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-2 Harlem River Actionable Element Site Environmental Appendix

July 2025

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EXECUTIVE SUMMARY

This discussion compliments the main report of which this document is an Appendix to, 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. 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.

The scope of the Interim Response 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 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 need for CSRM where able 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 Actionable Element documented in this appendix is referred to as Harlem River, located in Manhattan, 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 as 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 Site, 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 Harlem River Actionable Element is located in and near the Harlem River, New York County, Manhattan, New York, with the Lower Bay Planning Region of the NYNJHAT Study Area. The location is characterized by mixed residential/commercial uses and open space and includes Holcombe Rucker Park, Frederick Johnson Tennis Courts, Macomb's Bridge Library, Harlem Lane Playground NYCHA's Ralph J. Rangel Houses and Polo Grounds Towers, the Macombs Dam Bridge, and Harlem River Drive.

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, complementary Nature-Based Solutions (NBS) and Non-Structural 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 complementary NBS and non-structural 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, Harlem River Actionable Element was identified to include NBS for consideration in the NYNJHAT Study.

The Harlem River Actionable Element is a Coastal Storm Risk Management (CSRM) structural measure with complementary nature-based solution (NBS) features to the NYNJHAT Study Overall Comprehensive Plan, providing high-frequency flood risk management, and serves as a multi-line of defense to the NYNJHAT Study, Harlem River section of Manhattan. This Site includes two separate alignments for public consideration: (1) a Seaward Alignment consisting of an in-water measure (combination seawall and tunnel span structure), shore-based tie-in measures (e.g. floodwall), deployable vehicular gates, and complementary NBS; and, (2) a Landward Alignment consisting of entirely on-land measures (e.g. floodwalls), several deployable vehicular gates, and invasive vegetation species management for replacement with native species and other potential complementary NBS to be identified.

No Action:

Under the No Action Alternative, the U.S. Army Corps of Engineers will not construct the CSRM project, therefore, he proposed Actionable Element Site would remain as is and would continue to be exposed to flood risks.

Action (two alternative alignments):

Seaward Alignment:

This alternative proposes approximately 320 linear feet (LF) of floodwall, two 40 LF each deployable flood barriers – vehicle gates, 3,636 LF anchored combi wall, and 155 LF tunnel span. The top of the

CSRM line of protection is approximately 17 ft NAVD88 which corresponds to approximately 6 ft higher than the existing barrier along the north bound section of the Harlem River Dr. The CSRM protection is approximately 25 feet in water (seaward) from the existing Harlem Rive Drive barrier and 5 feet wide. Backfill will fill in the space between the roadway barrier and the seawall, and will include NBSs such as oyster reefs, tidal wetlands, tide pools, and seawall panels, armor blocks, and or pile encapsulations that support aquatic marine organism growth for wave attenuation. This alignment also includes some invasive vegetation species management and replacement for the tie-ins.

Landward Alignment:

This alternative proposes approximately 2,700 LF of floodwall and five 40 LF each deployable flood barriers. approximately 17 ft NAVD88 which corresponds to 0 - 12 ft above ground. The floodwalls and barriers will be approximately 5 ft wide. Also included is approximately 1+ acre (AC) of invasive vegetation species management and replacement with native species.

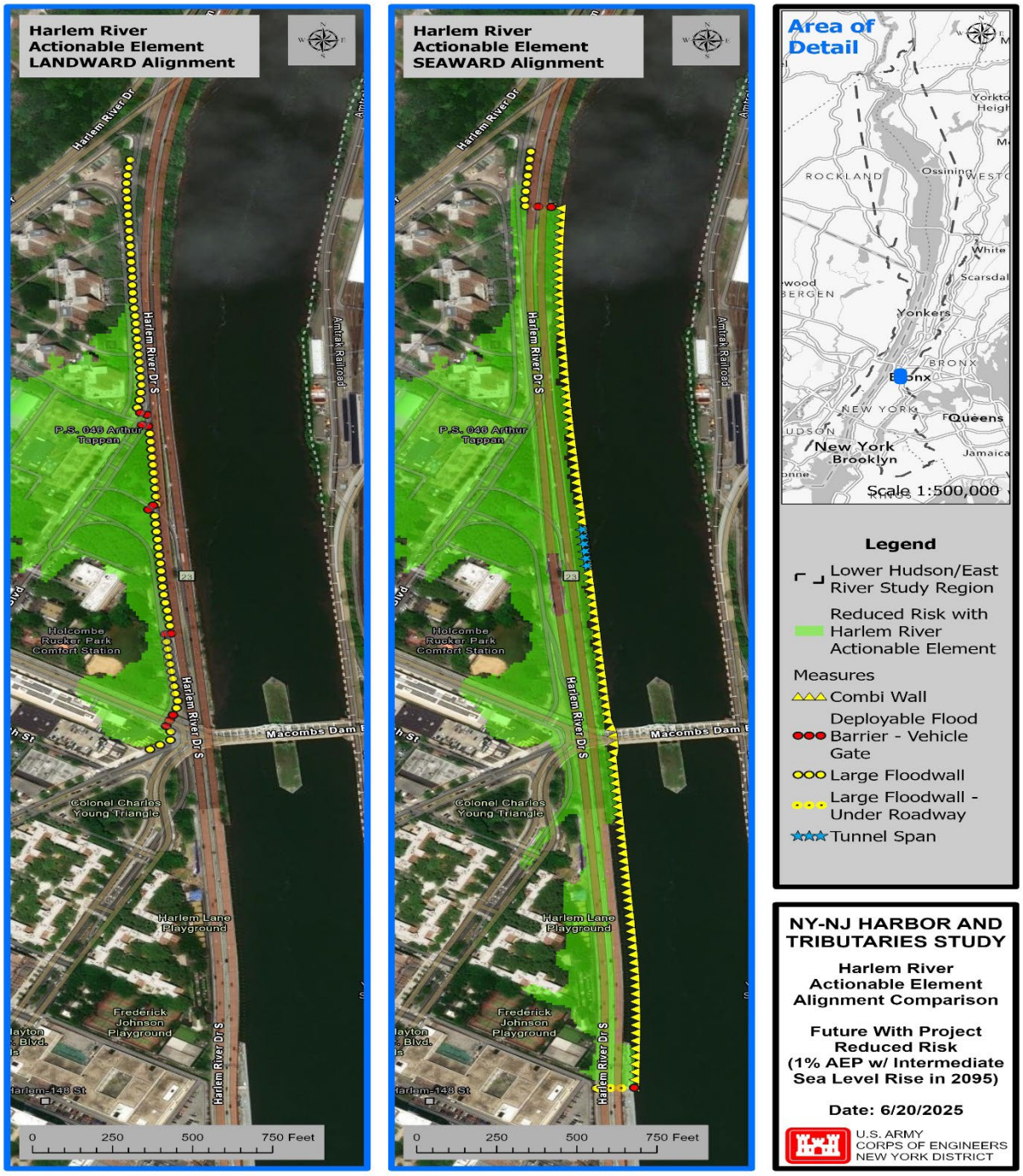


Figure 1. Harlem River CSRM Alignment Alternatives

At the time of release of this report, New York District has not chosen a preferred alignment between the two alignments and seeks public and stakeholder comment with comparison of the environmental analysis attached within this Appendix. Either of the two alignments can be advanced, and the

rationale for the decision will be documented in the Final Integrated Interim Response and EA for Actionable Elements, explaining how the study team incorporated feedback received on the draft report to make the ultimate decision on the preferred alignment.

