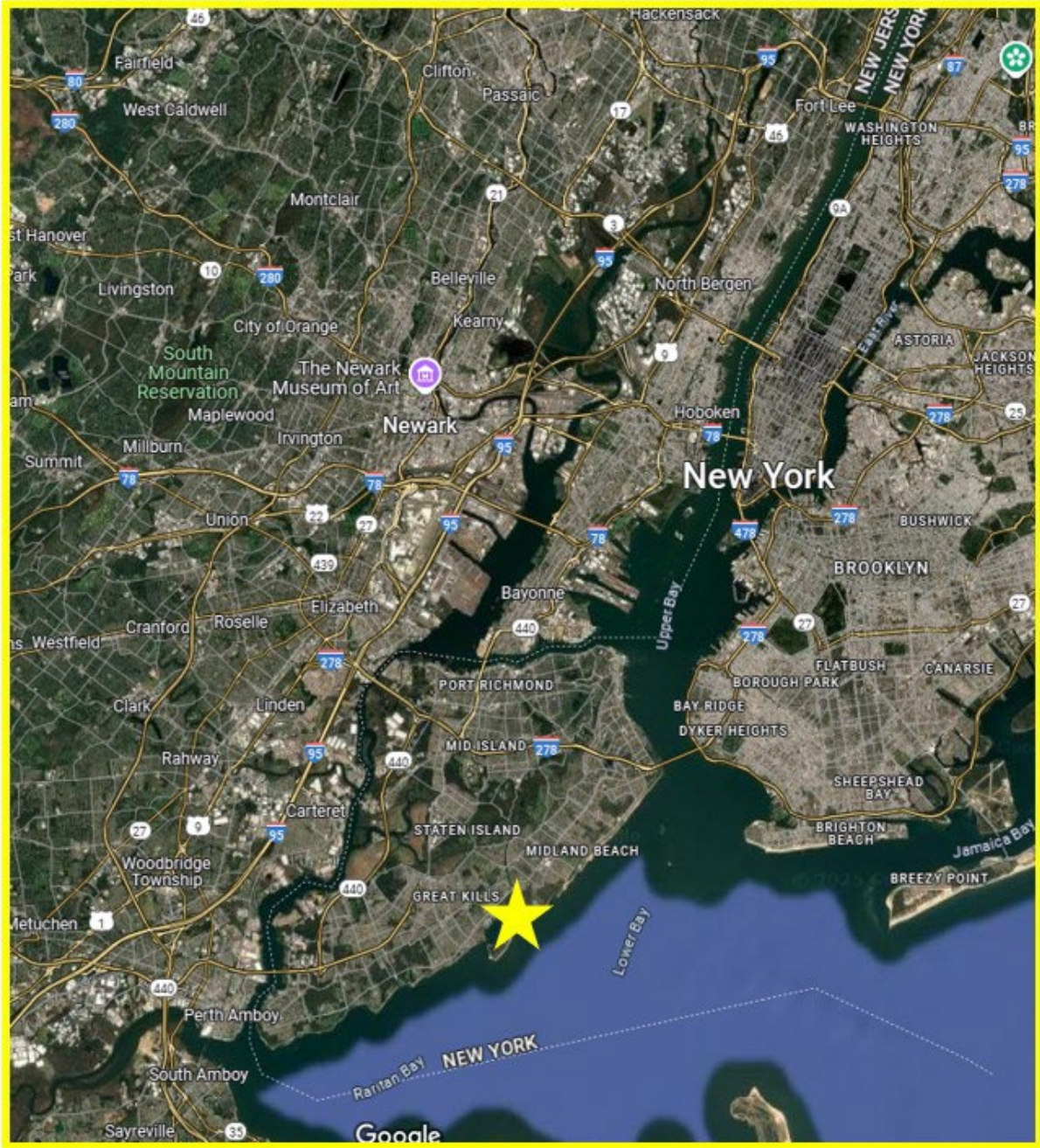


Figure 2. Oakwood Beach Actionable Element Site Location

3 OAKWOOD BEACH ACTIONABLE ELEMENT SITE

3.1 PROJECT DESCRIPTION

The Oakwood Beach Actionable Element Site is a Coastal Storm Risk Management (CSRM) nature-based feature of the NYNJHAT Study Overall Comprehensive Plan, providing managed high-frequency flood risk by serving as a natural buffer and also working complementary to the South Shore of Staten Island Project (presently under construction) and to Great Kills Park. The proposed Actionable Element will also reduce wildfire risk for the impacted area. This CSRM-focused Nature-Based Solution (NBS) wetland enhancement includes four primary components: removal of non-native invasive plants, creation of a vegetative mosaic with native plants and tidal channels, dune restoration, and offshore rock reefs described in more detail below.

