Draft 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-1 OAKWOOD BEACH ACTIONABLE ELEMENT SITE ENVIRONMENTAL APPENDIX

July 2025

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EXECUTIVE SUMMARY

This Environmental Appendix supports the main text comprising of an Integrated Interim Response Feasibility Report (FR) and Environmental Assessment (EA). The details included herein are presented as a summary in the main text in a more condensed version than what has been detailed here, to simplify the discussion of the main text and provide additional detail where needed specific to each individual Actionable Element Site and the resources of which it may affect. This Appendix focuses primarily on the Existing Conditions of the Actionable Element Site, and the Environmental Effects (both adverse and beneficial) of the Actionable Element Alternatives, including the No Action Alternative. Refer to the Main Text for the introduction, plan formulation, alternatives considered, and other National Environmental Policy Act (NEPA) sections of which this Appendix provides the supporting detail and analyses completed.

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. The Comprehensive Plan is a programmatic assessment described as containing two tiers, with the September 2022 Draft Report initiating the Tier 1, or broad-level assessment, with plans for a future Tier 2 containing the detailed site-specific analyses including any design refinements and reasonable alternatives. This Report is not a Tier 2, but rather 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, like Tier 2, 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.

The Actionable Element documented in this appendix is referred to as Oakwood Beach, located in Staten Island, New York, which falls within the Lower Bay Planning Region of the Comprehensive Plan, discussed in the Draft Integrated FR/Tier 1 (Programmatic) EIS. This Actionable Element serves is an interim action of the Comprehensive Plan.

The purpose and need for the NYNJHAT Study, including the Interim Response action, and the Alternative details for each Actionable Element site are discussed in more depth in the Main Text, of which this document is an appendix to. The affected environment and environmental consequences and benefits detailed here, are presented in the Main Text in summary format.

This Appendix is organized by Resource Categories, originally identified in the Draft Integrated FR/Tier 1 (Programmatic) EIS. Each Resource Category, if applicable to this Actionable Element, includes an existing conditions summary for resources of the Natural Environment and Physical Environment. Each Resource Category also includes an assessment of potential direct and reasonably foreseeable indirect adverse and beneficial effects of the Alternatives. An evaluation of reasonably foreseeable effects is included in the main text. Any Resource Category not applicable to this Actionable Element Site is stated as such in this document and does not include any score or associated adverse or beneficial effects analyses, because the resource is not present, or potentially present, in a manner that would incur any kind of effect directly, or reasonably foreseeable effect.

1 ACTIONABLE ELEMENT SITE OVERVIEW

1.1 ACTIONABLE ELEMENT LOCATION AND EXISTING CONDITION SUMMARY

The Oakwood Beach Actionable Element Site is located in Great Kills Park, Richmond County, Staten Island, New York, within the Lower Bay Planning Region of the NYNJHAT Study Area.

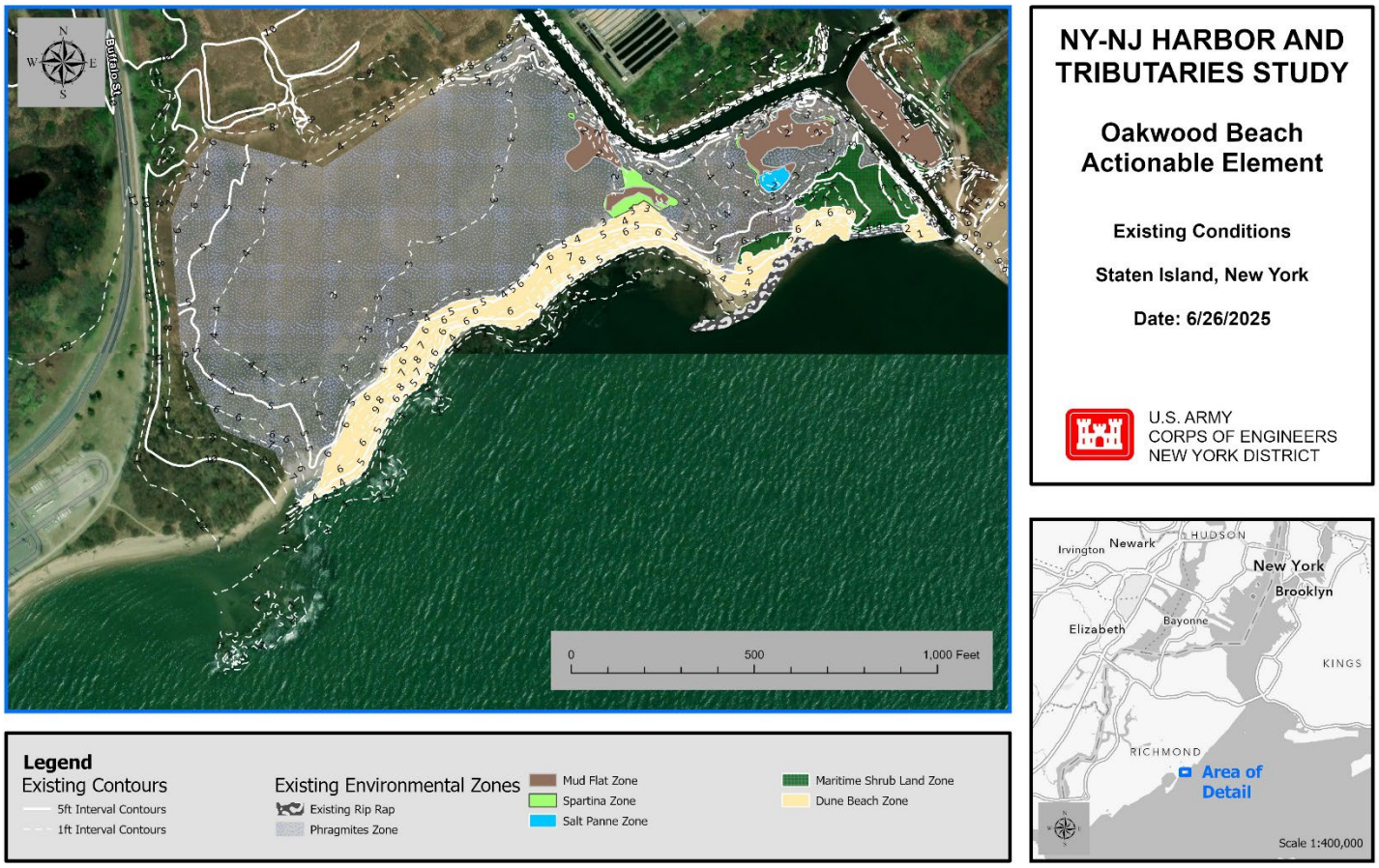

Figure 1. Existing Conditions

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 1. Existing Vegetative Communities

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 habitat 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.

1.2 ACTIONABLE ELEMENT PROJECT DESCRIPTION

All NYNJHAT Study Alternatives contained primary structural features, such as floodwalls, seawalls, and storm surge barriers as well as secondary, complimentary Nature-Based Solutions (NBS) and Nonstructural Measures. At the time of the release of the September 2022 Draft Integrated Feasibility Report and Tier 1 (Programmatic) EIS, only the structural measures had been included as those would provide the primary CSRM function, and complimentary NBS and Nonstructural Measures would be identified for inclusion into all Alternatives at a future date. Following substantial public review period of 175+ days, and approximately 2,700+ comments received, many comments requested a need for, among other requests, more consideration for NBS to be incorporated into the Study. Following, Oakwood Beach was identified as a potential NBS site for consideration in the NYNJHAT Study.

The Oakwood Beach Actionable Element Site is a Coastal Storm Risk Management (CSRM) nature-based measure of the NYNJHAT Study Overall Comprehensive Plan, managing 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, which has been a prevalent issue throughout New York State and in Staten Island, attributed to the abundance of existing non-native invasive common reed. This CSRM-focused NBS wetland enhancement includes three primary components: removal of non-native invasive plants, creation of a vegetative mosaic with native plants and tidal channels, and dune restoration 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.

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 operations and maintenance (O&M) and public access.

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

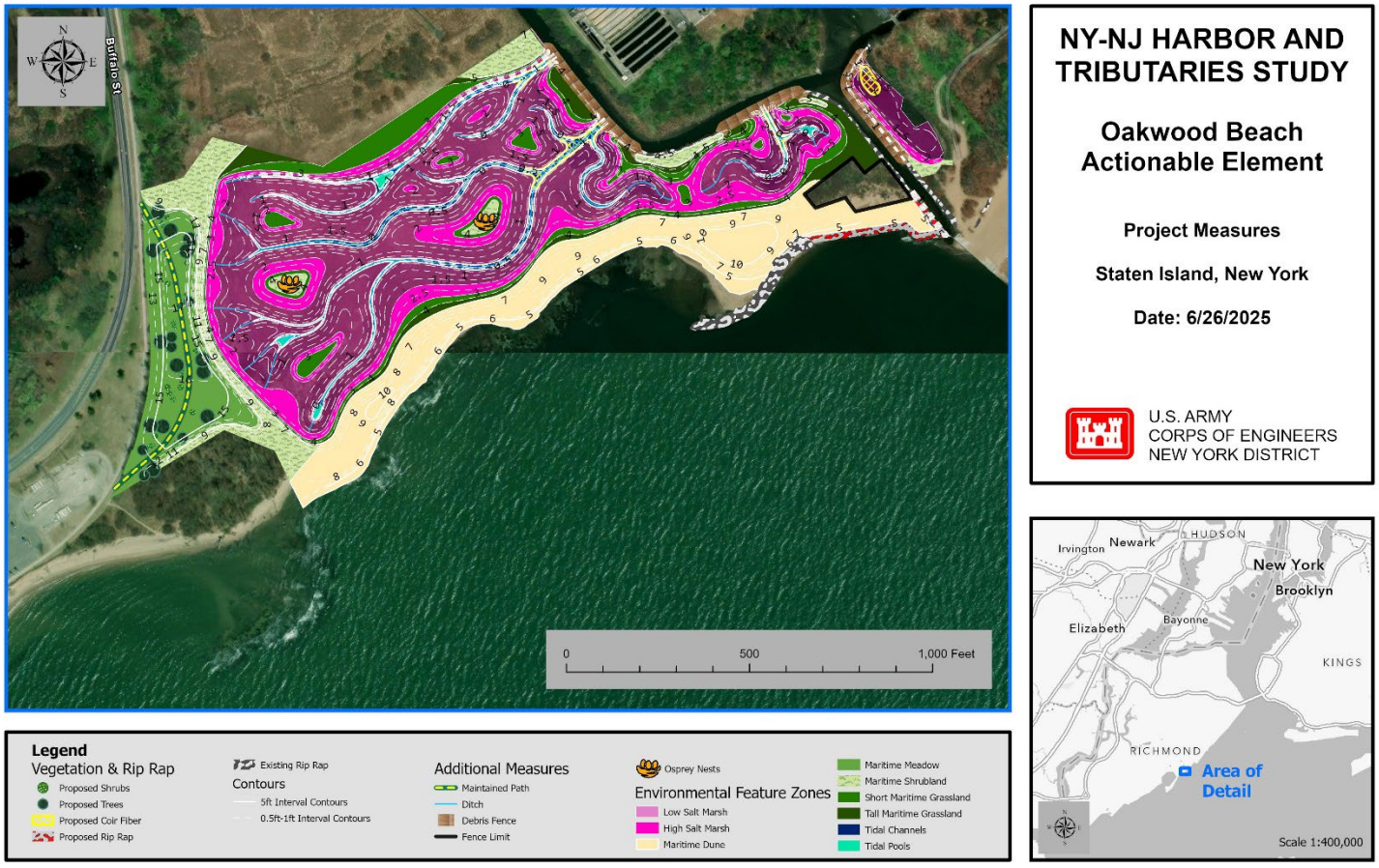

Figure 2. Project Measures

1.3 ACTIONABLE ELEMENT PROJECT OBJECTIVES

The primary objectives of this Actionable Element Site are to manage coastal storm risk to communities by restoring and enhancing natural coastal habitats that attenuate wave energy, and are complimentary to the overall NYNJHAT Comprehensive Plan, which will simultaneously provide ecological value through the removal of invasive species,

and increasing habitat diversity for natural resilience that is highly desired by the non-federal sponsors and partners, public, and stakeholders throughout the larger NYNJHAT Study Area to incorporate nature-based solutions (NBS).

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 the Table, below:

Table 2. Target Natural Communities

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**

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

2 EXISTING CONDITIONS AND ENVIRONMENTAL EFFECTS

As presented in the Draft Integrated FR/Tier 1 (Programmatic) EIS, Resource Categories within the Study Area have been reviewed to determine if there is a potential for the Alternatives to effect, either adversely or beneficially, Resource Categories starting with an initial screening to identify *if* there is a potential for adverse effects (Yes – Y; or No – N) by the measures of each Alternative, followed by an assessment of the magnitude of those identified potential adverse effects, rated on a scale of 0 (No Adverse Effects) to minus 5 (–5, Significant Adverse Effects), by Alternative. Each Natural and Physical Resource includes a summary discussion of the anticipated and reasonably foreseeable effects of each Alternative, additionally reflected by qualitative magnitude of effect ratings. Based on comments received following release of the Draft Report, the qualitative rating system and criteria has been revised and expanded upon in the following manner:

- Adverse effects rating criteria ranges from "0" to "–5", with negative (-) markers added to emphasize the anticipated qualitative negative effect.
- Beneficial effects rating criteria was established and presented herein, following a similar structure as the adverse effects rating criteria, except the beneficial effects ranging from 0 to +5, including a positive marker to emphasize the anticipated qualitative beneficial effect.
- The No Action was assessed like the Alternative Actions, with qualitative rating scores accompanying each no action resource description.

2.1 RESOURCE LIST AND POTENTIAL EFFECTS DETERMINATION

This table represents the overview of the Resources identified in the September 2022 Draft Report as potentially occurring within the Study Area to determine if the Comprehensive Plan would affect. Per the standards and processes described in the Main Text, these same resources were again reviewed for this Actionable Element Site, to be reviewed in the same manner. The difference between the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS potential to effect determination for the Comprehensive Plan and this Interim Response potential to effect analyses is that:

- This does not include the negative and positive markers to establish the presence/absence of adverse and/or beneficial effects, and is instead is comprised of an overview of the resources that are present in the vicinity of the Actionable Element Site, with the adverse and beneficial effect analyses in subsequent sections for each resource with additional detail. A deviation from this process, is the exclusion of the New York Bight Ecological Model (NYBEM) Developed by the U.S. Army Corps of Engineers, Engineering Research and Development Center, as it is not applicable to these AE sites but rather the larger Comprehensive Plan as a whole; and,
- This is an assessment of the entire Actionable Element Site inclusive of all measures, and not individual measures of all Alternative plans like the Comprehensive Plan addressed.

Table 3. Potential Effects Determination

RESOURCE	POTENTIALLY PRESENT Oakwood Beach Actionable Element Site
NATURAL ENVIRONMENT	
Wildlife	Y
Fish	Y
Migratory Fish	Y
Terrestrial Vegetation	Y
Submerged Aquatic Vegetation	N

Invasive and Aquatic Nuisance Species	Y
Threatened and Endangered Species Terrestrial	Y
Threatened and Endangered Species Aquatic	N
Migratory Bird Treaty Act Species and Bald Eagles	Y
Marine Mammal Protection Act Species	N
Sea Turtles	N
Essential Fish Habitat (EFH) and EFH-Designated Species	Y
Wetlands	Y
Floodplains	Y
Wild and Scenic Rivers	N
Designated Critical Habitat	N
Critical Environmental Areas (State)	Y
Marine Protected Areas	Y
Coastal Zone Management Act Areas	Y
Coastal Barrier Resources System Areas	N
National Park Service Land	Y
Wildlife Refuge Land	N
Commercial and Recreational Fishing	N
PHYSICAL ENVIRONMENT	
Topography and Geology	Y
Surface Waters	Y
Sediment	Y
Land Use	Y
Bathymetry	Y
Inland Hydrology	Y
Coastal Hydrology, Currents, and Circulation	Y
Tides, Tidal Exchange, and Tidal Range	Y
Sediment Transport	Y
Water Quality	Y
Regional Air Quality and Clean Air Act	Y
Regional Climate and Relative Sea Level Change	Y
Cultural Resources	Y
Native American Lands	N
Hazardous, Toxic, and Radioactive Waste	Y
Navigation	N
Noise and Vibration	Y
Socioeconomics and Demographics	Y

Notes:

Y – Measures of the Alternative have the potential to affect the resource, either beneficially or adversely.

N – Measures of the Alternative is not anticipated to affect the resource, either beneficially or adversely.

N/A - Not Applicable to the area of effect.

Following the potential to effect analyses, the qualitative magnitude of effect, for adverse and beneficial effects, is assessed to further identify the significance of any potential effect, described in the Environmental Consequences section of this Appendix.

2.2 QUALITATIVE RATING METHODOLOGY AND SCORING PROCESS

A rating methodology tool was developed by the USACE New York District, and utilized in the preparation of this Appendix to qualitatively assess and compare the adverse and beneficial effects of each resource within the Study Area. A prior version of this tool was presented in the September 2022 Draft Integrated Report and Tier 1 (Programmatic) EIS, and comments received relevant to the tool informed further refinements. Enhancements to the tool since release of the Draft Report include refinements of adverse effects criteria definitions, development of beneficial effects criteria definitions, development of a Cultural Resource rule set, synthesizing the data by additional methods (averaging, as also done in the September 2022 report, numerical computing of the beneficial effects, as well as escalating the highest adverse effect score and highest benefit score for alternative comparison purposes, to inform plan selection, the environmentally preferred alternative, and the wholistic adverse and beneficial effects anticipated by the alternatives of the Actionable Element Site). The applied scoring methodology is provided in the following tables:

Applied Scoring Methodology for Adverse Effects

Adverse Effect Rating Criteria	
Impact Rating and Numerical Score	**Description**
High (-5)	Effects to the resource would have substantial consequences, locally and/or regionally. Impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would not be enough to reduce the significance of effect and therefore, effects to the resource would not be environmentally acceptable.
Moderate to High (-4)	Effects to the resource would be locally and/or regionally significant. Impacts would be within regulatory standards; however, existing resource conditions are expected to be affected in the near-term, but not necessarily in the long term. Mitigation measures to reduce any potential adverse impacts would be necessary.
Moderate (-3)	Effects to the resource are expected to be moderate in the near-term and localized. Impacts would be within or below regulatory standards, as applicable, and the use of mitigation measures would reduce potential adverse impacts, if applicable.
Low to Moderate (-2)	Effects to the resource are expected to be low to moderate in the near-term and localized. Impacts would be within or below regulatory standards, as applicable, and the use of mitigation measures would reduce potential adverse impacts, if applicable.
Low (-1)	Effects to the resource would either be negligible or, if detectable, have minor temporary impacts locally to the resource. The impacts would be well below regulatory standards, as applicable, and mitigation measures are not necessary to sustain low to no impact to the resource.
No Impact (0)	There would be no adverse effects to the resource because the resource would not be affected.

Applied Scoring Methodology for Beneficial Effects

Beneficial Effect Rating Criteria	
Impact Rating and Numerical Score	**Description**
High (+5)	Effects to the resource would have substantial beneficial effects, locally and regionally in the near-term and long-term, that are measurable and quantifiable in some manner of significance (e.g. manage coastal storm risk for communities and ecosystems and significantly improve area above and beyond existing conditions that is quantifiable and measurable beyond qualitative existing condition.
Moderate to High (+4)	Effects to the resource would have substantial beneficial effects either locally and/or regionally in the near-term or long term, that is noticeably greater and may be quantifiable in some matter (e.g. manage coastal storm risk to communities and ecosystems, additional benefit(s) to the resource that is quantifiable or measurable beyond qualitative existing condition, or that is qualitatively beneficial to a number of related resources).
Moderate (+3)	Effects to the resources would have more substantial beneficial effects, that are localized to the resource, or multiple resources, that is noticeably greater and may be quantifiable in some manner (e.g. managed coastal storm risk for communities and ecosystems and additional benefits to the resource that is measurable beyond existing condition).
Low to Moderate (+2)	Effects to the resources would have additional beneficial effects beyond the prior rating criteria, that are localized to the resource (e.g. manage coastal storm risk for communities and ecosystems and an additional benefit to the resource).
Low (+1)	Effects to the resource would have some beneficial effects, that are localized to the resource, and improves beyond existing condition (e.g. manage coastal storm risk for communities and ecosystems).
No Impact (0)	There would be no anticipated beneficial effects to the resource because the resource would not be affected beyond that of existing condition.

Both rating methodologies analyses and qualitative scoring informed the effects assessments and the Plan Formulation Environmental Quality (EQ) account for Plan Selection, described in more detail in the Main Text, and identifying the environmentally preferred alternative for each Actionable Element Site. Scores for adverse impacts were rated for each resource on a scale of "0" to "–5", with "0" being no impact to the resource, and "–5" being significant impacts to the resource that would be considered not environmentally acceptable. Scores for beneficial effects were rated for each resource on a scale of "0" to "+5", with "0" being no beneficial effect to the resource, and "+5" being significance beneficial effect to the resource, or multiple resources, that would be quantifiable and measurable above and beyond existing condition.

Example explanation:

Table 4. Example Scorecard

Resource Qualitative Rating	Adverse Effects	Beneficial Effects		ACTION

	No Action	Action	No Action	Action	NO ACTION TOTAL SCORE[1]	TOTAL SCORE[2]
Construction/Footprint	-1	-1	0	+3	-1	+2
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+3*	*-1*	*+2*
Mitigation (if applicable, otherwise 0)	*0*	*0*	*0*	*0*	*0*	*0*
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+2**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

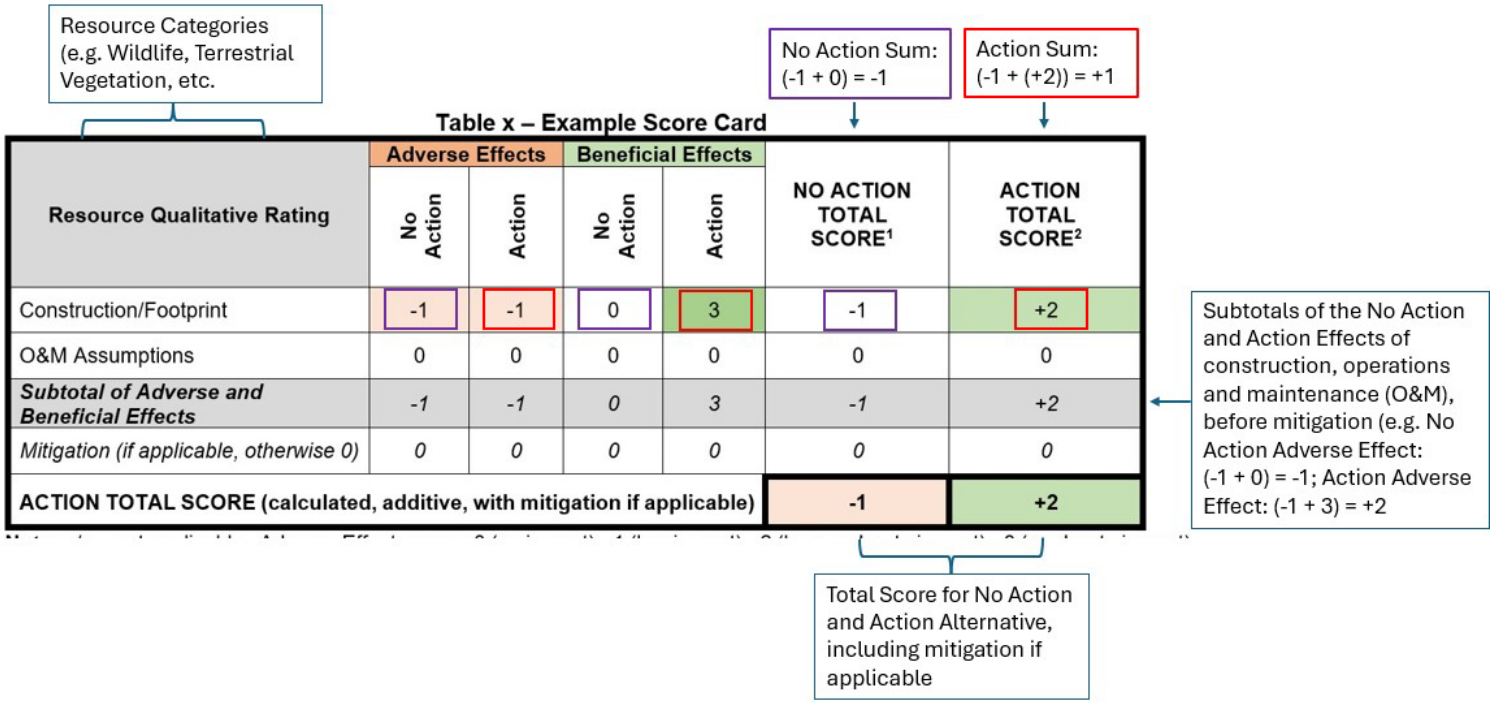

Figure 3. Example Scorecard with Notes

How to read score cards:

Following text descriptions of anticipated effects, each resource will have a score card displaying the Alternatives (No Action and Action(s)) anticipated effects, utilizing the qualitative rating criteria. Each Alternative will be assessed for Construction/Footprint, Operations and Maintenance (O&M) assumptions as raw impacts. If mitigation is needed or applicable to reduce adverse effects, an additional score for Mitigation will be provided, to represent the reduced effect through mitigation. Mitigation can include avoidance, minimization, and/or compensation for adverse effects. If no mitigation is applicable or necessary to reduce impacts, a score of "0" will be observed in these score cards. The Subtotal Resource Score with mitigation result will show a comparison between the Alternatives inclusive of raw and mitigated impacts. The columns to the far right "No Action Total Score" and "Action Total Score" are sums of the

No Action, and Action, respectively for each category: “Construction/Footprint”, “O&M Assumptions”, “Mitigation” (if applicable), and “Subtotal Resource Score with mitigation”.

Construction/Footprint category includes direct and indirect effects of the physical process of pre-construction and constructure of the measures, as well as the measures constructed as in-place.

O&M Assumptions category includes direct and indirect effects of the anticipated operations of the measures, as well as the maintenance of those measures which may include mowing, post construction surveys/inspections, and if applicable, deployment of gate structures.

Action Total Score (calculated, additive, with mitigation) is the sum for each No Action and Action scores, inclusive of Construction/Footprint, O&M Assumptions, and any mitigation, if applicable. These scores are rolled up into additional resource categories in the Main Text, to be utilized for Alternative comparison for environmental acceptability.

Where appropriate and noted, supplementary “frameworks” or “rule books” may be implemented for a particular resource that may require an added level of nuance for scoring anticipated adverse and beneficial effects.

These individual scorecards support the development of Actionable Element Site scorecards and the EQ account scorecards presented in this Environmental Appendix, and the Main Text of which this document is an appendix to. The Actionable Element Site scorecards additionally include a **Highest Escalated Adverse Effect Score**, and a **Highest Beneficial Effect Score**, to further analyze the information generated and results derived from this scoring method tool.

3 NATURAL ENVIRONMENT

The Natural Environment includes a discussion of the existing conditions for wildlife, special status species, special status areas, and other relevant environmental resources within the Study Area, and this Actionable Element Site. This Appendix focuses on the Oakwood Beach Actionable Element Site, utilizing and relying heavily on existing readily available data and reports complimented by field observations and discussions with representatives knowledgeable of the area. As this Actionable Element Site is located adjacent to the "South Shore of Staten Island (SSSI)" USACE project and the New York Department of Environmental Protection "Mid-Island Bluebelt Drainage Plans", much of the below existing conditions and effects assessment utilizes this project as one of the sources of readily available information.

3.1 WILDLIFE AND VEGETATION

This Section primarily addresses terrestrial wildlife including mammals, birds, reptiles, amphibians, and pollinator species (insects). Fish, benthic resources, and special status species, such as Threatened and Endangered Species and Essential Fish Habitat may be mentioned here but these resources are discussed in more depth in other sections of this report.

3.1.1 Wildlife

3.1.1.1 Existing Conditions

Mammals reported as present, or potentially present, at the site and surrounding vicinity are primarily comprised of species tolerant of urban development, such as the eastern gray squirrel (*Sciurus carolinensis*), deer (*Cervidae*), eastern cottontail (*Sylvilagus floridanus*), eastern chipmunk (*Tamias striatus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), muskrat (*Ondatra zibethicus*), white-footed mouse (*Peromyscus leucopus*), and introduced species such as the house mouse (*Mus musculus*) and Norway rat (*Rattus norvegicus*) (USACE 2016). Although highly unlikely at this Actionable Element Site, harbor seals (*Pinniped phocidae*) could utilize beach shoreline areas for hauling out to rest and sunbathe between November and March as they have been found in the waters surrounding Gateway National Recreation Area, although other portions of the Gateway National Recreation Area such as the bay side of Sandy Hook is most popular (NPS 2022). USACE biologists have conducted bird monitoring along the southern shore of Staten Island, including along Oakwood Beach, since circa 2017 between May 1 and June 15; and July 15 through November 30th each year. Wildlife such as foxes, racoons, and many birds have been observed over the years; however, no harbor seals have been observed during any of these monitoring efforts.

The Oakwood Beach project area, as well as the entire NYNJHAT Study Area Planning Regions, is part of the Atlantic Flyway, one of the four major avian migratory routes in North America. The Atlantic Flyway is comprised of some of the most productive ecosystems (including forests, beaches, and coastal wetlands) but is under threat of Relative Sea Level Change and human activity disturbances to habitat (USACE 2022). The Raritan Bay-Sandy Hook Bay is listed as one of the United States Fish and Wildlife Service (USFWS) significant complexes of the New York Bight Watershed, where beach habitat provides foraging for waterfowl and water birds and Sandy Hook provides as a corridor for northern harrier, osprey, common bark owl, red-tail hawk, Cooper's hawk (*Accipiter cooperii*), sharp-skinned hawk (*Accipiter striatus*), American kestrel, and peregrine falcon. Small mammals and songbirds common to the area provide a source of food for raptor populations (USACE 2022). The Rapid Avian Information Locator lists over 270 bird species as potential present in the vicinity of the project site (Avian Knowledge Network 2021), and 130 bird species have been observed by citizen scientists throughout Staten Island (iNaturalist 2025).

Reptile and amphibian species that frequent tidal marshes and shallows, woodland pools, ponds, freshwater wetlands, and adjacent terrestrial forests in the vicinity the project site may include the eastern garter snake (*Thamnophis sirtalis ssp. Sirtalis*), common garter snake *(Thamnophis sirtalis*), common water snake (*Nerodia sipedon*), easter box turtle (*Terrapene carolina ssp. carolina*), painted turtle (*Chrysemys picta),* pond slider *(Trachemys scripta),* fowler's toad (*Anaxyrus fowleri),* spring peeper (*Pseudacris crucifer*), spotted salamander

(*Ambystoma maculatum*), and eastern red-backed salamander (*Plethodon cinereus),* to name a few (iNaturalist 2025).

Pollinator species, particularly insects, are likely to be present throughout the project site, including wasps, bees, butterflies, and moths.

Great Kills Park, of which Oakwood Beach is collocated, provides an abundance of vegetative habitat for these species to frequent, although some of this habitat is degraded by a known Comprehensive Environmental Response and Liabilities Act (CERCLA) Site at Great Kills Park, and non-native phragmites. Nonetheless, these areas are likely frequented and utilized by existing wildlife in the area.

3.1.1.2 No Action

Adverse Effects

The no action is anticipated to continue to have wildlife vulnerable to coastal flood risk and damages. Coastal storm damages would contribute to continued loss of habitat and food species based on repeated flooding and wind from storms and RSLC. Coastal erosion may contribute to habitat removal or alterations not consistent with pre-existing conditions pre-storm, including transitional areas which are critical for coastal wildlife species. Although the no action would continue from the existing condition trajectory, frequency of storms and severity of storms may increase over time, as may relative sea level change (RSLC), erosion, continued habitat degradation and succession of existing habitat, both related and unrelated to coastal storm influences. Wildlife disturbance, displacement, and, in severe cases casualties, could occur, as could degradation and/or removal of associated habitat for foraging and shelter. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study of 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). Evidence following severe storms in the area such as Hurricane Sandy exhibited erosion, tree-felling, severe flooding, and damages felt by many resources throughout the Study Area. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.1.1.3 Action Alternative

Adverse Effects

Direct adverse effects from construction may cause temporary displacement, noise, vibrations, and disturbances that would make existing habitat temporarily unusable. Wildlife are expected to move to areas of nearby suitable habitat and avoid active construction, returning once construction is complete. Indirect effects may cause foraging / food sources to be disturbed and/or removed temporarily but are anticipated to return in frequency and abundance following construction. The transition of non-native habitat to native habitat would be more suitable for native wildlife, but may temporarily deter wildlife that previously were accustomed to the non-native conditions and relevant food sources of the site in its previous state. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to wildlife. 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 wildlife, but would be negligible given that species present are likely highly adaptable to urban environments of the New York City Metropolitan Area. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

The proposed project would remove non-native phragmites, and replace with native habitat more suitable for native wildlife. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing fire risk to wildlife with the restoration of the wetland, and removal of highly ignitable non-native phragmites. Further benefits to wildlife would be anticipated, as the site would be transition from non-native invasive habitat to native habitat, and would increase the availability of native foraging and sheltering areas attractive to wildlife in the vicinity, as well as species migrating through the area (e.g. birds). As this site is part of the Atlantic Flyway, the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, this effects category is representative as a high benefit, with a corresponding score of +5.