1.3 ACTIONABLE ELEMENT PROJECT OBJECTIVES

Actionable Elements were evaluated on whether they make significant contributions to the planning objectives and sufficiently avoid planning constraints. The study objectives, below, were used to evaluate the Actionable Elements:

- Manage the risk of coastal storm flood damage to communities, public infrastructure, important societal resources, and the environment.
- Improve the community's ability to recover from damages caused by storm surges by reducing the duration of interruption in services provided by manufactured and natural systems.
- Enhance human health and safety by improving the performance of critical infrastructure and natural features during and after storm surge events.
- Recruit natural ecosystems into the coastal storm risk management framework where able to provide multiple lines of defense.

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 those resources. 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 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 Actionable Element 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 2-1 Resource List and Potential Effects Determination

RESOURCE	POTENTIALLY PRESENT Harlem River 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	Y
Migratory Bird Treaty Act Species and Bald Eagles	Y
Marine Mammal Protection Act Species	N
Sea Turtles	Y
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)	N
Marine Protected Areas	N
Coastal Zone Management Act Areas	Y
Coastal Barrier Resources System Areas	N
National Park Service Land	N
Wildlife Refuge Land	N
Commercial and Recreational Fishing	Y
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 Sea Level Change	Y
Cultural Resources	Y
Native American Lands	N
Hazardous, Toxic, and Radioactive Waste	Y
Navigation	Y
Noise and Vibration	Y
Socioeconomics and Demographics	Y

Note:
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:

Table 2-2 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.

Table 2-3 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 EQ account for Plan Selection 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.

Example explanation:

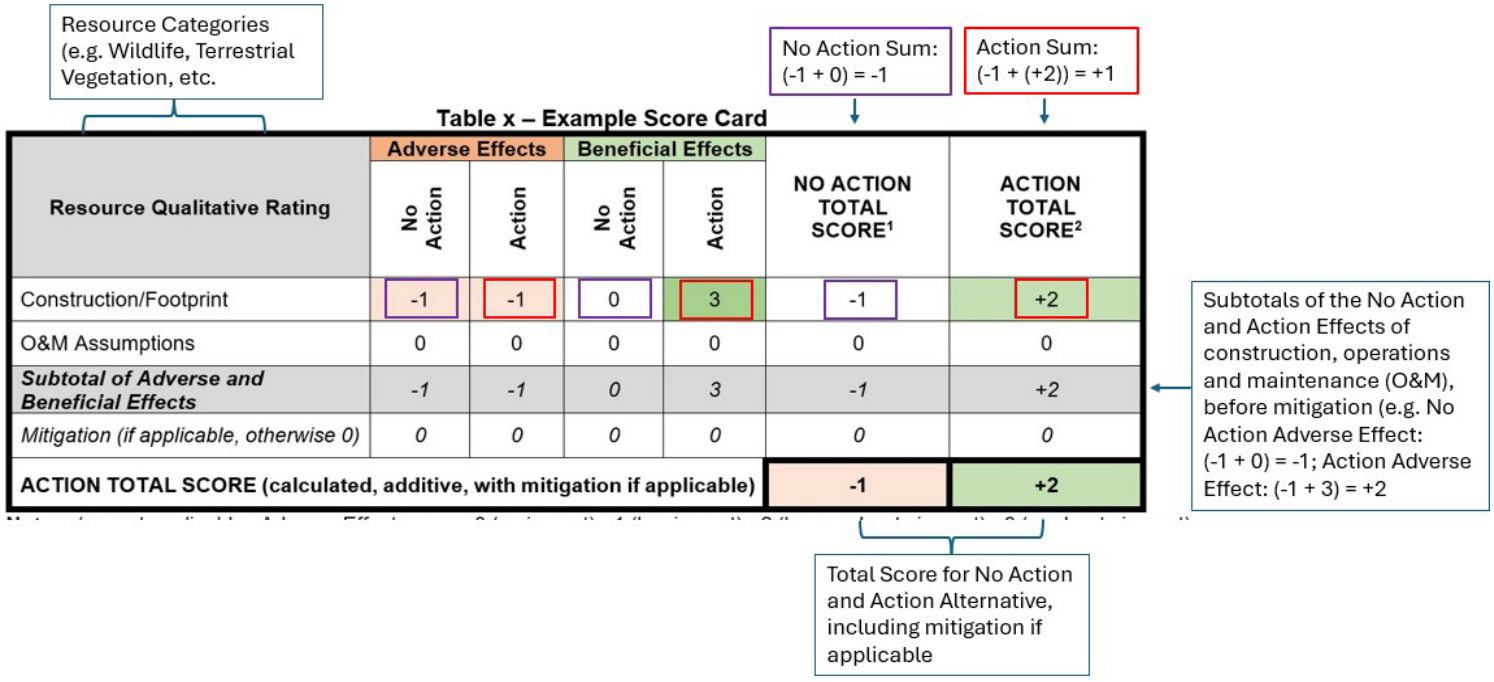
Table 2-4 Example Score Card

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

Table 2-5 Example Score Card 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 an 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 structures 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 the 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.

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 Harlem River 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 within New York City Economic Development Corporations (NYCEDC) Manhattan Greenway – Harlem River (NYC SBS, 2020), 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

The Study Area is urbanized, and wildlife is limited. The majority of the Study Area is developed with existing roads, parks, and pedestrian and bicycle paths, limiting the type and amount of wildlife present. Some areas of vegetative habitat are present, although it is also indicative of a heavily urban environment comprised of non-native invasive species and litter/debris.

Mammals potentially present are primarily comprised of species tolerant of urban development, such as the eastern gray squirrel (*Sciurus carolinensis*), 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*). Although highly unlikely at this Actionable Element Site, harbor seals (*Pinniped phocidae*) could be in the river.

The Harlem River 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). eBird is among the world's largest biodiversity-related science projects, with more than 100 million bird sightings contributed annually by eBirders around the world. eBird data document bird distribution, abundance, habitat use, and trends through checklist data collected within a simple, scientific framework. In 2024 – 2025 eBird reports (eBird, 2025) Rock Pigeon (*Columba livia*), Downy Woodpecker, (*Dryobates pubescens*), European Starling, (*Sturnus vulgaris*), House Sparrow (*Passer domesticus*), and White-throated Sparrow (*Zonotrichia albicollis*) at Holcombe Rucker Park in the southern end of the project. Other common urban avian species that could be expected in the project area are Mallard (*Anas platyrhynchos*), Double-crested Cormorant (*Phalacrocorax auritus*), Mourning Dove (*Zenaida macroura*), Blue Jay (*Cyanocitta cristata*),

American Crow (*Corvus brachyrhynchos*), American Robin (*Turdus migratorius*), Gray Catbird (*Dumetella carolinensis*), Northern Mockingbird (*Mimus polyglottos*), European Starling (*Sturnus vulgaris*), and Northern Cardinal (*Cardinalis cardinalis*).

Only a few reptiles and amphibian could be expected to be found at the project are such as American bullfrog (*Lithobates catesbeianus*), American Toad (*Anaxyrus americanus*), Common Garter Snake (*Thamnophis sirtalis*).

Pollinator species, particularly insects, are likely to be present throughout the project site, including wasps, bees, butterflies, and moths. Habitat for these species exists mostly in the city park and the urban vegetative overgrowth within the project 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 relative sea level change (RSLC). Although the no action would continue from the existing condition trajectory, frequency of storms and severity of storms may increase over time, as may RSLC. 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 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.