Removal of Non-Native Plants and Creation of Native Vegetative Mosaic and Tidal Channels:

The project proposes the removal of approximately 22.38-acres of non-native invasive Common Reed (*Phragmites australis*) and replacement with a vegetative mosaic of Low Salt Marsh (11.5 acres), High Salt Marsh (4.5 acres), Maritime Grassland (4.5 acres), Maritime Dune (5.5 acres), with upland buffers of Maritime Shrubland (3 acres) and Maritime Woodland (1 acre). Native plants will be established, with a particular focus on *Spartina alterniflora*, *Spartina patens* (salt meadow cordgrass), and *Distichlis spicata* (salt grass) for the created low and high marsh habitats. Any existing native plants that are salvageable will be salvaged and transplanted in the appropriate habitat. A network of tidal channels and/or pools with three main branches will be created within the vegetative mosaic supporting the created habitat, referred to as the North Channel, Middle Channel, and South Channel, totaling approximately 1.30-acres.

Dune Restoration:

Along the shoreline in front of and to the south of the created vegetative mosaic, adjacent to the mudflats and Lower Bay, a dune restoration measure is proposed for shoreline stabilization integral to maintaining the essential function of the restored wetland. The dune will consist of approximately 5.5 acres of clean sand with an elevation range up to 10-feet above mean sea level.

Offshore Rock Reefs:

Seaward of the mean low water line, four offshore rock reefs are proposed for erosion control to attenuate wave energy, shield the dune from storm-induced erosion, and extend renourishment intervals. Additionally, the reefs will stabilize the toe of the existing tidal flat and provide valuable habitat. The reef structures will be porous and low-crested, with variable stone gradations. Larger stones will be placed at the seaward edge to resist wave forces, with stone sizes decreasing landward to enhance habitat diversity. The outer perimeter of the reefs will be nearly circular to promote wave attenuation, while the irregular inner edge will provide enhanced fish refuge and habitat complexity. The reef crest elevation is 1.0-foot NAVD88 with average crest widths ranging from 130 to 160 feet and with side slopes of 3H:1V on the landward side and 5H:1V on the seaward side. The footprint of the four reefs will cover a total area of 8.69 acres.

Additional Plan Features:

Riprap will be placed at several locations at the site to support erosion control and channel protection, including an approximate 1,115 cubic yards (CY) area to the east of the restored dune at the southeastern border adjacent to the Lower Bay between the existing riprap and main tidal channel (where a deteriorated wooden seawall is currently), 55-CY along the southwestern banks of the main tidal channel where existing riprap has eroded, 600-CY on the southeastern bank of the main tidal channel convergence with an eastern branching tidal channel where existing riprap is placed, and 700-CY at the inlets of the created tidal channels (along with coir fiber mats).

A maintained lawn trail will be developed on the westernmost edge of the site through the proposed maritime meadow, connecting an existing adjacent concrete bike/walking path to the parking lot for Great Kills Park to be utilized for O&M and public access.

Two osprey nests are proposed in the created maritime shrublands located within central the tidal channel network.