3.1.2 Wildlife Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Wildlife Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+5	-1	+4
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+4*	*-1*	*+4*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+4**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.1.3 Fish

This Section generally lists fish located within the NYNJHAT Study Lower Bay Planning Region, within which this Actionable Element site is located within. This Section may mention migratory and special status fish; however, refer to subsequent Sections for additional details on migratory fish and special status fish.

There are four main categories of fish found throughout the waters within the NYNJHAT Study Area. The first is Estuarine fishes; they live in tidal waters where fresh and salt waters mix. The salt content varies: water closer to the ocean has a has higher salinity. The shallow water and low wave action of estuaries make them an important nursery for juvenile fish. Examples of Estuarine fishes include bluefish and weakfish. The second is Anadromous fish. Anadromous fish migrate from the ocean to freshwater to spawn. After spawning, adult fish often swim downstream

to an estuary and eventually out to sea. Examples of anadromous fish found in the boundaries of the NYNJHAT Study Area include striped bass, shad, and river herring. The next category of fish is Marine or pelagic, these fish spend much time living in the open ocean. These are often large, fast-growing and swift-moving species adapted to living in deep waters. Examples of Pelagic fish that can be found within the NYNJHAT Study Area are: tuna and predatory pelagic sharks. The last is Catadromous fish, they migrate from freshwater to the ocean to spawn. Spawning often takes place offshore and a great distance from waters with the NYNJHAT Study bounds. An example of a Catadromous fish is the American eel (Monmouth County Parks 2015).

Atlantic menhaden (*Brevoortia tyrannus*), anchovies (*Anchoa spp.),* silversides (*Menidia spp.*), and killifish (*Fundulus spp.*) are important forage species found in all of the Planning Regions. An abundance of these important prey species are present within the Lower Bay, Jamaica Bay, Upper Bay/Arthur Kill, and Lower Hudson/East River makes each Region important foraging and nursery habitat for several migratory, EFH-designated, and/or commercially and recreationally important fish species such as summer flounder, winter flounder, tautog, bluefish, and weakfish.

3.1.3.1 Existing Conditions

The finfish community in the NYNJHAT Study Area Planning Regions, including Lower Bay, consists of a variety of estuarine, marine, and anadromous fish species, is typical of large coastal estuaries and inshore waterways along the Mid-Atlantic Bight. Situated in the transition zone between northern cold water (boreal) species and temperate (warm-water) species, New York Bight and the NY/NJ Harbor estuary serve as a spawning ground, migratory pathway, and nursery/foraging area for many fish species. Many of the species that are seasonally abundant in these regions are transient or migratory, moving through the Bay to upstream spawning grounds in the Hudson River or entering the area on a seasonal basis from nearby ocean waters. These species include estuarine migratory species that use the estuary primarily as a nursery, or as a forage area for juveniles or adults. Species that migrate from marine waters to spawn in the freshwater reaches of the Hudson River, in freshwater tributaries, or in the upper reaches of the estuary are considered anadromous. This includes several common species of herring (*Clupeidae*) such as blueback herring (*Alosa aestivalis*), alewife (*A. pseudoharengus*), and American shad (*A. sapidissima*), as well as the relatively less common hickory shad (A. mediocris) and gizzard shad (*Dorosoma cepedianum*) (USFWS, 1997). These species occur in the project area primarily as adults, migrating to spawning areas, and heavily influence the seasonal composition and abundance of the fish community. Other anadromous species occurring in the project area include Atlantic tomcod (*Microgadus tomcod*), Atlantic sturgeon (*Acipenser oxyrhyncus*), rainbow smelt (*Osmerus mordax*), and striped bass. Deeper, open-water habitats in these regions support over 60 migratory and resident fish species including species of commercial or recreational importance such as winter flounder and black sea bass.

Figure 4. Oakwood Beach Actionable Element Site Main Tidal Channel

The Oakwood Beach Actionable Element Site is adjacent to a tidal channel that extends parallel to the Site from the north to the south, discharging through an outfall into the Lower Bay. A convergence between this channel (referred to as the Main Channel in the NYCDEP's Bluebelt Project) and an eastern branch of a tidal channel (referred to as the East Branch in the NYCDEP's Bluebelt Project) is present to the east, near and along the southern boundary of the neighboring Wastewater Resource Recovery Facility (WRRF, also known as a Wastewater Treatment Plant (WWTP)). The East Branch contains a tide

gate structure that controls flow upstream of the East Branch channel. USACE biologists have observed small fish present within the tidal channel, as well as some other species such as fiddler crab. Kingfishers, osprey, and wading birds frequenting the Oakwood Beach area have also been observed foraging and fishing in the tidal channel for prey. Benthic species would be anticipated within the sediments of the tidal channel and along the shoreline and submerged depths of the Lower Bay. A fish sampling survey conducted for the NYCDEP BlueBelt Project in September 2011 identified banded killifish (*Fundulus diaphanous)*, blue claw crab, fiddler crab, and grass shrimp (NYCDEP 2014). This report also notes that the portion of the Main Channel nearest the outfall to the Lower Bay has the highest potential for fish resources due to the ability to access and tidal exchange with the Lower Bay. Potential access to the tidal channel may occur through the outfall and the deteriorated wooden seawall to the adjacent west, particularly during high-tide when the area floods.

3.1.3.2 No Action

Adverse Effects

The no action is anticipated to continue to have fish vulnerable to the effects of coastal flood risk and damages. Changes in water quality (e.g. salinity and DO) and flow patterns could disrupt fish use and cause a shift in plankton and benthic communities which are food sources for fish species. Fish species could be impacted by ocean acidification which is anticipated to continue with RSLC projections. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Fish and benthic disturbances, displacement, and in severe cases casualties could occur, as could removal of associated habitat for foraging and shelter. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study of 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.1.3.3 Action Alternative

Adverse Effects

While fish are not present within the project site due to a lack of sustaining habitat (permanent saturation), small fish are potentially present in the adjacent tidal channel, and as construction would include the creation of a tidal channel network within the site from the existing channel, fish would be able to access additional portions of the site from the convergence. During construction direct impacts would occur to the adjacent channel in the process of expanding the tidal channel network into the site, and as such areas of fish habitat would be removed, or introduce limited access to those area temporarily. Direct adverse effects from construction may cause temporary displacement, noise, vibrations, sediment resuspension, and disturbances that would make existing habitat temporarily unusable. Fish are expected to move to areas of nearby suitable habitat and avoid active construction, returning once construction is complete. Indirect effects may cause foraging/food sources to be disturbed and/or removed temporarily but are anticipated to return in frequency and abundance following construction. The transition of non-native habitat to native habitat would be more suitable for fish, but may temporarily deter fish while the wetland is re-established to fully functioning habitat. Measures and best management practices to reduce potential impacts to fish may be considered on an as needed basis, if necessary. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to fish. 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 fish that would be present and venture to access the inner network of the wetland. Maintenance may include non-native plant management, such as herbicide application and removal which could temporarily disturb fish, but would be negligible given that species present are likely highly adaptable to urban environments of the New York City Metropolitan Area. Any operations and maintenance activities, including herbicide

applicable, will be done under Best Management Practices, and with the appropriate Federal and/or State permit and regulations. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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 fish, providing additional areas to forage and shelter. With the conversion to native habitat, the wetland would be better quality habitat for fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing fire risk that can have indirect effects to fish, such as fire damage and storm damage related pollution into waters frequented by fish. Further benefits to fish would be anticipated, as the site would be transition from non-native invasive habitat to native habitat inclusive of a new network of tidal channels and pools that would increase the availability of foraging and sheltering areas for fish in the vicinity. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, this effects category is representative as high benefit, with a corresponding score of +5.

3.1.4 Fish Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Fish Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+5	-1	+4
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+5*	*-1*	*+4*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+4**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.1.5 Migratory Fish

Highly migratory fish travel long distances and often cross domestic and international boundaries. These pelagic species live in water of the open ocean, although they may spend part of their life cycle nearshore waters. Continuous disturbances to benthic habitat, littoral environments, and irregular changes to tidal flow change cause irreparable

damage to the species within these regions (NOAA 2022). For additional information on fish and special status fish, refer to other Sections of this Appendix.

A few migratory fish present throughout the Lower Bay include Atlantic Herring (*Clupea harengus*) and striped bass, as identified in the September 2022 Draft Integrated Feasibility Report and Tier 1 (Programmatic) EIS:

Species Name: Atlantic Herring (*Clupea harengus)*
Regions: Capital District, Jamaica Bay, Lower Bay Hackensack/Passaic Region
Habitat: The spatial distribution of spawning is restricted to locations with coarse gravel and hard bottom habitats in waters <100 m depth. This specific spawning habitat restricts spawning to discrete areas of the continental shelf, which results in a discontinuous pattern to spawning (Hare and Richardson 2014).
Migratory Patterns: Atlantic herring migrate in schools to areas where they feed, spawn, and spend the winter. They spawn as early as August in Nova Scotia and eastern Maine and from October through November in the southern Gulf of Maine, Georges Bank, and Nantucket Shoals. By late spring, larvae grow into juvenile herring, which form large schools in coastal waters during the summer.

Photo credit: Dockside: It's Time for Herring - The Fisherman

Species Name: Striped bass
Regions: Mid-Hudson, Jamaica Bay, Raritan Region, Lower Bay (Striped bass is an anadromous species and mature individuals utilize the Region to reach upriver spawning habitat in the spring, while juveniles travel downriver during summer and fall to reach coastal waters to live as adults (ASMFC 2009)).
Habitat: These basses generally live from Canada down to Florida into Louisiana. Due to being introduced to lakes and rivers by humans, striped bass can also be found inland and on the West Coast as well as the East coast. Striped bass spend most of their time either in rivers or in the ocean just off the coast. Since they move between fresh water and saltwater for breeding, they will usually stay in saltwater for most months before embarking on their annual trip to mate.
Migratory Patterns: Migration for the mass of the stock s: (a) in summer, they school near the surface on feeding migrations in the tributaries , bays, and ocean along the New England coast; (b) in autumn, schools move into lower tributaries and bays partly for feeding but primarily for overwintering; (c) in winter, they concentrate in a somewhat less active condition in the deeper waters of the lower tributaries and bays (in Chesapeake Bay they live as deep as 15 0 feet); and (d) in spring, they move from the deeper waters, mature
fish ascend rivers to spawn, and immature ones start on their feeding migration. From April to early June, striped bass will either move back to their birthplace or find a new location to breed.

Photo credit: Everything You Want To Know About The Striped Bass (proangler.us)

3.1.5.1 Existing Conditions

The Oakwood Beach Actionable Element site is adjacent to a tidal channel that extends from the north of the site running south to an outfall to the Lower Bay. USACE biologists have observed small fish present within the tidal channel, as well as some other species like horseshoe crab. Kingfishers and other birds frequenting the Oakwood Beach area have been observed foraging and fishing in the tidal channel for prey. Benthic species would be anticipated within the sediments of the tidal channel and along the shoreline and submerged depths of the Lower Bay.

Due to the size of these species, accessibility constraints of the outfall, and migratory patterns, it is not likely that highly migratory fish are utilizing the adjacent channel frequently, if at all. The few migratory fish that might gain access through the outfall or through the deteriorated wooden seawall to the adjacent west, could potentially enter the tidal channel, although there is no known evidence of this, and only small fish, crabs, and shrimp have been observed in fish surveys, to date (NYCDEP 2014).

3.1.5.2 No Action

Adverse Effects

As discussed in the Fish section, changes in water quality (e.g. temperature, salinity and DO), flow patterns, and habitat due to extreme events could disrupt migratory fish patterns and cause a shift in plankton and benthic communities which are food sources for fish species. The no action is anticipated to continue to have fish vulnerable to the effects of coastal flood risk and damages. Fish species could be impacted by ocean acidification which is anticipated to continue with RSLC projections. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Fish and benthic casualties could occur, as could removal of associated habitat for foraging and shelter. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts

due to the infrequency of severe storms (e.g. 1 in 100 years). Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.1.5.3 Action Alternative

Adverse Effects

While fish are not present within the project site due to a lack of sustaining habitat (permanent saturation), small fish are potentially present in the adjacent tidal channel, and as construction would include the creation of a tidal channel network within the site from that existing channel, fish would be able to access additional portions of the site from the convergence. During construction direct impacts would occur to the adjacent channel in the process of expanding the tidal channel network into the site, and as such areas of fish habitat would be removed, or introduce limited access to those area temporarily. Direct adverse effects from construction may cause temporary displacement, noise, vibrations, sediment resuspension, and disturbances that would make existing habitat temporarily unusable. Fish are expected to move to areas of nearby suitable habitat and avoid active construction, returning once construction is complete. Indirect effects may cause foraging / food sources to be disturbed and/or removed temporarily but are anticipated to return in frequency and abundance following construction. The transition of non-native habitat to native habitat would be more suitable for fish, but may temporarily deter fish while the wetland is re-established to fully functioning habitat. Measures and best management practices to reduce potential impacts to fish may be considered on an as needed basis, if necessary. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to fish. 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 fish that would be present and venture to access the inner network of the wetland. Maintenance may include non-native plant management, such as herbicide application and removal which could temporarily disturb fish, but would be negligible given that species present are likely highly adaptable to urban environments of the New York City Metropolitan Area. Any operations and maintenance activities, including herbicide applicable, will be done under Best Management Practices, and with the appropriate Federal and/or State permit and regulations. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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 fish, providing additional areas to forage and shelter. With the conversion to native habitat, the wetland would be better quality habitat for fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing fire risk that can have indirect effects to fish, such as fire damage and storm damage related pollution into waters frequented by fish. Further benefits to fish would be anticipated, as the site would be transition from non-native invasive habitat to native habitat inclusive of a new network of tidal channels and pools that would increase the availability of foraging and sheltering areas for fish in the vicinity. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, this effects category is representative as high benefit, with a corresponding score of +5.

3.1.6 Migratory Fish Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Migratory Fish Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+5	-1	+4
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+5*	*-1*	*+4*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+4**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[12] – Sum of the Action Adverse Effect and Beneficial Effect

3.1.7 Terrestrial Vegetation

3.1.7.1 Existing Conditions

A terrestrial vegetation survey was completed for the project site in December 2016 for the City of New York Department of Environmental Protection, Bureau of Environmental Planning and Analysis. The site consists of approximately 39-acres located to the adjacent southwest of the Oakwood Beach Wastewater Treatment Plant, and exists as a portion of the Gateway National Recreation Area under the jurisdiction of the National Park Service. Common reed (*Phragmites australis*) dominants much of the project site, with a few small areas of existing low salt marsh containing smooth cordgrass (*Sparina alterniflora*) totaling approximately 1.44-acres, non-contiguously. Six areas of coastal shoals, bars, and mudflats were observed during the vegetation survey, some exhibiting dead common reed root masses. One 0.11-acre vegetated coastal shoals, bars, and mudflats was identified containing some grasses and glassworts (*Salicornia spp.*), and smooth cordgrass. The salt pannes contained common reed and smooth cordgrass around the edges, with no vegetation growing within the salt panne proper. Maritime shrubland areas were observed with flourishing native species including shining sumac *(Rhus copallinum),* bayberry *(Morella pensylvanica),* high-tide bush *(Iva frutescens),* eastern baccharus (*Baccharus halimifolia*), and beach plum (*Prunus maritima*), as well as some other vegetation such as switchgrass, grass leaved goldenrod (*Euthamia graminifolia*), coastal panic grass (*Panicum amarum*), poison ivy (*Toxicodendron radicans*), and seaside goldenrod (*Solidago sempervirens*). Maritime beach and dune exhibited common reed, as well as Datura (*Datura spp*), sandbur (*Cenchrus spp*), and seaside goldenrod (*Solidago sempervirens*). The eastern side of the tide channel contains common reed and Japanese knotweed (*Fallopia japonica).* Adjacent to the project area and surrounding the WRRF, tree of heaven (*Ailanthus altissima*),

black cherry (Prunus serotina), black locust (*Robinia pseudoacacia*), eastern cottonwood (*Populus deltoides*), porcelain berry (*Ampelopsis brevipedunculata*), and poison ivy was observed (Hazen and Sawyer 2016).

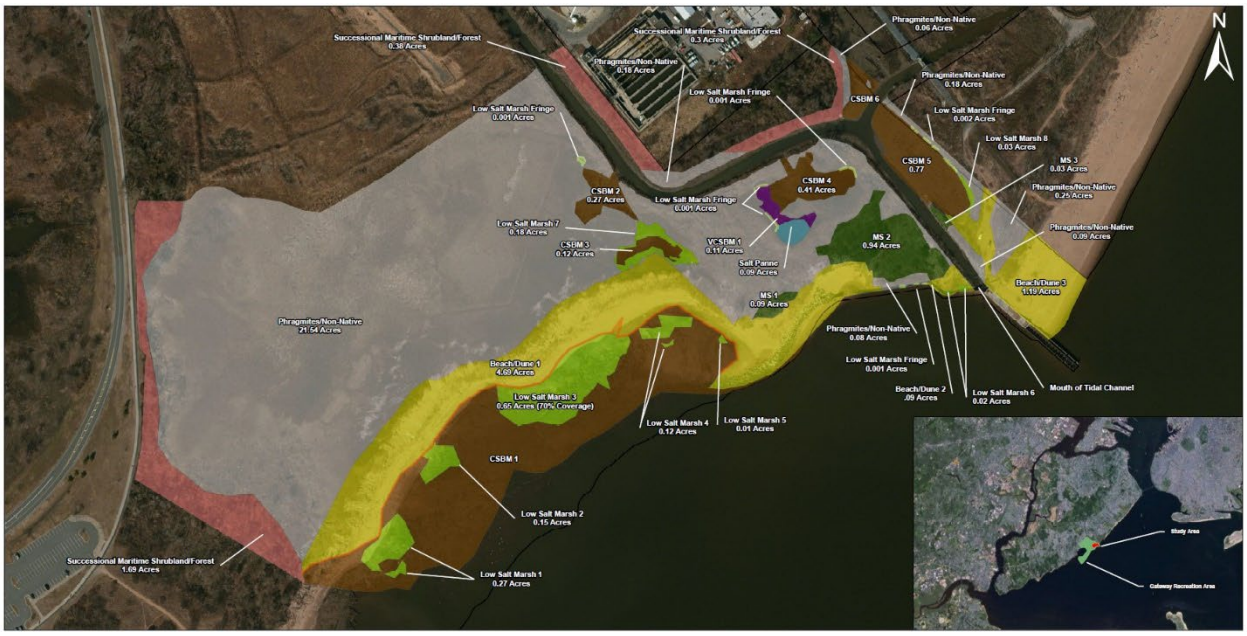

Figure 5. Existing Condition Terrestrial Vegetation Survey

3.1.7.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island and doesn't fully function as a wetland due to the dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Terrestrial vegetation casualties could occur, as could removal of associated habitat for foraging and shelter for wildlife. While difficult to predict the adverse effects of such change over an extended period of time beyond the 100-year planning horizon of this Study, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would persist and vary in severity with each outbreak. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.1.7.3 Action Alternative

Adverse Effects

Direct impacts during construction would result in complete removal of non-native phragmites, which largely dominates the site, and replacement with native wetland plants, including Spartina, to redevelop and regrade the low and high salt marsh of the wetland. This would result in temporary removal of low value habitat during construction. Re-establishment of the wetland may also include the removal of native species that are intermixed with the phragmites, in order to develop the tidal channel network, low salt marsh, and dunes proposed. Native

species will be salvaged, as able, and reused on site. Large trees throughout the site may be left in place, or removed and replaced in kind, or better, depending on their size and ability to thrive in the restored wetland bounds. Any vegetation or tree removal will be done in accordance with best management practices, as well as Federal and State regulations for removal and replacement. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to terrestrial vegetation, 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 terrestrial 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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing 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. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, this effects category is representative as high benefit, with a corresponding score of +5.

3.1.8 Terrestrial Vegetation Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Terrestrial Vegetation Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+5	-1	+4
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+5*	*-1*	*+4*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+4**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.1.9 Submerged Aquatic Vegetation

The project site, although subject to some coastal influences, is primarily within a terrestrial habitat. Aquatic vegetation, such as Submerged Aquatic Vegetation (SAV), was assessed in the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS; however, is not applicable to this specific project site. Therefore, a site-specific effects analysis is not applicable.

3.1.10 Invasive and Aquatic Nuisance Species

Invasive species are non-native animal and plant species that can cause harm to the environment, the economy, and human health. Harm caused by invasive non-indigenous species may include habitat degradation and loss, loss of native wildlife and plant species, impacts to recreation, agriculture, livestock, and risks to public health and safety (NYSDEC 2022).

Invasive species Executive Orders (E.O. 13312 and 13751) were enacted, as amended, to ensure Federal agencies do not authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that is has prescribed, the agency has determined and made public it's determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species, and that all feasible and prudent measures to manage risk of harm will be taken in conjunction with the actions.


Figure 6. Photo of Common Reed at Oakwood Beach

The following terrestrial (T) and aquatic (A) invasive species of concern in New York State include, but are not limited to, the following plants and animals (NYSDEC 2022):

Giant hogweed (T) Slender false brome (T) Wild parsnip (T) Didymo (A) Hydrilla (A) Starry stoneword (A) Water chestnut (A) Animals: Asian longhorned beetle (T) Emerald ash borer (T) Eurasian boar (T) Spondy moth (gypsy moth) Hemlock woolly adelgid (T) Sirex woodwasp (T) (T) Spotted lanternfly (T) Chinese mitten crab (A) Northern snakehead fish (A) Sea lamprey (A) Spiny waterflea (A).

3.1.10.1 Existing Conditions

A terrestrial vegetation survey was completed for the project site in December 2016 for the City of New York Department of Environmental Protection, Bureau of Environmental Planning and captures a detailed account of the invasive species observed throughout, and the vicinity of, the project site. These species include Common reed (*Phragmites australis*) which dominates much of the project site, as well as nearby Japanese knotweed, and tree of heaven (Hazen and Sawyer 2016). Phragmites (Phragmites australis) are one of the most invasive

plant species in New York State and are prevalent throughout New York City ponds and marshes, which is observed in abundance in Oakwood Beach. Spotted lanternfly, as noted in the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS, is found in terrestrial habitats of New York (in addition to several other surrounding States). Spotted lanternfly are attracted to walnut, maple, and birch trees, especially the tree of heaven (*Ailanthus altissima)* which is this species host plant, prompting locals to remove tree of heaven plants, and destroy eggs, nymphs, and adults where found (USACE 2022).

3.1.10.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Invasive species casualties could occur, as could removal of associated habitat for foraging and shelter for wildlife. Invasive species could also proliferate further, with each storm and fire event, further degrading the wetland habitat. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). Evidence following severe storms in the area such as Hurricane Sandy exhibited erosion, tree-felling, severe flooding, and damages felt by many resources throughout the Study Area. However, the threat of persistent wildfires in the dry season would persist, and vary in severity with each outbreak. Therefore, this effects category is representative as low to moderate impact, with a corresponding score of -2.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.1.10.3 Action Alternative

Adverse Effects

Direct impacts of construction would result in complete removal of non-native phragmites, which largely dominants the site, and replacement with native wetland plants including Spartina to redevelop the low salt marsh of the wetland. This would result in temporary removal of habitat during construction.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated, 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 terrestrial 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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural

CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing 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. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, this effects category is representative as high benefit, with a corresponding score of +5.

3.1.11 Invasive and Aquatic Nuisance Species Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Invasive and Aquatic Nuisance Species Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-2	-1	0	+5	-2	+4
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-2*	*-1*	*0*	*+5*	*-2*	*+4*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-2**	**+4**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.2 SPECIAL STATUS SPECIES

3.2.1 Threatened and Endangered Species

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.

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, threated, 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.

3.2.1.1 Existing Conditions

A list of federal and state listed terrestrial and/or aquatic threatened and endangered species potentially present within the Comprehensive Plan Study Area, Lower Bay Planning Region are listed below, and those species identified as potentially present in the vicinity of the Actionable Element site, sourced from the IPaC database are highlighted yellow.

Table 5. Terrestrial Listed Species 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
Mammals					
Indiana bat	*Myotis sodalis*	E	E	32 FR 4001; Draft Recovery Plan: USFWS 2007	LB
Northern long-eared bat	*Myotis septentrionalis*	E	T	80 FR 17973 18033	LB
Tricolored bat	*Perimyotis subflavus*	P	NL	FR 2022-18852	LB
Birds					
Piping plover	*Charadius melodus*	T	E	49 FR 44712; Recovery plan USFWS 2016	LB, AE
Red knot	*Calidris canutus rufa*	T	T	79 FR 73705; Draft Recovery plan: USFWS 2021	LB, AE
Roseate tern	*Sterna dougalli dougalli*	E	E	52 FR 42064; Recovery plan USFWS 1998	LB, AE
Least bittern	*Ixobrychus exilis*	NL	T	N/A	LB
Bald eagle	*Haliaeetus leucocephalu s*	NL	T	N/A	LB
Reptiles					
Bog turtle	*Glyptemys muhlenbergii*	T	E	62 FR 59605 59623; Recovery plan: USFWS 2001	LB
Insects					
Monarch butterfly	*Danaus plexippus*	P	NL	85 FR 81813	LB, AE

Northeast beach tiger beetle	*Habroscelimorpha dorsalis dorsalis*	T	T	55 FR 32088; Recovery plan: USFWS 1994	LB
Rusty-patched bumble bee	*Bombas affinis*	E	NL	80 FR 56423 56432, Recovery plan: 85 FR 4334 4336	LB
Yellow-banded bumble bee	*Bombas terracola*	C	NL	N/A	LB
Flowering Plants					
American chaffseed	*Schwalbea americana*	E	NL	57 FR 44703 44708; Recovery plan: USFWS 2019	LB
Knieskern beaked-rush	*Rhynchospor a knieskernii*	T	NL	56 FR 32978 32983; Recovery plan: USFWS 1993	LB
Seabeach amaranth	*Amaranthus pumilus*	T	T	58 FR 18035; Recovery plan: USFWS 1996	LB
Swamp pink	*Helonias bullata*	T	NL	53 FR 35076 35080; Recovery plan: USFWS 1991	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.

Table 6. Aquatic Listed Species 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	*Acipenser oxyrinchus oxrynchus*	E	E	77 FR 5880 and 77 FR 5914	LB
Shortnose sturgeon	*Acipenser brevirostrum*	E	E	32 FR 4001; Recovery plan: NMFS 1998	LB
Reptiles					
Green sea turtle	*Chelonia mydas*	T	T	81 FR 20057; Recovery plan: NMFS & USFWS 1991	LB
Kemp's ridley turtle	*Lepidochelys kempii*	E	E	35 FR 18319; Recovery plan: NMFS et al. 2011	LB

Leatherback turtle	*Dermochelys coriacea*	E	E	35 FR 8491; Recovery plan: NMFS & USFWS 1992	LB
Loggerhead turtle	*Caretta caretta*	E	T	76 FR 58868; Recovery plan: NMFS & USFWS 2008	LB
Mammals					
Fin Whale	*Balaenoptera physalus*	E	E	35 FR 18319; Recovery plan: NMFS 2010	LB
Humpback Whale	*Megaptera novaeangliae*	NL – delisted for U.S. harbors	E	FR 15993; Recovery plan: NMFS 1991	LB
North Atlantic Right Whale	*Eubalaena glacialis*	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 present onsite. Additional species of concern to be identified in coordination with USFWS, NMFS, and NYNHP.

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; however, no species were identified as present within the boundaries of the Actionable Element Site (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 Section "Sea Turtles"), although near-shore encounters for many of these species is unlikely given the shallowness of the shoreline.

USACE biologists perform yearly bird monitoring along the Great Kills beaches and mudflats since 2017, including Oakwood Beach, and have reported some sightings of red knot, one piping plover, as well as State listed species over several survey years. Surveys take place from May 1 to June 15 and July 15 to November 30th. Most recently in 2024, USACE biologists reported observing 70 species and 4,190 individual birds, but no red knots during the survey windows.

Although not yet a federally or state listed species, saltmarsh sparrow (*Ammospiza caudacuta*) is a bird of particular concern. Although relevant habitat for saltmash sparrow are within the NYNJHAT Study Area, no habitat is anticipated to currently exist at the Actionable Element Site.

Additionally of note, Diamondback terrapins (*Malaclemys terrapin)*, are the only turtle species in North America that live in brackish water including coastal salt marshes, tidal creeks, estuaries, bays, and coves, coming ashore to nest (NYSDEC n.d.). Although not Federal or State listed as threatened or endangered, they are considered a vulnerable species of concern in New York State and have been observed on nearby beaches.

3.2.1.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island and doesn't fully function as a wetland due to this dominant species at the

site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Stressors to special status species, such as erosion and habitat conversion, could occur, as could removal of associated existing habitat for foraging and shelter for wildlife. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would be anticipated to continue, and vary in severity with each outbreak, potentially affected species and associated habitat. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no effect, with a corresponding score of 0.

3.2.1.3 Action Alternative

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 efforts at this Actionable Element Site 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 within the Actionable Element Site. Since the site is coastally influenced with potential presence of shore-birds, USACE biologists/scientists may continue threatened and endangered species monitoring as they have done for the neighboring South Shore of Staten Island project. If necessary, biologists/scientists may also be present during construction to monitor for special status species and confirm avoidance during construction. Environmental windows will also be implemented, as appropriate for species of concern, anticipated to include at a minimum a no-construction window from November-March for Red Knots, as recommended for the South Shore of Staten Island USACE project adjacent to this Actionable Element Site, determined from several years of bird monitoring data collected by USACE biologists. Potential indirect effects may include the temporary disturbance and/or removal of habitat for foraging species and prey during construction. Although the threatened and endangered species will be avoided, there may be ancillary disturbances that cannot be avoided that may deter species, such as noise and vibrations although those are anticipated to be temporary, low, and addressed through no-construction windows. Therefore, this effects category is representative as low adverse effect, represented by a corresponding rating criteria score of -1.

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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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. With the conversion to native habitat, the wetland would be better quality habitat for a variety of wildlife, birds, and fish from the creation of tidal channels, vegetative mosaic, and native salt marsh plantings. Additionally, as part of the action, the installation of two osprey nests within the central portions of the vegetative mosaic and network of tidal channels is proposed. Although not yet a federally or state listed species, the saltmarsh sparrow may benefit from the creation of high-marsh habitat, although both eBird and the Saltmarsh Sparrow Restoration Priority Mapper indicate no saltmarsh sparrows have previously been detected at this Actionable Element Site (BirdLife International 2020). The increased function and capacity of the CSRM 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 CSRM buffer for multiple lines of defense between the coast and surrounding communities. Increased benefits would be observed from managing 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. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +3.

3.2.2 Threatened and Endangered Species Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Terrestrial Threatened and Endangered Species Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+2	-1	+1
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+2*	*-1*	*+1*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+1**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

Aquatic Threatened and Endangered Species Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		

Construction/Footprint	0	0	0	0	0	0
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*0*	*0*	*0*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**0**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.2.3 Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act Species

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, was implemented for the protection and conservation of migratory birds. The MBTA prohibits, unless permitted by regulations, actions that could cause detrimental effects to migratory birds. Under the MBTA, it is illegal to possess, import, export, transport, sell, purchase, barter or offer for sale migratory birds, including their parts, feathers, nests, and eggs. The law additionally makes it illegal to engage in a "take", or to "pursue, hunt, shoot, wound, kill, trap, capture or collect, or any attempt to carry out these activities" of migratory birds including their parts, feathers, nests, and eggs (USFWS 2022a).

The Bald and Golden Eagle Protection Act of 1940, as amended, prohibits, unless under permit issued by the Secretary of the Interior, actions that could disturb or cause detrimental effects to bald and golden eagles. Under this Act, and similar to the MBTA, it is illegal to possess, import, export, transport, sell, purchase, barter or offer for sale, including their parts, feathers, nests and eggs. The law additionally makes it illegal to engage in a "take", or to "pursue, hunt, shoot, wound, kill, trap, capture or collect, or any attempt to carry out these activities" of bald and golden eagles, including their parts, feathers, nests and eggs (USFWS 2022a).