There is no operation and maintenance 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.

There is no operation and maintenance therefore this effects category is representative as no impact, with a corresponding score of 0.

3.1.1.3 Seaward 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. Wildlife in this area are accustomed to noise, vibration, and the activity of city life. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Direct adverse effects from operations and maintenance impacts would be temporary and associated with upkeep of the complementary NBS and seawall and deployable barrier closures before a storm, of which the activity and noise would encourage wildlife to disperse. Likely maintenance would occur from the water side. No indirect adverse effects from operation and maintenance of the site are anticipated to wildlife. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

The proposed project would add complementary NBS. These NBS would create more friendly habitat for wildlife such as fish and birds. This alternative would reduce risk to the more inland vegetation maintaining wildlife habitat during storm events. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

The continued growth of the NBS habitat and the operation and maintenance would provide foraging habitat by encouraging vegetation and animal life. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

3.1.1.4 Landward Alternative

Adverse Effects

Direct adverse effects from construction may cause temporary displacement, noise, vibrations, and disturbances that would make existing habitat temporarily unusable. Wildlife is expected to move to areas of nearby suitable habitat and avoid active construction, returning once construction is complete. Construction in areas of vegetation will remove wildlife habitat temporary particularly for small mammals and birds. 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. Wildlife in this area are accustomed to noise, vibration, and the activity of city life. Therefore, this effects category is representative as low adverse effect, with a corresponding score of -2.

Direct adverse effects from operations and maintenance impacts would be temporary and associated vegetative maintenance (mowing) which may impact pollinator species. Mammals would avoid maintenance/operational actions. Indirect adverse effects from operations and maintenance impacts to wildlife is they would likely to avoid operations and maintenance actions or may be inclined to relocate to other surrounding areas. Therefore, this effects category is representative as low to moderate impact, with a corresponding score of -2.

To mitigate for the effects of greenspace effects (although degraded), the adverse effects will be reduced, but not totally eliminated. Therefore, the mitigated score adjustment is +1, for an overall adverse effect of -1.

Beneficial Effects

Direct beneficial effects may deter wildlife from the busy road of the Harlem River Dr. decreasing incidents with traffic. The entire degraded greenspace may be replaced by native, pollinator friendly species, improving wildlife habitat and promote success of the native plantings through removal of all invasives in the greenspace. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

The continued growth of the NBS habitat and the operation and maintenance would provide foraging habitat by encouraging vegetation and animal life. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

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

3.1.3 Fish/Migratory Fish

This Section lists fish located within the NYNJHAT Study Lower Bay Planning Region, 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).

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 Harlem River is an authorized navigation channel, generally -15 feet MLLW (Mean Lower Low Water), bank to bank. Common recreational fish species that have been observed include striped bass (*Morone saxatilis*), bluefish (*Pomatomus saltatrix*), white perch (*Morone americana*), American eel (*Anguilla rostrata*) (Guidesly, 2025).

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 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.

There is no operation and maintenance 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.

There is no operation and maintenance therefore this effects category is representative as no impact, with a corresponding score of 0.

3.1.3.3 Seaward Alternative

Adverse Effects

Direct adverse effects from construction may cause temporary displacement, noise, vibrations, 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. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Direct adverse effects from operation and maintenance of the site are not anticipated to fish. Temporary minor effects from upkeep with the in-water structure and complementary NBS maintenance that may include temporary removal or disturbances to foraging. Therefore, operations and maintenance effects are anticipated to have low impact, represented by a corresponding rating criteria score of -1.

Beneficial Effects

The proposed project would add complementary NBS and create habitat for fish and benthic fauna to flourish. This would create breeding and foraging habitat for species that previously had no option in this river. Reef effect of the in-water structure also provides subsurface feeding opportunities further enhancing habitat. If oysters which naturally filter water are placed, a larger food pyramid with the improved water conditions would also occur. Therefore, this effects category is representative as moderate to high benefit, with a corresponding score of +4.

The continued growth of the NBS habitat and the operation and maintenance would provide foraging habitat by encouraging vegetation and animal life. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +3.

3.1.3.4 Landward Alternative

Adverse Effects

The landward alternative would have no adverse impacts to fish as the alternative is not in the water. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

The landward alternative would have no beneficial effects to fish as the alternative is not in the water. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.1.4 Fish/Migratory 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/Migratory Qualitative Rating	Adverse Effects			Beneficial Effects			NO ACTION TOTAL SCORE[1]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	-1	-1	0	+1	+3	0	**0**	**+2**	**0**
O&M Assumptions	0	-1	0	0	+3	0	**0**	**+2**	**0**
Subtotal of Adverse and Beneficial Effects	*-1*	*-2*	*0*	*1*	*+6*	*0*	***0***	***+4***	***0***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**0**	**+4**	**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

3.1.5 Terrestrial Vegetation

3.1.5.1 Existing Conditions

As noted, the Harlem River project site is highly urbanized, and vegetation is mostly constrained to parks and gardens. New York City Parks maintains a tree map (NYC Parks, 2025) of most of the trees within the city. Below is a list of trees identified within the project area.

Common Name	Scientific Name
London planetree	*Platanus x acerfolia*
Tree of heaven	*Ailanthus altissima*
Siberian elm	*Ulmus pumila*
Black oak	*Quercus velutina*
Northern red oak	*Quercus rubra*
Swamp white oak	*Quercus bicolor*
Hawthorn	*Crataegus*

Goldenrain tree	*Koelreuteria paniculata*
Willow oak	*Quercus phellos*
American elm	*Ulmus americana*
Japanese pagoda tree	*Styphnolobium japonicum*
Bur oak	*Quercus macrocarpa*
Ginkgo	*Ginkgo biloba*
River birch	*Betula nigra*
Thornless honey locust	*Gleditsia triacanthos var. inermis*
Japanese zelkova	*Zelkova serrata*
Eastern redbud	*Cercis canadensis*
Japanese flowering cherry	*Prunus serrulata*
American basswood	*Tilia americana*
thornless honey locust	*Gleditsia triacanthos var. inermis*
Cornelian cherry dogwood	*Cornus mas*
Eastern redcedar	*Juniperus virginiana*

Table 3-1 Trees in Harlem River

Other vegetation that may be found is turf grass in the parks, as well as bushes and flowering plants. The river is mostly devoid of vegetation within the project area except there are about 12 trees located along the Harlem River Dr within the river.

3.1.5.2 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. Available existing habitat, although degraded invasive, would also be at risk for storm damages. Flood water risk of urban runoff would further degrade existing habitat. 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.

3.1.5.3 Seaward Alternative

Adverse Effects

Direct adverse effects from construction include the trees along the riverfront that may have to be removed for placement of the seawall. No indirect adverse effects from construction are anticipated. 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. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Direct beneficial effects from construction include reduced CSRM flooding for inland vegetation that would be protected by the seaward alternative. The removal of invasive trees along the alignment would also be beneficial as they would not be able to spread seedlings. No indirect beneficial effects from construction are anticipated. 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. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.1.5.4 Landward Alternative

Adverse Effects

Direct adverse effects to terrestrial vegetation include the removal of existing vegetative habitat along the footprint of the alignment and staging areas (if placed on vegetative areas). Most of the vegetation planted for this alternative would be on the western side and the floodwall could hinder growth of vegetation reducing available sunlight. Indirect adverse effects include habitat conversion from vegetation to floodwall losing habitat for terrestrial species. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Operations and maintenance require restrictions on vegetation along floodwalls. This could impact the types of vegetation allowed near the floodwalls. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

Direct beneficial effects from construction include reduced CSRM to vegetative damages. Another beneficial effect is the conversion of invasive species to native species. Indirect beneficial effect includes native habitat creation for wildlife with the conversion from invasive to native vegetation. Therefore, this effects category is representative as low impact, with a corresponding score of +1.