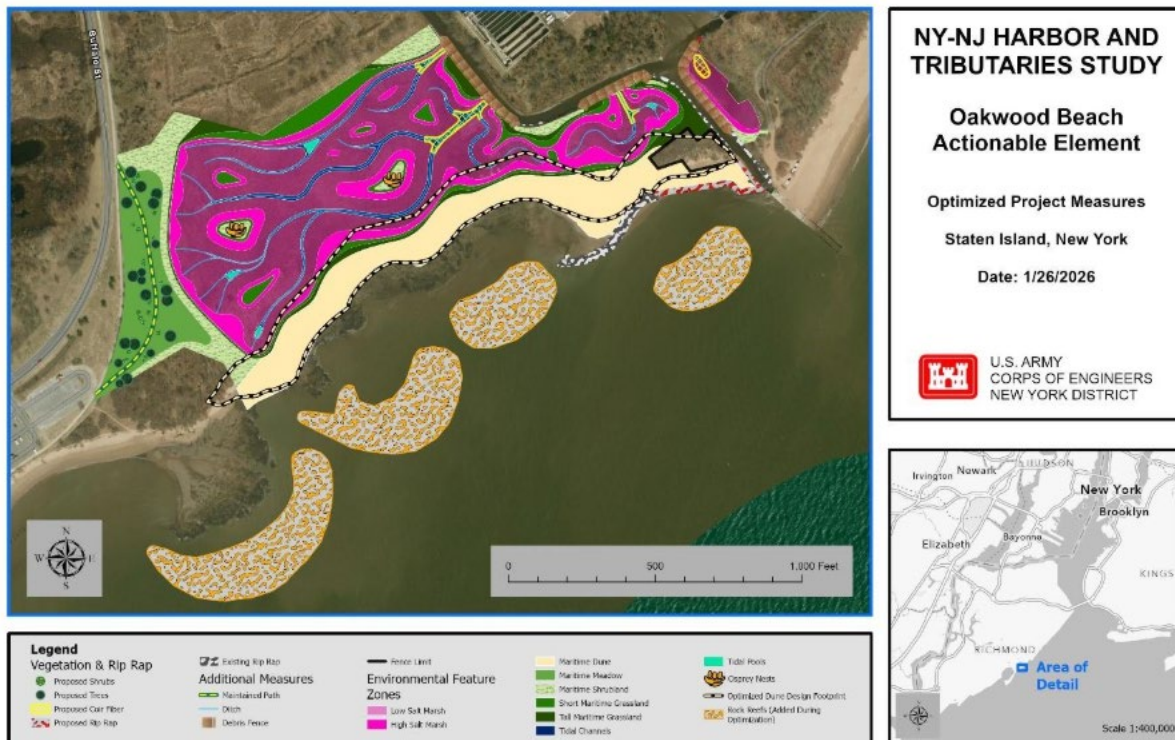


Figure 3. Oakwood Beach Actionable Element Site Project Figure

3.2 ACTIONABLE ELEMENT PROJECT OBJECTIVES

As excerpted from the New York City Department of Environmental Protections Habitat Restoration Plan:

*This restoration will maximize the replacement of the disturbed habitat with salt marsh naturally excluding *Phragmites australis* (common reed) – the invasive species responsible for the wildfires -- by bringing tidal flow into the interior of the project site area through a network of proposed channels via the existing tidal channel connected to the Lower New York Bay.*

*Currently, the site contains dense stands of common reed (*Phragmites australis*) which outcompete native vegetation that provides forage, cover, and other types of habitat for local and migrating wildlife species. To accomplish the project goals, hydrologic and topographical modifications are proposed to eliminate the standing crop of common reed and introduce tidal flow that will support low and high intertidal salt marsh habitat.*

Elevations to be achieved are those which predominantly support the low salt marsh habitat and eradicate common reed. The common reed root mass will be excavated to depths ranging approximately three to five feet. Tidal channels will be created, and the project area will be backfilled with approximately one foot of clean sand. The clean sand will provide the planting medium necessary to support the tidal wetland and associated coastal upland habitats that will be created as part of the project.

The existing tidal channel will be analyzed to determine the placement and depth of tidal channels within the proposed project area. Proposed elevations will be chosen based on tidal levels that targeted plant communities require. Channels created within the proposed salt marsh will drain of salt water during ebbing tide, where some mixing and influence of groundwater and stormwater may occur, including within the proposed tidal pools. The proposed site design will maximize the elevation range of Mid Tide to Mean High Water that will support low marsh intertidal habitat. The creation of higher and lower points around the low salt marsh to establish both tidal salt pools and high marsh hummocks can be established throughout the site to increase habitat diversity and usage by coastal wildlife.

The existing site also contains a diverse patchwork of ecological systems that are worth preserving, both through protection and salvaging of existing plant material. The most notable ecological communities and features at the site include the maritime dune and beach and maritime shrubland. The proposed restoration plan incorporates and expands the extent and integrity of these communities preserving the maritime shrubland to the northeast of the site and expanding the existing dune to protect the salt marsh from future storms. Restoration plantings will be focused on *Spartina alterniflora*, *Spartina patens* (saltmeadow cordgrass), and *Distichlis spicata* (salt grass), for the created low and high marsh habitats.