3.2.3.1 Existing Conditions

As discussed in prior sections of this Report the NYNJHAT Study Area is located within the Atlantic Flyway. New York has at least 136, identified critical bird breeding, migratory stop-over, feeding, and overwintering areas, referred to as Important Bird Areas, which include forest shrub/scrub, grasslands, freshwater and saltwater wetlands, and bodies of water (Audubon 2022b). The list of migratory bird species protected under the MBTA is extensive and includes many native species found throughout the Comprehensive Study Area including the Lower Bay Planning Region and AE site (RAIL 2025). The Bald Eagle (*Haliaeetus leucocephalus*) is found within the Comprehensive Study Area including the Lower Bay Planning Region and the Golden Eagle (Aquila chrysaetos) migrates through the Study Area each year. MBTA and Bald and Golden Eagle Protection Act species, and the habitats upon which they depend, are under threat of RSCL and human disturbances.

Birds of particular concern species were identified through the USFWS IPaC database for the September 2022 Draft Integrated Feasibility Report and Tier 1 (Programmatic) EIS, and in reviewing the IPaC database for the preparation of this report, the USFWS website referred to the RAIL database while the IPaC is undergoing updates. Some of these birds identified in both the September 2022 Draft Integrated Feasibility Report and Tier 1 (Programmatic) EIS for the Lower Bay and the RAIL database for the Oakwood Beach Actionable Element Site include:

Table 7. Birds Potentially Present within the Lower Bay Planning Region (including, but not limited to)

Common Name	Scientific Name	Common Name	Scientific Name
Bald eagle	*Haliaeetus leucocephalus*	American oystercatcher	*Haematopus palliates*
Black scoter	*Melanitta nigra*	Black skimmer	*Rynchops niger*
Black-legged kittiwake	*Rissa tridactyla*	Brown pelican	*Pelecanus occidentalis*
Dovekie	*Alle alle*	Double-crested cormorant	*Phalacrocorax auratus*
Long-tailed duck	*Clangula hyemalis*	Purple sandpiper	*Calidris maritima*
Red-breasted Merganser	*Mergus serrator*	Red-throated loon	*Gavia stellata*
Roseate tern	*Sterna dougallii*	Short-billed dowitcher	*Limnodromus griseus*

Source: (USACE 2022) and (Avian Knowledge Network 2021)

3.2.3.2 No Action

Adverse Effects

The no action is anticipated to continue to have wildlife vulnerable to coastal flood risk and damages. Coastal storm damages would contribute to continued loss of habitat and food species based on repeated flooding and wind from storms and RSLC. Coastal erosion may contribute to habitat removal or alterations not consistent with pre-existing conditions pre-storm, including transitional areas which are critical for coastal wildlife species. Although the no action would continue from the existing condition trajectory, frequency of storms and severity of storms may increase over time, as may relative sea level change (RSLC). Wildlife, including migratory birds, disturbance, displacement, and, in severe cases casualties, could occur, as could degradation and/or removal of associated habitat for foraging and shelter. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study of 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). Evidence following severe storms in the area such as Hurricane Sandy exhibited erosion, tree-felling, severe flooding, and damages felt by many resources throughout the Study Area. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages, and the non-native phragmites dominance, and further degradation of existing habitat would persist. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.2.3.3 Action Alternative

Adverse Effects

Direct adverse effects from construction may cause temporary displacement, noise, vibrations, and disturbances that would make existing habitat temporarily unusable. Birds are expected to move to areas of nearby suitable habitat and avoid active construction, returning once construction is complete. Indirect effects may cause foraging / food sources to be disturbed and/or removed temporarily but are anticipated to return in frequency and abundance following construction. The transition of non-native habitat to native habitat would be more suitable for native wildlife, but may temporarily deter species that previously were accustomed to the non-native conditions and relevant food sources of the site in its previous state. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to migratory birds. 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 stop over migrations. Maintenance may include non-native plant management, such as herbicide application and removal which could temporarily disturb migratory species, but would be negligible given that species that frequently utilize the area are likely highly adaptable to urban environments of the New York City Metropolitan Area. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

The proposed project would remove non-native Phragmites, and replace with native habitat more suitable for native wildlife. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. The creation of a more advanced tidal channel network would increase usable habitat for migratory birds, as well as hunting and foraging grounds, including prey species upon which they rely. Increased benefits would be observed from managing fire risk to wildlife with the restoration of the wetland, and removal of highly ignitable non-native phragmites. As this site is part of the Atlantic Flyway, National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, this effects category is representative as high benefit, with a corresponding score of +5.

3.2.4 Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act Species Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act Species Vegetation Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+5	-1	+4
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+5*	*-1*	*+4*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+4**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.2.5 Marine Mammal Protection Act Species

The Marine Mammal Protection Act (MMPA) of 1972 establishes a national policy to prevent marine mammal species and population stocks from declining beyond the point where they cease to be significant functioning element of the ecosystems of which they are a part. The NOAA, USFWS, and Marine Mammal Commission

share responsibility for implementing the MMPA (NOAA 2022). All marine mammals, such as whales, dolphins, porpoises, seals, sea lions, walruses, polar bears, sea otters, manatees, and dugongs, are protected under the MMPA, some of which are also protected under the ESA (NOAA 2022). Similar to the ESA and MBTA, and with a few exceptions, the MMPA prohibits the "take" of marine mammals, including harassment, hunting, capturing, collecting, or killing. Additionally, the MMPA makes it illegal to import marine mammal products into the United States without a permit (NOAA Fisheries 2022).

Marine Mammal Protection Act Species is a resource that was reviewed and assessed in the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS due to the size of the Study Area. The Actionable Element Site, although with coastal influences, is primarily within a terrestrial habitat, on the north side of the shoreline beach. A tidal channel extends from the north adjacent to the Actionable Element Site flowing south to an outfall that discharges into the Lower Bay. This outfall, as well as the adjacent deteriorated wooden seawall, is too constrained, shallow, and narrow for marine mammals to access the area. Particularly for several species of whales that occur seasonally in the offshore waters of New York, as the depths near the inshore waters of Staten Island are too shallow to be occupied by any listed whales (NYCDEP 2014). Although highly unlikely at this Actionable Element Site, harbor seals (*Pinniped phocidae*) utilize beach shoreline areas in the surrounding vicinity for hauling out to rest and sunbathe between November and March as they have been observed in the waters surrounding Gateway National Recreation Area, although other portions of the Gateway National Recreation Area such as the bay side of Sandy Hook is most popular (NPS 2022). No harbor seals have been observed by USACE biologists along the Oakwood Beach shoreline. Although it is highly unlikely, if in a rare instance a harbor seal is observed 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.

As this report is an interim response to the Comprehensive Plan, the same resources were reviewed for applicability to the Actionable Elements Interim Response sites and determined to not apply to this specific Actionable Element Site. Therefore, an effects analysis is not applicable.

3.2.6 Sea Turtles

Four species of sea turtles can be found in the lower part of the NYNJHAT Study Area including green (threatened), Kemp's ridley (endangered), leatherback (endangered), and loggerhead (threatened) sea turtles. Warmer waters starting in late spring and early summer provide more suitable temperatures for sea turtle presence, typically between the months of May through November, and particularly within the coastal bays, Long Island Sound, and Jersey shore. In 2018, Kemp's ridley sea turtles were observed nesting on the Rockaway Peninsula within the Gateway National Recreation Area. Due to concerns for extreme high tides, the NPS excavated the nests and incubated the recovered eggs from those nests. Later that year, 96 Kemp's ridley sea turtle hatchlings were released at West Beach. Sea turtles, including the Kemp's ridley, are under threat of human and environmental disturbances, such as vessel strikes, marine water pollution (e.g. plastics), climate change (e.g. cold-stunning), illegal harvesting, and entrapment in fishing gear (USACE 2022). Sea turtle nesting sites include sandy beaches with little to no vegetative cover (NYCDEP 2014).

As this report is an interim response to the Comprehensive Plan, the same resources were reviewed for applicability to the Actionable Elements Interim Response sites and determined to not apply to this specific Actionable Element Site. Therefore, an effects analysis is not applicable. 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.

3.2.7 Essential Fish Habitat and EFH-Designated Species

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended, was first passed in 1976 for the purpose of preventing overfishing, rebuilding overfished stocks, increase long-term economic

and social benefits, ensure safe and sustainable supply of seafood, and protect habitat that fish need to spawn, breed, feed, and grow to maturity. The MSA Reauthorization Act of 2007 amended the MSA to include annual catch limits and accountability measures, promote market-based management strategies (e.g. catch shares), strengthened peer-reviewed science, and enhance international cooperation to address illegal, unregulated, and unreported fishing. The Sustainable Fisheries Act of 1996, as amended, strengthened the requirements to prevent overfishing and rebuilding overfished fisheries, set standards for fishery management plants to specific objectives and measurable criteria of stock status, added national standards for fishing vessel safety, fishing communities, and bycatch, new requirements for fishery management councils to identify and describe Essential Fish Habitat (EFH), to protect, conserve and enhance EFH, to designate Habitat Areas of Particular Concern, and establish a federal EFH consultation process that advises federal agencies to avoid, minimize, mitigate, or offset adverse effects to EFH (NOAA Fisheries 2022).

The NOAA Fisheries EFH Mapper is a tool that allows users to discover where managed fish species spawn, grow, or live in a chosen location on the map: (https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper). The EFH mapper displays EFH, EFH areas protected from fishing, habitat areas of particular concern (HAPC), fishery management plans, and NOAA nautical charts.

Consultation with NOAA Fisheries is required for any Federal action that may adversely affect EFH. An adverse effect includes direct or indirect physical, chemical, or biological alternations to waters or substrate, species and their habitat, other ecosystem components, and quality and quantity of EFH. Consultation requires the preparation of an EFH Assessment (50 CFR Part 600.905).

3.2.7.1 Existing Conditions

EFH within the NYNJHAT Study Area is both spatially and temporally highly variable. Some species are restricted to offshore waters, while others may occupy both nearshore and offshore waters, and migrate within and around the bays. Some species are well adapted for life within open ocean or pelagic waters, while others are primarily associated with the benthos or demersal waters. These habitat preferences can also vary among the different life stages of the species, and finfish studies conducted within the region confirm that seasonal abundances are highly variable, as many species are highly migratory (USACE 2020). The Study Area does not contain EFH areas protected from fishing. One HAPC, summer flounder SAV, is mapped across most of Study Area. Due to the dynamic nature of SAV and the differences in local mapping, detailed region-wide mapping of this HAPC is not available. Therefore, local mapping and site investigations, where appropriate, must be used to determine SAV presence at a specific area. Refer to the SAV (Submerged Aquatic Vegetation) Resource Section for additional information, as applicable, to this Actionable Element Site.

Based on a review of the EFH Mapper for the New England / Mid-Atlantic and Atlantic Highly Migratory Species Councils, the Actionable Element Site may contain EFH for various life stages of approximately 13 managed fish and invertebrate species. Refer to the EFH Appendix for additional information.

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

Table 8. Species with designated EFH in the Lower Bay Planning Region, Oakwood Beach Actionable Element Site.

Common Name	Scientific Name	Life Stage	Habitat Association	Fishery Management Plan
Winter Flounder	*Pseudopleuronectes americanus*	E, L, J, A	Demersal	Amendment 14 to the Northeast Multispecies FMP

Little Skate	*Leucoraja erinacea*	J, A	Demersal	Amendment 2 to the Northeast Skate Complex FMP
Atlantic Herring	*Clupea harengus*	L, J, A	Pelagic	Amendment 3 to the Atlantic Herring FMP
Red Hake	*Urophycis chuss*	E, L, J, A	Egg/Larvae: Pelagic; Juvenile/Adult: Demersal	Amendment 14 to the Northeast Multispecies FMP
Silver Hake	*Merluccius bilnearis*	E, L,	Demersal/Pelagic	Amendment 14 to the Northeast Multispecies FMP
Yellowtail Flounder	*Limanda ferruginea*	J	Demersal	Amendment 14 to the Northeast Multispecies FMP
Windowpane Flounder	*Scophthalmus aquosus*	E, L, J, A	Egg: Pelagic; Larvae/Juvenile/Adult: Demersal	Amendment 14 to the Northeast Multispecies FMP
Winter Skate	*Leucoraja ocellata*	J, A	Demersal	Amendment 2 to the Northeast Skate Complex FMP
Clearnose Skate	*Raja eglanteria*	J, A	Demersal	Amendment 2 to the Northeast Skate Complex FMP
Bluefish	*Pomatomus saltatrix*	J, A,	Pelagic	Bluefish
Longfin Inshore Squid	*Loligo pealeii*	E	Egg: Demersal/Somewhat Structure Oriented; Juvenile/Adult: Pelagic	Atlantic Mackerel, Squid,& Butterfish Amendment 11
Atlantic Butterfish	*Peprilus triacanthus*	L	Pelagic	Atlantic Mackerel, Squid,& Butterfish Amendment 11
Summer Flounder	*Paralichthys dentatus*	L, J, A	Demersal	Summer Flounder, Scup, Black Sea Bass

Notes: E (egg), L (larvae), J (juvenile), A (adult).

3.2.7.2 No Action

Adverse Effects

The no action is anticipated to continue to have fish vulnerable to the effects of coastal flood risk and damages. Changes in water quality (e.g. salinity and DO) and flow patterns could disrupt fish use and cause a shift in plankton and benthic communities which are food sources for fish species. Fish species could be impacted by ocean acidification which is anticipated to continue with RSLC projections. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Fish and benthic disturbances, displacement, and in severe cases casualties could occur, as could removal of associated habitat for foraging and shelter. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study of 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.2.7.3 Action Alternative

Adverse Effects

While fish are not present within the project site due to a lack of sustaining habitat (permanent saturation), small fish are potentially present in the adjacent tidal channel, and as construction would include the creation of a tidal channel network within the site from that existing channel, fish would be able to access additional portions of the site from the convergence. During construction direct impacts would occur to the adjacent channel in the process of expanding the tidal channel network into the site, and as such areas of fish habitat would be removed, or introduce limited access to those area temporarily. Direct adverse effects from construction may cause temporary displacement, noise, vibrations, sediment resuspension, and disturbances that would make existing habitat temporarily unusable. Fish are expected to move to areas of nearby suitable habitat and avoid active construction, returning once construction is complete. Indirect effects may cause foraging/food sources to be disturbed and/or removed temporarily but are anticipated to return in frequency and abundance following construction. The transition of non-native habitat to native habitat would be more suitable for fish, but may temporarily deter fish while the wetland is re-established to fully functioning habitat. Measures and best management practices to reduce potential impacts to fish may be considered on an as needed basis, if necessary. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to fish. 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 fish that would be present and venture to access the inner network of the wetland. Maintenance may include non-native plant management, such as herbicide application and removal which could temporarily disturb fish, but would be negligible given that species present are likely highly adaptable to urban environments of the New York City Metropolitan Area. Any operations and maintenance activities, including herbicide applicable, will be done under Best Management Practices, and with the appropriate Federal and/or State permit and regulations. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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 fish, providing additional areas to forage and shelter. With the conversion to native habitat, the wetland would be better quality habitat for fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing fire risk that can have indirect effects to fish, such as fire damage and storm damage related pollution into waters frequented by fish. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +3.

3.2.8 Essential Fish Habitat and EFH-Designated Species Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

	Adverse Effects	Beneficial Effects		ACTION

Essential Fish Habitat and EFH-Designated Species Qualitative Rating	No Action	Action	No Action	Action	NO ACTION TOTAL SCORE[1]	TOTAL SCORE[2]
Construction/Footprint	-1	-1	0	+3	-1	+2
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*3*	*-1*	*+2*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+2**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.3 SPECIAL STATUS AREAS

3.3.1 Wetlands

Wetlands are defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are transitional areas between open water and dry land and are often found along bays, lakes, rivers, and streams (USACE 2022). Executive Order 11990, Protection of Wetlands, states that Federal agencies must avoid undertaking or providing assistance for new construction in wetlands unless there is no practical alternative to such construction and the proposed action includes all practicable measures to minimize harm to the wetland. Wetlands are essential for maintaining biodiversity, mitigating flooding, and protecting water quality. The DEC ensures that wetlands are appropriately classified and regulated to support ecological and community resilience (NYSDEC 2025). Jurisdictional criteria for protection of state wetlands are that the wetland must have an area of 12.4 acres in size or greater (until January 2028 when the threshold will be reduced to 7.4 acres), meet any of the 11 Unusual Importance criteria, and regulated 100-foot buffers to adjacent areas to ensure functions and benefits of wetlands are preserved (NYSDEC 2025).

The USFWS maintains Federally listed wetlands records on the National Wetlands Inventory Mapper online database and New York State maintains State-listed wetlands records on the NYSDEC Environmental Resource Mapper. Federal and/or State wetland code classifications include, but are not limited to, those listed in parathesis below (e.g. PFO1R). Note: there is no attempt to define the limits of proprietary jurisdiction of any federal, state, or local government, or to establish the geographical scope of the regulatory programs of government agencies.

3.3.1.1 Existing Conditions

The USFWS National Wetlands Inventory Mapper online database classifies the entire Actionable Element Site as estuarine and marine wetland habitat (E2EM5P):

Classification Code	Definition
Estuarine (E)	The Estuarine System consists of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly

	obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines, there is appreciable dilution of sea water. Offshore areas with typical estuarine plants and animals, such as red mangroves (Rhizophora mangle) and eastern oysters (Crassostrea virginica), are also included in the Estuarine System.
Intertidal (2)	The substrate in these habitats is flooded and exposed by tides; includes the associated splash zone.
Emergent (EM)	Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.
Phragmites australis (5)	Large perennial grass found in wetlands throughout temperate and tropical regions of the world. It is characterized by its towering height of up to four meters (about 14 feet) and its stiff wide leaves and hollow stem. Its feathery and drooping inflorescences (clusters of tiny flowers) are purplish when flowering and turn whitish, grayish or brownish in fruit.
Irregularly Flooded (P)	Tides flood the substrate less often than daily.

Source: USFWS National Wetlands Inventory Mapper, 2025 (USFWS 2025)

Figure 7. Federally Listed Wetlands

The New York State Environmental Resource Mapper online database lists a portion of the area as freshwater emergent wetland, with the identification code of NA-10, Class 1; which is a wetland of Unusual Importance for meeting one or more of the Wetlands of Unusual Importance criteria (e.g. Class 1, defined at https://dec.ny.gov/nature/waterbodies/wetlands/freshwater-wetlands-program).

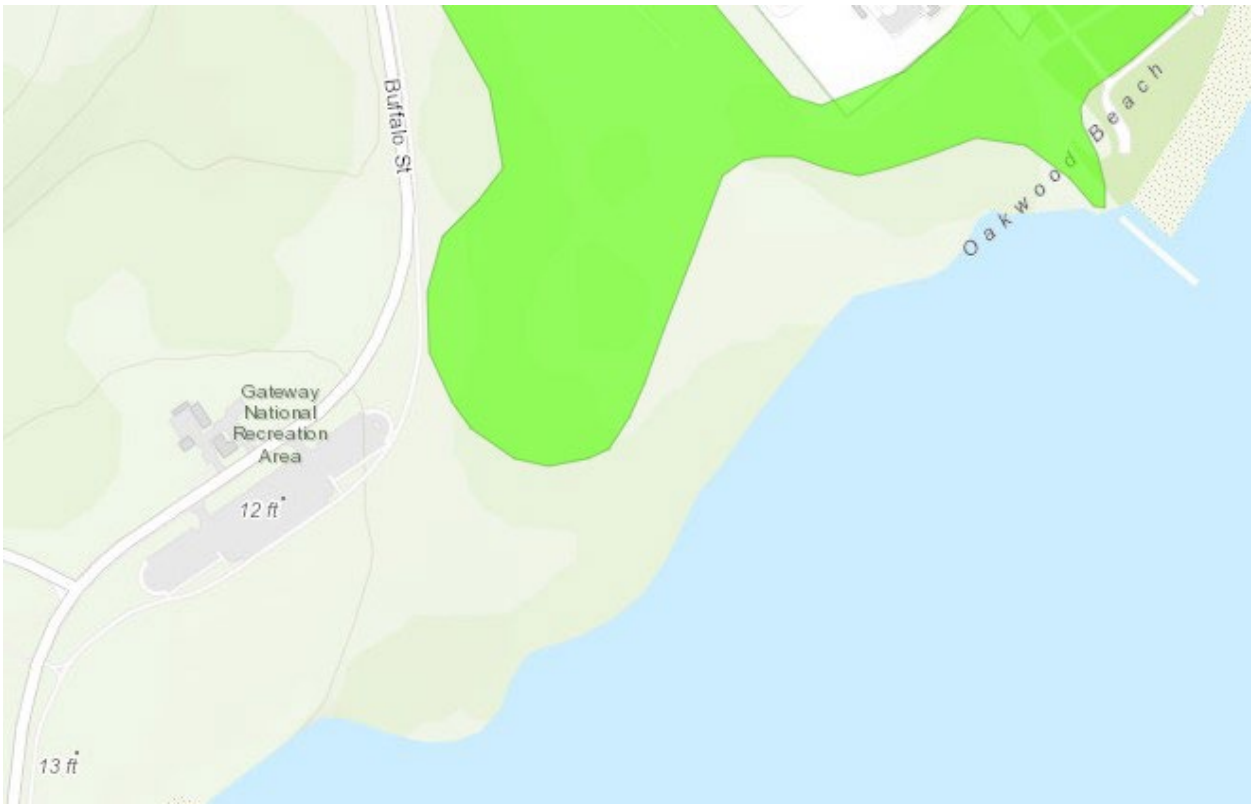

Figure 8. State Listed Wetlands

Overtime, urban development, erosion, floods, coastal storms, and the introduction of invasive common reed (Phragmites australis) degraded the pre-existing salt marsh and sand dunes of this approximate 39-acre area. Based on a vegetation survey completed in 2016, the site is comprised of limited vegetative communities of low salt marsh, coastal shoals, bars, and mudflats, vegetated coastal shoals, bars, and mudflats, salt panne, maritime shrubland, maritime beach and maritime dune, and successional maritime shrubland/forest; and dominated by common reed/non-native-dominated areas (22.38-acres of the approximate 39-acre area). Acreage of each community type is presented in the following table:

Existing 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**

Refer to Terrestrial Vegetation for a figure showing the locations and acreage of these communities.

3.3.1.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Continued wetland loss, including size and type to RSLC, as well as degradation due to water quality, erosion, and stormwater-related pollution would continue, and depending on scenario would vary in severity. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.3.1.3 Action Alternative

The Habitat Restoration Plan developed for the City of New York Department of Environmental Protection for the Oakwood Beach Actionable Element Site includes a quantification of Proposed Enhanced and Created Natural Communities following the removal of the non-native Phragmites as follows:

Proposed Vegetative Community	Acreage (total, non-contiguous)
Low Salt Marsh	11.5
High Salt Marsh	4.5
Maritime Grassland	4.5
Maritime Dune	5.5
Maritime Shrubland	3
Maritime Woodland	1
Total Vegetative Community Acreage Created	**30**

Source: (Hazen and Sawyer 2018)

Adverse Effects

Direct impacts during construction would result in complete removal of non-native phragmites, which largely dominants the site, and replace with native wetland plants including Spartina to redevelop the low salt marsh of the wetland behind a restored dune. This would result in temporary removal of habitat during construction. Re-establishment of the wetland may also include the removal of native species that are intermixed with the phragmites, in order to develop the tidal channel network, low salt marsh, and dune proposed. Large trees throughout the site may be left in place, or removed and replaced in kind, or better, depending on their size and ability to thrive in the restored wetland bounds. Any vegetation or tree removal will be done in accordance with best management practices, as well as Federal and State regulations for removal and replacement. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to terrestrial vegetation, as the site would continue to be monitored for establishment of the native habitat, to prevent the

return of non-native habitat, preserving the quality of terrestrial 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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

During future Study phases, including preconstruction, engineering, and design phase of this Actionable Element Site, USACE will engage with the National Park Service, USFWS, and NOAA-NMFS on refining the designs for this CSRM-focused complimentary NBS.

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. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing 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. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, as well as a State and Federally listed wetland, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, this effects category is representative as high benefit, with a corresponding score of +5.

3.3.2 Wetlands Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Wetlands Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+5	-1	+4
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+5*	*-1*	*+4*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+4**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.3.3 Floodplains

The Federal Emergency Management Agency (FEMA) provides an online public source for flood hazard information. The FEMA maintains and updates data through the Flood Insurance Rate Map and risk assessments, utilizing data statistics for river flow, storm tides, hydrologic/hydraulic analyses, rainfall, and topographic surveys. The FEMA online Flood Mapper is found at https://msc.fema.gov/portal/home (FEMA 2022).

Executive Order 11988 Floodplain Management was issued in 1977 to ensure Federal Agencies "assert leadership in reducing flood losses and losses to environmental values served by floodplains; avoid actions located in or adversely affecting floodplains unless there is no practicable alternative; take action to mitigate loses if avoidance is not practicable;" and to establish "a process for flood hazard evaluation based upon the 1% floodplain base flood standard of the National Flood Insurant Program (NFIP). It also direct[s] Federal agencies to issue implementing procedures; provide[s] a consultation mechanism for developing the implementing procedures; and provide[s] oversight mechanism" (FEMA 2021). FEMA's implementing guidelines for Executive Order 11988 utilizes an eight-step process for identifying and assessing impacts to floodplains. Refer to Chapter 8 for more information regarding how the NYNJHAT Study is implementing the eight-step process (Engineering Regulation 1165-2-26). For context in the following Sections, an area with 1% chance of annual flood (Zone AE) is known as the "100-year floodplain" or "base floodplain", and an area with 0.2% chance of annual flood (Zone X, where shaded on the FEMA Fire Insurance Rate Map) is known as the "500-year floodplain". Any area that is outside the 0.2% floodplain is also referred to as Zone X, or Zone C, but are unshaded on The FEMA Fire Insurance Rate Map.

3.3.3.1 Existing Conditions

The Actionable Element site is entirely within the Zone AE, an area with 1% chance of annual flood, or the "100-year floodplain", identified on the FEMA FIRM panel 3604970336F, effective September 5, 2007.

Figure 9. Federal floodplains

3.3.3.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. The floodplain could increase in size and encroach on surrounding areas relevant to erosion and flood damages altering topographic gradients, and compounded by RSCL. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.3.3.3 Action Alternative

Adverse Effects

Direct impacts of construction would result in alterations to the existing topographic gradients to place a network of tidal channels with low and high marsh areas for wetland enhancement; however, these effects would be temporary and negligible. Through the re-establishment of the wetland, removal of non-native phragmites and

replacement with native habitat, the floodplain would be unchanged from its intended purposes or boundaries. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to the floodplain, as the site would be monitored for wetland establishment. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing 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. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, as well as a State and Federally listed wetland, and Federal floodplain, the benefits of this project would be of regional significance to multiple resources and communities throughout the area Therefore, this effects category is representative as high benefit, with a corresponding score of +5.

3.3.4 Floodplains Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Floodplains Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	0	0	0	+5	0	+5
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*+5*	*0*	*+5*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**+5**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.3.5 Wild and Scenic Rivers

Wild and Scenic Rivers Act was enacted by the U.S Congress in 1968 to preserve and protect certain rivers with scenic, natural, cultural, and recreational values for the enjoyment of present and future generations (Public Law

90-542; 16 U.S.C. 1271 et seq.). New York has approximately 73.4 miles out of approximately 51,790 miles of river designated as wild and scenic (NWSRS 2022).

Wild and Scenic Rivers was a resource that was reviewed and assessed in the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS due to the size of the Study Area. During review, it was determined that no Wild and Scenic Rivers were present within the Study Area. As this report is an interim response to the Comprehensive Plan, the same resources were reviewed for applicability to the Actionable Elements Interim Response sites and determined to not apply to this specific Actionable Element Site. Therefore, an effects analysis is not applicable.

3.3.6 Designated Critical Habitat

Designated Critical Habitat is defined as habitat needed to support the recovery of threatened and endangered listed species under the ESA. Although an area may be designated as Critical Habitat, that does not necessarily also designate that area as a Critical Environmental Area, Marine Protected Area, Wildlife Refuge, wilderness reserve, preservation, or other conservation area (NOAA Fisheries 2022).

Designated Critical Habitat was a resource that was reviewed and assessed in the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS. As reported, no USFWS Designated Critical Habitat; however, NOAA ESA Critical Habitat is present within the Study area of Atlantic Sturgeon. As this report is an interim response to the Comprehensive Plan, the same resources were reviewed for applicability to the AE Interim Response sites and determined to not apply to this specific Actionable Element site. No Designated Critical Habitat is present within this Actionable Element Site. Therefore, an effects analysis is not applicable.

3.3.7 Critical Environmental Areas (State)

A State designated Critical Environmental Area (CEA) is defined by NJDEP (known as Critical Environmental Sites in New Jersey) as a habitat critical to threatened, endangered or other rare wildlife, and by NYSDEC under 6 NYCRR 617.14(g) as:

"a geographic location within exceptional or unique character with respect to one or more of the following:

1. A benefit or threat to human life;
2. A natural setting such as fish and wildlife habitat, forest and vegetation, open space, and areas of important aesthetic or scenic quality;
3. Agricultural, social, cultural, historic, archaeological, recreational, or educational values; or,
4. An inherent ecological, geological, or hydrological sensitivity that may be adversely affected by any change."

Critical Environmental Areas (State) was a resource that was reviewed and assessed in the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS. As reported, no USFWS Designated Critical Habitat is present within the Study Area; however, NOAA ESA Critical Habitat is present within the Study Area for Atlantic Sturgeon. As this report is an interim response to the Comprehensive Plan, the same resources were reviewed for applicability to the Actionable Element Interim Response sites and determined to not apply to this specific Actionable Element site. No Critical Environmental Areas (State) is present within this Actionable Element Site. Therefore, an effects analysis is not applicable. It should be noted, however, that there is an adjacent regulatory tidal wetland that will be avoided, and have no effect.

3.3.8 Marine Protected Areas

Marine Protected Areas (MPA) are defined as "a place in our ocean, estuaries, or Great Lakes where human activities are managed to protect important natural or cultural resources" (NOAA 2020). Depending on the type

of MPA, depends on the level of protection to that area; for example, a marine reserve (also known as a "no take" is the most protective type of MPA in which removing or destroying natural or cultural resources is prohibited (NOAA 2020). NOAA maintains an online publicly available mapper of U.S. MPA boundaries and additional information, on the NOAA MPA Center website:

https://marineprotectedareas.noaa.gov/dataanalysis/mpainventory/mpaviewer/

MPA's are designated to conserve important places in oceans, help sustain ocean health and the social and economic uses that depend on it, strengthen protection and resilience. A MPA network is a connected group of MPAs that operate cooperatively to fulfill biodiversity goals and objectives more effectively than an individual site. Ecological Networks Integrating ecological connectivity and representativeness into the design and management of MPA networks can enhance conservation outcomes. Adaptive design of MPA networks can provide corridors for shifting species and habitats, and promotes resilience to relative sea level rise and other impacts (NOAA 2020).