Direct and indirect beneficial effects from operation and maintenance include reduced CSRM with the growth and maintenance of the planted native vegetation. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

3.1.6 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		SEAWARD TOTAL	LANDWARD

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

3.1.7 Submerged Aquatic Vegetation

The project site, although with coastal influences, is entirely 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.

3.1.8 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. 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) Spondy moth (gypsy moth) Hemlock woolly adelgid (T) Sirex woodwasp (T) Spotted lanternfly (T) Chinese mitten crab (A) Northern snakehead fish (A) Sea lamprey (A) Spiny waterflea (A).

3.1.8.1 Existing Conditions

There are three areas between Frederick Douglas Blvd and the Harlem River Dr entrance and that contain unmanaged vegetation. A survey of the area was not conducted; however, it is likely non-native vegetative species can be found here. Non-native trees can be found as noted above however many were planted by New York City as shade trees.

3.1.8.2 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. 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 50-years, the effects within the 50-year planning horizon would be anticipated to have no adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years). Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

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

3.1.8.3 Seaward Alternative

Adverse Effects

Direct adverse effects from construction may cause temporary displacement, noise, vibrations, and disturbances that would make existing habitat temporarily unusable. Other direct impacts to the project: invasive spread onsite during construction. Indirect effects include invasive spread offsite by equipment. Removal of invasive habitat could have an indirect adverse effect for wildlife that utilizes that space. Removal could include physical removal or spraying with EPA approved pesticides. Through best management practices (BMP) the spread of invasive species will be management by cleaning equipment pre and post construction. 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 as management strategies to prevent return of invasives (may include use of pesticides and herbicides) will be utilized. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Invasive habitat removed would be replaced with native habitat, of better quality. During this transition period, there will be limited habitat available for wildlife temporarily, and the habitat replaced will be different than existing conditions. Therefore, the mitigation effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

Direct beneficial effects from construction include reduced CSRM flood risk to spreading invasive species, because the species were removed as part of construction. In accordance with USACE policy, post-construction site restoration efforts offer the potential to re-establish some greenspace with native species along the on land tie-ins. Therefore, the construction effects category is representative as low impact, with a corresponding score of +1.

Direct or indirect beneficial effects from operation and maintenance of the site may include maintenance of native species survival, and surveying. Therefore, operations and maintenance effects are anticipated to have low beneficial effect, represented by a corresponding rating criteria score of +1.

Invasive habitat removed would be replaced with native habitat, of better quality. During this transition period, there will be limited habitat available for wildlife temporarily, and the habitat replaced will be different than existing conditions. Therefore, the mitigation effects category is representative as low impact, with a corresponding score of +1.

3.1.8.4 Landward Alternative

Adverse Effects

Direct adverse effects from construction may cause temporary displacement, noise, vibrations, and disturbances that would make existing habitat temporarily unusable. Other direct impacts to the project: invasive spread onsite during construction. Indirect effects include invasive spread offsite by equipment. Removal of invasive habitat could have an indirect adverse effect for wildlife that utilizes that space. Removal could include physical removal or spraying with EPA approved pesticides. Through best management practices (BMP) the spread of invasive species will be management by cleaning equipment pre and post construction. 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 as management strategies to prevent return of invasives (may include use of pesticides and herbicides) will be utilized. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Invasive habitat removed would be replaced with native habitat, of better quality. During this transition period, there will be limited habitat available for wildlife temporarily, and the habitat replaced will be different than existing conditions. Therefore, the mitigation effects category is representative as low impact, with a corresponding score of -1.

Beneficial Effects

Direct beneficial effects from construction include reduced CSRM flood risk to spreading invasive species, because the species were removed as part of construction. In accordance with USACE policy, post-construction site restoration efforts offer the potential to re-establish some greenspace with native species along the on land tie-ins. Therefore, the construction effects category is representative as low impact, with a corresponding score of +1.

Direct or indirect beneficial effects from operation and maintenance of the site may include maintenance of native species survival and surveying. Therefore, operations and maintenance effects are anticipated to have low impact, represented by a corresponding rating criteria score of +1.

Invasive habitat removed would be replaced with native habitat, of better quality. During this transition period, there will be limited habitat available for wildlife temporarily, and the habitat replaced will be different than existing conditions. Invasive plant removal would occur along roadways where invasives are more prevalent. There would be invasive removal through the greenspace, replaced by native species that would encourage native habitat to replace invasive habitat. Therefore, the mitigation effects category is representative as low to moderate impact, with a corresponding score of +2.

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

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 notes the potential presence of several special status sea turtles, including Loggerhead Turtle (*Caretta caretta*), Kemp’s ridley sea turtle (*Lepidochelys* kempii), Leatherback (*Dermochelys coriacea*), and Green Turtle (*Chelonia mydas*).

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, NYC EAF Mapper, and NOAA ESA Section 7 Mapper.

Table 3-2 Terrestrial Federal and State Threatened and Endangered Species Potentially Present in the Lower Hudson/East River 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	LH/ER
Northern long-eared bat	*Myotis septentrionali s*	E	T	80 FR 17973 18033	LH/ER
Tricolored bat	*Perimyotis subflavus*	P	NL	FR 2022-18852	LH/ER
Birds					
Piping plover	*Charadius melodus*	T	E	49 FR 44712; Recovery plan USFWS 2016	LH/ER
Red knot	*Calidris canutus rufa*	T	T	79 FR 73705; Draft Recovery	LH/ER

				plan: USFWS 2021	
Roseate tern	*Sterna dougalli dougalli*	E	E	52 FR 42064; Recovery plan USFWS 1998	LH/ER
Bald eagle	*Haliaeetus leucocephalu s*	NL	T	N/A	LH/ER
Reptiles					
Bog turtle	*Glyptemys muhlenbergii*	T	E	62 FR 59605 59623; Recovery plan: USFWS 2001	LH/ER
Insects					
Monarch butterfly	*Danaus plexippus*	P	NL	85 FR 81813	LH/ER, AE
Rusty-patched bumble bee	*Bombas affinis*	E	NL	80 FR 56423 56432; Recovery plan: 85 FR 4334 4336	LH/ER
Yellow-banded bumble bee	*Bombas terracola*	C	NL	Not Found	LH/ER
Flowering Plants					
Seabeach amaranth	*Amaranthus pumilus*	T	T	58 FR 18035; Recovery plan: USFWS 1996	LH/ER
Small whorled pogonia	*Isotria medeoloides*	T	E	59 FR 50852 50857; Recovery plan: USFWS 1992	LH/ER