The proposed higher diversity of intertidal marsh and maritime vegetated communities allows for the highest potential of biodiversity in plant and animal habitat once the project is completed. Targeted animal species include benthic invertebrates, marine herptiles, wading shorebirds and the species of fish that they typically forage for. The communities proposed offer the ideal habitat to support these species. The target habitats to be created/ restored with target elevation ranges and total acreage are included in Table 1, below:

Table 1. Target Natural Community

Target Natural Community	Elevation Range (above mean sea level, AMSL)	Acreage (total, non-contiguous)
Low Salt Marsh	-0.2 to 2.15 feet	11.5
High Salt Marsh	2.15 to 3 feet	4.5
Maritime Grassland	3 to 5 feet	4.5
Maritime Dune	Up to 10 feet	5.5
Maritime Shrubland	5+ feet	3
Maritime Woodland	6+ feet	1
Total Vegetative Community Acreage Created		30
Rocky Intertidal Reef	-8 to 1 feet	8.1

Note: Approximates, may change quantities during Preconstruction, Engineering and Design. Source: (Hazen and Sawyer 2018)

3.3 EXISTING CONDITIONS SUMMARY

The Oakwood Beach Actionable Element Site is identified as a Federal and State listed wetland, with classification codes of Estuarine (E), Intertidal (2), Emergent, Phragmites australis [dominated], and Irregularly Flooded (P), as well as classification (NA-10) Class I, respectively. Vegetative communities present onsite includes non-native invasive common reed (Phragmites australis) dominance (approximately 22-acres) as well as some smaller vegetative communities of coastal shoals, bars and mudflats, maritime beach and maritime dune, successional maritime shrubland/forest, low salt marsh, and others in various quantities presented on the following table:

Table 2. Existing Vegetative Community

Vegetative Community	Acreage (total, non-contiguous)
Low Salt Marsh	1.43
Coastal Shoals, Bars, and Mudflats	6.07
Vegetated Coastal Shoals, Bars, and Mudflats	0.11
Salt Panne	0.09
Maritime Shrubland	1.06
Maritime Beach and Maritime Dune	5.98
Successional Maritime Shrubland/Forest	2.37
Common Reed/Non-Native Community	22.38
Total Vegetative Community Acreage	39.49

This Actionable Element Site is within a 100-year floodplain, Zone AE defined as an area with 1% chance of annual flood.

Existing habitat, although largely comprised of non-native invasive common reed, is anticipated to provide cover, shelter, foraging, and hunting for wildlife. USACE biologists have performed yearly bird monitoring along the Oakwood Beach shore since approximately 2017, noting observed presence of wildlife including wading, migratory, and predator birds, racoons, fox, and small fish and crabs in the existing tidal channel along the eastern border of the Site. Special status species potentially occurring in the vicinity of the Oakwood Beach Actionable Element Site include both Federal and State listed terrestrial species, such as piping plover, red knot, roseate tern, monarch butterfly (proposed). Aquatic special status species are present throughout the Comprehensive Plan Study Area, including the Lower Bay Planning Region where this Actionable Element Site is located; however, no aquatic threatened or endangered species are anticipated within the Actionable Element Site.

The sediment in the nearshore waters surrounding the rock reef footprints consist of mostly sandy material. Benthic resources may include a diversity of species including those types considered primary prey species for sturgeon and sea turtles (crustaceans and mollusks). There is no submerged aquatic vegetation (SAV) present in the area. Landward of the rock reefs, are ecologically sensitive areas of mud flat and low salt marsh.

Four Marine Protected Areas (MPAs) are present within the Lower Bay Planning Region, one of which is collocated within this Actionable Element Site. This MPAs classification is zoned as "Multiple Use", and is managed by the National Park Service (NPS). Commercial and recreational fishing is restricted. This Actionable Element Site is also present within a Coastal Zone Management Act boundary and NPS Great Kills Park.