3.3.8.1 Existing Conditions

There are four Marine Protected Areas within the Lower Bay Region discussed in the September 2022 Draft Integrated FR/Tier 1 EIS, two of which are identified as portions of the Gateway National Recreation Area at Sandy Hook, New Jersey and along the south shore of Staten Island. The NPS manages these MPAs with a primary conservation focus on natural heritage. Commercial and recreational fishing is restricted. The other two Marine Protected Areas are not located near this Actionable Element site. The Marine Protected Area along the south shore of Staten Island extends from Great Kills Harbor from its southernmost reach where it follows the shoreline north to the Verrazano Narrows Bridge, with two additional "island" areas situated slightly off the shore. This area was established in 1972 and comprised of an area, including land area, that is 109 kilometers squared. This MPA is classified as "Zoned Multiple-Use" for Natural Heritage and Cultural Heritage defined as follows:

Classification	**Definition**
Zoned Multiple-Use	*MPAs that allow some extractive activities throughout the entire site, but that use marine zoning to allocate specific uses to compatible places or times in order to reduce user conflicts and adverse impacts. Examples: Zoned multiple-use MPAs are increasingly common in U.S. waters including some marine sanctuaries (such as Monterey Bay), national parks, national wildlife refuges, and state MPAs.*
Natural Heritage	*MPAs or zones established and managed wholly or in part to sustain, conserve, restore, and understand the protected area's natural biodiversity, populations, communities, habitats, and ecosystems; the ecological and physical processes upon which they depend; and, the ecological services, human uses and values they provide to this and future generations. Examples: Natural Heritage MPAs include most national marine sanctuaries, national parks, national wildlife refuges, and many state MPAs.*
Cultural Heritage	*MPAs or zones established and managed wholly or in part to protect and understand the legacy of physical evidence and intangible attributes of a group or society which is inherited and maintained in the present and bestowed for the benefit of future generations. Examples: Cultural Heritage MPAs include some national marine sanctuaries, national and state parks, and national historic monuments.*
Source: (NOAA 2020)	

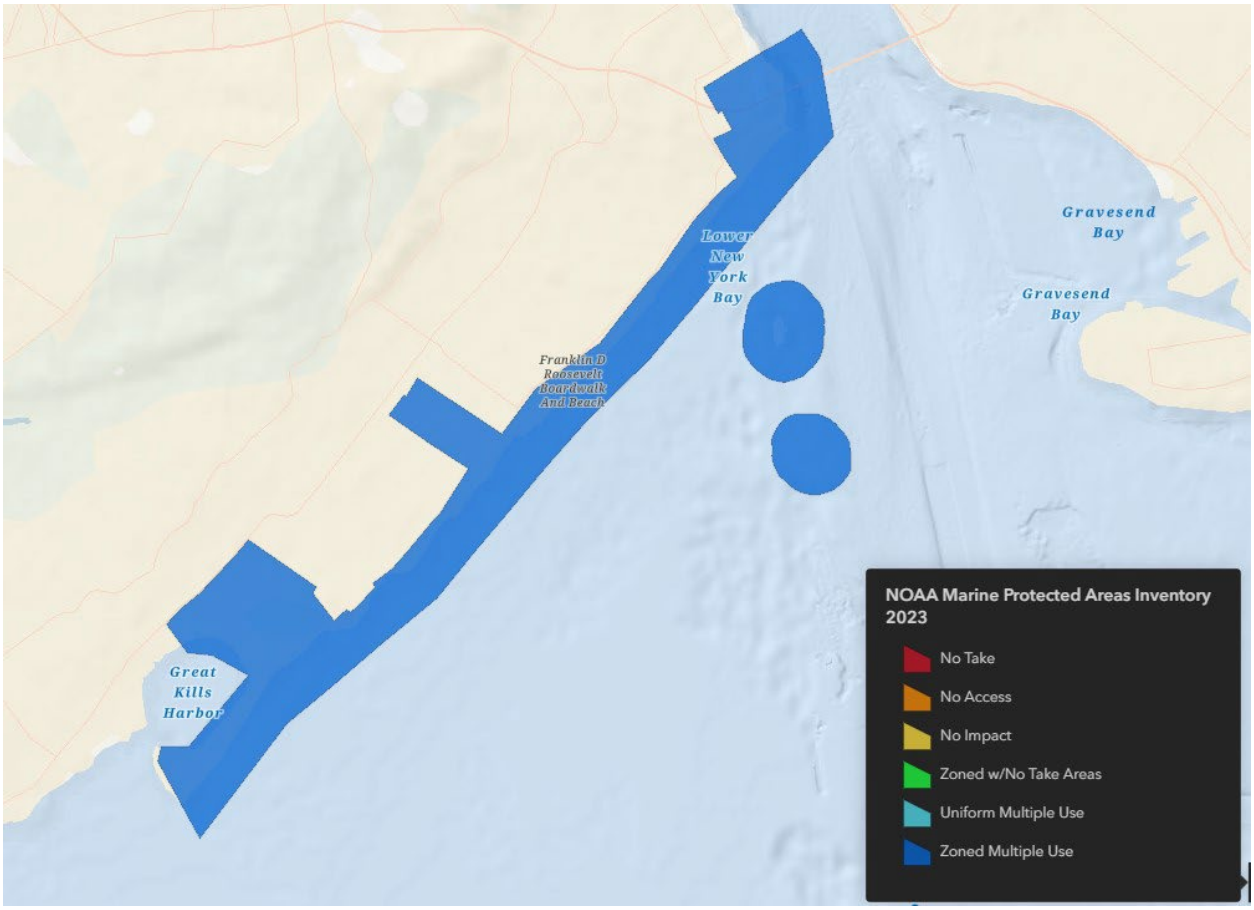

Figure 10. Marine Protected Areas

3.3.8.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. The existing wetland habitat within this MPA may continue to deteriorate and succumb entirely to invasive species as the Phragmites persist. Terrestrial vegetation casualties could occur, as could removal of associated habitat for foraging and shelter for wildlife, as may impacts to the larger NPS Great Kills Park of which this site is a part of, relevant to the MPA. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.3.8.3 Action Alternative

Adverse Effects

The CSRM wetland restoration of Oakwood Beach would be consistent with the intent of the Zoned Multiple Use Marine Protected Area designation of which this Actionable Element Site is located within.

Although no direct adverse effects are anticipated, some indirect adverse effects may be observed temporarily from construction noise. Direct impacts of construction would result in complete removal of non-native phragmites, which largely dominants the site, and replace with native wetland plants including Spartina to redevelop the low salt marsh of the wetland. This would result in temporary removal of habitat during construction. Re-establishment of the wetland may also include the removal of native species that are intermixed with the phragmites, in order to develop the tidal channel network, low salt marsh, and dunes proposed. Large trees throughout the site may be left in place, or removed and replaced in kind, or better, depending on their size and ability to thrive in the restored wetland bounds. Any vegetation or tree removal will be done in accordance with best management practices, as well as Federal and State regulations for removal and replacement. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to the MPA and associated habitat, 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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Benefit to the surrounding Great Kills Park, NPS jurisdiction would be anticipated with this nature-based solution. Increased benefits would be observed from manaing 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. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, this effects category is representative as high benefit, with a corresponding score of +5.

3.3.9 Marine Protected Areas Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Marine Protected Areas Qualitative Rating	Adverse Effects	Beneficial Effects	NO ACTION TOTAL SCORE	ACTION TOTAL SCORE

	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+5	-1	+4
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*3*	*-1*	*+2*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+4**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.3.10 Coastal Zone Management Act Areas

The Coastal Zone Management Act (CZMA) was enacted in 1972 and is administered by the NOAA to manage the Nation's coastal resources, including the Great Lakes (NOAA n.d.). CZMA, as amended, declares a national policy to "preserve, protect, develop, and where possible, to restore or enhance, the resources of the [N]ation's coastal zone" for current and succeeding generations. NOAA maintains federally mapped CZMA boundaries and the NYSDOS Office of Planning and Management maintains New York State mapped CZMA boundaries present within New York State.

New York City also regulates CZMA through the Local Waterfront Revitalization Program (WRP). As excerpted from The New York City Local WRP website (NYSDEC 2016):

The New York City [WRP] refines and supplements the State's Coastal Management Program (CMP) and provides a framework within which critical waterfront issues can be addressed, and waterfront improvement projects implemented.

The New York City WRP serves as a long-term management program for the City's 520 miles of natural, public, redeveloping and working waterfronts, and waterways in between. The program identifies specific projects needed to revitalize the waterfront. As a result, the NYS Department of State will improve its ability to work with the City to protect and revitalize the working waterfront, and protect habitat, natural resources, and water quality.

For additional information, refer to the CZMA Subappendix.

3.3.10.1 Existing Conditions

The entire coastline of the south shore of Staten Island is designated a Federal CZMA boundary. The New York State CZMA boundary extends from the Upper Bay/Arthur Kill Region boundary along the eastern shoreline of Staten Island to the south passing by Ocean Breeze Park, Miller Field, and Great Kills Park before turning west through Oakwood Heights Station (NYSDOS 2022). The New York State CZMA boundary extends from the Upper Bay/Arthur Kill Region boundary along the eastern shoreline of Staten Island to the south passing by Ocean Breeze Park, Miller Field, and Great Kills Park before turning west through Oakwood Heights Station (NYSDOS 2022).

The NYC WRP boundary encompasses much of Richmond County, Staten Island, including the South Shore of Staten Island with the exception of Federal Property, on which this Site is located.

3.3.10.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Continued erosion, habitat degradation, RSLC and flood encroachment on surrounding neighborhoods and facilities, and terrestrial vegetation casualties could occur, as could removal of associated habitat for foraging and shelter for wildlife. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of erosion, RSLC, and persistent wildfires every dry season would persist, and vary in severity with each outbreak. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.3.10.3 Action Alternative

Adverse Effects

To determine the Action's consistency with the policies of the NYS Coastal Management Plan (NYSCMP, as well as New York City's WRP, a Federal Consistency Assessment was completed (CZMA Subappendix). As indicated on the assessment form and supporting documentation, the recommended CSRM-focused wetland enhancement is consistent with federal, state and local coastal zone management policies.

Direct impacts of construction would result in temporary impacts within the CZMA zone through the alteration of topography, bathymetry and vegetative communities at the Site. Some of the individual active construction effects are not consistent with the NYS/NYC during construction; however, the Actionable Element in itself is consistent with the spirit and intent of the CZMA to "preserve, protect, develop and where possible, to restore or enhance the resources of the [N]ation's coastal zone." After construction and enhancement of the CSRM-focused wetland, the project fulfills the two programs objectives in the long-term. The project would result in the complete removal of non-native phragmites, which largely dominants the site, and replace with native wetland plants including Spartina to redevelop the low salt marsh of the wetland. This would result in temporary removal of habitat during construction. Re-establishment of the wetland may also include the removal of native species that are intermixed with the phragmites, in order to develop the tidal channel network, low salt marsh, and dunes proposed. Large trees throughout the site may be left in place, or removed and replaced in kind, or better, depending on their size and ability to thrive in the restored wetland bounds. Any vegetation or tree removal will be done in accordance with best management practices, as well as Federal and State regulations for removal and replacement.

No direct or indirect adverse effects from operation and maintenance of the Site are anticipated to CZMA, 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 coastal wetland 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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Once constructed, measures would provide a managed risk to New York's coastal zone at this Actionable Element Site, particularly during large storm events, as well as delay the effects of flood and erosion damages associated with, and potential compounded overtime by, RSLC.

Increased benefits would be observed from managing 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. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +3.

3.3.11 Coastal Zone Management Act Areas Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Coastal Zone Management Act Areas Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE	ACTION TOTAL SCORE
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+1	-1	0
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+1*	*-1*	*0*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**0**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.3.12 Coastal Barrier Resources Act Areas

The Coastal Barrier Resources Act (CBRA) was enacted in 1982 to prohibit most Federal expenditures and financial assistance within CBRA designated areas, and to encourage the conservation of storm-prone and dynamic coastal barriers that have historically been subsidized for development on coastal barriers, resulting in the loss of natural resources, threats to human life, health, and property, and the expenditure of millions of tax dollars each year (USFWS n.d.). Approximately 1.4 million acres of land encompass the 588 System Units and 2.1 million acres of land encompass 282 Otherwise Protected Areas designated under CBRA throughout the United States and associated territories along the Atlantic, Gulf of Mexico, Great Lakes, U.S. Virgin Islands, and Puerto Rico coasts, including associated aquatic habitats (USFWS n.d.). CBRA established the John H. Chafee Coastal Barrier Resources System (CBRS) which defines CBRA System Units and Otherwise Protected Areas.

A CBRA System Unit is primarily comprised of privately owned areas, or area held for conservation and/or recreation. Most Federal expenditures and financial assistance, including Federal flood insurance, are prohibited within System Units unless the action is covered under an exemption (USFWS n.d.). Exceptions to the CBRA System Unit restrictions include General Exception 16 U.S.C. §3505(a)(2) (maintenance or construction of improvements of existing federal navigation channels), and specific exceptions 16 U.S.C. §3505(a)(6)(A) (projects for the study, management, protection, and enhancement of fish and wildlife resources and habitats) and 16 U.S.C. §3505(a)(6)(G) (nonstructural projects for shoreline stabilization). A CBRA Otherwise Protected Area is a category of coastal barriers that is primarily protected for conservation and/or recreation. Otherwise Protected Areas contain a “P” at the end of the unit number. The only Federal spending prohibited in Otherwise Protected Areas is related to Federal flood insurance (USFWS n.d.).

The USFWS maintains an online mapping tool for official (and proposed draft) maps of CBRS Units and Otherwise Protected Areas: https://www.fws.gov/program/coastal-barrier-resources-act/maps-and-data. Refer to the Draft Integrated FR/Tier 1 (Programmatic) EIS for more information.

Coastal Barrier Resources Act Areas was a resource that was reviewed and assessed in the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS due to the size of the Study Area. As this report is an interim response to the Comprehensive Plan, the same resources were reviewed for applicability to this Actionable Element Site. While four Coastal Barrier Resources Act System Units and six Otherwise Protected Areas were identified within the Lower Bay Region of the NYNJHAT Study Comprehensive Plan, no System Units or Otherwise Protected Areas were identified at this specific Actionable Element site (USFWS 2025). Therefore, an effects analysis is not applicable.

3.3.13 National Park Service Land

3.3.13.1 Existing Conditions

The Actionable Element Site is located within Great Kills Park, part of the Staten Island Unit of the National Park Service’s (NPS) Gateway National Recreation Area (GNRA). This unit is designated as a National Heritage Area (NHA), a classification established by the U.S. Congress to recognize regions where natural, cultural, and historic resources collectively form cohesive and nationally significant landscapes (NPS 2019). Unlike national parks, NHAs encompass large, inhabited landscapes. For additional details, refer to the Cultural Resource Subappendix.

The Staten Island Unit of GNRA includes Great Kills Park, Miller Field, Fort Wadsworth, and Fort Hancock (NPS 2018). The GNRA preserves significant estuarine and freshwater forested/shrub wetland habitats (USFWS 2018). In addition to its ecological and cultural significance, the GNRA General Management Plan identifies “fundamental resources and values” as essential to the park's identity. These include critical features, ecological systems, natural processes, visitor experiences, interpretive themes, visual and acoustic environments, and

recreational opportunities that are vital to fulfilling the park's purpose and maintaining its national significance (NPS 2014).

3.3.13.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. The existing wetland habitat within this NHA, and MPA, may continue to deteriorate and succumb entirely to invasive species as the Phragmites persist. Terrestrial vegetation casualties could occur, as could removal of associated habitat for foraging and shelter for wildlife, as may impacts to the larger NPS Great Kills Park of which this site is a part of, relevant to the MPA. Under this scenario, no measures would be implemented to address future flood risks. As a result, this alternative would leave existing aesthetic, visual, historical, and cultural resources vulnerable to damage. Archaeological sites within the study area face the risk of deterioration or destruction from coastal flooding and sea-level rise. Additionally, submerged cultural resources may be affected by underwater storm activity and alterations in seawater flow patterns associated with flooding and rising sea levels. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0. No beneficial effects of no action to cultural resources are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding Impact Score of 0.

3.3.13.3 Action Alternative

Adverse Effects

The CSRM wetland restoration of Oakwood Beach would be consistent with the intent of the Zoned Multiple Use Marine Protected Area designation of which this Actionable Element Site is located within. MPA's are designated to conserve important places in oceans, help sustain ocean health and the social and economic uses that depend on it, strengthen protection and resilience. A MPA network is a connected group of MPAs that operate cooperatively to fulfill biodiversity goals and objectives more effectively than an individual site. Ecological Networks Integrating ecological connectivity and representativeness into the design and management of MPA networks can enhance conservation outcomes. Adaptive design of MPA networks can provide corridors for shifting species and habitats, and promotes resilience to relative sea level rise and other impacts (NOAA 2025).

Although no direct adverse effects are anticipated, some indirect adverse effects may be observed temporarily from construction noise. Direct impacts of construction would result in complete removal of non-native phragmites, which largely dominants the site, and replace with native wetland plants including Spartina to redevelop the low salt marsh of the wetland. This would result in temporary removal of habitat during construction. Re-establishment of the wetland may also include the removal of native species that are intermixed with the phragmites, in order to develop the tidal channel network, low salt marsh, and dunes proposed. Large trees throughout the site may be left in place, or removed and replaced in kind or better, depending on their size and ability to thrive in the restored wetland bounds. Any vegetation or tree removal will be done in accordance

with best management practices, as well as Federal and State regulations for removal and replacement. The construction period and spatial location of the construction would have little to no impact on visitor experience. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to cultural resources or the MPA and associated habitat, 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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

It must be noted that for any measure to be constructed within NPS Land, mutual acceptability between the Department of Interior and the Department of Army is required. The GATE enabling legislation (Public Law 92592, 1972) states: “The authority of the Secretary of the Army to undertake or contribute to water resource developments, including shore erosion control, beach protection, and navigation improvements (including the deepening of the shipping channel from the Atlantic Ocean to the New York harbor) on land and/or waters within the recreation area shall be exercised in accordance with plans which are mutually acceptable to the Secretary of the Interior and the Secretary of the Army and which are consistent with both the purpose of this subchapter and the purpose of existing statutes dealing with water and related land resource development.” A mutually acceptable plan must meet USACE project objectives, minimize impacts to NPS cultural, natural and recreational resources, and mitigate for all unavoidable impacts to NPS resources.

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. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. Additionally, the removal of non-native invasive species will improve the interpretive integrity of the site and support the area's role as a natural defense system, benefiting the larger NYNJHAT Study area and adjacent South Shore and Great Kills Park. These landscape-scale improvements provide lasting scenic, educational, and ecological value that reinforce the cultural identity of the region. The restoration efforts would yield moderate beneficial impacts to cultural resources, particularly in the form of landscape restoration that enhances the cultural viewshed and reestablishes the ecological and visual character of the shoreline. The creation of a vegetative mosaic with native plants, the reintroduction of tidal channels, and dune restoration will help restore a historically and environmentally significant shoreline buffer. These improvements align with long-term resilience and sustainability goals and reflect traditional environmental knowledge systems tied to Indigenous and early land use patterns. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Benefit to the surrounding Great Kills Park, NPS jurisdiction would be anticipated with this nature-based solution. Increased benefits would be observed from managing 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. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, as well as a State and Federally listed wetland, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, this effects category is representative as high benefit, with a corresponding score of +5.

3.3.14 National Park Service Land Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

National Park Service Land Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE	ACTION TOTAL SCORE
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+5	-1	+4
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+5*	*-1*	*+4*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+4**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

3.3.15 Wildlife Refuge Land

Wildlife Refuge Land was a resource that was reviewed and assessed in the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS due to the size of the Study Area. One wildlife refuge was identified in the Lower Bay Region, identified as the William T. Davis Wildlife Refuge in east Staten Island. As this report is an interim response to the Comprehensive Plan, the same resources were reviewed for applicability to the Actionable Elements Sites. No wildlife refuge land was identified in the vicinity of this Actionable Element Site. Therefore, an effects analysis is not applicable.

3.3.16 Commercial and Recreational Fishing

Commercial fishing in New York State is an important staple of New York's culture and economy, for many target species including summer flounder, scup, black sea bass, striped bass, bluefish, spiny dogfish, horseshoe crab, menhaden, lobster, and whelk (NYSDEC 2022).

Recreational fishing areas in New York State and New York City are also abundant for a wide variety of fish species including freshwater trout, black bass, northern pike, pickerel, walleye, crappie, yellow perch, sunfish, and saltwater striped bass, American eel, hickory shad, American shad, river herring (alewife and blueback herring north of the George Washington Bridge), yellowtail founder, winter flounder, crab, lobster, shellfish, and whelk (NYSDEC 2022).

Commercial and Recreational Fishing was a resource that was reviewed and assessed in the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS due to the size of the Study Area. As this report is an interim response to the Comprehensive Plan, the same resources were reviewed for applicability to the Actionable Element Sites. Commercial and Recreational Fishing was determined to not apply to this specific Actionable

Element Site, as the Site is within a Marine Protected Area where commercial and recreational fishing are prohibited. Therefore, an effects analysis is not applicable.

4 PHYSICAL ENVIRONMENT

The Physical Environment includes a discussion of topography, surface waters, water quality, land use, cultural resources, hazardous, toxic, and radioactive waste, navigation, noise, socioeconomics and demographics, and other relevant environmental and human resources within Planning Region not listed under the Natural Environment. Relevant data from recent USACE reports within the Study Area were incorporated, and other available data sources supplemented this assessment. Additional information on existing conditions within the Planning Region, can be found in the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS. As this Actionable Element Site is located adjacent to the "South Shore of Staten Island (SSSI)" USACE project and the New York Department of Environmental Protection "Mid-Island Bluebelt Drainage Plans", much of the below existing conditions and effects assessment utilizes these projects as sources of readily available information. These documents are listed in the References Section of this Report. Refer to the online NYNJHAT Study StoryMap to explore a few of the publicly available environmental resource data sets and mappers of environmental resources that were considered in preparation of this Integrated Interim Response FR/EA.

4.1 PHYSICAL RESOURCES

The following Sections discuss the physical resources relevant within the Study Area, including the topography and geology, surface water resources, sediment, and land use. Relevant to this discussion, is Table X, which presents the potential erosion control measures that may be implemented to prevent and/or reduce adverse effects, some of which are anticipated to be utilized temporarily during construction activities, while others (such as the coir fiber mats and rip rap) are intended to be permanent site features. This figure also presents the proposed vegetation and tree removal, discussed in the Natural Environment Section of this Appendix.

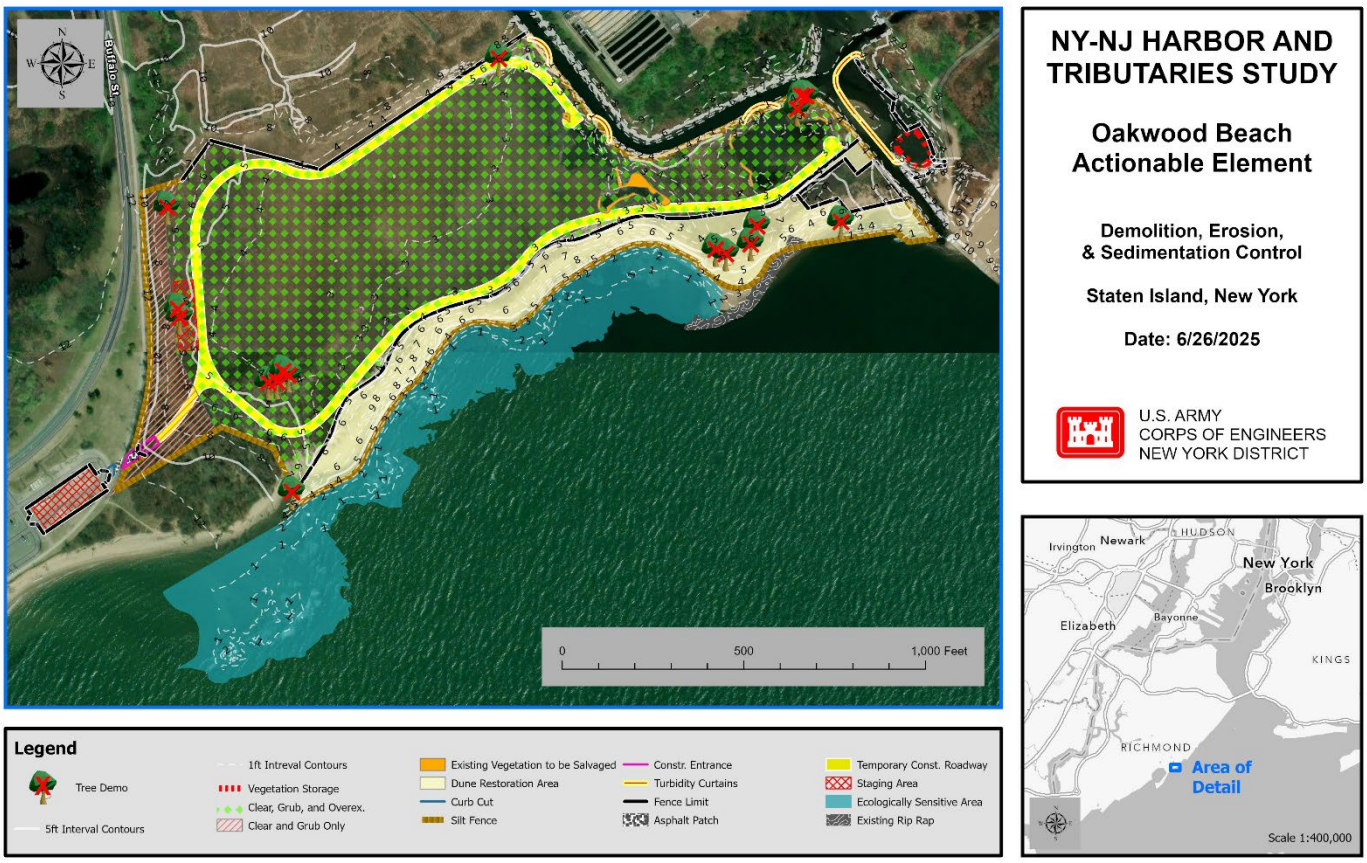

Figure 11. Demolition, Erosion, and Sedimentation Control

4.1.1 Topography and Geology

4.1.1.1 Existing Conditions

The portions of Staten Island within the Lower Bay Planning Region are comprised of igneous, metamorphic, and sedimentary bedrock ranging from Upper Proterozoic to Lower Jurassic age overlain by unconsolidated Upper Cretaceous Raritan Formation or upper Pleistocene Wisconsinan glacial drift deposits. Holocene shore and salt marsh deposits overlying upper Pleistocene deposits are present along the shore and low-lying areas of western Staten Island.

Serpentine bedrock, consisting of greenish ultrabasic crystalline rock and Manhattan Schist are also reported in portions of Staten Island (Ecology and Environment, Inc. 2009). The Actionable Element Site geology is characterized as predominantly flat, with gentle grade slopes (primarily 0-3%) towards the Lower Bay of the New York Bight. Soils are classified as Beaches (Be), Water (W), Barren sand (BaA), Bigapple fine sand (BiA), Fortress sand (FoA), Gravesend and Oldmiss coarse sands (GOB), Hooksan-Dune land complex (HAD), Ipswich-Pawcatuck complex (IPA), Jamaica sand (JaA), Sandyhook muchy fine sand (SaA), and Urban land-Verrazano complex (UVAl) (Hazen and Sawyer 2018).

A topographic survey was completed in 2017 shows the site ranging from its lowest elevation at 0 feet above mean sea level (amsl) up to its highest elevation observed at approximately 13 feet amsl; however, much the site is observed to range between 2-3 feet amsl. Mud flats are present along the shoreline exposed during low tide and saturated during high tide.

4.1.1.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Surficial topographic gradients could be affected by storm and flood related erosion; however, no significant effects are anticipated on the underlying geology. RSLC may flood and fill areas of low salt marsh with accumulated sediments and water, and groundwater could become more susceptible to saltwater intrusion. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.1.3 Action Alternative

Adverse Effects

Direct impacts of construction would result in complete removal of non-native phragmites, which largely dominants the site, and replace with native wetland plants including Spartina to redevelop the low salt marsh of the wetland. Topography gradients would be altered through clearing and grading the site, particularly in areas proposed as tidal channels, low salt marsh (-0.2 to 2.15-feet AMSL), and high salt marsh (2.15-3-feet AMSL). The dune restoration would also raise the topographic gradient from existing condition up to 10-feet AMSL. This would result in temporary removal of habitat during construction, as well as permanent removal of soil and sediments. Additionally, riprap placed between the restored dune and existing Main Tidal Channel would be placed for erosion control in an area that has had substantial erosion evidenced by aerial photographs of the shoreline, as well as the deteriorated wooden seawall structure. Soils excavated will either be reused on site, or removed from site for potential beneficial reuse or placement at an approved appropriate facility authorized to receive such material. Therefore, this effects category is representative as low to moderate adverse effect, with a corresponding score of -2.

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**

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to topography and geology, as the site would continue to be monitored for establishment of the native habitat, with erosion control measures such as riprap and coir mats. 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 have no effect on the topography and geology. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. The dune restoration, riprap placement, and coir mats would support erosion protection, minimizing repair, and the loss of the restored wetland habitat as a result of flood damage and storm surges. Increased benefits would be observed from managing 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 to soil and surface waters. Therefore, this effects category is representative as low to moderate benefit, with a corresponding score of +2.

4.1.2 Topography and Geology Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Topography and Geology Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-2	0	+2	-1	0
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-2*	*0*	*+2*	*-1*	*0*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**0**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.3 Surface Waters

4.1.3.1 Existing Conditions

The Lower Bay portion of the Harbor complex is comprised of extensive shallow flats with scattered areas of deeper waters, including borrow areas and pits. The relatively shallow bottoms exclusive of the navigation channels cover 77% of the total area (38 percent is <15 feet and 39% is 15 – 25 feet deep). Major waterbodies in this area provide a combination of marine and estuarine habitats that support diverse ecological communities and are hydrologically connected to the Upper Bay and Hudson River, Jamaica Bay, and the Atlantic Ocean (USACE 2022).

The Oakwood Beach Actionable Element site is limited in surface water presence onsite, as it is primarily dominated by wetland vegetation. A tidal channel is located along the eastern edge of the Actionable Element project site, that extends from north of the site to the Lower Bay.

4.1.3.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Surface waters can be impacted by severe storms and flooding through erosion effects, surface water runoff, and water quality effects. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak, which can cause water quality effects. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.3.3 Action Alternative

Adverse Effects

Direct impacts of construction would result in an expanded tidal channel network originating from the existing Main Tidal Channel of which would be affected during the creation new hydrologically connected areas that will expand surface waters into the site. The created tidal channel network would comprise, in total, of 1.30-acres, and introduce aquatic habitat for fish, crab, and birds to forage and shelter. Erosion control measures would be installed to protect the newly develop channels including coir fiber mats, riprap, and fencing from both inland and coastal influences.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to surface waters, 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 both terrestrial and aquatic habitat created. Maintenance may include non-native plant management, such as herbicide application and removal, but this would not be anticipated to affect surface water. Existing conditions along the shoreline and in the Lower Bay would be unaffected. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing 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. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +3.

4.1.4 Surface Waters Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Surface Waters Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+3	-1	+2
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+3*	*-1*	*+2*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+2**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.5 Sediment

4.1.5.1 Existing Conditions

The Lower Bay portion of the Harbor complex is comprised of extensive shallow flats with scattered areas of deeper waters, including borrow areas and pits. The relatively shallow bottoms exclusive of the navigation channels cover 77% of the total area (38 percent is <15 feet and 39% is 15 – 25 feet deep). Major waterbodies in this area provide a combination of marine and estuarine habitats that support diverse ecological communities and are hydrologically connected to the Upper Bay and Hudson River, Jamaica Bay, and the Atlantic Ocean (USACE 2022).

The Oakwood Beach Actionable Element site is limited in surface water, and associated sediments, presence onsite, as it is primarily dominated by low value wetland vegetation. A tidal channel located along the eastern edge of the Actionable Element Site extends from north of the site to the Lower Bay where it discharges through and outfall.

4.1.5.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Sediment quality would continue to be affected by stormwater runoff and flood-related pollution, as well as erosion effects within the existing tidal channel and the shoreline. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). Evidence following severe storms in the area such as Hurricane Sandy exhibited erosion, tree-felling, severe flooding, and damages felt by many resources throughout the Study Area. However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak. This could have sediment-quality related effects from fire-derived pollution into surface waters. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.5.3 Action Alternative

Adverse Effects

Direct impacts from construction would result in complete removal of non-native phragmites, which largely dominants the site, and replace with native wetland plants including Spartina to redevelop the low salt and high salt marsh of the wetland. Topographic gradients would be altered through clearing and grading the site, particularly in areas proposed as tidal channels, low salt marsh, and high salt marsh creating new areas of sediment presence and accumulation. This would result in temporary removal of habitat during construction, as well as permanent removal of soil and sediments associated with the connection to the Main Tidal Channel. Soils excavated will either be reused on site, or removed from site for potential beneficial reuse or placement at an approved appropriate facility authorized to receive such material. Erosion control measures, such as turbidity curtains and coir mats may be used to prevent sediment erosion, and reduce sediment resuspension and transport, although turbidity and resuspension concerns would be temporary, as the sediment would settle following active construction and establishment of the tidal channel network.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to sediment quality, 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 terrestrial 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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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. Development of the tidal channel network and tide pools from the existing Main Channel, and low salt marsh would create additional areas of sediment presence at the site. Additionally, riprap placement between the restored dune and existing Main Tidal Channel would provide shoreline stabilization and erosion control in an area that has had substantial erosion evidenced by aerial photographs of the shoreline, as well as the deteriorated wooden seawall structure. With additional sediment presence at the site, so would there be additional areas for benthic flora and fauna to provide foraging grounds for fish and birds. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing 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. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +3.

4.1.6 Sediment Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Sediment Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+3	-1	+2
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*+3*	*-1*	*+2*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+2**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.7 Land Use

4.1.7.1 Existing Conditions

The Oakwood Beach Actionable Element site is an existing, although degraded by non-native invasive Phragmites, estuarine wetland habitat that is part of the NPS Great Kills Park and Marine Protected Area for natural and cultural heritage and associated recreation. The area surrounding this Actionable Element Site includes remaining portions of the NPS Great Kills Park to the west and north, a WRRF to the east, and the Lower Bay to the south. Beyond the Great Kills Park to the north are residential communities.

4.1.7.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Land use would remain the same; however, further degradation of the wetland would be anticipated. During storm conditions, terrestrial vegetation casualties could occur, as could removal of associated low value habitat for foraging and shelter for wildlife. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak, affecting land use and special status protections. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.7.3 Action Alternative

Adverse Effects

No direct adverse effects from construction are anticipated to land use, as the site would continue to have the same land use as preexisting conditions. The quality of land use would change; however, through the removal of non-native phragmites, which largely dominants the site, and replace with native wetland plants including Spartina to redevelop the low salt marsh of the wetland. Indirect effects would result in temporary removal of habitat during construction. Re-establishment of the wetland may also include the removal of native species that are intermixed with the phragmites, in order to develop the tidal channel network, low salt marsh, and dunes proposed. Large trees throughout the site may be left in place, or removed and replaced in kind, or better, depending on their size and ability to thrive in the restored wetland bounds. Any vegetation or tree removal will be done in accordance with best management practices, as well as Federal and State regulations for removal and replacement.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to land use, 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 terrestrial 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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

Land use quality would increase, as 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. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing fire risk that can have direct and indirect effects to the surrounding Oakwood Beach land uses, neighborhoods, wildlife, and fish, such as air quality concerns, smoke, fire damage, and storm damage related pollution. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, as well as a State and Federally listed wetland, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, this effects category is representative as high benefit, with a corresponding score of +5.