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

Table 3-3 Aquatic Terrestrial Federal and State Threatened and Endangered Species Potentially Present in the Lower Hudson/East River 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	*Acipenser*	E	E	77 FR 5880 and	LH/ER

sturgeon	*oxyrinchus oxrynchus*			77 FR 5914	
Shortnose sturgeon	*Acipenser brevirostrum*	E	E	32 FR 4001; Recovery plan: NMFS 1998	LH/ER
Reptiles					
Green sea turtle	*Chelonia mydas*	T	T	81 FR 20057; Recovery plan: NMFS & USFWS 1991	LH/ER
Kemp's ridley turtle	*Lepidochelys kempii*	E	E	35 FR 18319; Recovery plan: NMFS et al. 2011	LH/ER
Leatherback turtle	*Dermochelys coriacea*	E	E	35 FR 8491; Recovery plan: NMFS & USFWS 1992	LH/ER
Loggerhead turtle	*Caretta caretta*	E	T	76 FR 58868; Recovery plan: NMFS & USFWS 2008	LH/ER

Notes: [1] Status Abbreviations – Threatened (T), Endangered (E), Candidate (C), Proposed (P), Not Listed (NL); [2] Region/Site Abbreviations – Lower Hudson/East River (LH/ER) Planning Region, Actionable Element (AE) site vicinity. Yellow = sourced from the USFWS IPaC database or NMFS Section 7 Mapper 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 Hudson/East River Region where this Actionable Element Site is located. Aquatic listed species with the potential to be present in the Harlem River include Atlantic and shortnose sturgeon. Species that may potentially be present in the larger Lower Hudson/East River include green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle (also discussed in the Section "Sea Turtles"), but are unlikely present in abundance in the Harlem River.

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. 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 no adverse impacts due to the infrequency of severe storms (e.g. 1 in 100 years. 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 effect, with a corresponding score of 0.

3.2.1.3 Seaward Alternative

Adverse Effects

Terrestrial Species:
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 that are relevant to the terrestrial environment portions of the alignment (such as the floodwall tie-ins to high ground) are highly urban. It is likely species potentially present in this area are accustomed to urban environments (e.g. bats).

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 and/or cofferdams as necessary to avoid or reduce effects.

During a site visit in March 2025, a Bald Eagle was observed during site visit along northern most alignment. Most likely the eagle was passing through from further north on the top of Manhattan. During construction eagles would be avoided as construction will not be near their habitat and they would avoid the construction area. Pre-construction surveys would occur to confirm no nest. There are no impacts anticipated during construction of the site therefore effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Aquatic Species:
While Atlantic and Shortnose Sturgeon may be present in the Harlem River, there is no anticipated sustaining habitat along this portion of the river. Direct effects from construction will cause temporary and localized noise, vibration, and turbidity disturbances for species passing through, which will be mitigated through appropriate construction windows, and the utilization of other BMPs to reduce adverse effects. Therefore, this effects category is representative and low impact, with a corresponding score of -1.

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

Beneficial Effects

There are no effects anticipated to terrestrial threatened and endangered species during construction of the alignment therefore effects are represented by a corresponding rating criteria score of 0.

Beneficial effects to aquatic threatened and endangered species are anticipated to be low, as the complementary NBS will provide newly created habitat aquatic species to forage and shelter where none existed before; however aquatic threatened and endangered species are not anticipated to be present in abundance. Therefore, a low beneficial effect is anticipated, represented by a corresponding rating criteria score of +1.

There are no impacts anticipated during operations and maintenance of the site therefore effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Replacement of existing degraded habitat will be replaced with native habitat, may consider pollinator friendly species. Therefore, effects are anticipated to have low benefit, represented by a corresponding rating criteria score of +1.

3.2.1.4 Landward Alternative

Adverse Effects

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 that is highly urban. 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 best management practices.

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.

A Bald Eagle was observed during site visit along northern most alignment. Most likely the eagle was passing through from further north on the top of Manhattan. During construction eagles would be avoided as construction will not be near their habitat and they would avoid the construction area. Pre-construction surveys would occur to confirm no nest. There are no impacts anticipated during construction of the site therefore effects are anticipated to have no impact, represented by a

corresponding rating criteria score of 0.

There are no impacts anticipated during operations and maintenance of the site therefore effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

Replacement of existing degraded habitat will be replaced with native habitat, may consider pollinator friendly species. Therefore, effects are anticipated to have low impact, represented by a corresponding rating criteria score of +1.

There are no impacts anticipated during operations and maintenance of the site therefore effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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

	Adverse Effects	Beneficial Effects	NO ACTION	SEAWARD TOTAL	LANDWARD

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

Due to the highly urbanized area and lack of breeding habitat, Bald and Golden Eagles may fly over but they are unlikely to utilize the project area.

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. However, these impacts would be minimal or none 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 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 Seaward 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. The tree habitat at the northern end of the alignment would be removed and therefore remove habitat. 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. 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

Direct and indirect effects during construction would be low. The creation of the NBS along the alignment may provide habitat for migratory bird to forage. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

There are low impacts anticipated during operations and maintenance of the site as the NBS are maintained for the life of the project. Therefore, effects are anticipated to have low benefit, represented by a corresponding rating criteria score of +1.

3.2.3.4 Landward 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. The vegetation habitat along the alignment would be removed and therefore remove habitat. 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. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

There are no impacts anticipated during operations and maintenance of the site therefore effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

Direct and indirect effects during construction would be low. The replacement of the invasive vegetation along the alignment and with the greenspace will provide habitat for migratory bird to forage. Therefore, this effects category is representative as low impact, with a corresponding score of +1.

There are low impacts anticipated during operations and maintenance of the site as the planting of native species are maintained for the life of the project. Therefore, effects are anticipated to have low impact, represented by a corresponding rating criteria score of +1.

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

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, one alternative is at the riverbank at an existing bulkhead and the other alternative is entirely inland. Particularly for several species of whales that occur seasonally in the offshore waters of New York, as the depths near the inshore waters of Harlem River are too shallow to be occupied by any listed whales (NYC 2013). Though 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). Although it is highly unlikely, if in a rare instance a harbor seal is observed along the Harlem River, 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 (NYSDEC 2022), and Jersey shore. In 2018, Kemp's ridley sea turtles were observed nesting on the Rockaway Peninsula within the Gateway National Recreation Area (NPS 2018). 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 (NPS 2018). 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 (NYSDEC 2022 and NPS 2018).

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, 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 (NOAA Fisheries 2022). 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 (NOAA Fisheries 2022). 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, 2020a). 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 11 managed fish and invertebrate species (Table 6 Essential Fish Habitat Mapper Report). Refer to the EFH SubAppendix 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 3-4 Essential Fish Habitat Mapper Report

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
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). No Action

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 Seaward Alternative

Adverse Effects

Direct adverse effects from construction may cause temporary displacement, noise, vibrations, 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. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

Direct adverse effects from operation and maintenance of the site are not anticipated to fish. Temporary minor from upkeep with the in-water structure and complementary NBS maintenance. Therefore, operations and maintenance effects are anticipated to have low impact, 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 fish. The site would continue to be monitored for establishment of the NBS. 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 add complementary NBS and create habitat for fish and benthic fauna to flourish. This would create breeding habitat for species that previously had no option in this river. Reef effect of the in-water structure also provides subsurface feeding opportunities further enhancing habitat. If oysters which naturally filter water are places, a larger food pyramid with the improved water conditions. Therefore, this effects category is representative as moderate benefit, with a corresponding score of +2.

The continued growth of the NBS habitat and the operation and maintenance would provide foraging habitat by encouraging vegetation and animal life. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

3.2.7.4 Landward Alternative

Adverse Effects

The landward alternative would have no adverse impacts to fish as the alternative is not in the water. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

The landward alternative would have no adverse impacts to fish as the alternative is not in the water. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

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.