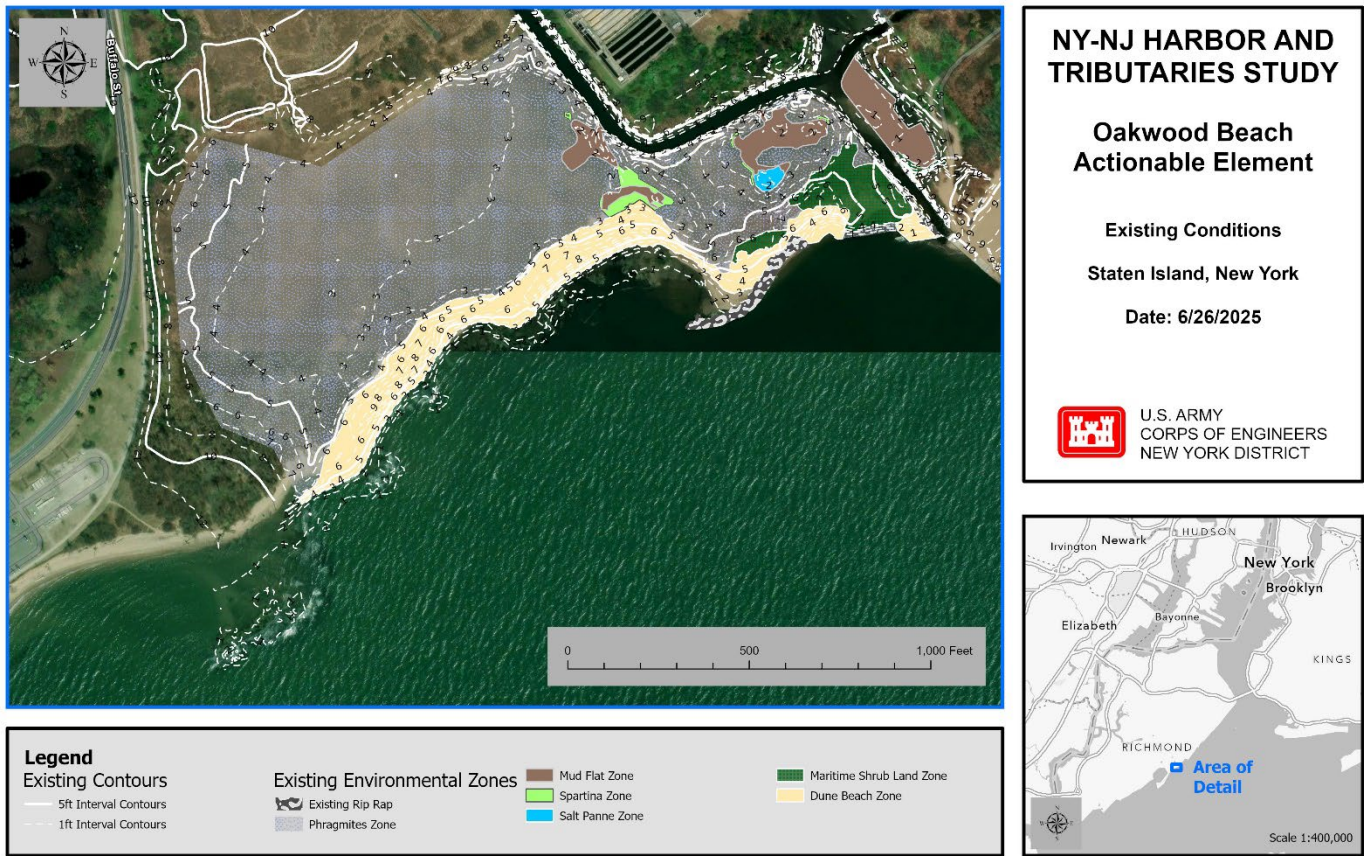


Figure 4. Oakwood Beach Actionable Element Site Existing Conditions

Threatened and endangered species, as well as vulnerable species of concern, with the potential to be present within the NYNJHAT Study Area, Lower Bay Planning Region and the Actionable Element Site were sourced from the Draft Integrated FR/Tier 1 (Programmatic) EIS, the USFWS IPaC database, the NMFS Section 7 Mapper, and the New York Natural Heritage Program website. A Fish and Wildlife Coordination Act Report (FWCAR) was requested from USFWS and a request for information was also submitted to the New York Natural Heritage Program, a response is pending at this time. The NYNHP website identifies that this Actionable Element site is in the location of plants listed as endangered, threatened, or rare by New York State. Additionally, the NYNHP website notes the potential presence of several special status sea turtles, including Loggerhead (T), Leatherback (E), Green Turtle (T), and Kemp's or Atlantic Ridley (E). Additional information received from the USFWS and NYNHP will be incorporated into the Final Integrated Interim Response FR/EA.

Refer to the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS for a list of all ESA species throughout the NYNJHATS Study Area.

Federal-listed aquatic threatened and endangered species potentially present within the Comprehensive Plan Study Area, Lower Bay Planning Region are listed below. Atlantic sturgeon; migrating North Atlantic right whale; migrating, foraging, calving, and overwintering fin whale; green sea turtle; Kemp's ridley sea turtle; leatherback sea turtle; and loggerhead sea turtle were listed as potentially present at the Actionable Element Site on the NMFS ESA Section 7 Mapper.