4.1.8 Land Use Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Land Use Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	0	0	0	+5	0	+5
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*+3*	*0*	*+3*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**+5**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.9 Bathymetry

4.1.9.1 Existing Conditions

The Lower Bay portion of the Harbor complex is comprised of extensive shallow flats with scattered areas of deeper waters, including borrow areas and pits. The relatively shallow bottoms exclusive of the navigation

channels further out in the Bay cover 77% of the total area (38 percent is <15 feet and 39% is 15 – 25 feet deep). Major waterbodies in this area provide a combination of marine and estuarine habitats that support diverse ecological communities and are hydrologically connected to the Upper Bay and Hudson River, Jamaica Bay, and the Atlantic Ocean (USACE 2022).

The Oakwood Beach Actionable Element site is limited in surface water presence onsite, as it is primarily dominated by a wetland vegetation. A tidal channel is located along the eastern edge of the Actionable Element project site, that extends from north of the site to an outfall to the Lower Bay. The bathymetry of the existing Main Tidal Channel is relatively shallow, anticipated to be approximately 0-2 feet below mean sea level. To the adjacent south of the Actionable Element site, bathymetry of the shoreline, comprising of mudflats, ranges in elevations of 0 to 2-feet above mean sea level nearshore that is exposed periodically daily dependent on the tide, and further descends in depth to the south into the Lower Bay.

4.1.9.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Shallow bathymetry could change from erosion as has been observed through Aerial photographs along the shoreline, and even more so with high flood events. Deeper bedrock is not anticipated to have any adverse effect. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have negligible adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). Therefore, this effects category is representative as negligible impact, with a corresponding score of 0.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.9.3 Action Alternative

Adverse Effects

Direct impacts of construction would result in an expanded tidal channel network originating from the existing Main Tidal Channel of which would be affected during the creation new areas of bathymetric value ranging 0 to 2-feet below mean sea level. The created tidal channel network would comprise, in total, of 1.30-acres. Erosion control measures would be installed to protect the newly develop channels including coir fiber mats, riprap, and fencing. Therefore, this effects category is representative of low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to bathymetry, 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 both terrestrial and aquatic habitat created. Maintenance may include non-native plant management, such as herbicide application and removal, but this would not be anticipated to affect bathymetric values. Existing conditions along the shoreline would be unaffected. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

The proposed project would remove non-native phragmites of which fill and degrade wetlands, 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. 1.30-acres of newly created tidal channels would expand the available bathymetry at the site, introducing additional opportunity for benthic resources and fish access into the site. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. The restored dune would serve to reduce wave attack effects on the protect side. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +2.

4.1.10 Bathymetry Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Bathymetry Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	0	-1	0	+2	0	+1
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*-1*	*0*	*+2*	*0*	*+1*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**+1**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.11 Inland Hydrology

4.1.11.1 Existing Conditions

Topographic gradients generally dictate surficial and shallow groundwater flow patterns, where hydrogeologic gradients typically follow, under normal ambient conditions, towards the nearest major body of water (e.g. Lower Bay or Atlantic Ocean); however, inland hydrology of urban environments are heavily influenced by impervious surfaces, stormwater runoff, drains and discharge points, CSO, WRRF discharges, culverts, drainage basins, retention ponds, navigation channelization, groundwater use, and other human-influenced hydrological

alternations.

The Oakwood Beach Actionable Element site is limited in surface water presence onsite, as it is primarily dominated by non-native invasive wetland vegetation. A tidal channel is located along the eastern edge of the Site, that extends from north of the site to an outfall that discharges to the Lower Bay to the adjacent south.

4.1.11.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of inland and coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Inland hydrological influences such as surficial runoff, stormwater discharges, WRRF effluent, etc. could affect, or accelerate, erosion overtime, and even more so with high flood events; however, these would remain unchanged from existing conditions. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have negligible adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). Therefore, this effects category is representative as negligible impact, with a corresponding score of 0.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.11.3 Action Alternative

Adverse Effects

Direct impacts of construction would result in an expanded tidal channel network originating from the existing Main Tidal Channel of which would be affected during the creation new hydrologically connected areas that may observe influences from coastal hydrological functions through the outfall to the Lower Bay that connects the two. The created tidal channel network would comprise, in total, of 1.30-acres, and introduce aquatic habitat for fish, crab, and birds to forage and shelter. Erosion control measures would be installed to protect the newly develop channels including coir fiber mats, riprap, and fencing from both inland and coastal influences.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to coastal hydrology, currents, and circulation, 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 both terrestrial and aquatic habitat created. Maintenance may include non-native plant management, such as herbicide application and removal, but this would not be anticipated to affect bathymetric values. Existing conditions along the shoreline would be unaffected. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

The proposed project would remove non-native phragmites of which fill and degrade wetlands, 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. 1.30-acres of newly created tidal channels would expand the available inland hydrological conditions at the site, introducing additional opportunity for benthic resources and fish access into the site. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and

capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. The restored dune would serve to reduce wave attack effects on the protect side. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +3.

4.1.12 Inland Hydrology Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Inland Hydrology Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	0	-1	0	+3	0	+2
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*-1*	*0*	*+3*	*0*	*+2*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**+2**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.13 Coastal Hydrology, Currents, and Circulation

4.1.13.1 Existing Conditions

Generally, coastal hydrology, currents, and circulation are influenced by the rise and fall of the tides, wind, and thermohaline (water density that is controlled by differences in temperature and salinity) (NOAA 2022). Currents form from tides in oceans, along shorelines, and within coastal bays and estuaries, are referred to as tidal currents and are considered predictable as they form in regular patterns (NOAA 2022). Surface currents driven by wind are typically measured in knots or meters per second. Thermohaline circulation occurs both at the surface and below surface, usually at a slower pace than tidally influenced currents and surface currents, as a function of water density where warmer waters lower in salinity form shallow currents and as those currents cool, they fall below surface forming a deeper and more saline currents (NASA 2022).

The Lower Bay is hydrologically connected, and tidally influenced by the Atlantic Ocean, Arthur Kill, Kill Van Kull, Newark Bay, and Raritan River, referred to as the “Newark Bay Complex”. Circulation patterns within the Newark Bay Complex and throughout the estuary are influenced by winds, freshwater inflow, and gravitational circulation, with strong winds exhibiting a greater effect on circulation (Chant 2007). As noted in

the *Hydrodynamics of the Newark Bay/Kills System*:

> *"[w]ithin the navigation channel of Newark Bay, classic estuarine gravitational circulation occurs, with daily averaged currents (the current averaged over several tidal cycles) directed seaward near the surface and landward near the bottom. The same estuarine circulation pattern occurs in the Kill van Kull and the southern portion of the Arthur Kill. However, in these tidal straights this pattern is not as pronounced during periods with a large range in tidal height (e.g., Spring tides)"* (Chant 2007).

Under typical conditions, wind influenced current patterns tend to flow landward during low freshwater discharge from the Passaic River (Figure 19), while strong winds tend to drive current directions landward (influenced by western winds) or seaward (influenced by eastern winds) as shown on Figure 20.

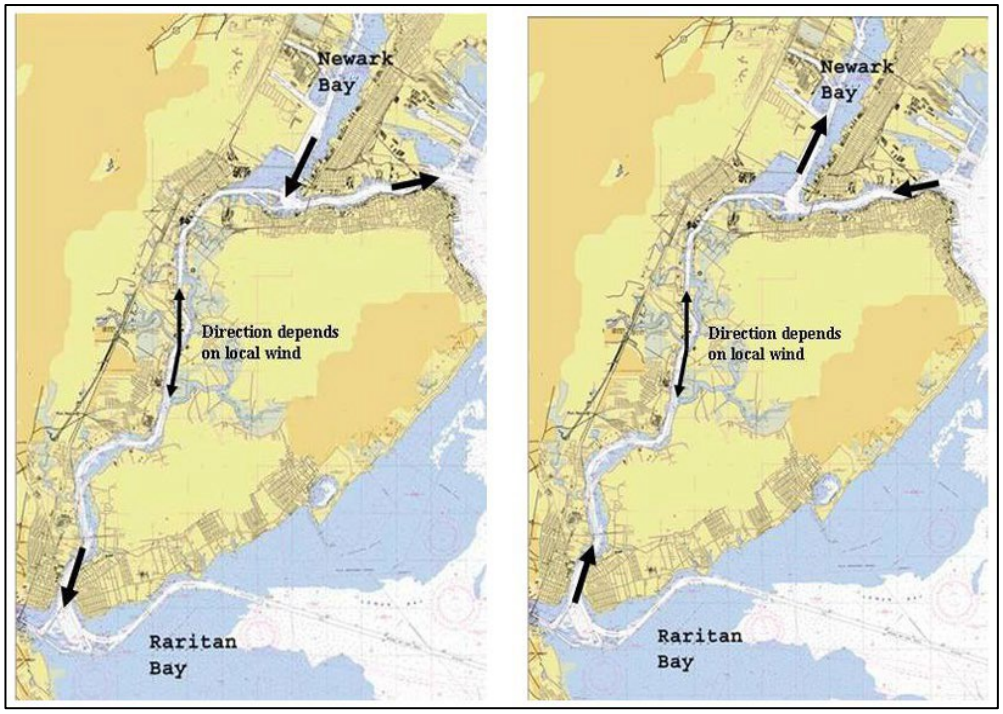

Figure 12. Current direction influenced by wind under typical conditions (Chant 2007)

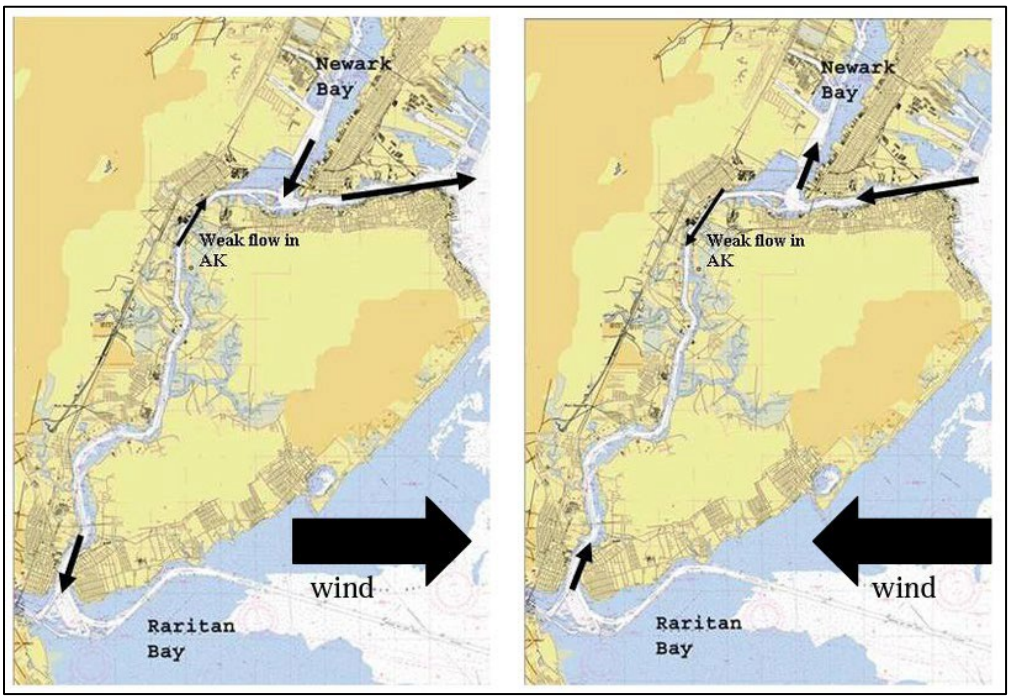

Figure 13. Current direction influenced by strong wind (Chant 2007)

4.1.13.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages; however, coastal hydrology, currents, and circulation would continue as natural functions with little effect. The tidal channel currently present on site would continue to discharge through an outfall to the Lower Bay same as existing condition. Therefore, this effects category is representative as low impact, with a corresponding score of 0.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.13.3 Action Alternative

Adverse Effects

Direct impacts of construction would result in an expanded tidal channel network originating from the existing Main Tidal Channel of which would be affected during the creation new hydrologically connected areas that may observe influences from coastal hydrological functions through the outfall to the Lower Bay that connects the two. The created tidal channel network would comprise, in total, of approximately 1.30-acres, and introduce aquatic habitat for fish, crab, and birds to forage and shelter. Erosion control measures would be installed to protect the newly develop channels including coir fiber mats, riprap, and fencing from both inland and coastal influences.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to coastal hydrology, currents, and circulation, 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 both terrestrial and aquatic habitat created. Maintenance may include non-native plant management, such as herbicide application and removal, but this would not be anticipated to affect bathymetric values. Existing conditions along the shoreline would be unaffected. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

The proposed project would remove non-native phragmites of which fill and degrade wetlands, 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. 1.30-acres of newly created tidal channels would expand the available bathymetry at the site, introducing additional opportunity for benthic resources and fish access into the site. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. Coastal influences through the Main Tidal Channel into the newly developed tidal channel network would introduce aquatic resources within the site. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. The restored dune would serve to reduce wave attack effects on the protect side. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +2.

4.1.14 Coastal Hydrology, Currents, and Circulation Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Coastal Hydrology, Currents, and Circulation Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	0	-1	0	+2	0	+1
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*-1*	*0*	*+2*	*0*	*+1*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**+1**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.15 Tides, Tidal Exchange, and Tidal Range

4.1.15.1 Existing Conditions

Tidal Constituents are forces that contribute to the tides. The two tidal constituents are Earth's rotation and the gravitational force of the sun and moon. Because of the proximity of the moon to Earth, the gravitational pull is greater than that of the sun and this is the main attribute to tides, tidal exchange, and tidal range (NOAA 2022). Tidal range is known as the difference between a high and low tide. The Study Area encompasses an estuarian waterbody with freshwater sources throughout, mixing with salt water from the nearby Atlantic Ocean.

The principal gateway of tides into the NYNJHAT Study Planning Regions is through the Lower Bay region where the Ambrose Channel is located as the entrance of vessels entering the Port of New York and New Jersey (Marmer, pg. 17). A semi-diurnal tidal fluctuation is experienced within these regions with relatively strong tidal currents that generate vertical turbulent mixing and partially mixes the water column along the separation between the two layers. The upstream edge of this separation is called the salt front (USACE 2020b).

4.1.15.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages; however, tides, tidal exchange, and tidal range would continue as natural functions with little effect. The tidal channel currently present on site would continue to discharge through an outfall to the Lower Bay same as existing condition. Therefore, this effects category is representative as low impact, with a corresponding score of 0.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.15.3 Action Alternative

Adverse Effects

Direct impacts of construction would result in an expanded tidal channel network originating from the existing Main Tidal Channel of which would be affected during the creation new hydrologically connected areas that may observe influences from coastal hydrological functions through the outfall to the Lower Bay that connects the two. The created tidal channel network would comprise, in total, of approximately 1.30-acres, and introduce aquatic habitat for fish, crab, and birds to forage and shelter. Erosion control measures would be installed to protect the newly develop channels including coir fiber mats, riprap, and fencing from both inland and coastal influences. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to coastal hydrology, currents, and circulation, 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 both terrestrial and aquatic habitat created. Maintenance may include non-native plant management, such as herbicide application and removal, but this would not be anticipated to affect bathymetric values. Existing conditions along the shoreline would be unaffected. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

The proposed project would remove non-native phragmites of which fill and degrade wetlands, 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. 1.30-acres of newly created tidal channels would expand the available bathymetry at the site, introducing additional opportunity for benthic resources and fish access into the site. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. Coastal influences through the Main Tidal Channel into the newly developed tidal channel network would introduce aquatic resources within the site. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. The restored dune would serve to reduce wave attack effects on the protect side. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +2.

4.1.16 Tides, Tidal Exchange, and Tidal Range Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Tides, Tidal Exchange, and Tidal Range Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	0	-1	0	+2	0	+1
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*-1*	*0*	*+2*	*0*	*+1*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**+1**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.17 Sediment Transport

4.1.17.1 Existing Conditions

Sediment dynamics in the Upper and Lower Bays of New York Harbor (Coch et al 2016), describes sediment transport characteristics with the Upper Bay/Arthur Kill and Lower Bay Regions:

> *"A long-term geologic and oceanographic study has provided the first holistic picture of sediment dynamics in the estuaries of SW New York state. Oceanographic data indicates that the east*

(Brooklyn) part of the Upper Bay is flood dominant, while the western (Staten Island) side is ebb-dominant. Bedform analysis indicates a net northerly (flood) orientation on the eastern side of the Lower Bay. The west side, in contrast, has fine sediment similar to that supplied by the Hudson River to the Upper Bay. The numerous sand borrow pits on the nearshore shelf also reflect a difference in net flow. The eastern pits are filled with shelf sands while the western ones are filled with mixtures of fine Hudson derived sediments and shelf sands. These patterns suggest flood dominant transport of shelf sands from the Lower Bay into the Upper Bay and ebb dominant supply of Hudson-derived fine material into the Lower Bay on the western side. The shelf and Hudson River Estuary are not the only suppliers of sediment to New York Harbor. The East River and Harlem Rivers have supplied significant amounts of coarse sediment to the northern part of the Upper Bay. This continued until massive stream changes in the 19th Century cut off sediment supply. The East and Harlem River sediments were deposited in a delta extending south and west of the Battery in Manhattan. Part of the relict East River material is now being reworked and moved northward by flood dominant nontidal flow along the eastern shore of the Hudson."

No sediment or associated sediment transport is within the Actionable Element Site, at least not in the traditional sense, as the site is comprised of a degraded wetland habitat without surface waters. Sediment transport near the Actionable Element Site would be present within the existing Tidal Channel on the easternmost portion of the Site, which has observed sediment accumulation at the outfall to the Lower Bay. Inland and coastal hydrology and tides influence sediment transport through the existing tidal channel, creating an exchange between the Main Tidal Channel and the Lower Bay.

4.1.17.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Sediment quality would continue to be affected by stormwater runoff and flood-related pollution, as well as erosion effects within the existing tidal channel and the shoreline. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). Evidence following severe storms in the area such as Hurricane Sandy exhibited erosion, tree-felling, severe flooding, and damages felt by many resources throughout the Study Area. However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak. This could have sediment-quality related effects from fire-derived pollution into surface waters. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.17.3 Action Alternative

Adverse Effects

Direct impacts from construction would result in complete removal of non-native phragmites, which largely dominants the site, and replace with native wetland plants including Spartina to redevelop the low salt and high salt marsh of the wetland. Topographic gradients would be altered through clearing and grading the site,

particularly in areas proposed as tidal channels, low salt marsh, and high salt marsh creating new areas of sediment presence and accumulation. This would result in temporary removal of habitat during construction, as well as permanent removal of soil and sediments associated with the connection to the Main Tidal Channel. Soils excavated will either be reused on site, or removed from site for potential beneficial reuse or placement at an approved appropriate facility authorized to receive such material. Erosion control measures, such as turbidity curtains and coir mats may be used to prevent sediment erosion, and reduce sediment resuspension and transport, although turbidity and resuspension concerns would be temporary, as the sediment would settle following active construction and establishment of the tidal channel network. Therefore, this effects category is representative as no impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to sediment quality, 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 terrestrial 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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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. Development of the tidal channel network and tide pools from the existing Main Channel, and low salt marsh would create additional areas of sediment presence at the site. Additionally, riprap placement between the restored dune and existing Main Tidal Channel would provide shoreline stabilization and erosion control in an area that has had substantial erosion evidenced by aerial photographs of the shoreline, as well as the deteriorated wooden seawall structure. With additional sediment presence at the site, so would there be additional areas for benthic flora and fauna to provide foraging grounds for fish and birds. Coir mats would be placed to support reduced sediment erosion and transport. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing 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. Therefore, this effects category is representative as low to moderate benefit, with a corresponding score of +2.

4.1.18 Sediment Transport Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Sediment Transport Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	0	-1	0	+2	0	+1

O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*-1*	*0*	*+2*	*0*	*+1*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**+1**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.19 Water Quality

The surface water systems located throughout the NYNJHAT Study Area are subject to water quality concerns including salinity variances, low dissolved oxygen, presence of pathogens, contaminants, and nutrient depletion. Potential water quality degradation sources vary between waterway, but generally are associated with known contaminated sites, Superfund Sites, wastewater treatment effluents, combined sewer outfalls, storms, and stormwater runoff from the highly urban surrounding environment (USACE 2022). The NJDEP and NYSDEC have established classification systems for the best intended uses of surface water quality within the Study Area (e.g. Surface Water Quality Standards, *New Jersey Administrative Code* (N.J.A.C.) 7:9B and Water Quality Regulations, 6 NYCRR Parts 700-705). These classifications are based on the extent to which these surface waters will attain the Clean Water Act goals of aquatic life support and swim-ability, and the designated uses outlined by each State.

The following briefly discusses the quantitative and qualitative water quality data taken from various sources, including a high-level overview inclusive of salinity, dissolved oxygen, nitrogen, fecal coliform, and chlorophyll-a trends in these dominant surface water bodies. Reference is specifically made to the Harbor-Wide Water Quality Monitoring Report (HWQMR) 2021 completed by the Hudson River Foundation as a part of the NY/NJ Harbor and Estuary Program. The report contains data on dissolved oxygen, pathogenic bacteria (fecal coliform and Enterococcus), nitrogen, and chlorophyll-a that was collected from 2010-2017 in many of the waterbodies in the Study Area. Those data are discussed frequently throughout this section. Much of this information is also presented in the New York New Jersey Harbor and Tributaries Draft Integrated Feasibility Report and Tier 1 Environmental Impact Statement, which encompasses much of the same Study Area as this, supplemented by the New York City Department of Environmental Protection 2022-2023 Harbor Survey Report (NYC DEP, 2024).

The USEPA defines salinity as "...the dissolved salt content of a body of water...[that] can be a chemical stressor in the aquatic environment as fluctuating levels of salinity can affect aquatic biological organisms which are adapted to prevailing salinity concentrations." Salinity concentrations can vary depending on a variety on conditions including location, tidal influence, weather, storms, and floods, etc. Salinity conditions are generally categorized as follows: tidal fresh (<0.5 parts per thousand [ppt]); oligohaline (0.5-5.0 ppt), mesohaline (5.0-18.0 ppt); polyhaline (18.0-30.0 ppt); and euhaline (>30.0 ppt).

The HWQMR utilized the USEPA's nationally recognized standards for dissolved oxygen, nitrogen, fecal coliform, and chlorophyll-a to compare the recorded values, as follows:

- **Dissolved Oxygen:** there are two threshold values for hypoxia: acute hypoxia, the dissolved oxygen level at which marine life has a greater potential to die, is indicated when water has less than 2.3 milligrams of dissolved oxygen per liter (mg/L); and chronic hypoxia, the continuous level at which

dissolved oxygen hinders growth of marine life and is indicated by dissolved oxygen levels less than 4.8 mg/L.

- **Nitrogen:** levels of total nitrogen exceeding 1.2 milligrams per liter (mg/L) is considered poor, and levels found equal to, or less than 0.4 mg/L is considered good.
- **Chlorophyll-a:** a threshold of greater than 20 micrograms per liter (µg/L) to indicate poor quality while considering values of less than 5 µg/L as supportive of healthier habitats for fish survival and propagation. High Chlorophyll-a concentrations can be indicative of an algal bloom.
- **Fecal Coliform:** fecal coliform levels should not exceed a geometric mean of 200 cfu/100mL. No more than 10% of all samples taken in a 30-day period should exceed 400 cfu/100 mL (Da Silva et al. 2021).

Details regarding potential for contaminants are discussed in the Hazardous, Toxic, Radioactive Waste Section of this Appendix.

4.1.19.1 Existing Conditions

The Lower Bay salinity is characterized by freshwater sources meeting tidally influenced, salty waters, therefore the salinity in this area varies greatly. Fish in this region are not consistently stressed by dissolved oxygen concentrations which have been recorded less than 4 mg/L between 0-8.2% for surface concentrations and between 0-10% for bottom concentrations in the HQWMR. The NYC DEP data collected between 2022-2023 show concentrations through the bay are generally greater than 5 mg/L. Between 2010 and 2017, the summer means for total nitrogen ranged between 0.56 and 1.03 mg/L, within the USEPA's threshold for healthy concentrations. Chlorophyll-a concentrations in the Lower Bay generally were observed ranging at or below 30 ug/L at the confluence with the Upper Bay and incrementally increasing in concentration further south towards New Jersey shoreline to less than or equal to 60 ug/L in 2022 and less than or equal to 70 ug/L in 2023 (NYC DEP, 2024). Fecal coliform summer discreet measurements ranged from 1 cfu/100mL to 2,000 cfu/100mL over the eight-year period as reported in the HWQMR. The average geomean for fecal coliform in this region is 8 cfu/100mL (USACE 2022), Da Silva et al., 2021).

Salinity in the Main Tidal Channel located to the adjacent east ranges from 1.5 to 23.9 parts per thousand with a mean of 13.3, appearing to be entirely depending on the tidal fluctuations from the Lower Bay, and associated flooding in the vicinity (USACE 2019).

The neighboring Oakwood Beach Wastewater Treatment Plant (also known as a WRRF) is adjacent east, and likely discharges into the Lower Bay possibly through the tidal channel on the eastern portion of the Site. Effluents are managed under Federal/State discharge permits. According to the USEPA Enforcement and Compliance History Online database, there are reported Clean Water Act violations, with the most recent identified in March 2025, and is unresolved. However, this Clean Water Act violation was related to one of 16 samples for total suspended solids exceeding the permit criteria. Occasional exceedances of total suspended solids thresholds are typical of wastewater treatment plants and have occurred three other times at the Oakwood Beach facility over the past five years, all being resolved after their identification with no other parameters (e.g., metals) exceeding the permit criteria. Additionally, NYSDEC maintains annual reports related to compliance and enforcement of facilities discharging pursuant to a State Pollution Discharge Elimination System (SPDES) permit. The Oakwood Beach Wastewater Treatment Plant is not listed on any of the compliance and enforcement reports made available by NYSDEC over the past five years, indicating no recent serious violations.

Although the project area is not permanently flooded, influences from the adjacent tidal channel and shore may influence the quality of any temporary water storage present onsite following a flood event, heavy rain, or tidal variations.

4.1.19.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Water quality can be impaired by flood waters, especially if the neighboring Wastewater Treatment Plant is affected in a manner that causes untreated sewage to escape in the effluents. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak, which can also impair water quality, although it is not known to what degree. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.19.3 Action Alternative

Adverse Effects

Direct impacts from construction would result in complete removal of non-native phragmites, which largely dominants the site, and replace with native wetland plants including Spartina to redevelop the low salt marsh of the wetland. This would result in temporary removal of habitat during construction. Re-establishment of the wetland may also include the removal of native species that are intermixed with the phragmites, in order to develop the tidal channel network, low salt marsh, and dunes proposed. Large trees throughout the site may be left in place, or removed and replaced in kind, or better, depending on their size and ability to thrive in the restored wetland bounds. Any vegetation or tree removal will be done in accordance with best management practices, as well as Federal and State regulations for removal and replacement. Water quality at the site would be anticipated to improve with native plantings and sediments serving as natural wetland filters of pollutants. Salinity in the created tidal channel network would take on the characteristics of the adjacent Main Tidal Channel of which they would connect into. As over 1-acre of land will be disturbed, a NPDES/SPDES permit will be required under the Clean Water Act. BMPs will be utilized to reduce adverse effects and prevent discharges into navigable waters. Sediment resuspension and turbidity would be anticipated during construction, although would be temporary and settle post construction. Therefore, this effects category is representative of low impact, with a corresponding score of -1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to water quality, 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 terrestrial 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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

The proposed project would remove non-native phragmites of which fill and degrade wetlands, 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. 1.30-acres of newly created tidal channels would expand the available surface waters, bathymetry, and sediments at the site, introducing additional opportunity for benthic resources and fish access into the site. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. Coastal influences through the Main Tidal Channel into the newly developed tidal channel network would introduce aquatic resources within the site (e.g. benthic resources, fish, crabs, etc.). The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. The restored dune would serve to reduce wave attack effects on the protect side. Increased benefits would be observed from managing 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. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +2.

4.1.20 Water Quality Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Water Quality Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE	ACTION TOTAL SCORE
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+2	-1	+1
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*3*	*-1*	*+1*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+1**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).

[1] – Sum of the No Action Adverse Effect and Beneficial Effect

[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.21 Air Quality

The Clean Air Act (CAA) is a federal law that regulates air emissions from stationary and mobile sources. This law authorized the USEPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and welfare, to regulate emissions of certain hazardous pollutants, and to designate geographical areas as in "attainment", "non-attainment", or "maintenance" for criteria air pollutants. Examples of stationary sources include coal-fired power plants, glass manufacturing plants, cement manufacturing plants, and petroleum refineries. Mobile sources may include vehicles, generators, mowers, ocean vessels, and large ships. An attainment area is defined as a geographic area in which levels of a given criteria of air pollutant (e.g. ozone, CO, particulate matter (PM), sulfur dioxide (SO2), nitrogen oxide (NO), and lead (Pb meet or is lower than the

health-based NAAQS. A non-attainment area is a geographic area in which air pollutant(s) do not meet/exceeds the health-based NAAQS (USEPA 2023a) and (USEPA 2023b). It is possible for a geographic area to be in attainment for one or more pollutant, and at the same time be in non-attainment for other pollutant(s). Maintenance areas are geographical areas that have been redesignated after having historically been in nonattainment and were subsequently brought into attainment and are under an attainment maintenance plan.

General Conformity (40 CFR 51 and 93) "prohibits a federal agency from interfering with the ability of a state or tribe to achieve the [NAAQS]" (USEPA 2010) and (USEPA 2024). Only actions that cause emissions in designated non-attainment and maintenance areas are subject to these regulations. A vast majority of federal actions do not result in a significant increase in emissions and therefore, include several exemptions. Applicability to General Conformity is determined by:

1. Whether the action will occur in a non-attainment or maintenance area,
2. Whether one or more of the specific exemptions apply to the action,
3. Whether the federal agency has included the action on its list of "presumed to conform" actions,
4. Whether the total direct and indirect emissions are below or above the *de minimis* levels, and/or,
5. Where the facility has an emission budget approved by the state or tribe as part of the state implementation plan (SIP) or Tribal Implementation Plan, the federal agency determines if the emissions from the proposed action are within the budget.

The *de minimis* threshold quantities within non-attainment and maintenance areas are defined as follows:

Table 9. De Minimis Quantities within Non-Attainment and Maintenance Areas (USEPA 2024b)

CRITERIA POLLUTANT	TONS/YEAR
Non-Attainment Areas (NAAs)	
Ozone (VOC or NOx):	
Serious NAA's	50
Severe NAA's	25
Extreme NAA's	10
Other NAA: Outside an Ozone Transport Region:	100
Other NAA: Inside an Ozone Transport Region:	
VOC	50
NOx	100
Carbon Monoxide: (all maintenance areas)	100
SO2 or NO2: (all NAA's)	100
PM10:	
Moderate NAA's	100
Serious NAA's	70
PM2.5 (direct emissions, Sox, NOx, VOC, and Ammonia)	
Moderate NAA's	100
Serious NAA's	70
Lead (Pb): All NAA's	25
Maintenance Areas	
Ozone (NOx), SOx or NOx:	
All maintenance areas	100
Ozone (VOCs)	
Maintenance inside an OTR	50
Maintenance outside an OTR	100
Carbon Monoxide:	
All maintenance areas	100

PM10:	
All maintenance areas	100
PM2.5 (direct emissions, Sox, NOx, VOC, and Ammonia)	100
All maintenance areas	100
Lead (Pb):	
All maintenance areas	25

Projects within non-attainment or maintenance areas that emit criteria pollutants, but do not have annual emissions exceeding these thresholds are considered exempt from General Conformity and in compliance with the SIP, as applicable.

4.1.21.1 Existing Conditions

The USEPA NEPAssist tool (accessed May 2025) was used to determine if the Oakwood Beach Actionable Element Site falls within non-attainment and maintenance zones. The site is located in Richmond County, New York which is in a non-attainment area for ozone 1-Hour (1979 standard-revoked) and ozone 8-Hour (per the 1997, 2008, and 2015 standards), and in a maintenance area for CO (1971), PM-2.5 24-Hour (2006 standard), and PM2.5 annual (1997 standard). These designations are summarized in the table below from the USEPA Kings County Green Book. Note, that while the Green Book 8-hour ozone (2015) nonattainment designation was previously classified as "moderate", a voluntary reclassification from "moderate" to "serious" non-attainment has recently been established by New York State and the USEPA (NYSDEC 2024).