Essential Fish Habitat and EFH-Designated Species Qualitative Rating	Adverse Effects			Beneficial Effects			NO ACTION TOTAL SCORE[1]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	*-1*	*-1*	*0*	*0*	*+2*	*0*	*-1*	*+1*	*0*
O&M Assumptions	*0*	*-1*	*0*	*0*	*+1*	*0*	*0*	*0*	*0*
Subtotal of Adverse and Beneficial Effects	*-1*	*-2*	*0*	*0*	*+3*	*0*	*-1*	*+1*	*0*
Mitigation (if applicable, otherwise 0)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							***-1***	***+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 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 2022b). 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 river portion of the AE as Estuarine and Marine Deepwater habitat (EiUBL):

Table 3-5 Wetland Classification Codes and Definitions

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.
Subtidal (1)	The substrate in these habitats is continuously covered with tidal water (i.e., located below extreme low water).
Unconsolidated Bottom (UB)	Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30%.
Subtidal (L)	Tidal salt water continuously covers the substrate.

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

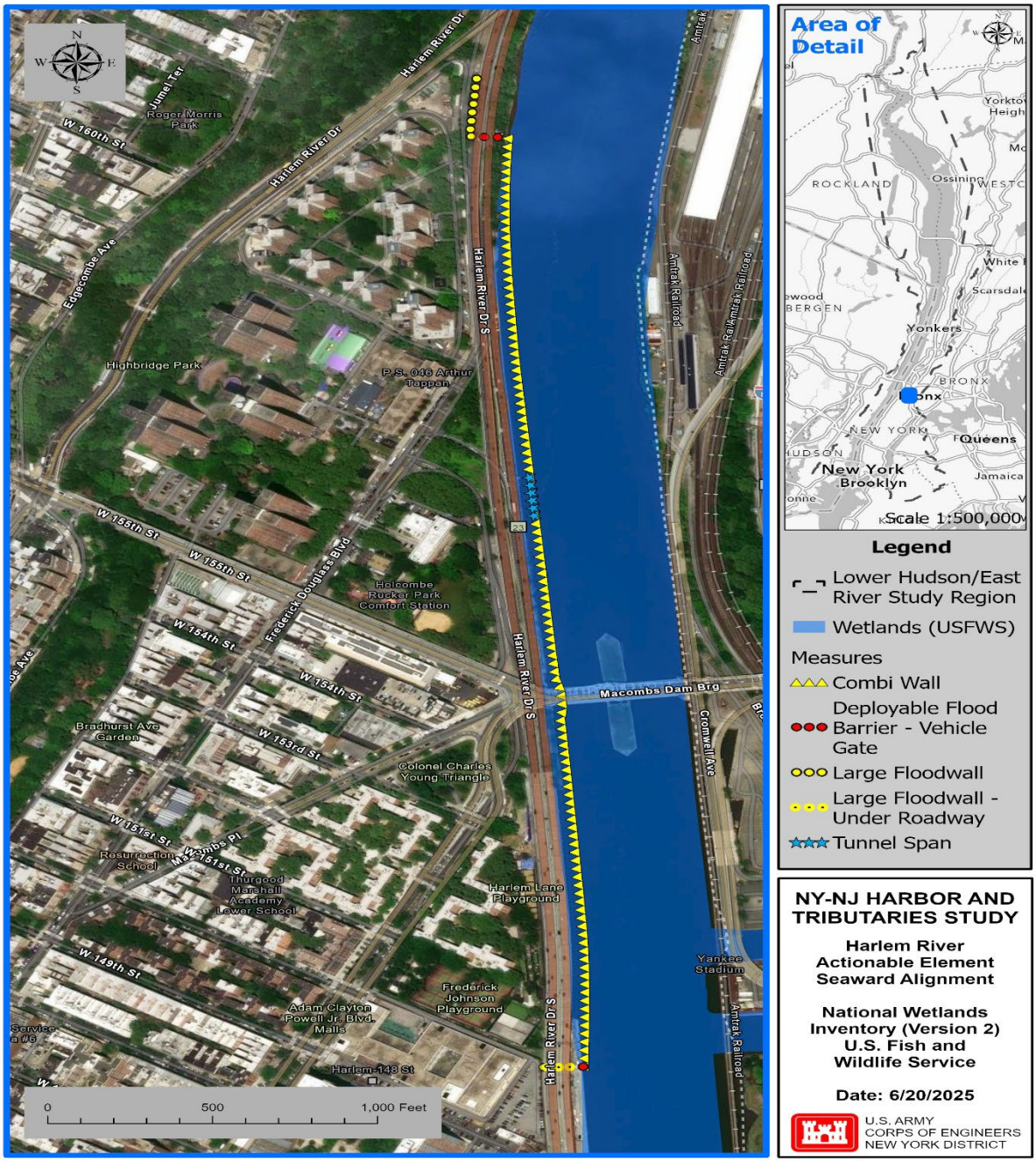


Figure 2. Harlem River Wetlands

3.3.1.2 No Action

Adverse Effects

The no action alternative would have no adverse impacts to wetlands as the existing wetlands are in

the river. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

The no action alternative would have no adverse impacts to wetland as the existing wetlands are in the river. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.3.1.3 Seaward Alternative

Adverse Effects

The seaward alternative would have no adverse impacts to wetland as the existing wetlands are in the river. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

The seaward alternative would have beneficial effects to wetland through the creation of the NBS such as oyster reefs, tidal wetlands, tide pools, and seawall panels, armor blocks, and or pile encapsulations that support aquatic marine organism growth. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

Direct and indirect beneficial effects from operation and maintenance of the site are anticipated to wetlands due to the NBS. The site would continue to be monitored for establishment of the NBS. Maintenance may include non-native plant management. 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 low benefit, represented by a corresponding rating criteria score of +1.

3.3.1.4 Landward Alternative

Adverse Effects

The landward alternative would have no adverse impacts to wetland as there are no existing wetlands within the project area. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

The landward alternative would have no beneficial impacts to wetland as there are no existing wetlands within the project area. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

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.

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

3.3.3 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 Insurance 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.