Table 3. Federally Listed Aquatic Species Potentially Present in the Lower Bay Planning Region and Actionable Element Site

Common Name	Scientific Name	Federal Status	New York State Status	Listing/Recovery Plan Citation	Region/Site Where Species May Occur
Fish					
Atlantic sturgeon	<i>Acipenser oxyrinchus oxyrinchus</i>	E	E	77 FR 5880 and 77 FR 5914	LB
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	E	32 FR 4001; Recovery plan: NMFS 1998	LB
Reptiles					
Green sea turtle	<i>Chelonia mydas</i>	T	T	81 FR 20057; Recovery plan: NMFS & USFWS 1991	LB
Kemp's ridley turtle	<i>Lepidochelys kempii</i>	E	E	35 FR 18319; Recovery plan: NMFS et al. 2011	LB
Leatherback turtle	<i>Dermochelys coriacea</i>	E	E	35 FR 8491; Recovery plan: NMFS & USFWS 1992	LB
Loggerhead turtle	<i>Caretta caretta</i>	E	T	76 FR 58868; Recovery plan: NMFS & USFWS 2008	LB
Mammals					
Fin Whale	<i>Balaenoptera physalus</i>	E	E	35 FR 18319; Recovery plan: NMFS 2010	LB
Humpback Whale	<i>Megaptera novaeangliae</i>	NL – delisted for U.S. harbors	E	FR 15993; Recovery plan: NMFS 1991	LB
North Atlantic Right Whale	<i>Eubalaena glacialis</i>	E	E	73 FR 12024; Recovery plan: NMFS 2005	LB

Notes: ¹ Status Abbreviations – Threatened (T), Endangered (E), Candidate (C), Proposed (P), Not Listed (NL); ² Region/Site Abbreviations - Lower Bay (LB) Planning Region, Actionable Element (AE) site vicinity. Yellow = sourced from the USFWS IPaC database as potentially occurring at the Actionable Element Site.

Aquatic Threatened and Endangered Species are present throughout the Comprehensive Plan Study Area including the Lower Bay Region where this Actionable Element Site is located (NOAA NMFS 2022). Species that may potentially be present in the larger Lower Bay include Atlantic Sturgeon, North Atlantic right whale, Fin whale, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle (also discussed in the Appendix A-1 Section "Sea Turtles").

Atlantic Large Whales

Federally endangered North Atlantic right whales (migrating adults and juveniles) and fin whales (migrating, foraging and overwintering adults and juveniles; and calving adults) are potentially present in the project area.

These species use the near shore, coastal waters of the Atlantic as they migrate between northern foraging and southern calving grounds. North Atlantic right whales are expected in mid-Atlantic waters primarily between November 1 and April 30, although transient right whales can be present outside of this time frame, and may utilize nearshore waters off of New Jersey. Fin whales are known to winter in the mid-shelf waters east of New Jersey. Both whale species are not expected to occur in the portion of the action area within the nearshore waters off of Oakwood Beach, but may occur in the open waters of the Lower Bay during transportation of material to the site.

Sea Turtles

Migrating and foraging adults and juveniles of four listed species of sea turtles are potentially present in the project area (see Table 3). Sea turtles seasonally migrate, moving north and inshore as waters warm and migrating south as water temperatures decline in the fall. Within the New York Harbor complex, sea turtles are likely to be present between May and November, with the highest concentrations present from June to October. Outside of this time period, cold-stunned individuals that fail to migrate south may be present between October and November (Morreale 1999; Morreale 2003; Morreale and Standora 2005; Shoop and Kenney 1992).

Several studies have examined the seasonal distribution of sea turtles in New York waters. In most years, sea turtles begin to arrive in New York waters in June (Morreale and Standora 1993; Morreale and Burke 1997). Tracking studies on Kemp's ridleys demonstrate that all tagged turtles had traveled south from New York coastal waters by the first week in November (Standora et al. 1992). Tracking studies summarized in Morreale and Standora (2005) indicate that loggerhead and Kemp's ridley sea turtles begin leaving New York waters in October and generally by the first week of November, turtles head southward past the Virginia border. Similar migratory patterns are expected for green and leatherback sea turtles (Shoop and Kenney 1992; Morreale 1999). Based on this information, sea turtles may occur in the area between May and November.

Atlantic Sturgeon

There are five DPSs of Atlantic sturgeon listed as federally threatened or endangered; the marine range of all five DPSs extends along the Atlantic Coast from Canada to Cape Canaveral, Florida. At around three years of age, subadults exceeding 2.3 feet in total length begin to migrate to marine waters (Bain et al. 2000). After emigration from the natal river/estuary, subadults and adult Atlantic sturgeon travel within the marine environment, typically in waters less than 164 feet in depth, using coastal bays, sounds, and ocean waters (ASSRT 2007). In rivers and estuaries, Atlantic sturgeon typically use the deepest waters available; however, Atlantic sturgeon also occur over shallow (8.2 feet), tidally influenced flats and mud, sand, and mixed cobble substrates (Savoy and Pacileo 2003). Occurrence in these shallow waters is thought to be tied to the presence of benthic resources for foraging. In the vicinity of the project area, Atlantic sturgeon are known to aggregate nearby in both Sandy Hook and Breezy Point and migrate through the Hudson river during spring/fall spawning.