Table 10. New York Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants

Criteria Pollutant	Designation	Non-Attainment Years	Classification
1-Hour Ozone (1979)-NAAQS revoked	Non-attainment	1992-2004 (revoked)	Severe 17
8-Hour Ozone (1997)-NAAQS revoked	Non-attainment	2004-2014 (revoked)	Moderate
8-Hour Ozone (2008)	Non-attainment	2012-2025	Severe 15
8-Hour Ozone (2015)	Non-attainment	2018-2025	Serious
Carbon Monoxide (CO) (1971)	Maintenance	1992-2001	Moderate >12.7 ppm
PM-2.5 (1997)-NAAQS revoked	Maintenance	2005-2013 (revoked)	Former Subpart 1
PM-2.5 (2006)	Maintenance	2009-2013	Former Subpart 1

Source: current as of 29 May 2025 https://www3.epa.gov/airquality/greenbook/anayo_ny.html
Note: If a criteria pollutant is not on this list, then that criteria pollutant is considered to be in attainment.

New York is also within the Ozone Transport Region (OTR), which makes up a collective group of several northeast states required to submit a SIP and install a certain level of controls for the pollutants that form ozone, regardless of if they meet the ozone thresholds (USEPA 2023). Ozone is controlled through regulations on its precursor emissions, which include NOx and VOCs; however, VOCs are emitted at a fractional rate compared to NOx.

Richmond County, New York is assumed in attainment for all other criteria pollutants, due to a lack of additional listings for other criteria pollutants.

4.1.21.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Air quality effects from wildfire could occur with each outbreak, otherwise, the No Action Alternative would continue as existing conditions are described and no construction or new operations would occur. The No Action Alternative would not result in any new emissions or associated air quality impacts. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.21.3 Action Alternative

Adverse Effects

Potential emissions from construction-related activities are anticipated to be associated with diesel mobile sources including construction equipment used on the site and trucks moving to/from the site on public and/or private roads. Emissions from these two source types include NO_x, VOCs, SO_2, CO, and $PM_{2.5}$. The Action would have temporary emissions associated with the site clearance and reconstruction of the CSRM-focused wetland enhancement, which will likely include the use of mobile equipment such as diesel-powered generators, compactors, compressors, dozers, excavators, loaders and graders, as well as off-road trucks. Emissions associated with the construction were estimated using project planning information provided for the current level of design, consisting of the anticipated equipment types, horsepower, and operating hours of those diesel engines powering the equipment. Conservative factors were used to represent the average level of engine load (load factors) and the average emissions of typical engines used to power the equipment (emissions factors). These estimates were developed using the following equation:

$$\mathbf{E = hrs \times LF \times EF}^{1}$$

E = Emissions per period of time (e.g. such as a year or the entire project)
Hrs = number of operating hours in the associated period of time (e.g. hours per year, hours per project)
LF = Load Factor, an estimate of the average percentage of full load an engine is run at in its usual operating mode.
EF = Emissions Factor, an estimate of the amount a pollutant (e.g. CO) that an engine emits while performing a defined amount of work.

To provide the upper limit of a conservative estimate, emissions were first calculated on the project as a whole, assuming that construction would be completed within the same calendar year, and additionally estimated on an average yearly basis for the designs current estimation that construction would be conducted over a duration of 2,550-days (approximately 7 years). Should the emissions for the project as a whole assumption exceed the *de minimis* quantities, then a yearly emissions estimate would provide a more precise calculation on a yearly basis, providing for a comparison of the two for the Action Alternative. Further, it should be noted that the emissions

[1] Converted from grams (g) to Metric Tons (MT). 1,000,000 g = 1 MT

from diesel engines vary with the age of an engine and, most importantly, with when it was manufactured. Newer engines of a given size and function typically emit lower levels of pollutants than older engines. The emission factors used in these calculations assume that the equipment pre-dates most emission control requirements (known as Tier 0 engines in most cases), to provide a reasonable yet conservative emission estimate. If newer engines, or alternative fuel source engines (e.g. electric), are used for construction activities, then emissions would be lower than estimated. The Emissions Factor[2] estimates used in this calculation originated from a recent USACE project using similar equipment, estimated conservatively to allow for a contingency should different equipment be used during construction.

Calculated emissions are anticipated as follows, based on the current level of design for the project as a whole, as well as the average potential yearly average estimates for approximately 2,550-days or 7 years of construction for comparison purposes:

Table 11. Air Quality Emissions Estimates (tons/year)

	Criteria Pollutant				
YEAR	**NO_x**	**VOC**	**SO_2**	**$PM_{2.5}$**	**CO**
1 (12 months)	0.757	0.015	0.004	0.012	0.004
2 (12 months)	0.757	0.015	0.004	0.012	0.004
3 (12 months)	0.757	0.015	0.004	0.012	0.004
4 (12 months)	0.757	0.015	0.004	0.012	0.004
5 (12 months)	0.757	0.015	0.004	0.012	0.004
6 (12 months)	0.757	0.015	0.004	0.012	0.004
7 (12 months)	0.757	0.015	0.004	0.012	0.004
PROJECT TOTAL	**5.3**	**0.106**	**0.003**	**0.089**	**0.003**

Although 12 months is assumed in these emissions calculations to provide a conservative limit, construction would actually occur each year during less than 12 months to account for environmental window restrictions.

As the Oakwood Beach Actionable Element Site is located within a maintenance zone for CO and $PM_{2.5}$ and is within the OTR for ozone, these criteria pollutants were compared to the applicable *de minimis* quantities emission thresholds, including the more stringent ozone (VOC and NOx) threshold, as follows:

Table 12. Air Quality Emissions compared to De Minimis Quantities Thresholds

Criteria Pollutant	Estimated Construction Emissions for the Total Project (tons/year)	Applicable De Minimis Quantities (tons/year)[3]
Ozone (VOC)	**0.106**	**25**
Ozone (NOx)	**5.3**	**25**
$PM_{2.5}$	**0.089**	**100**
CO	**0.003**	**100**

Note: Green highlight indicates emissions estimate is below the applicable *de minimis* quantities. Red highlight indicates emissions estimate is above the applicable *de minimis* quantities. Estimated emissions for the total project were conservatively estimated based on the 100% designs developed for NYCDEP, but not yet refined by USACE including relevant ER policy, to account for future design changes.

[2] Equipment use estimates were sourced from the USACE Hudson Raritan Estuary, Spring Creek North project as it is similar to this Actionable Element Site, General Conformity Emissions Estimates dated 2018.

[3] While the recent ozone (2015) nonattainment designation was classified as "moderate" and is being redesignated as "serious", the ozone (2008) nonattainment designation is "severe"; therefore, the more stringent *de minimis* threshold of "severe" is the applicable threshold for NOx and VOC within this nonattainment area, at 25 tons per year.

The estimated construction emissions for Ozone (VOC, NOx), $PM_{2.5}$, and CO are well below the applicable *de minimis* quantities thresholds for the entire project and for the average yearly emissions; therefore, the construction of the complimentary CSRM NBS is considered exempt and not applicable to General Conformity. A record of non-applicability (RONA) is provided in the CAA Subappendix.

Additionally, it should be noted that during construction fugitive dust at the construction site may be generated during construction activities, including from trucks and equipment moving on unpaved surfaces; however, this dust can be significantly reduced utilizing BMPs, such as continuously wetting dry and unpaved surfaces.

Emissions from construction of the Action Alternative are below the de minimis levels on a yearly basis. The sold impact producing factor to air quality is regulated air emissions, which will be below General Conformity significance. Therefore, all qualitative scores are rated "0" for no effect.

Negligible operations and maintenance assumption emissions are anticipated, as the site would be a restored wetland habitat. It is possible that some vegetative maintenance may occur but would be infrequent and limited to invasive species management, or small area mowing. Therefore, all qualitative scores are rated "0" for no effect.

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. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing 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. Air quality would be sustained, with periodic ancillary improvement with managing fire risk, from fire-related air pollutant smoke and ash, including particulate matter. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +1.

4.1.22 Air Quality Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses. As stated above, emissions from construction of the Action Alternative are below the de minimis levels on a yearly basis. The sold impact producing factor to air quality is regulated air emissions, which will be below General Conformity significance. Therefore, all qualitative scores are rated "0" for no effect.

Air Quality Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	0	0	0	+1	0	+1
O&M Assumptions	0	0	0	0	0	0

Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*0*	*0*	*0*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**+1**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.23 Climate and RSLC

4.1.23.1 Existing Conditions

The climate of the lower NYNJHAT Study Area, including the Lower Bay Planning Region, is characterized as warm and temperate, with four months of summer (June through September). The average annual temperature is approximately 52.9 degrees F, ranging from an average of 29.5 degrees F to 75.7 degrees F, although winter temperatures below freezing and summer temperatures above 80 are common. January is recorded as the coldest month. Rainfall and snowfall can be significant with approximately 45 inches of precipitation each year. Humidity is relatively stable throughout the year, ranging from an average of approximately 63 to 71%.

Hurricane Sandy caused extensive damage along the Atlantic shoreline, within coastal wetlands and freshwater surface waters within the NYNJHAT Study area, and relevant Lower Bay Planning Region. The Atlantic shoreline, including Coney Island in New York, Sandy Hook, and areas south to Manasquan Inlet in New Jersey, experienced changes to the shore profile and loss of beach fill and erosion, with an estimated average drop in beach elevation of five to 10 feet. Locations which previously supported dunes prior to the storm lost up to 100% of existing dunes (including dune vegetation), which is critical habitat for nesting seabirds, and feeding and roosting migratory shorebirds (USACE 2020b). Significant amounts of sand overwashed into the streets of many coastal residential areas at least 60 to 150 feet inland, including the Borough of Atlantic Highlands, New Jersey, the private community of Sea Gate, New York, and Staten Island Borough (USACE 2020b). Sandy Hook was exposed to the full power of the tidal surge and the worst of the storm's winds. The shore profile was completely changed and sand dunes along the peninsula were pushed up to several hundred feet west. Many dunes were completely flattened, uprooting and dispersing the beach grass normally found on them and likely affecting the bird species that use them for breeding. In addition to the overwash of sand and beach erosion, many coastal areas, such as Coney Island, were inundated and sustained damages to residential buildings and waterfront structures including boardwalks, concrete walls, roads, and other coastal infrastructure. In the private community of Sea Gate, the waterfront bulkhead and the first row of residential buildings were severely damaged by storm waves (USACE, 2012). Coastal wetlands within Raritan Bay and on Staten Island experienced damage caused by the tidal surge and debris. Reportedly, small mammal populations were eliminated in many areas, creating a food shortage for northern harriers, a New York State threatened species, and New Jersey State endangered hawk species (USACE 2020b)Approximately 100,000 tons of debris was deposited in Cheesequake State Park. This debris layer, composed mostly of reeds and other vegetation, combined with tires, duck blinds, and other manmade structures is expected to inhibit vegetation growth, impacting invertebrate communities (e.g., fiddler and marsh crabs) as well as kingfishers, herons, gulls, and other marsh-dependent birds that feed upon them (ALS, 2012). Maritime holly (*Illex opaca*) and red cedar (*Juniperus virginiana*) forests in Sandy Hook survived the storm. However, there was extensive damage to Atlantic white cedar (*Chamaecyparis thyoides*) swamp forests in Cheesequake State Park, including saltwater intrusion, blow-down trees, and the creation of canopy gaps. More than 300 trees were lost, including 100-year-old oaks and numerous Atlantic white cedars ((USACE 2020b).

RLSC can compound with the effects of intense storms as time advances, with area of effects varying depending on what direction the storm advances from, how it hits landfall, and duration of storm surge and rain. Storms typically lose their intensity as they move across land masses, and with RSCL considerations, area of land effect would be anticipated to encroach further inland. USACE projects must consider RSLC when planning and designing projects, per Engineering Regulation (ER) 1100-2-8162 (December 31, 2013). ER 1100-2-8162 requires that future RSLC projections must be incorporated into the planning, engineering design, construction, and operation of all civil works projects. Below are three figures depicting the low, intermediate, and high RSLC scenarios for Oakwood Beach Actionable Element Site for comparison Purposes:

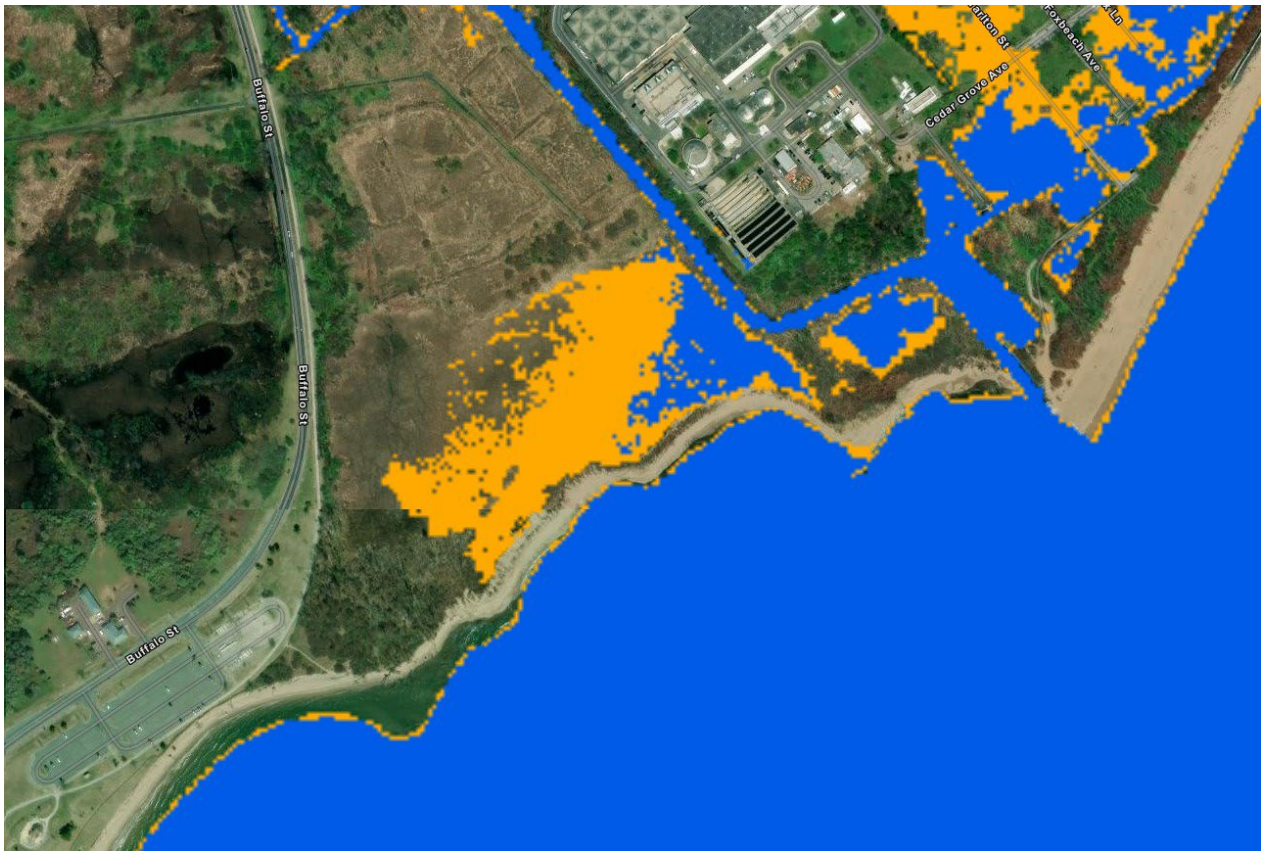

Figure 14. Low RSLC Scenario Projection for Oakwood Beach Actionable Element Site (1-foot)

Figure 15. Intermediate RSLC Scenario Projection for Oakwood Beach Actionable Element Site (2 feet)

Figure 16. High RSLC Scenario Projection for Oakwood Beach Actionable Element Site (5 feet)

4.1.23.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. The site is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island, and doesn't fully function as a wetland due to this dominant species at the site. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Terrestrial vegetation casualties could occur, as could removal of associated habitat for foraging and shelter for wildlife. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). However, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak, relevant to climate science. A comparison of the low, intermediate, and high RSLC projection scenarios over the next 100-years exhibit exponential threat from the low scenario of which estimates a portion of the eastern side of the Site would be underwater, the intermediate scenario estimates approximately half of the site would be under water, while the high scenario which estimates the Oakwood Beach Actionable Element Site entirely under water. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated to existing habitat present at the Site, as under each RSLC scenario projection, habitat changes would be anticipated, and the area would continue to be vulnerable to coastal flood risk and damages. However, there could be a benefit to new habitat created from RSLC, although that is difficult to quantify given the uncertainty of new habitat value. As RSLC persists under any project scenario, a corresponding managed risk of wildfire would be incurred because portions of the Site would be underwater. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.23.3 Action Alternative

Adverse Effects

Throughout the life of the project, RSLC is anticipated to increase mean water elevation and climate-driven effects is anticipated to increase storm severity and frequency. Appropriately defining the design condition related to the expected RSLC scenario is important. Since 1900, relative sea level has risen by more than a foot within the NYNJHAT Study Area due to global conditions and local land subsidence (NPCC2, 2013). According to the NYS 2100 Commission Report (2013), RSLC in NYC and Long Island is projected to be as much as six feet within the next 90 years. Coastal storms will cause flooding at increased heights and over larger areas than in the past as RSLC continues, and frequency and intensity of coastal storms is anticipated to increase (NPCC 2013). USACE projections for the Battery, NY range from an increase of 0.7 feet for the low scenario, increase of 1.8 feet for the intermediate, and up to 5 feet for the high scenario through 2100.

Alternatives are evaluated in consideration of the "low", "intermediate", and "high" potential rates of future RSLC for both "with" and "without project" conditions. ER 1100-2-8162 considers the historic rate of RSLC as the low rate. The intermediate and high rates are computed from the modified National Research Council (NRC) Curve I and III respectively, considering both the most recent IPCC projections and modified NRC projections with the local rate of vertical land movement added.

Direct impacts of construction would result in complete removal of non-native phragmites, which largely dominants the site, and replace with native wetland plants including Spartina to redevelop the low salt marsh of

the wetland. This would result in temporary removal of habitat during construction. Re-establishment of the wetland may also include the removal of native species that are intermixed with the phragmites, in order to develop the tidal channel network, low salt marsh, and dunes proposed. Large trees throughout the site may be left in place, or removed and replaced in kind, or better, depending on their size and ability to thrive in the restored wetland bounds. Topographic gradients would be altered, particularly for the creation of tidal channels and low salt marsh, as well as the restored dune and riprap placement for erosion control, most notable along the shoreline connecting the restored dune to the existing tidal channel. These changes in topographic gradients may alter the RSCL projection areas and pattern of water infiltration at the site, as those figures are generated based on current topographic conditions. It's possible, however, that if the high RSLC projection scenario comes to pass, the entire site will still be inundated with water, changing the wetland habitat entirely.

The Action would create a network of tidal channels, decreasing the topographic elevation and potentially overtime focus water from RSLC to central portions of the Site in the near term. However, overall, RSCL depending on which scenario comes to pass, would be anticipated to affect the Action to some degree, changing habitat conditions such as changes from high marsh to low marsh, etc.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated 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 terrestrial 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. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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. With the conversion to native habitat, the wetland would be better quality habitat for wildlife and fish with the tidal channel and native salt marsh plantings. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Increased benefits would be observed from managing 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. As RSLC persists under any project scenario, a corresponding managed risk of wildfire would be incurred because portions of the Site would be underwater. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

4.1.24 Climate and RSLC Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Climate and RSLC Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		

Construction/Footprint	-1	0	0	+1	0	+1
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*+1*	*0*	*+1*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**+1**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.25 Cultural Resources

As a federal agency, USACE has certain responsibilities for the identification, protection and preservation of cultural resources that may be located within the Area of Potential Effect (APE) associated with the proposed project. Present statutes and regulations governing the identification, protection and preservation of these resources include the National Historic Preservation Act of 1966, as amended; the National Environmental Policy Act of 1969; Executive Order 11593; and the regulations implementing Section 106 of the National Historic Preservation Act of 1966 (36 Code of Federal Regulations Part 800, Protection of Historic Properties, August 2004). A historic property is defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places (NRHP), including artifacts, record, and material remains related to such a property or resource.

Cultural resources include historic properties as well as other cultural aspects of the human environment. This work is done in coordination with the State Historic Preservation Offices of New Jersey and New York, federally recognized Tribes, and interested parties. The New York District carried out a review of existing surveys and historical documentation as part of both the Tier I EIS as well as the current EA, to identify cultural resources within the Planning Region including previously recorded historic properties and properties with the potential to be eligible for the National Register of Historic Places to inform an initial assessment of potential impacts that the proposed undertaking may have on cultural resources within the APE.

4.1.25.1 Existing Conditions

4.1.25.2 Cultural Resources within the 100-meter Direct APE

Cultural resources are vulnerable to the impacts of storm surges, flooding, and sea-level rise. These types of exposures can diminish the physical and historic integrity of archaeological sites, historic buildings, and cultural landscapes through physical damage or destruction. Integrity is essential for historic properties to retain their designations as National Historic Landmarks, State / National Register listed or eligible resources, NYC Landmarks, and/or NPS parks or site units, examples of all of which are present throughout the study area.

National Register Listed and Eligible Resources. According to the NYSHPO's Cultural Resource Information System (CRIS), no National Register listed or eligible resources are in the study area. However, there are 2 individual aboveground historic resources (both historic properties are not NR Eligible), and 1 National Recreation Area. There are an additional 2 known archaeological sites that have yet to be investigated to determine whether they are eligible for NRHP.

New York State Museum Archaeological Sites. The NYSM has no records for archaeological sites or archaeological areas in the study area.

National Historic Landmarks (NHLs). National Historic Landmarks are historic properties that illustrate the heritage of the United States. There are currently more than 2,600 NHLs designated which represents an outstanding aspect of American history and culture (NPS 2022a). There are many types of NHLs which include historic buildings, sites, structures, objects, and districts. There are no identified NHLs within the study area.

National Park Service Sites. National Park Service Sites are administered by the federal government. The single NPS site, Gateway National Recreation Area: Great Kills Park, in the study area contains a wide variety of cultural resources and historic landscapes. The Great Kills Park represent over 400 years of American history, and was once home to the second permanent European Settlement in Staten Island. This is one of the most iconic and visible parks in the harbor area.

New York City Landmarks. The New York City Landmarks Preservation Commission (LPC) administers the city's Landmarks Preservation Law. It is responsible for protecting New York City's architecturally, historically, and culturally significant buildings and sites by granting them landmark or historic district status and regulating them after designation (NYC LPC 2022).

NYC LPC landmarks are designated in four categories: individual landmarks, interior landmarks (i.e., building interiors), scenic landmarks, and historic districts. The National Register is separate from the LPC although many of New York City's individual landmarks and historic districts are also listed on the National Register. There are more than 37,600 landmark properties in New York City, most of which are in 152 historic districts and historic district extensions in all five boroughs (NYC LPC 2022). None of the NYC Scenic Landmarks are in the study area.

No NYC Landmark individual properties or historic districts have been identified as partially in or adjacent to the 100-m Direct APEs for the project alternative.

4.1.25.3 Cultural Resource Impact Evaluation Framework

While environmental impact frameworks provide a broad lens for evaluating project effects, cultural resources require a more nuanced and specialized approach due to their historical, archaeological, and intangible values. Environmental models often emphasize biophysical metrics such as land use, hydrology, or emissions, which can overlook the complex regulatory, contextual, and community-based significance of cultural resources. Under Section 106 of the National Historic Preservation Act, federal undertakings must consider not only physical alterations but also visual, auditory, and contextual impacts to historic properties and archaeological sites. Therefore, a more refined framework tailored to cultural resources is essential to adequately assess both adverse and beneficial effects, guide meaningful mitigation, and ensure compliance with federal preservation mandates. This approach enables more precise evaluations and protects cultural heritage in ways that environmental scoring systems alone cannot achieve.

Cultural Resources Impact Evaluation Framework

Resource Categories:
Above-Ground: Historic structures, viewsheds, cultural landscapes
Below-Ground: Archaeological sites (terrestrial and submerged)
Project Phases Considered: Construction, Operations & Maintenance
Impact Types: Adverse (negative) Effects, and Beneficial (positive) Effects

Evaluation Factors:
Impact Magnitude (Intensity/Extent)
Geographic Scope (Local/Regional)

Temporal Scope (Shore-/Long-Term)
Regulatory Thresholds (e.g. NEPA, NRHP eligibility, Section 106 Compliance)
*Mitigation Potentia*l (Avoidance, Minimization, Treatment, Enhancement)

Cultural Adverse Effects Rating Table (With Mitigation Evaluation Built In)

Impact Rating	Score	Description	Example	Mitigation Category
High	-5	Permanent destruction of resource; exceeds regulatory thresholds; mitigation **insufficient** to reduce impact to an acceptable level.	Demolition of an NRHP-listed building without documentation or alternatives.	**No effective mitigation possible**; total loss of integrity/significance.
Mod–High	-4	Significant adverse effect; mitigation **necessary and substantial**, but cannot eliminate loss of integrity.	Cut through historic landscape with unavoidable impacts.	**Partial mitigation** (e.g., detailed documentation, interpretive signage, data recovery).
Moderate	-3	Impact is localized and within thresholds; mitigation **can fully address** resource loss or damage.	Archaeological site disturbed by utilities, but full data recovery is planned.	**Effective mitigation** (e.g., redesign, excavation, relocation, HABS/HAER documentation).
Low–Mod	-2	Minor adverse impact; mitigation **simple and sufficient** to avoid significance loss.	Short-term construction next to historic structure with vibration monitoring.	**Standard BMPs** or buffer zones.
Low	-1	Temporary, negligible effects; no mitigation required.	Minor access near site boundary.	**No mitigation necessary**.
No Impact	0	No effect on cultural resources.	Boring in fully disturbed, tested area.	Not applicable.

Cultural Beneficial Effects Rating Table (With Enhancement Evaluation)

Benefit Rating	Score	Description	Example	Mitigation / Enhancement Category
High	+5	Regionally significant enhancement of a cultural resource or site; measurable, long-term improvement; promotes public engagement.	Adaptive reuse of a historic building as public space with interpretation.	**Preservation + Public Benefit** (e.g., funding, easements, partnerships).
Mod–High	+4	Strong enhancement locally or regionally; mitigation or restoration improves condition or setting.	Viewshed restoration at a historic site through invasive species removal.	**Restoration + Setting Rehabilitation**.

Moderate	+3	Measurable benefit to one or more cultural resources; increased protection or documentation.	Phase III recovery with public education materials produced.	**Public interpretation, research access, stewardship agreements**.
Low–Mod	+2	Some improvement beyond existing condition; resource protected or documented more completely.	HABS documentation of vulnerable site.	**Archival mitigation + limited outreach**.
Low	+1	Minor benefit, such as improved access, visibility, or documentation.	Signage for nearby unmarked historic feature.	**Minimal enhancement**.
No Impact	0	No beneficial effect beyond current condition.	Routine maintenance in non-sensitive areas.	Not applicable.

4.1.25.4 No Action

Adverse Effects

The no action or no-build alternative was evaluated against the project purpose and need. The no action or no-build alternative would have impacts to existing aesthetic, visual, historical, or cultural resources since there would be no measures to manage future flood risks that are expected to be exacerbated by RSLC. Archaeological resources in the Study Area are at risk of damage or destruction from coastal flooding and sea-level rise. Additionally, submerged resources may be affected by underwater storm action and changes in seawater flow that accompany sea-level rise and flooding. Without coastal storm risk management measures, the AE will be impacted by the 1% floodplain.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.25.5 Action Alternative

Adverse Effects

Although the alternative includes a known archaeological site and is designated as sensitive for prehistoric archaeological resources, the site has been extensively modified by past development, fill, and infrastructure activities. As such, any intact archaeological deposits are expected to be deeply buried and isolated, reducing their vulnerability to disturbance from planned surface-level work. However, certain components of the project, such as tidal channel excavation and dune regrading, may involve limited subsurface impacts.

These potential effects warrant a low-to-moderate adverse effect rating for terrestrial archaeological resources during construction. No adverse effects are anticipated for submerged archaeological resources or above-ground historic structures. However, targeted archaeological monitoring or testing in higher sensitivity zones will be necessary to avoid unanticipated impacts and ensure compliance with Section 106 of the National Historic Preservation Act.

Beneficial Effects

The Oakwood Beach Alternative is expected to yield moderate beneficial impacts to cultural resources, particularly in the form of landscape restoration that enhances the cultural viewshed and reestablishes the ecological and visual character of the shoreline. The creation of a vegetative mosaic with native plants, the reintroduction of tidal channels, and dune restoration will help restore a historically and environmentally

significant shoreline buffer. These improvements align with long-term resilience and sustainability goals and reflect traditional environmental knowledge systems tied to Indigenous and early land use patterns.

Additionally, the removal of non-native invasive species will improve the interpretive integrity of the site and support the area's role as a natural defense system, benefiting the larger NYNJHAT Study area and adjacent South Shore and Great Kills Park. These landscape-scale improvements provide lasting scenic, educational, and ecological value that reinforce the cultural identity of the region.

4.1.25.6 Cultural Resources within Visual Impact Area (Indirect Effects)

The measures included in the study will enhance existing viewscapes, depending on location and scale. Construction of nature based measures may positively affect scenic byways, improve existing residential views, and/or increase access to historic coastal sites (USACE 2019). Aesthetic valuation, a judgement of value based on appearance of an object and emotional responses, of the public is ongoing and will be updated as stakeholder input is aggregated, but was not used to determine the preliminary impact rating.

Aerial photographs, LiDAR and field observations were analyzed for each alternative of visual effect, that will later be considered in determining the build alternative. This includes project visibility and viewsheds from neighbors and travelers as well the influence of topography, vegetation, and structures. An inventory of existing landscape character, viewers and visual quality is the baseline for this documentation. Characterization of visual quality of landscape compositions based on intrinsic characteristics of natural, and existing roadway features; stakeholder values, public interest, real estate and scenic designations may be altered by the implementation of the proposed structural measures but will greatly manage the impact from coastal storms. Generally, implementing the alternatives could provide direct benefits by reducing the severity of damage to coastal sites and residences.

In support of the viewshed analysis, New York District undertook a preliminary identification of known cultural resources that could be visually affected by the project in accordance with the New Jersey Historic Preservation Office's (2004) Guidelines for the Preparation of Cultural Resource Management Archaeological Reports; New York Archeological Council's (NYAC) Standards for Cultural Resources Investigations and the Curation of Archeological Collections in New York State; New York State Office of Parks, Recreation, and Historic Preservation's (2005) State, Historic Preservation Office Phase I Archaeological Report Format Requirements; and the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48FR4473437), and the New York District NYNJHATS OSE Report (2022). Visual analysis, as a component of the NEPA and Section 106 analyses, includes a broad look at the potential impacts to historic properties. By definition, a visual effect occurs whenever a proposed undertaking will be visible from an historic property. The mere existence of a visual effect does not automatically imply that the effect is adverse.

Measures proposed for the AE will not involve the construction of structures that have a potential to indirectly affect historic properties, there are no historic properties impacted by the Action Alternative, and will not alter the visible environment (i.e., setting) of those resources. For this study, the visual impact study area (Indirect APE) includes those places within one mile (1.6 km) of proposed measures for the alternative that are in the potential viewshed (based on topography). This Visual Impact Area, or Zone of Visual Influence (ZVI), encompasses parts of coastal Staten Island, New York City. As of this writing, this preliminary visual impact analysis is an initial screening of impacted historic properties and will be refined in subsequent iterations.

Additional visual assessment for the measures proposed at Oakwood Beach was deemed unnecessary because the design elements do not introduce visual changes that rise to the threshold of an adverse effect under Section 106 criteria. An adverse visual effect occurs only when a new element added to the landscape diminishes the aspects of a property's significance or integrity, such as its historic setting, that contribute to its eligibility for listing in the State or National Registers of Historic Places (S/NRHPs).

The Action Alternative, which includes elements such as vegetative plantings, grading, and berms with naturalistic contours, are compatible with the existing coastal landscape. These measures do not obstruct significant views to or from eligible or listed historic properties, nor do they introduce visual elements that are out of scale, incompatible, or in stark contrast with the surrounding character. Because the proposed nature-based components are designed to blend with the natural setting and do not diminish the visual integrity or appreciation of any known historic resource in the area, neither adverse aesthetic nor obstructive effects are anticipated. Accordingly, based on established guidance and definitions of visual impacts, further detailed visual analysis was not required for this portion of the undertaking.