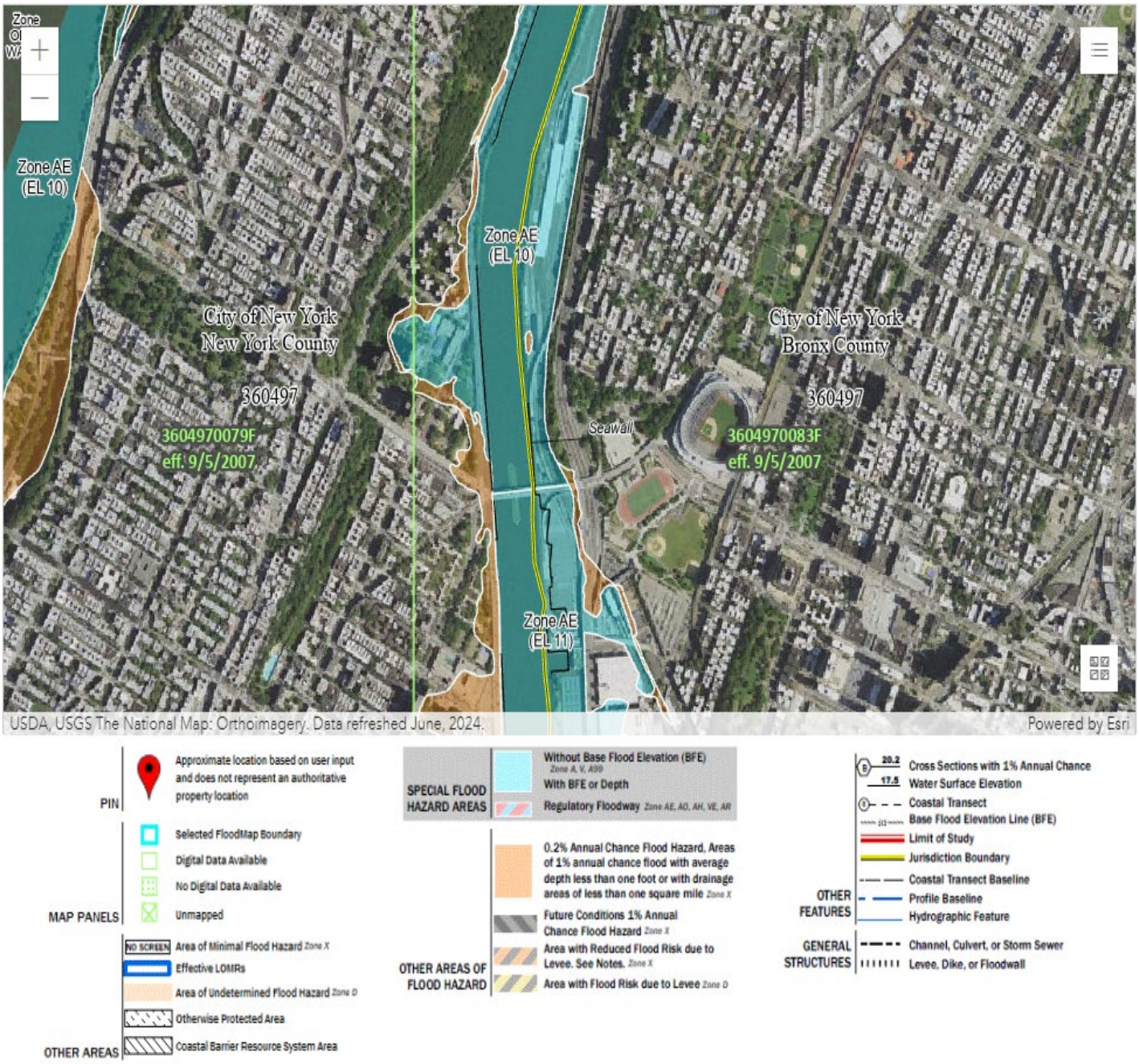


Figure 3. Harlem River Floodplain

3.3.3.2 No Action

Adverse Effects

No direct or indirect adverse effects from construction of the site are anticipated to the floodplain. The floodplain is highly urbanized and almost all of the floodplain is covered with buildings or roads. Therefore, construction effects are anticipated to have no impact, represented by a corresponding rating criteria 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.

3.3.3.3 Seaward Alternative

Adverse Effects

No direct or indirect adverse effects from construction of the site are anticipated to the floodplain. The floodplain is highly urbanized and almost all of the floodplain is covered with buildings or roads. Therefore, construction effects are anticipated to have no impact, represented by a corresponding rating criteria 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

As the floodplain in this area is highly urbanized, and almost the entire floodplain is covered with buildings or roads, there would be no beneficial effect to the floodplain. The alignments would manage flood risk in an environment that is not conducive to functioning as a natural floodplain would in a less urban environment. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

3.3.3.4 Landward Alternative

Adverse Effects

No direct or indirect adverse effects from construction of the site are anticipated to the floodplain. The floodplain is highly urbanized and almost all of the floodplain is covered with buildings or roads. Therefore, construction effects are anticipated to have no impact, represented by a corresponding rating criteria 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

As the floodplain in this area is highly urbanized, and almost the entire floodplain is covered with buildings or roads, there would be no beneficial effect to the floodplain. The alignments would manage flood risk in an environment that is not conducive to functioning as a natural floodplain would in a less urban environment. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

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.

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

3.3.5 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 Actionable Element 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.

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 2025). 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. No Marine Protected Areas is present within this Actionable Element Site. Therefore, an effects analysis is not applicable.

3.3.9 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 (NYDOS, 2025):

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.

3.3.9.1 Existing Conditions

The entirety of the AE is within the Federal CZMA boundary and the NYC LWRP. The New York State and NYC LWRP extends throughout all waterfronts within the city including the Harlem River (NYSDOS 2022).

3.3.9.2 No Action

Adverse Effects

Under the no action, the Actionable Element area would continue to be vulnerable to surge-driven coastal inundation. The resources and infrastructure within the Actionable Element area would

continue to be impacted by RSLC, storm surges, and coastal flooding. Therefore, this effects category is representative as a low-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.

3.3.9.3 Seaward 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 (Sub-Appendix A). As indicated on the assessment form and supporting documentation, the recommended CSRM features are consistent with federal, state, and local coastal zone management policies.

Direct impacts of construction would result in temporary impacts within the CZMA zone to fish and wildlife and potentially present submerged archaeological resources. These impacts would be minimized by the implementation of BMPS and appropriate monitoring of archaeological resources. Permanent low impacts to the visual resources due to the height of the floodwall are anticipated, however, the protection provided to the existing resources by the CSRM features from the impacts of coastal storms minimize these impacts. Dredging and excavation during construction would result in temporary resuspension of sediments but the implementation of BMPs would minimize sediment transport. 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 of the CSRM features, the project fulfills two of the programs' objectives in the long-term. Therefore, construction effects are anticipated to have low impacts, represented by a corresponding rating criteria score of -1.

No direct or indirect adverse effects from operation and maintenance of the Actionable Element are anticipate to CZMA. Therefore, construction effects are anticipated to have no impacts, represented by a corresponding rating criteria score of 0.

Beneficial Effects

The Actionable Element will reduce coastal storm risk to the Harlem River waterfront area from the impacts associated with sea level change, storm surges, and coastal flooding. The landward alignment would reduce risk to the environment, life, property, and infrastructure from the impacts of coastal storms in the area. This alignment of the Actionable Element would incorporate NBSs such as oyster reefs, tidal wetlands, tide pools, seawall panels, armor blocks, and/or pile encapsulations that support marine organism growth and would create habitat for fish and benthic fauna. Therefore, this effects category is anticipated to have moderate benefit, represented by a corresponding rating criteria score of +3.

3.3.9.4 Landward 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 (Sub-Appendix A). As indicated on the assessment form and supporting documentation, the recommended CSRM features are consistent with federal, state, and local coastal zone management policies.

Direct impacts of construction would result in temporary impacts within the CZMA zone to wildlife and to potentially present below-ground archaeological resources. These impacts would be minimized by the implementation of best management practices and appropriate monitoring for archaeological resources. Permanent moderate impacts to the visual resources due to the height of the floodwall are anticipated, however, the protection provided to the existing resources by the CSRM features from the impacts of coastal storms minimize these impacts. The AE 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 of the AE, the project fulfills two of the programs' objectives in the long-term. Therefore, construction effects are anticipated to have low-moderate impacts, represented by a corresponding rating criteria score of -2.

The only direct impact from operations and maintenance activities would include temporary impacts to pollinator species during maintenance mowing. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

The alignment will reduce coastal storm risk to the Harlem River waterfront area from the impacts associated with sea level change, storm surges, and coastal flooding. The landward alignment would reduce risk to the environment, life, property, and infrastructure from the impacts of coastal storms in the area. This alignment of the AE would remove invasive species from the degraded greenspace and replace them with native, pollinator-friendly species, which would improve the existing wildlife habitat and promote the success of native plantings. Therefore, this effects category is anticipated to have moderate benefit, with a corresponding score of +3.