Based on the above, adult and subadult Atlantic sturgeon from any of the five DPSs could occur in the project area. However, as Atlantic sturgeon spawn in freshwater portions of large rivers and early life stages are not tolerant of salinity, no eggs, larvae, or juvenile Atlantic sturgeon occur in the project area.

3.4 EFFECTS AND CONSEQUENCES SUMMARY

The species identified as potentially present within the Lower Bay Planning Region and this Actionable Element Site were reviewed for potential to effect, based on the existing conditions and the proposed action, to determine if the species was likely to be present at the Site relative to suitable habitat, and if so further assess if there is an anticipated adverse or beneficial effect. Species that are anticipated to not have suitable habitat available at the Site are likely to have no effect.

Adverse Effects

The ESA prohibits the "take" of protected species, including harassment, hunting, capturing, collecting, or killing. Direct impacts from construction are not anticipated to result in a "take" of a regulated wildlife species due to the

limited presence of these species at the project site. Prior to construction, threatened and endangered species surveys may be conducted as necessary to identify potential special status plants or wildlife species present, or with the potential to be present. Should species be identified as present, or potentially present, avoidance is the primary mitigation action to prevent adverse effects to these species. The proposed wetland and dune enhancements are primarily focused on a terrestrial environment set back from the shoreline, aquatic threatened and endangered species, while potentially present in the vicinity, would not be expected. The proposed rock reefs are to be constructed in the nearshore, and aquatic threatened and endangered species, while potentially present in the vicinity, are not expected and direct effects are not anticipated. Material transportation to the rock reefs via barge will follow best management practices, including maintaining low speeds while transporting material to the site to avoid collisions with ESA species in the larger Lower Bay. Although highly unlikely, if in a rare instance a sea turtle is observed utilizing the Actionable Element Site or nesting along the beach, NMFS and NYNHP will be notified to establish a proper procedure, and the area will be avoided to ensure no adverse effects. Construction of the wetland and dune are anticipated to be performed from the land, with no equipment use or staging in water. Construction of the rock reefs is expected to be marine-based, with rocks transported to the site via barge and placement conducted with a barge-mounted crane or amphibious excavator. No work is to occur in the ecologically sensitive areas of low marsh and mudflat along the shoreline landward of the rock reefs.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to threatened and/or endangered species, as the site would continue to be monitored for establishment of the native habitat, to prevent the return on non-native habitat, preserving the quality of habitat for wildlife present. Maintenance may include non-native plant management, such as herbicide application and removal which could temporarily disturb terrestrial vegetation to eliminate non-native or invasive species, but would be negligible given that procedures would be established to avoid such impacts.

Beneficial Effects

The proposed project would remove non-native phragmites, and replace with native habitat, inclusive of a new network of tidal channels more suitable for an estuarine wetland habitat, providing additional areas for wildlife to forage and shelter. The proposed rock reef creation would increase habitat complexity and species richness, while providing additional fish refuge. With the conversion to native habitat, the wetland would be better quality habitat for a variety of wildlife and fish from the creation of tidal channels, vegetative mosaic, and native salt marsh plantings. The increased function and capacity of the CSRW wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of high frequency flood damages, and would be more readily able to function as a natural CSRW buffer for multiple lines of defense between the coast and surrounding communities. Increased benefits would be observed from a reduced fire risk that can have direct and indirect effects to the Oakwood Beach neighborhood, wildlife, and fish, such as air quality concerns, smoke, fire damage, and storm damage related pollution. The rock reefs would provide CSRW benefits through the attenuation of wave energy, shielding the dune from storm-induced erosion and extending renourishment intervals while providing erosion protection to the enhanced wetland, restored dune, and ecologically sensitive areas along the shorefront behind the reefs.

3.5 POTENTIAL STRESSORS LIKELIHOOD OF EFFECT ASSESSMENT

Potential Stressor	Sturgeon	Sea Turtles	Whales
Water Quality	NLAA	NLAA	N/A
Vessel Interaction	NLAA	NLAA	NLAA
Underwater Noise and Vibration	NLAA	NLAA	NLAA
Physical Seabed Disturbance	N/A	N/A	N/A

Notes: NLAA (not likely to adversely affect) is the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. LAA (likely to adversely affect) is the appropriate conclusion when

effects on listed species are expected to be measurable and significant. N/A (not applicable) means the stressor/species is not applicable to the action and will not be considered further.