4.1.26 Cultural Resources Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Cultural Resources - Historic Structures Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	0	0	0	0	0	0
O&M Assumptions	0	-1	0	+1	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*-1*	*0*	*+1*	*0*	*0*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**0**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

Cultural Resources – Viewshed/Historic Setting Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	0	0	+1	-1	+1
O&M Assumptions	0	0	0	+3	0	+3
Subtotal of Adverse and Beneficial Effects	*-1*	*0*	*0*	*+4*	*-1*	*+4*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**+4**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

Cultural Resources – Terrestrial Archaeological Resources Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	0	-1	-1
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-2*	*0*	*0*	*-1*	*-1*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**-1**	**-1**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

Cultural Resources – Submerged Archaeological Resources Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	0	0	0	0	0	0
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*0*	*0*	*0*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**0**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.27 Native American Land

Native American Lands, or Indian Land, is typically either fee land purchased by tribes or land held in trust by the U.S. government. Federally Recognized Tribes whose ancestral lands include all or a portion of the Study Area include the Delaware Nation, the Delaware Tribe of Indians, and the Stockbridge Munsee Community Band of Mohican Indians. The Delaware Nation is based today in Anadarko, Oklahoma, the Stockbridge Munsee Community Band of Mohican Indians is situated in Shawano County, North central Wisconsin, and the Delaware Tribe of Indians in Bartlesville, Oklahoma. At present a list of properties of traditional religious and cultural importance (Traditional Cultural Properties) has not been quantified for the Study Area. There are no Native American lands within or near the Actionable Element Site; therefore, an effects analysis is not applicable.

4.1.28 Hazardous, Toxic, and Radioactive Wastes

Hazardous, toxic and radioactive waste (HTRW) is defined by Engineer Regulation 1165-2-132 as:

> *"Except for dredged material and sediments beneath navigable waters proposed for dredging… hazardous, toxic and radioactive waste includes any material listed as a "hazardous substance" under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601 et eq (CERCLA)."*

CERCLA, commonly known as Superfund, was enacted by the U.S Congress on December 11, 1980, and provides the U.S. Environmental Protection Agency the funds and authority to remediate contaminated sites where there is no identifiable responsible party. CERCLA was enacted to provide the necessary funds to protect human health and the environment, identify responsible parties to pay for remediation of sites, involve communities in the process, and return contaminated sites to productive uses (USEPA 2020a).

The NYNJHAT Study Area predominantly covers the NYC Metropolitan Area, where many Federal and State listed known contaminated sites, and other related sites of interest, are prevalent throughout. Engineer Regulation 1165-2-132 states that HTRW collocated within the proposed project footprint must be avoided where feasible, and where it cannot be avoided, those sites must be remediated at 100% nonfederal cost prior to construction. The costs and complexities of remediation will likely impact the local sponsors' ability to expedite plan features located within HTRW sites. The HTRW Report was prepared by: 1) reviewing existing and readily available Federal and State records of contaminated sites within or near the Study Area and other existing reports; 2) identifying contaminated sites that are collocated within or near the areas of the proposed project; and 3) determining if collocated or nearby contaminated sites may affect or be affected by the project. Below is a brief summary of HTRW sites within the vicinity of proposed project features. Refer to the HTRW Subappendix for additional details and figures with approximate locations of mapped sites in the vicinity of this Actionable Element Site.

4.1.28.1 Existing Conditions

The Study Area exists in an urbanized portion of the New York Metropolitan Area that has been subject to a history of anthropogenic activity and other uses with the potential to affect the subsurface or otherwise impact the project. Through the evaluations contained within the sub-appendix, several relevant collocated environmental listings or other environmental concerns have been documented, including:

- Great Kills Park (GKP) Superfund Site (ID# NYN000200666). Operable Unit 1 of the GKP Site overlaps with the northeast portion of the Study Area. The primary environmental concerns related to the GKP Site are waste fill derived from historical waste disposal operations and radiological artifacts incidentally contained in waste fill. Although the waste fill extents do not appear to overlap with the Study Area based on previous investigations, this site and its relation to the Study Area, was documented as a recognized environmental concern (REC) in a 2019 Phase I Environmental Site Assessment (ESA).
- The adjacent Oakwood Beach WRRF and its related environmental listings:

    - Chemical Bulk Storage Facilities (CBS): The City of New York/NYCDEP facility (ID# 2-000255) and Oakwood Beach WRRF facility (ID# 2-000237)
    - Petroleum Bulk Storage Facilities (PBS): Oakwood Beach WWTP (ID# 2-456381)
    - Wastewater SPDES: Oakwood Beach WWRF (ID# NY0026174)
        - Effluent from the WRRF discharged under this State Pollution Discharge Elimination System (SPDES) permit has the potential to interact with the Study Area due to tidal channels (with the potential to receive SPDES effluent) being directly adjacent to the project and its proposed measures.
    - Documentation of 20 closed spill incidents at the property.
- The 2019 Phase I ESA identified a small portion of the Study Area that appeared to have been filled in between approximately 1949 and 1961. No information regarding the sources of the historic fill were identified. It was determined that the fill of unknown origins represented a REC. There exists the potential that certain project features will necessitate construction through this placed fill.

Environmental listings and concerns are ubiquitous with the New York Metropolitan Area, particularly along certain coastal boundaries with histories of shoreline alteration (e.g., filling). As the proposed project progresses into the Pre-Construction Engineering and Design (PED) phase a subsurface planning investigation will take place to further characterize the subsurface conditions. This investigation will inform any potential HTRW risks associated with construction and implementation of the proposed project.

4.1.28.2 No Action

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. Storm damage to a significantly urbanized area, such as the Lower Bay Planning Region, can cause new releases of petroleum and/or hazardous substances, further spread historical contaminated soils and sediment, increase potential risk of exposure, and extend time and increase costs for addressing HTRW sites. Additionally, the Study Area is largely dominated by non-native phragmites that pose a fire risk to the Oakwood Beach neighborhood of Staten Island. Fire risk has similarly negative effects on nearby HTRW sites. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for 100-years, the effects within the 100-year planning horizon would be anticipated to have low adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). Additionally, the threat of persistent wildfires every dry season would persist, and vary in severity with each outbreak, which can also negatively impact nearby HTRW sites, although it is not known to what degree. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.28.3 Action Alternative

Adverse Effects

While encountering HTRW during construction is not anticipated at this time, any intrusive subsurface work associated implementation of a project has the potential to disturb soil/sediment that could be contaminated with HTRW. Should contaminated soil/sediment be disturbed, there could be increased risk to human health

and the environment. However, to mitigate that risk, a subsurface planning investigation would be conducted during the PED phase to further characterize the subsurface conditions. This investigation will inform any potential HTRW risks associated with construction and implementation of the proposed project and ensure there are not HTRW concerns in any areas where the subsurface may be disturbed. As per Engineer Regulation 1165-2-132, HTRW collocated within the proposed measure footprints must be avoided where feasible, and where they cannot be avoided, those sites must be remediated at 100% nonfederal cost prior to construction. Best management practices will be employed during project implementation to ensure the construction is conducted in a manner that is protective of human health and the environment and that any handling of subsurface materials is in compliance with applicable regulatory requirements. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Maintenance may include non-native plant management, such as herbicide application, which has the potential to introduce chemicals into the environment that cause increased risk to human health and the environment. However, all pesticides would be applied pursuant to applicable permits and would be approved by the USEPA. When applied in compliance with these restrictions, HTRW concerns associated with pesticide application would be negligible. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. With managed CSRM flooding, there would be less risk of severe storm damage to the surrounding urbanized area and less risk of petroleum and/or hazardous substances release, spread of historical contaminated soils and sediment, HTRW exposure, and delays and cost increases for addressing HTRW sites. Additionally, increased benefits would be observed from managing fire risk to nearby HTRW sites with the restoration of the wetland, and removal of highly ignitable non-native phragmites. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

4.1.29 Hazardous, Toxic, and Radioactive Waste Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Hazardous, Toxic, and Radioactive Wastes Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	-1	-1	0	+1	-1	0
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*1*	*-1*	*0*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0

ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)	-1	0

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.30 Navigation

Navigation was a resource that was reviewed and assessed in the September 2022 Draft Integrated FR/Tier 1 (Programmatic) EIS due to the size of the Study Area. Navigation channels are present through the New York Bight and surrounding surface waters, including the Lower Bay. As this report is an interim response to the Comprehensive Plan, the same resources were reviewed for applicability to the Actionable Elements Sites. No navigation channel is identified in the vicinity of this Actionable Element Site. Therefore, an effects analysis is not applicable.

4.1.31 Noise and Vibration

Noise is generally defined as undesirable sound that may interfere with communication, damage hearing, and/or may diminish the quality of an environment. Noise intensity is measured and monitored in decibels (dBA). Approximate noise levels can be estimated based on surrounding land use and can typically range from an average of 30 dBA in wilderness areas to 90 dBA in more urban areas (USACE 2020b). Common sources of noise in our environment include transportation vehicles, equipment, machinery, construction, appliances, and motors, to name a few. While The Noise Control Act of 1972 established a national policy to promote an environment free of noise that jeopardizes human health and welfare, the primary responsibility for noise control relies on State and local governments (USEPA 2022). Table 13 has a few examples of common sources of noise and their anticipated average sound levels:

Table 13. Common Sources of Noise

Common Sources of Noise	Average Sound Level (Decibels/dBA)	Interpreted Level of Disturbance (from routine or repeat exposure)
Normal conversation and air conditioner	60	Low
City Traffic (from inside a vehicle), Gas-powered lawnmowers and leaf blowers	80-85	Mid-High
Approaching subway train and car horn	100	High
Entertainment venues	105-110	High
Fire crackers	140-150	High

Source: CDC 2022

Noise can carry a considerable distance underwater and on land; however, geographical extents of noise impacts are dependent on several factors including type of equipment utilized, noise exposure duration, amplitude, and wind direction/speed (USACE 2022) in relation to proximity to sensitive receptors such as residential communities and ecologically significant or special status species and wildlife.

Vibration is generally defined as rhythmic repetitive motion that may be experienced from a particular extraneous media (such as the ground or equipment). The duration of constant repetitive motion can cause

disturbances in the environment both naturally (such as an earthquake) and mechanically (such as large vehicles, equipment and machinery), as well as occupational hazards to the human body having the potential to cause injury from prolonged exposure (e.g. jack hammer).

4.1.31.1 Existing Conditions

Ambient noise levels within the Lower Bay Planning Region would likely be in the low to mid-range, as much of the Planning Region encompasses residential communities, open water, or open space. The primary sources of noise in the Planning Region include boat traffic in Raritan and Sandy Hook Bays, automobile traffic on local roads, and periodic explosions from demolition training at Naval Weapons Station Earle (USACE 2020b). Potential sensitive receptors in the Lower Bay Planning Region include residential areas and wildlife habitats. Noise criteria and the descriptors used to evaluate project noise depend on the type of land use in the vicinity of the proposed project areas. Potential sources of vibration to sensitive receptors may include automobiles, large motor vehicles, boat traffic, construction, and periodic explosions from demolition training at Naval Weapons Station Earle.

Noise and vibrations at the Oakwood Beach actionable element site would be anticipated to be on the lower end of the spectrum than the surrounding areas, since it is a part of the larger Great Kills Park, of which is primarily recreational beach and vegetative areas. Anticipated noise near the Actionable Element site would be vehicular traffic to the Great Kills Parking lot, pedestrian conversation, song and wading birds, ocean tides ebbing, and offshore boat traffic.

4.1.31.2 No Action

Adverse Effects

No adverse effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages, and existing conditions for noise and vibrations would remain unchanged. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages, and existing conditions for noise and vibrations would remain unchanged. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.31.3 Action Alternative

Adverse Effects

The project would create temporary construction-related noise and vibration from heavy diesel-powered machinery to excavate, grade, and clear the site. Noise and vibrations would be largely on land, with some localized disturbance in water during construction of the new tidal channel network and riprap placement; however, the use of water-based equipment will not be utilized (e.g. barges/dredges). Wildlife are anticipated to avoid areas of active construction, noise, and vibration, moving to nearby suitable habitat until construction is complete. Best management practices will be utilized to reduce the effects of noise and vibration on surrounding communities, such as local noise ordinance construction windows and environmental windows. Therefore, this effects category is representative as low adverse effect, with a corresponding score of -1.

Beneficial Effects

Following wetland restoration and establishment of the vegetative mosaic, the newly created habitat may attract more song and wading birds. Birders have been observed walking the Oakwood Beach front, providing an additional recreational value for bird identification. As this site is not adjacent to any residential housing, the

wildlife noises would not be considered nuisance noise. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

4.1.32 Noise and Vibration Score

Existing Conditions and consequences of the No Action and Action Alternative were assessed, including the adverse and beneficial effects. Qualitative scores are summarized below accounting for the highest direct and indirect adverse effect and beneficial effects discussed above in the supportive effects analyses.

Noise and Vibration Qualitative Rating	Adverse Effects		Beneficial Effects		NO ACTION TOTAL SCORE[1]	ACTION TOTAL SCORE[2]
	No Action	Action	No Action	Action		
Construction/Footprint	0	-1	0	+1	0	0
O&M Assumptions	0	0	0	0	0	0
Subtotal of Adverse and Beneficial Effects	*0*	*-1*	*0*	*+1*	*0*	*0*
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)					**0**	**0**

Note: n/a – not applicable. Adverse Effect scores: 0 (no impact), -1 (low impact), -2 (low-moderate impact), -3 (moderate impact), -4 (moderate-high impact), -5 (significant impact). Beneficial Effect scores: 0 (no benefit), +1 (low benefit), +2 (low-moderate benefit), +3 (moderate benefit), +4 (moderate-high benefit), +5 (significant benefit).
[1] – Sum of the No Action Adverse Effect and Beneficial Effect
[2] – Sum of the Action Adverse Effect and Beneficial Effect

4.1.33 Socioeconomics and Demographics

Socioeconomics and demographics are an important part of project planning, design, and construction to ensure communities at risk are considered at a local level with regard for the human environment and experience as well as safety, resilience, and cohesion. A critical aspect of understanding the effects to the human environment is understanding the socioeconomic and demographic conditions in the vicinity of a Federal project, by soliciting feedback from the public through the public review and comment period, and providing forums, such as public engagement meetings, to engage all members of those communities at risk. Considering socioeconomics and demographics in decision making creates opportunities for incorporating the publics feedback into the decision-making process, relevant to the ground-level needs of those communities. Utilizing statistical parameters, the effects assessment can be focused on determining if a Federal project may adversely or beneficially effect the sustainability of communities, and informs actions of which may be necessary to ensure no project disproportionately effects one group over another.

4.1.33.1 Existing Conditions

The Actionable Element Site is located in the southeastern quadrant of Great Kills Park, under the jurisdiction of the National Park Service. The vicinity immediately surrounding the Site is vacant park land, and a wastewater treatment plant to the east, and the Lower Bay to the south. Areas beyond those adjacent land uses include residential communities to the north and east, as well as additional non-contiguous portions of the Great Kills Park (at Miller Field). Beach front access is walking distance from the Great Kills Park parking lot located to the

west. Although not anticipated to be in abundance, birders utilize the Oakwood Beach shorefront for recreational purposes. The Site is also part of a Marine Protected Area for cultural and natural heritage.

According to the USEPA ECHO Database, the following socioeconomic and demographic conditions are present within a 1-mile radius of the Actionable Element Site:

General Statistics (ACS)	
Total Persons	7,357
Population Density	4,891/sq.mi.
Housing Units in Area	2,714
Percent People of Color	36%
Households in Area	2,594
Households on Public Assistance	52
Persons With Low Income	2,183
Percent With Low Income	30%

Geography	
Radius of Selected Area	1 mi.
Center Latitude	40.548889
Center Longitude	-74.113167
Total Area	--
Land Area	48%
Water Area	52%

Income Breakdown (ACS) - Households (%)	
Less than $15,000	189 (7.29%)
$15,000 - $25,000	142 (5.47%)
$25,000 - $50,000	378 (14.57%)
$50,000 - $75,000	318 (12.26%)
Greater than $75,000	1,567 (60.41%)

Age Breakdown (ACS) - Persons (%)	
Children 5 years and younger	451 (6%)
Minors 17 years and younger	1,502 (20%)
Adults 18 years and older	5,853 (80%)
Seniors 65 years and older	1,083 (15%)

Race Breakdown (ACS) - Persons (%)	
White	5,251 (71%)
African-American	148 (2%)
Hispanic-Origin	1,034 (14%)
Asian	1,068 (15%)
Hawaiian/Pacific Islander	0 (0%)
American Indian	0 (0%)
Other/Multiracial	808 (11%)

Education Level (Persons 25 & older) (ACS) - Persons (%)	
Less than 9th Grade	254 (4.89%)
9th through 12th Grade	370 (7.13%)
High School Diploma	2,171 (41.82%)
Some College/2-year	716 (13.79%)
B.S./B.A. or More	1,406 (27.09%)

Figure 17. ECHO Database Socioeconomics and Demographics Distribution within 1-Mile of the Oakwood Beach Actionable Element Site

4.1.33.2 No Action

Adverse Effects

No adverse effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages, and existing conditions for noise and vibrations would remain unchanged.

Beneficial Effects

No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages, and existing conditions for noise and vibrations would remain unchanged.

4.1.33.3 Action Alternative

Adverse Effects

The project would create temporary construction-related noise and vibration from heavy diesel-powered machinery to excavate, grade, and clear the site. Noise and vibrations would be largely on land, with some localized disturbance in water during construction of the new tidal channel network and riprap placement; however, the use of water-based equipment will not be utilized (e.g. barges/dredges). Construction fencing would restrict access to the work area during construction, until construction is complete. Best management practices will be utilized to reduce the effects of noise and vibration on surrounding communities, such as local noise ordinance construction windows and environmental windows.

Beneficial Effects

Following wetland restoration and establishment of the vegetative mosaic, the newly created habitat may attract more song and wading birds. Although not anticipated in abundance, birders have been observed walking the Oakwood Beach front, in which the project would be expected to provide an additional recreational value for birding. As this site is not adjacent to any residential housing, the wildlife noises would not be considered nuisance noise. A newly placed mowed path connecting the western adjacent parking lot at Great Kills Park would connect to the Site, and additionally to a walking/bike path, increasing recreational access to the enhanced wetland.

4.1.34 Socioeconomics and Demographics Score (not scored)

Existing Conditions as well as effects and consequences of the No Action and Action Alternative were assessed, including any anticipated adverse and beneficial effects perceived to socioeconomic and demographic conditions; however, qualitative scores were not generated for this section, as the adverse effects and/or benefits of the No Action and Action Alternative are highly subjective to the human experience of those living within the vicinity of this Actionable Element Site, and those utilizing this Site for recreational purposes. However, a scorecard may be generated for the Final Report, should there be enough supporting information received through comments from stakeholders and the public during the comment review period that would reasonably allow for a qualitative effect score to be generated.

5 ENVIRONMENTAL COMMITMENTS, COMPLIANCE, AND MITIGATION

The following summarizes environmental commitments and compliance relative to this Actionable Element Site including but not limited to those discussed in more detail below. The potential BMP's and mitigation actions that may be utilized to sustain low adverse effects for the Actionable Element Site are presented on the following table:

RESOURCE CATEGORY	POTENTIAL BMPs AND MITIGATION
Wildlife and Vegetation	Erosion and sediment control BMPs, vegetation restoration and compensation, invasive species BMPs, tree/shrub clearing restriction windows, replanting with native vegetation, pre-construction vegetation surveys
Special Status Species	Avoidance. Environmental window restrictions for construction and maintenance activities, terrestrial aquatic species and vegetation surveys, continued coordination with respective regulatory Agencies.
Special Status Areas	Erosion and sediment control BMPs, continued coordination with respective regulatory Agencies.
Physical Resources	Erosion and sediment control BMPs, disturbed areas restored to pre-construction land use.
Hydrological Resources	Erosion and sediment control BMPs, water quality certificate recommendations/BMPs
Air Quality and Clean Air Act	Air emissions from construction of the Actionable Element are anticipated to be below all de minimis levels on a yearly basis; and therefore, is not anticipated to trigger General Conformity Review.
Cultural Resources	In continued coordination with NYSHPO, NJHPO, LPC, NPS and other stakeholders, avoid/minimize adverse effects to Cultural Resources in accordance with stipulations of the Programmatic Agreement.
HTRW	Avoidance and minimization of impacts to HTRW sites, implementation of BMPs when working near HTRW sites. Coordination with Federal, State, and Local agencies as needed.
Navigation	Not Applicable.
Noise and Vibration	Construction timeframes will be coordinated with local ordinance. noise and vibration monitoring may be conducted during construction.
Socioeconomics and Demographics	Construction timeframes will be coordinated with local ordinances, noise and vibration monitoring/surveys may be conducted during construction. Additional BMPs may be tailored to the community concerns.

Avoidance, Mitigation, and Best Management Practices Considerations

As the anticipated adverse effects of this Actionable Element are low ("-1") additional mitigation beyond avoidance is not necessary to sustain low adverse effect qualitative rating, therefore, no mitigation scores were generated. This does not mean that best management practices or mitigation (avoidance) will not be implemented, but rather, that it is not necessary to quantify beyond what is already being performed as part of the implementation of the project. Refer to the Environmental Appendices for supporting detail and individual resource effect rating score cards.

5.1.1 Clean Air Act

Section 118 of the Clean Air Act states that any Federal action that may result in discharge of air pollutants must comply with Federal, State, interstate, and local requirements respecting control and abatement of air pollution. Section 176(c) of the Act requires that Federal actions conform to an implementation plan after is has been approved or promulgated under Section 110 of the Act. As this Actionable Element Site is located within a maintenance zone for CO and $PM_{2.5}$ and is within the Ozone Transportation Region and in non-attainment area for ozone, these criteria pollutants were compared to the applicable *de minimis* quantities emission thresholds, including the more stringent ozone (VOC and NOx) threshold.

Emissions from construction will be below all of these de minimis levels on a yearly basis; and therefore, is not anticipated to trigger General Conformity Review. A Clean Air Act assessment, with Record of Non-Applicability (RONA) was prepared for this Actionable Element Site, provided in the CAA Subappendix. Any design refinements will be reviewed for consistency with this determination in future phases of the Study.

5.1.2 Clean Water Act, 33 U.S.C. 1251, et seq.

Section 401 of the Clean Water Act (CWA) requires every applicant for a Federal license or permit for any activity that may result in a discharge into navigable waters to obtain a State Water Quality Certificate or a waiver that the proposed activity will comply with the state water quality standards. NYSDEC and NJDEP issue Section 401 Water Quality Certificates for activities within each respective State (in New Jersey via the Waterfront Development Permits and CAFRA Permits processes).

Section 402 of the CWA prohibits the discharge of pollutants to the waters of the United States from any point source unless the discharge follows a National Pollutant Discharge Elimination System (NPDES) Permit (SPDES in New York and NJPDES in New Jersey). Storm water discharges associated with any activity that involves earth disturbances that exceed one acre also require a NPDES permit.

Section 404 of the CWA regulates the discharge of dredge or fill materials into the waters of the Unites States, including wetlands, at specific disposal sites. The selection and use of disposal sites must be in accordance with guidelines development by the U.S. EPA in conjunction with the Secretary of the Army and published in 40 CFR Part 230 (also known as the 404(b)(1) guidelines). Under Section 404(b)(1) USACE shall examine practicable alternatives to the proposed discharge and permit only the Least Environmentally Damaging Practicable Alternative (LEDPA). Both Section 404 and 33 C.F.R. 336(c)(4) and 320.4(b) require USACE avoid, minimize, and mitigate impacts to wetlands.

A CWA assessment was prepared for this Actionable Element Site, provided in the CWA Subappendix.

5.1.3 Coastal Zone Management Act, 16 U.S.C. 1451, et seq.

To implement CZMA and to establish procedures for compliance with the Act's Federal consistency provisions, NOAA promulgated regulations (15 C.F.R. Part 930), which state that a federal agency may use NEPA documents as a vehicle for CZMA consistency determination. The NYSDOS Office of Planning and Management administers and maintains New York State mapped CZMA boundaries present within New York State. Additionally, the NYC WRP manages boundaries established at a local level. The Actionable Element is within Federal and State mapped CZMA zones; therefore, a CZMA assessment was prepared, provided in the CZMA Subappendix.

5.1.4 Endangered Species Act, 16 U.S.C. 1531, et seq. (USFWS and NOAA-NMFS)

Consultation with the USFWS and/or NOAA-NMFS is required when a Federal action may affect a Federally- listed species or designated critical habitat. Many terrestrial and aquatic threatened, endangered,

as well as candidate species are present within the NYNJHAT Study Area. The Actionable Element Site is not anticipated to have adverse effects on threatened and endangered species as documented within this Appendix. Endangered Species Act coordination was initiated with the U.S. Fish and Wildlife Service, and an ESA assessment was prepared for the Actionable Element, provided in the ESA Subappendix for USFWS and NOAA-NMFS.

5.1.5 Fish and Wildlife Coordination Act Report

The New York District and the USFWS are in the process of initiating a scope of work for the preparation of a FWCAR pursuant to the Fish and Wildlife Coordination Act 48 Stat. 401, as amended; 16 U.S.C 661 et seq., to provide information of fish and wildlife resources, including listed species under the ESA, and trust resources within the Actionable Element Site area. The FWCAR will be coordinated with the U.S. EPA, NYSDEC, NJDEP, and other agencies/organizations as appropriate, regarding the project area resources, potential project related impacts, and the means and measures that should be adopted to prevent the loss of or damage to fish and wildlife resources, as well as recommendations to avoid, minimize, or compensate for impacts resulting from the Actionable Element Sites. The New York District anticipates a Draft FWCAR before the Final Integrated FR/EA, and a Final FWCAR thereafter following a review and comment period. This Appendix will be updated with the FWCAR findings and recommendations for issuance of the Final Integrated FR/EA.

5.1.6 Floodplain Management (E.O. 11988)

Executive Order 11988 *Floodplain Management* implementing procedures include an eight-step process for determining potential impacts to floodplains. These steps, as outlined by 44 CFR 9.6 and under USACE ER 1165-2-26 *Implementation of Executive Order 11988 on Flood Plain Management*, are summarized as follows:

- Determine if the proposed action is in the base floodplain (1% chance of annual flood, also known as the 1% floodplain)
- If the action is in the base floodplain, involve the public in the decision-making process
- Identify and evaluate practicable alternatives to locating the action in the base floodplain
- Identify beneficial and adverse impacts of the proposed action
- Minimize threats to life and property and to natural and beneficial floodplain values. Restore and preserve natural and beneficial floodplain values
- Reevaluate the alternatives
- If the final determination is made that no practicable alternative exists to locating the action in the flood plain, advise the public of findings
- Implement the proposed action

The alternative plans were assessed under the eight-step process. The Actionable Element Site is located within and/or near a base floodplain, of which are presented and evaluated within this Environmental Appendix to the Integrated Interim Response FR/EA. Avoidance of base floodplains in CSRM studies is largely unavoidable as storm-related flooding inundates the 1% and 0.2% floodplain areas, and upland areas depending on location and severity of the storm. As the NYNJHAT Study Area is heavily urban, many areas within or near the 1% floodplain are developed communities in New Jersey (such as Hoboken, Jersey City, Newark) and New York (including Seagate, Coney Island, Rockaway). Potential beneficial and adverse effects of the Action are discussed in this report, which has been made available for public review and input. Public meetings will be held during the public comment period to present and discuss findings to stakeholders within the NYNJHAT Study Area. Public and Agency feedback will be incorporated into the Final Integrated Interim Response FR/EA. Additionally, FEMA is a participating agency for the NYNJHAT Study and New York District has coordinated with The FEMA throughout the Study's progress including during the NYNJHAT

CSRM Study scoping, the interim report release (2019), and during Cooperating and Participating Agency coordination meetings for the larger Comprehensive Plan and for this Interim Response, which has included an engineering presentation on the NYNJHAT Study Alternatives, a presentation on the TSP selection process and TSP (Alternative 3b), and a presentation on the Interim Response Actionable Elements discussed in more detail in the Main Text. New York District will continue to coordinate with FEMA in subsequent phases of the Study to minimize threats to life and property, and to preserve natural and beneficial floodplain values, as applicable. As this is just an interim action of the larger Comprehensive Plan, there will be additional opportunities for the public and Agencies to review the future proposed plan and provide feedback during the remainder of the Tier 1 and Tier 2 NEPA documents, subject to future funding and appropriations.

5.1.7 National Park Service Lands, Public Law 92-592, 1972

CSRM plans that fall within the boundaries of or impact the resources of the NPS Lands, i.e. Gateway National Recreation Area, must be mutually acceptable to the Department of the Interior and the Department of the Army. The authorizing legislation (Public Law 92-592, 1972) for GNRA recognized the potential need for water resource development projects within USACE mission to be undertaken within its boundaries by establishing that that there must be agreement between the two agencies. The authorizing language states that "The authority of the Secretary of the Army to undertake or contribute to water resource developments, including shore erosion control, beach protection, and navigation improvements (including the deepening of the shipping channel from the Atlantic Ocean to the New York harbor) on land and/or waters within the recreation area shall be exercised in accordance with plans which are mutually acceptable to the Secretary of the Interior and the Secretary of the Army."

5.1.8 National Environmental Policy Act of 1969. 42 U.S.C. §4321 et seq.

Environmental data for the NYNJHAT Study has been compiled and documented in the September 2022 Integrated FR/Tier 1 (Programmatic) EIS that was released for public, state, and Federal agency review and comment. Environmental data for the Actionable Element Sites has been compiled and documented in this Integrated Interim Response FR/EA, for public, state, and Federal agency review. NEPA compliance will continue to be implemented throughout subsequent phases of the Study, including the remainder of this Interim Response action phase, as well as the Comprehensive Plan's Tier 1 and the Tier 2 phases.

5.1.9 National Historic Preservation Act of 1966 (INTER ALIA)

The Actionable Element is in compliance with Section 106 of the National Historic Preservation Act, as amended. As part of the requirements and consultation process contained within the National Historic Preservation Act implementing regulations of 36 CFR 800, this project is also in compliance through ongoing consultation with the Archaeological and Historic Preservation Act, as amended, Archeological Resources Protection Act, American Indian Religious Freedom Act, Executive Order 11593, 13007, and 13175, the Presidential Memo of 1994 on Government to Government Relations, New York State Office of Parks, Recreation and Historic Preservation(OPRHP) Section 14.09 of the New York State Historic Preservation Act and the New Jersey Register of Historic Places Act, (Laws of 1970, Chapter 268) and New Jersey Public Law 2004,Chapter 1. Consultation with the New York State Historic Preservation Office (NYSHPO), NYC Landmarks Preservation Commission (LPC), the New Jersey Historic Preservation Office (NJHPO), NJDEP, and NYSDEC, the Secretary of the Interior (SOI) in consultation with NPS Interior Region 1 Office, the Delaware Nation, the Stockbridge Munsee Community Band of Mohican Indians, and the Delaware Tribe of Indians (federally-recognized tribes), and other interested parties was initiated on May 23, 2022. Coordination on the potential for effects with the interested parties and the appropriate federally recognized tribes is ongoing and will be finalized prior to implementation of the proposed action. The proposed action will be in compliance with the goals of this Act upon completion of coordination as stated above.

The Actionable Element Site has the potential to have an adverse impact on historic properties, however, additional investigation is required to determine what resources will be impacted. A Programmatic Agreement (see Cultural Resource Subappendix) which stipulates the actions the New York District will take with regard to cultural resources as the Project proceeds. The Programmatic Agreement will be used to ensure that the New York District satisfies its responsibilities under Section 106 of the NHPA and other applicable laws and regulations. The Draft PA will be provided to the New York District, New York and New Jersey State Historic Preservation Offices, New York City Landmarks Preservation Commission, Federally Recognized Tribes, and Interested parties for their review and participation. Both cultural resource surveys, and additional analysis of the impacts to the viewshed will be carried out in compliance with Stipulations I-V in the PA.

5.1.10 Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. et seq.

The Magnuson-Stevens Fishery Conservation and Management Act (PL 94-265), as amended, establishes procedures for the identification of essential fish habitat and required interagency coordination to further the conservation of Federally-managed fisheries. The implementing regulations require Federal agencies that authorizes, funds, or undertakes, or proposes to authorize, fund, or undertake, an activity that could adversely affect essential fish habitat is subject to the consultation provisions of the Act and identified consultation requirements. This Actionable Element Site is not likely to have adverse effects on essential fish habitat. An essential fish habitat assessment was prepared for this Actionable Element Site, provided in the EFH Subappendix.

5.1.11 Marine Mammal Protection Act of 1972, 16 U.S.C. 1631, et seq.

The MMPA prohibits the “take” of marine mammals within a federally authorized project area. The Actionable Element Site is not anticipated to have an adverse effect on marine mammals and aquatic life within the estuary. New York District will continue to coordinate with the USFWS and NOAA-NMFS, both of which are Cooperating Agencies on this Study, as needed to determine any potential effects in the future.

5.1.12 Migratory Bird Treaty Act, 16 U.S.C. 715-715s, and E.O. 13186 Responsibilities of Federal Agencies to Protect Migratory Birds

A “take” of a migratory bird protected under the MBTA. Section 704 of the MBTA states that the Secretary of the Interior is authorized and directed to determine if, and by what means, the take of migratory birds should be allowed and to adopt suitable regulations permitting and governing “takes”. Disturbance of a nest of a migratory bird requires a permit issued by the USFWS pursuant to Title 50 of the Code of Federal Regulations. Construction of the Actionable Element Site is not anticipated to have the potential to “take” migratory birds, eggs, nests, or young during construction that may involve mechanized land clearing. New York District will coordinate with the USFWS, NYSDEC, to determine the appropriate construction windows that avoid “takes” and establish best management practices to be implemented during construction and operations and maintenance activities of the Actionable Element Sites.

5.1.13 Rivers and Harbors Act, 33 U.S.C. 401, et seq.

The Rivers and Harbors Act prohibits the construction of any bridge, dam, dike, or causeway over and/or in navigable waters of the United States without Congressional approval. The USCG administers Section 9 of the Act, and issues bridge crossing permits over navigable waters, in addition to requiring the necessary lighting aids to navigation to approve any temporary or permanent closures or restrictions of navigation channels. While it is anticipated that the Comprehensive Plan storm surge barriers would require a permit from the USCG to be constructed, it is not anticipated that any permit is needed from the USCG for this Actionable Element Site. New York District will continue to coordinate with the USCG, a Cooperating

Agency on the NYNJHAT Study, in subsequent phases of the Study.

6 CONCLUSIONS

This Integrated Interim Response FR/EA Appendix describes the existing conditions and Alternative effects, including adverse and beneficial, of the Oakwood Beach Actionable Element Site.

Each individual resource scorecard is combined into one collective Actionable Element Site scorecard to compare the Alternatives, including the No Action Alternative, and presented in the Main Text, Effects and Consequences Section, of which this document is appended to, as well as the following section as to provide a high-level overview of the anticipated adverse and beneficial effects concisely; with additional detail in the Appendices where necessary to elaborate on the extent of those adverse and beneficial effects. An additional score card was further developed and presented in the Environmental Quality Section of the Main Text, which presents the data in a format that provides further comparison of the adverse and beneficial effects.

6.1 ENVIRONMENTAL CONSEQUENCES MAIN TEXT SUMMARY TABLES

The following tables have been provided in the Main Text of this Integrated Interim Response FR/EA, and below for ease of review.

6.1.1 Natural Environment

The following tables of effects was generated from the adverse and beneficial effects assessment presented in Appendix A, providing a high-level overview of the anticipated adverse and beneficial effects, collectively, of Construction, Operations and Maintenance, and Mitigation if applicable. Refer to the Environmental Appendix sections for supporting detail of the adverse and beneficial effects analysis and the corresponding individual resource effect rating score cards that informed this table.

NATURAL ENVIRONMENT SCORECARD OAKWOOD BEACH Qualitative Rating Scores	NO ACTION TOTAL SCORE	ACTION TOTAL SCORE
WILDLIFE AND VEGETATION		
Wildlife	**-1**	**+4**
Fish	**-1**	**+4**
Migratory Fish	**-1**	**+4**
Terrestrial Vegetation	**-1**	**+4**
Submerged Aquatic Vegetation	**N/A**	**N/A**
Invasive and Aquatic Nuisance Species	**-1**	**+4**
SPECIAL STATUS SPECIES		
Threatened and Endangered Species (Terrestrial)	**-1**	**+1**
Threatened and Endangered Species (Aquatic)	**0**	**0**
Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act Species	**-1**	**+4**
Marine Mammal Protection Act Species	**N/A**	**N/A**

Sea Turtles	**N/A**	**N/A**
Essential Fish Habitat and EFH-Designated Species	**-1**	**+2**
SPECIAL STATUS AREAS		
Wetlands	**-1**	**+4**
Floodplains	**0**	**+5**
Wild and Scenic Rivers	**N/A**	**N/A**
Designated Critical Habitat	**N/A**	**N/A**
Critical Environmental Areas	**N/A**	**N/A**
Marine Protected Areas	**-1**	**+4**
Coastal Zone Management Act Areas	**-1**	**0**
Coastal Barrier Resources Act Areas	**N/A**	**N/A**
National Park Service Land	**-1**	**+4**
Wildlife Refuge Land	**N/A**	**N/A**
Commercial and Recreational Fishing	**N/A**	**N/A**
Subtotal Scores (additive, for calculation)	***-12***	***44***
TOTAL AVERAGED SCORE (calculated, averaged. Subtotal divided by total number of resources applicable and scored):	**-0.92**	**3.14**
TOTAL HIGHEST ADVERSE EFFECT ESCALATED SCORE (for comparison purposes)	**-1**	**-1**
TOTAL HIGHEST BENEFICIAL EFFECT ESCALATED SCORE (for comparison purposes)	**0**	**+5**

6.1.2 Adverse Effects Summary

6.1.2.1 Wildlife and Vegetation

No Action Alternative

The No Action Alternative adverse effects range from 0, or no adverse effect, to -1 (low adverse effect) primarily due to the coastal storm risk, persistent wildfires, and RSLC.

Action Alternative

During construction, the Action Alternative adverse effects range from 0, or no adverse effect, to -1 (low adverse effect) primarily due to the temporary disturbances from active construction, and the physical manipulation of the Actionable Element Site that would be anticipated to displace wildlife and disturb existing vegetation during the removal of non-native invasive phragmites. Wildlife would be anticipated to avoid areas of construction, and return once construction is complete. Operations and maintenance activities are anticipated to be negligible.

6.1.2.2 Special Status Species

No Action Alternative
The No Action Alternative adverse effects range from 0, or no adverse effect, to -1 (low adverse effect) primarily due to the coastal storm risk, persistent wildfires, and RSLC.

Action Alternative
During construction, the Action Alternative adverse effects range from 0, or no adverse effect, to -1 (low adverse effect) primarily due to the temporary disturbances of active construction, and the physical manipulation of the Actionable Element Site that would be anticipated to deter wildlife and disturb existing vegetation during the removal of non-native invasive phragmites. Environmental windows will be implemented as appropriate for species of concern, anticipated to include at a minimum a no-construction window from November to March for Red Knots, as recommended for the neighboring South Shore of Staten Island USACE project. Ancillary disturbances that cannot be avoided may deter species, such as construction related noise and vibrations, although those are anticipated to be temporary, low, and addressed through the no-construction windows. Operations and maintenance activities are anticipated to be negligible.

6.1.2.3 Special Status Areas

No Action Alternative
The No Action Alternative adverse effects range from 0, or no adverse effect, to -1 (low adverse effect) primarily due to the coastal storm risk, persistent wildfires, and RSLC.

Action Alternative
During construction, the Action Alternative adverse effects range from 0, or no adverse effect, to -1 (low adverse effect) primarily due to the temporary disturbances of active construction, and the physical manipulation of the Actionable Element Site that would be anticipated to disturb existing special status areas. These disturbances include temporary removal of habitat and restricted access to portions of the site while active construction is commencing. Operations and maintenance activities are anticipated to be negligible

6.1.3 Beneficial Effects Summary

6.1.3.1 Wildlife and Vegetation

No Action Alternative
No beneficial effects of the no action are anticipated.

Action Alternative
Beneficial effects of the Action Alternative are primarily focused on the management of coastal storm risk and wave attenuation, as well as the additional related ecological wetland enhancement benefits that provide noticeable qualitative, and quantifiable, benefits to several natural resources. Further benefits to wildlife and vegetation would be anticipated, as the site would be transition from non-native invasive habitat to native habitat, increasing the availability of foraging and sheltering areas for wildlife in the vicinity, as well as species migrating through the area (e.g. birds). As this site is part of the Atlantic Flyway, the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, many of the wildlife and vegetation resources would incur a “+5” score, with a net outcome of “+4” in consideration for the adverse effect of “-1”.

6.1.3.2 Special Status Species

No Action Alternative
No beneficial effects of the no action are anticipated.

Action Alternative
Beneficial effects to special status species are anticipated primarily for birds protected under the Migratory Bird Treaty Act, as well as for Osprey, a species of special concern, due to the inclusion of Osprey nests proposed as part of the project. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, as well as a State and Federally listed wetland, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. However, due to the limit in special status species habitat and presence anticipated for threatened and endangered species, a corresponding overall score of "+1" is anticipated; while Migratory Bird Treaty Act species would incur a "+5" score, with a net outcome of "+4" in consideration for the adverse effect of "-1".

6.1.3.3 Special Status Areas

No Action Alternative
No beneficial effects of the no action are anticipated.

Action Alternative
Beneficial effects of the Action Alternative are highest for wetlands, floodplains, National Park Service land, and Marine Protected Areas. The increased function and capacity of the CSRM wetland would be designed to function as a nature-based coastal storm risk management feature that could more naturally support the absorption of flood damages, and would be more readily able to function as a natural CSRM buffer between the coast and surrounding communities. Benefit to the surrounding Great Kills Park, NPS jurisdiction would be anticipated with this nature-based solution. Increased benefits would be observed from managing 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. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, as well as a State and Federally listed wetland, the benefits of this project would be of regional significance to multiple resources and communities throughout the area. Therefore, many of the special status area resources would incur a "+5" score, with a net outcome of "+4" in consideration for the adverse effect of "-1".

6.1.4 Physical Environment
The following table of effects was generated from the effects assessment presented in Appendix A, and provides a high-level overview of the anticipated adverse and beneficial effects of Construction, Operations and Maintenance, and Mitigation if applicable. Refer to Appendix A for supporting detail and individual effect rating score cards.

PHYSICAL ENVIRONMENT SCORECARD OAKWOOD BEACH Qualitative Rating Scores	NO ACTION TOTAL SCORE	ACTION TOTAL SCORE
Physical Resources		
Topography and Geology	**-1**	**0**
Surface Waters	**-1**	**+2**
Sediment	**-1**	**+1**

Land Use	**0**	**+5**
Hydrological Resources		
Bathymetry	**0**	**+1**
Inland Hydrology	**0**	**+2**
Coastal Hydrology, Currents, and Circulation	**0**	**+1**
Tides, Tidal Exchange, and Tidal Range	**0**	**+1**
Sediment Transport	**0**	**+1**
Water Quality	**-1**	**+1**
Air Quality	**0**	**+1**
Climate and Regional Sea Level Change	**-1**	**+1**
Cultural Resources[1]		
Historic Structures[1]	**0**	**0**
Viewshed / Historic Setting[1]	**-1**	**+3**
Terrestrial Archaeological Resources[1]	**-1**	**-1**
Submerged Archaeological Resources[1]	**0**	**0**
Native American Land	**N/A**	**N/A**
Hazardous, Toxic, and Radioactive Waste	**-1**	**0**
Navigation	**N/A**	**N/A**
Noise and Vibration	**0**	**0**
Socioeconomics and Demographics	**NS**	**NS**
Subtotal Scores (additive, for calculation)	***-8***	***19***
TOTAL AVERAGED SCORE (calculated, averaged. Subtotal divided by total number of resources applicable and scored):	**-0.44**	**1.05**
TOTAL HIGHEST ADVERSE EFFECT ESCALATED SCORE (for comparison purposes)	**-1**	**-1**
TOTAL HIGHEST BENEFICIAL EFFECT ESCALATED SCORE (for comparison purposes)	**0**	**+5**

[1] Cultural Resource Category is broken out by resource of significance.
N/A Not Applicable, NS Not Scored.

6.1.5 Adverse Effects Summary

6.1.5.1 Physical and Hydrological Resources

No Action Alternative

The No Action Alternative adverse effects range from 0, or no adverse effect, to -1 (low adverse effect) primarily due to the coastal storm risk, persistent wildfires, and RSLC.

Action Alternative
During construction, the Action Alternative adverse effects range from 0, or no adverse effect to -2, or low to moderate adverse effect primarily due to the temporary disturbances of active construction, and the physical manipulation of the Actionable Element Site.

The majority of Physical Environment resources would have no or negligible adverse and no or negligible beneficial effects from the operations and maintenance of the Actionable Element, as the site would continue to be monitored for wetland development, inclusive of invasive species management and maintaining the path along the western side of the site. Otherwise, the site may persist self-sufficiently with minimal artificial support. As this Actionable Element is a CSRM-focused wetland enhancement replacing low quality habitat with a vegetative mosaic with tidal channel network that is conducive to the surrounding area, the enhancement itself in its operating state provides a moderate benefit to viewshed.

As the anticipated adverse effects of this Actionable Element are low ("-1") for the majority of Physical Environment resources and low to moderate ("-2") for a few resources, additional mitigation beyond avoidance is not necessary to sustain low adverse effect qualitative rating; therefore, a collective scorecard was not generated. This does not mean that best management practices or mitigation (avoidance) will not be implemented, but rather, that it is not necessary to quantify beyond what is already being performed as part of the implementation of the project. Refer to the Individual Scorecards in each resource section of this Appendix for supporting detail and individual resource effect rating score cards.

6.1.5.2 Water Quality and Air Quality

No Action Alternative
The No Action Alternative adverse effects range from 0, or no adverse effect, to -1 (low adverse effect) primarily due to the coastal storm risk, persistent wildfires, and RSLC.

Action Alternative
Water quality at the site would be anticipated to improve with native plantings and sediments serving as natural wetland filters of pollutants. Salinity in the created tidal channel network would take on the characteristics of the adjacent Main Tidal Channel of which they would connect into. As over 1-acre of land will be disturbed, a NPDES/SPDES permit will be required under the Clean Water Act. BMPs will be utilized to reduce adverse effects and prevent discharges into navigable waters. Sediment resuspension and turbidity would be anticipated during construction, although would be temporary and settle post construction.
Emissions from construction of the Action Alternative are below the de minimis levels on a yearly basis. The sold impact producing factor to air quality is regulated air emissions, which will be below General Conformity significance. Therefore, all qualitative scores are rated "0" for no effect.

Negligible operations and maintenance assumption emissions are anticipated, as the site would be a restored wetland habitat. It is possible that some vegetative maintenance may occur but would be infrequent and limited to invasive species management, or small area mowing. Therefore, all qualitative scores are rated "0" for no effect.

6.1.5.3 Cultural Resources

No Action Alternative
The no action or no-build alternative was evaluated against the project purpose and need. The no action or no-build alternative would have impacts to existing aesthetic, visual, historical, or cultural resources since there

would be no measures to manage future flood risks that are expected to be exacerbated by RSLC. Archaeological resources in the Study Area are at risk of damage or destruction from coastal flooding and sea-level rise. Additionally, submerged resources may be affected by underwater storm action and changes in seawater flow that accompany sea-level rise and flooding. Without coastal storm risk management measures, the AE will be impacted by the 1% floodplain.

Action Alternative
Although the alternative includes a known archaeological site and is designated as sensitive for prehistoric archaeological resources, the site has been extensively modified by past development, fill, and infrastructure activities. As such, any intact archaeological deposits are expected to be deeply buried and isolated, reducing their vulnerability to disturbance from planned surface-level work. However, certain components of the ~~project;~~project, such as tidal channel excavation and dune regrading, may involve limited subsurface impacts. These potential effects warrant a low-to-moderate adverse effect rating for terrestrial archaeological resources during construction. No adverse effects are anticipated for submerged archaeological resources or above-ground historic structures. However, targeted archaeological monitoring or testing in higher sensitivity zones will be necessary to avoid unanticipated impacts and ensure compliance with Section 106 of the National Historic Preservation Act.

6.1.5.4 Hazardous, Toxic, Radioactive Waste

No Action Alternative
The No Action Alternative adverse effects range from 0, or no adverse effect, to -1 (low adverse effect) primarily due to the coastal storm risk, persistent wildfires, and RSLC.

Action Alternative
While encountering HTRW during construction is not anticipated, any intrusive subsurface work associated with implementation of the proposed project has the potential to disturb soil/sediment that could be contaminated with HTRW. Should contaminated soil/sediment be disturbed, there could be increased risk to human health and the environment. However, a subsurface planning investigation would be conducted during the PED phase to further characterize the subsurface conditions. This investigation will inform any potential HTRW risks associated with construction and implementation of the proposed project and ensure there are not HTRW concerns in any areas where the subsurface may be disturbed. As per Engineer Regulation 1165-2-132, HTRW collocated within the proposed measure footprints must be avoided where feasible, and where they cannot be avoided, those sites must be remediated at 100% nonfederal cost prior to construction.

6.1.5.5 Noise and Vibration

No Action Alternative
No adverse effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages, and existing conditions for noise and vibrations would remain unchanged.

Action Alternative
The project would create temporary construction-related noise and vibration from heavy diesel-powered machinery to excavate, grade, and clear the site. Noise and vibrations would be largely on land, with some localized disturbance in water during construction of the new tidal channel network and riprap placement; however, the use of water-based equipment will not be utilized (e.g. barges/dredges). Wildlife are anticipated to avoid areas of active construction, noise, and vibration, moving to nearby suitable habitat until construction is complete.

6.1.5.6 Socioeconomics and Demographics

No Action Alternative
The No Action Alternative adverse effects range from 0, or no adverse effect, to -1 (low adverse effect) primarily due to the coastal storm risk, persistent wildfires, and RSLC.

Action Alternative
The project would create temporary construction-related noise and vibration from heavy diesel-powered machinery to excavate, grade, and clear the site. Noise and vibrations would be largely on land, with some localized disturbance in water during construction of the new tidal channel network and riprap placement; however, the use of water-based equipment will not be utilized (e.g. barges/dredges). Construction fencing would restrict access to the work area during construction, until construction is complete.

6.1.6 Beneficial Effects Summary

6.1.6.1 Physical and Hydrological Resources

No Action Alternative
No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages.

Action Alternative
Beneficial effects of the Action Alternative range from 0, or no benefit, to +5 for high benefits particularly for Land Use. Land use quality would increase, as 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. Increased benefits would be observed from managing fire risk that can have direct and indirect effects to the surrounding Oakwood Beach land uses, neighborhoods, wildlife, and fish, such as air quality concerns, smoke, fire damage, and storm damage related pollution. 1.30-acres of newly created tidal channels would expand the available surface waters, bathymetry, and sediments at the site, introducing additional opportunity for benthic resources and fish access into the site. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, as well as a State and Federally listed wetland, the benefits of this project would be of regional significance to multiple resources and communities throughout the area.

6.1.6.2 Water Quality and Air Quality

No Action Alternative
No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages.

Action Alternative
Beneficial effects of the Action Alternative range from +1 (low) to +2 (low to moderate). The proposed project would remove non-native phragmites of which fill and degrade wetlands, 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, and improvements to water quality. Air quality is anticipated to improve from the managed wildfire risk.

6.1.6.3 Cultural Resources

No Action Alternative
No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Action Alternative
The Oakwood Beach Alternative is expected to yield moderate beneficial impacts to cultural resources, particularly in the form of landscape restoration that enhances the cultural viewshed and reestablishes the ecological and visual character of the shoreline. The creation of a vegetative mosaic with native plants, the reintroduction of tidal channels, and dune restoration will help restore a historically and environmentally significant shoreline buffer. These improvements align with long-term resilience and sustainability goals and reflect traditional environmental knowledge systems tied to Indigenous and early land use patterns.

Additionally, the removal of non-native invasive species will improve the interpretive integrity of the site and support the area's role as a natural defense system, benefiting the larger NYNJHAT Study area and adjacent South Shore and Great Kills Park. These landscape-scale improvements provide lasting scenic, educational, and ecological value that reinforce the cultural identity of the region.

Viewshed. The measures included in the study will enhance existing viewscapes, depending on location and scale. Construction of nature based measures may positively affect scenic byways, improve existing residential views, and/or increase access to historic coastal sites (USACE 2019). Aesthetic valuation, a judgement of value based on appearance of an object and emotional responses, of the public is ongoing and will be updated as stakeholder input is aggregated, but was not used to determine the preliminary impact rating.

Measures proposed for the AE will not involve the construction of structures that have a potential to indirectly affect historic properties, there are no historic properties impacted by the Action Alternative, and will not alter the visible environment (i.e., setting) of those resources. For this study, the visual impact study area (Indirect APE) includes those places within one mile (1.6 km) of proposed measures for the alternative that are in the potential viewshed (based on topography). This Visual Impact Area, or Zone of Visual Influence (ZVI), encompasses parts of coastal Staten Island, New York City. As of this writing, this preliminary visual impact analysis is an initial screening of impacted historic properties and will be refined in subsequent iterations.

Additional visual assessment for the measures proposed at Oakwood Beach was deemed unnecessary because the design elements do not introduce visual changes that rise to the threshold of an adverse effect under Section 106 criteria. An adverse visual effect occurs only when a new element added to the landscape diminishes the aspects of a property's significance or integrity, such as its historic setting, that contribute to its eligibility for listing in the State or National Registers of Historic Places (S/NRHPs).

The Action Alternative, which includes elements such as vegetative plantings, grading, and berms with naturalistic contours, are compatible with the existing coastal landscape. These measures do not obstruct significant views to or from eligible or listed historic properties, nor do they introduce visual elements that are out of scale, incompatible, or in stark contrast with the surrounding character. Because the proposed nature-based components are designed to blend with the natural setting and do not diminish the visual integrity or appreciation of any known historic resource in the area, neither adverse aesthetic nor obstructive effects are anticipated. Accordingly, based on established guidance and definitions of visual impacts, further detailed visual analysis was not required for this portion of the undertaking.

6.1.6.4 Hazardous, Toxic, Radioactive Waste

No Action Alternative
No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages.

Action Alternative
Beneficial effects of the Action Alternative are anticipated to be low (+1). With managed CSRM flooding, there would be less risk of severe storm damage to the surrounding urbanized area and less risk of petroleum and/or hazardous substances release, spread of historical contaminated soils and sediment, HTRW exposure, and

delays and cost increases for addressing HTRW sites. Additionally, increased benefits would be observed from managing fire risk to nearby HTRW sites with the restoration of the wetland, and removal of highly ignitable non-native phragmites.

6.1.6.5 Noise and Vibration

No Action Alternative
No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages.

Action Alternative
Following wetland enhancement and establishment of the vegetative mosaic, the newly created habitat may attract more song and wading birds. Birders have been observed walking the Oakwood Beach front, providing an additional recreational value for bird identification. As this site is not adjacent to any residential housing, the wildlife noises would not be considered nuisance noise.

6.1.6.6 Socioeconomics and Demographics

No Action Alternative
No beneficial effects of no action are anticipated, as the area would continue to be vulnerable to coastal flood risk and damages.

Action Alternative
Beneficial effects of the Action Alternative are primarily focused on the nature of the wetland enhancement providing noticeable qualitative, and sometimes quantifiable, benefits to physical and cultural resources. Although not anticipated in abundance, birders have been observed walking the Oakwood Beach front, in which the project would be expected to provide an additional recreational value for birding. As this site is not adjacent to any residential housing, the wildlife noises would not be considered nuisance noise. A newly placed mowed path connecting the western adjacent parking lot at Great Kills Park would connect to the Site, and additionally to a walking/bike path, increasing recreational access to the enhanced wetland.

6.2 ENVIRONMENTAL QUALITY MAIN TEXT SUMMARY TABLES

To review and compare the Actionable Elements Alternatives for environmental acceptability, the individual resource impact assessment rating scores generated and presented in Appendix A were combined into broader resource categories and reviewed in two ways: first the resources were averaged together to identify the mean of adverse and beneficial effects, and second, the highest adverse and beneficial effect were escalated for each category to establish the upper limit of anticipated effects.

The results of those calculations are considered in three forms: an impact rating showing the “initial” or “unmitigated” impact of the construction and footprint, the operations and maintenance assumptions ratings, and the mitigated impact rating.

Potential adverse effects were rated on a scale of “0” to “5” with “0” representing No Adverse Effect and “5” representing High (significant) Adverse Effects that would be environmentally unacceptable. Likewise, potential beneficial effects were rated on a scale of “0” to “5” with “0” representing No Beneficial Effect, and “5” representing High (significant) Beneficial Effects that would be regionally and nationally significant.

The following general findings are based on the environmental analysis conducted and presented in the Environmental Appendix A for each of the Actionable Element Sites. General findings of the Interim Response Alternative comparison are presented below for each Actionable Element Site, inclusive of the Natural and

Physical Environment resources, and associated effects related to construction, operations and maintenance, and mitigation (if applicable). Where noted, resources were combined into overarching resource categories of which they relate, such as Wildlife and Vegetation which includes the averaged scores of Wildlife, Fish, Terrestrial Vegetation, Submerged Aquatic Vegetation (if applicable), and Invasive and Aquatic Nuisance Species. This was done in order to provide a high-level comparison of the Actionable Element Alternatives for Environmental Acceptability. Additional tables were generated for the highest escalated adverse effect and the highest escalated beneficial effect, which is comprised not of the resource score card totals but rather, the highest score observed raw impact of construction or operations and maintenance. Refer to Table 7 for the definitions to support impact rating tables to identify which resources were combined into one overarching resource category, and each individual resource section score cards for additional information.

Table : Definitions of Resource Categories to Support Effects Rating Tables

A	Wildlife and Vegetation Category	=	Wildlife, Fish, Migratory Fish, Terrestrial Vegetation, Submerged Aquatic Vegetation, Invasive and Aquatic Nuisance Species
B	Special Status Species (Terrestrial)	=	Threatened and Endangered Species (terrestrial), Migratory Bird Treaty Act and Bald and Golden Eagle Act Species
C	Special Status Species (Aquatic)	=	Threatened and Endangered Species (aquatic), Marine Mammal Protection Act Species, Sea Turtles, Essential Fish Habitat, Migratory Fish, Special Status Fisheries
D	Special Status Areas	=	Wetlands, Floodplains, Wild and Scenic Rivers, Designated Critical Habitat, Critical Environmental Areas (State), Marine Protected Areas, Coastal Zone Management Act Areas, Coastal Barrier Resources System Areas, NPS Land, Wildlife Refuge Land
E	Physical Resources	=	Topography and Geology, Surface Waters, Sediment, Land Use
F	Hydrological Resources	=	Bathymetry; Inland Hydrology; Coastal Hydrology, Currents, and Circulation; Tides, Tidal Exchange, and Tidal Range; Sediment Transport
G	Cultural Resources	=	Historic Structures, Viewshed/Historic Setting, Terrestrial Archaeological Resources, Submerged Archaeological Resources

Average Adverse and Beneficial Effect Scores of Resource Categories

OAKWOOD BEACH Qualitative Rating Total Scores (calculated, with mitigation if applicable)	NO ACTION SCORE	ACTION SCORE
NATURAL AND PHYSICAL ENVIRONMENT		
Wildlife and Vegetation[A]	**-1**	**+4**
Special Status Species (Terrestrial)[B]	**-1**	**+2.5**
Special Status Species (Aquatic)[C]	**-0.5**	**+2**
Special Status Areas[D]	**-0.8**	**+3.4**
Commercial and Recreational Fishing	**N/A**	**N/A**
Physical Resources[E]	**-0.75**	**+2.25**
Hydrological Resources[F]	**0**	**+1.2**
Water Quality	**-1**	**+1**
Air Quality	**0**	**+1**
Climate and Relative Sea Level Change	**-1**	**+1**
Cultural Resources[G]	**-0.5**	**0.5**
Native American Land	**N/A**	**N/A**
Hazardous, Toxic, and Radioactive Waste	**-1**	**0**
Navigation	**N/A**	**N/A**
Noise and Vibration	**0**	**0**
Socioeconomics and Demographics	**NS**	**NS**
Subtotal Scores (additive for calculation)	***-7.55***	***18.85***
TOTAL SCORE AVERAGED (calculated, additive and averaged):	**-0.62**	**1.57**

Highest Adverse Effect Scores, Escalated

OAKWOOD BEACH Qualitative Rating Total Scores (calculated, with mitigation if applicable)	NO ACTION SCORE	ACTION SCORE
NATURAL AND PHYSICAL ENVIRONMENT		
Wildlife and Vegetation[A]	**-1**	**-1**
Special Status Species (Terrestrial)[B]	**-1**	**-1**
Special Status Species (Aquatic)[C]	**-1**	**-1**
Special Status Areas[D]	**-1**	**-1**
Commercial and Recreational Fishing	**N/A**	**N/A**
Physical Resources[E]	**-1**	**-2**
Hydrological Resources[F]	**0**	**-1**
Water Quality	**-1**	**-1**
Air Quality	**0**	**0**
Climate and Relative Sea Level Change	**-1**	**0**
Cultural Resources[G]	**-1**	**-1**
Native American Land	**N/A**	**N/A**
Hazardous, Toxic, and Radioactive Waste	**-1**	**-1**
Navigation	**N/A**	**N/A**
Noise and Vibration	**0**	**-1**
Socioeconomics and Demographics	**NS**	**NS**
Subtotal Scores (additive for calculation)	***N/A***	***N/A***
TOTAL SCORE HIGHEST ESCALATED:	**-1**	**-2**

Highest Beneficial Effect Scores, Escalated

OAKWOOD BEACH Qualitative Rating Total Scores (calculated, with mitigation if applicable)	NO ACTION SCORE	ACTION SCORE
NATURAL AND PHYSICAL ENVIRONMENT		
Wildlife and Vegetation[A]	**0**	**+5**
Special Status Species (Terrestrial)[B]	**0**	**+5**
Special Status Species (Aquatic)[C]	**0**	**+3**
Special Status Areas[D]	**0**	**+5**
Commercial and Recreational Fishing	**N/A**	**N/A**
Physical Resources[E]	**0**	**+5**
Hydrological Resources[F]	**0**	**+2**
Water Quality	**0**	**+2**
Air Quality	**0**	**+1**
Climate and Relative Sea Level Change	**0**	**+1**
Cultural Resources[G]	**0**	**+3**
Native American Land	**N/A**	**N/A**
Hazardous, Toxic, and Radioactive Waste	**0**	**+1**
Navigation	**N/A**	**N/A**
Noise and Vibration	**0**	**+1**
Socioeconomics and Demographics	**NS**	**NS**
Subtotal Scores (additive for calculation)	***N/A***	***N/A***
TOTAL SCORE HIGHEST ESCALATED:	**0**	**+5**

Qualitatively, both the No Action and Action Alternative are anticipated to have potential adverse effects that are relatively minor ranging from no (0) to low (-1), while the Action Alternative anticipates potential substantial beneficial effects that are, in many cases, significant depending on resource and existing conditions present at this Actionable Element Site. The highest beneficial effects are anticipated to wildlife and vegetation, special status species (migratory birds), special status areas (wetlands, floodplains, marine protected areas, and National Park Service land), land use, and cultural resources (viewshed/historic setting).

As gathered from the Individual Resource scorecards presented in the Environmental Appendix A that have been combined into Resource Categories and presented on the tables above, the summary of adverse effects range from no to low (“0” to “-1”) for the vast majority of resources present, and beneficial effects range from no to high (“0” to “+5”).

The net Average Adverse and Beneficial Effect score combined for the No Action exhibits an overall “-0.62” which would be equivalent by definition as “no to low” adverse effect when considering all resources adverse effects and benefits equally and combined, while the Action Alternative exhibits an overall “+1.57” which would be equivalent by definition as “low to moderate” beneficial effect when consideration all resources adverse and beneficial effects equally and combined.

In comparison, the No Action’s highest adverse effect anticipated is low, or “-1” and its highest anticipated beneficial effect is no or “0”. The Action Alternative’s highest adverse effect anticipated is low or “-1”, while its highest anticipated beneficial effect is high or “+5”.

The majority, if not all, of the adverse effects are derived from construction related disturbances that are anticipated to be temporary and manageable thorough avoidance and best management practices. The beneficial effects are qualitatively derivative from the conversion from low-quality degraded non-native and largely invasive habitat conversion to native habitat with a network of tidal channels that provide additional access, foraging, and sheltering to wildlife. As this site is part of the National Park Service, Gateway National Recreation Area (a Marine Protected Area) and New York Bight Estuary, as well as a State and Federally listed wetland, and floodplain, the benefits of this project would be of regional significance to multiple resources and communities throughout the area.

This comparative assessment, informed by the individual resource scorecards presented in this Appendix A, and the Natural and Physical Environment scorecards presented in the Effects and Consequences Section, support the decision making process for the EQ account by presenting a qualitative side by side comparison of the Alternatives net average score, highest adverse effect score, and highest benefit score to further understand the nuances of the Action versus the No Action, as well as determine the environmentally preferred alternative, which would largely be considered as the alternative with the greatest benefits, lowest tolerable adverse effects, and net positive outcome that is more favorable than the other alternatives considered. In this instance, the Action Alternative presents both the most favorable average score, as well as the highest escalated benefit score, with adverse effects that are no greater than -1, for low adverse effect.

7 LIST OF PREPARERS AND CONTRIBUTORS

Cheryl R. Alkemeyer, PMP, ENV SP, Physical Scientist, U.S. Army Corps of Engineers, New York District

Matt Voisine, Biologist, U.S. Army Corps of Engineers, New York District

Ryan Constantine, Archaeologist, U.S. Army Corps of Engineers, New York District

John Sulich, P.E., Environmental Engineer, U.S. Army Corps of Engineers, New York District

Jesse L. Miller, Biologist, U.S. Army Corps of Engineers, New York District

Carissa Scarpa, Chief Watershed Section, Environmental Analysis Branch, U.S. Army Corps of Engineers, New York District

Peter M. Weppler, Chief Environmental Analyses Branch, U.S. Army Corps of Engineers, New York District

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