Additional information received from the USFWS, NOAA-NMFS, and NYNHP will be incorporated into the Final Integrated Interim Response FR/EA, including any conclusions to the adverse and/or beneficial effects of the Actionable Element Site. As described below, potential impacts to listed species will be minimized through the use of best management practices where appropriate, such as vessel speed limits and time of year restrictions to be coordinated with the NMFS.

Water Quality

Turbidity is not expected to increase during construction of the rock reefs. Due to the low percentage of fine-grained sediments that will be disturbed by rock placement, turbidity will be temporary and localized (immeasurable and insignificant). Turbidity from the placement of rocks in the nearshore environment is expected to be negligible, as any sandy material disturbed is expected to quickly settle out of the water column. This turbidity is a natural feature of estuarine habitats and is comparable to the turbidity currently experienced in this high-energy coastal ecosystem. No information is available on the effects of TSS on whales or juvenile/adult sea turtles. Studies of the effects of TSS levels on fish have been shown to adversely affect the most sensitive species at concentrations of 580.0 mg/L, with most species more typically adversely affected at concentrations of 1,000 mg/L (Burton, 1993). The TSS concentrations associated with the operation of a barge-mounted crane or amphibious excavator are comparable to a mechanical bucket dredge; the TSS levels expected for mechanical dredging (up to 445.0 mg/L) are below those shown to have an adverse effect on fish. TSS is most likely to affect sea turtles, subadult and adult Atlantic sturgeon, or whales if a plume causes a barrier to normal behaviors. These species are highly mobile and would likely be able to avoid any plume and effects on their movements is expected to be insignificant (immeasurable and undetectable). Whales are not expected to be present in the nearshore environment, and would not be impacted by any potential turbidity. As turbidity from the proposed action is expected to be temporary and localized (immeasurable and insignificant), is below the level shown to adversely affect fish, and is comparable to existing conditions, it is determined that the effects of suspended sediment on sea turtles, and Atlantic sturgeon resulting from construction of the rock reefs are insignificant and not likely to adversely affect these species.

Vessel Interaction

The Lower Bay is a well-trafficked waterway, used by both recreational, commercial, and industrial vessels. The short-term presence of a construction vessels (likely a barge and tow) during reef construction are not expected to have a significant impact or cause observable changes in the behavior and/or presence of aquatic species. Whale, sea turtles, and Atlantic sturgeon may be present in the larger Lower Bay during transportation of rock to the construction site. However, there would be ample room for movement in the Bay and the barge would be moving at slow speeds during transportation to avoid collision with ESA species. Vessel strikes are thought to occur as a result of fast-moving vessels. Therefore, interactions with the dredge vessel are not anticipated.

Noise

No blasting or pile driving is proposed as a part of the project, and therefore no direct injury or mortality to aquatic mammals, sea turtles, or fish species are anticipated. The noises associated with the operation of a barge-mounted crane or amphibious excavator are similar to the noises associated with mechanical dredging. From a literature review, noise generated during backhoe dredging activities range from 163-179dB (Burton et al., 2019), with the most intense noises from bucket operation with sound levels measured at 179dB; the noise associated with the crane or excavator operation are expected to be less than this sound level. Other noise during construction includes engine operation (167dB) and noise from barge unloading (166dB). The noise generated during construction is expected to be within the range of noise experienced in the larger NY Harbor and adjacent waters. Noise generated by small boats and ships range from 160-180dB and larger vessels range from 180-190dB (Burton et al., 2019). Auditory injury (AUD INJ or TTS) is not expected as a result of construction. The AUD INJ onset acoustic threshold for low-frequency crustaceans is 197dB and the TTS onset threshold is 177dB. The acoustic threshold for behavioral disturbance of marine mammals is 160dB (NMFS 2025). Construction

noise is expected to be well below the threshold for AUD INJ onset and at or below the threshold for TTS. Behavioral disturbances to aquatic species are not expected to occur. The acoustic thresholds for behavioral disturbances to marine mammals, fishes, and sea turtle species are 10dB, 150dB, and 175dB, respectively. As construction activities are limited to a small area in the nearshore, and these species are not expected to be present in the nearshore area, and noise from construction operation is expected to significantly decrease with increased distance, behavioral disturbances are not expected to occur.

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