3.3.10 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.

	Adverse Effects	Beneficial Effects		SEAWARD	LANDWARD

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

3.3.11 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 2022). 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 [America] (formerly Mexico), Great Lakes, U.S. Virgin Islands, and Puerto Rico coasts, including associated aquatic habitats (USFWS 2022). 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 and exemption (USFWS 2019). 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 2019).

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. No System Units or Otherwise Protected Areas were identified at this specific Actionable Element Site (USFWS, 2025). Therefore, an effects analysis is not applicable.

3.3.12 National Park Service Land

National Park Service Lands 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 National Park Service Land were in the Actionable Element Site. 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.

3.3.13 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. As this report is an interim response to the Comprehensive Plan, the same resources were reviewed for applicability to the Actionable Element Sites. No wildlife refuge land was identified in the vicinity of this Actionable Element Site. Therefore, an effects analysis is not applicable.

3.3.14 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).

3.3.14.1 Existing Conditions

The Harlem River is a navigation channel bank-to-bank that does not have commercial fishing operations or designations. Some recreational fishing may occur from small vessels and potentially areas that have access to the waterfront, although in this area of the Harlem River, waterfront access is limited.

3.3.14.2 No Action

Adverse Effects

Under the no action, the Actionable Element area would continue to be vulnerable to surge-driven coastal inundation. The resources and infrastructure within the Actionable Element area would continue to be impacted by RSLC, storm surges, and coastal flooding, including the effects urban influences, such as runoff, into the river. These direct and indirect effects from flooding and RSLC may cause changes to species usage of the river, particularly due to storm driven changes and non-storm related ocean acidification overtime. Therefore, this effects category is representative as a low impact, with a corresponding score of -1.

Beneficial Effects

No beneficial effects are anticipated, as the no action would continue to be vulnerable to surge-driven coastal inundation; therefore, this effects category is represented as no effect with a corresponding score of 0.

3.3.14.3 Seaward Alternative

Adverse Effects

Construction of the alignment would result in temporary adverse effects to recreational fishing, from related noise and vibrations that fish would be anticipated to avoid, and construction equipment may limit the availability of space in this area for other vessels to utilize. It would be anticipated that recreational fishers would also avoid areas of active construction, and return following construction. These effects are anticipated to be negligible or low given the lack of sustaining habitat for fish in the river. Therefore, construction effects are anticipated to have low impact, 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 the recreational fishing, as the site would be monitored for NBS 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 add complementary NBS and create habitat for fish and benthic fauna to flourish. This would create breeding and foraging habitat for species that previously had no option in this river. Reef effect of the in-water structure also provides subsurface feeding opportunities further enhancing habitat. If oysters which naturally filter water are placed, a larger food pyramid with the improved water conditions would also occur. Although recreational fishing in this portion of the Harlem River is not abundant, it could encourage fishing in the future. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

The continued growth of the NBS habitat and the operation and maintenance would provide foraging habitat by encouraging vegetation and animal life. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

3.3.14.4 Landward Alternative

Adverse Effects

No adverse effects are anticipated, as the landward alignment does not contain surface waters that would provide areas for fishing; therefore, this effects category is represented as no effect with a corresponding score of 0.

Beneficial Effects

No beneficial effects are anticipated, as the landward alignment does not contain surface waters that would provide areas for fishing; therefore, this effects category is represented as no effect with a corresponding score of 0.

3.3.15 Commercial and Recreational Fishing 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.

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

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.

4.1.1 Topography and Geology

4.1.1.1 Existing Conditions

The topography of the Actionable Element Site ranges from -28 feet in the Harlem River to 62 feet in the Ralph J. Rangel Houses and Polo Grounds Towers Housing. Roads, bridges, parks housing, and commercial and government businesses dominate the landscape.

The Harlem River watershed lies within the Highlands Province, a geologic region characterized by mountains consisting of metamorphic and igneous rocks. The rocky hills and valleys created by the underlying bedrock helped shape the watershed's topography. The Harlem River watershed primarily consists of metamorphic bedrock such as Fordham Gneiss, Inwood Marble, Manhattan Formation, and Yonkers Gneiss. Retreating glaciers during the Pleistocene era had a profound impact on the region's geology and soils. The New York County Soil Survey maps several urban land soil types within the Project Area.

The major soil types found are the following:

Table 4-1 Harlem River Major Soil Types

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
UGA	Urban land-Greenbelt complex, 0 to 3 percent slopes	22.1	14.9%
UGAl	Urban land-Greenbelt complex, 0 to 3 percent slopes, low impervious surface	23.7	16.0%
UGBl	Urban land-Greenbelt complex, 3 to 8 percent slopes, low impervious surface	23.2	15.7%
ULA	Urban land-Laguardia complex, 0 to 3 percent slopes	17.9	12.1%

4.1.1.2 No Action Alternative

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 area is highly urbanized with minimal amounts of soils available on the surface and topography dominated with buildings and roads. 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.

4.1.1.3 Seaward Alternative

Adverse Effects

Direct and indirect adverse effects from construction are not anticipated. As noted earlier the area is highly urbanized with minimal amounts of soils available on the surface and topography dominated with buildings and roads. 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 wildlife. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

Direct and indirect beneficial effects from construction are anticipated to be minimal. Soils may be protected as erosion through coastal storm will be reduced. Therefore, this effects category is representative as low impact, with a corresponding score of 1.

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

4.1.1.4 Landward Alternative

Adverse Effects

Direct and indirect adverse effects from construction are not anticipated. As noted earlier the area is highly urbanized with minimal amounts of soils available on the surface and topography dominated with buildings and roads. 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 wildlife. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

Direct and indirect beneficial effects from construction are not anticipated to be minimal. Soils may be protected as erosion through coastal storm will be reduced. Therefore, this effects category is representative as low impact, with a corresponding score of +1.

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

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

4.1.3 Surface Waters

4.1.3.1 Existing Conditions

The Actionable Element Site is located in the NYNJHAT Lower Hudson/East River Planning Region along the Harlem River, which is the dominant water feature of this Actionable Element site, consisting of a tidal strait connecting the East River and Long Island Sound to the Hudson River.

4.1.3.2 No Action Alternative

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. Surface waters would be expected to rise and continue to flood the Harlem River Drive. These flood waters could impair surface waters from the urban nature of the surrounding 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.

4.1.3.3 Seaward Alternative

Adverse Effects

Temporary adverse impacts to surface waters will occur during the construction of seaward alternative. The in-water measure would be anticipated to be placed approximately 25-feet into the river, which would result in the Harlem River being less wide in this portion of the river. Given the river has limited use beyond vessels passing through and some recreational fishing, this effect is not anticipated to be significant. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

During operations and maintenance, impacts to surface waters are not anticipated, Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

The proposed project would add complementary NBS and create habitat for fish and benthic fauna to flourish. This would create breeding and foraging habitat for species that previously had no option in this river. Reef effect of the in-water structure also provides subsurface feeding opportunities further enhancing habitat. If oysters which naturally filter water are placed, a larger food pyramid with the improved water conditions would also occur. These effects would be anticipated to beneficially effect surface water conditions and quality of the river. Therefore, this effects category is representative as low beneficially effect, with a corresponding score of +1.

During operations and maintenance, impacts to surface waters are not anticipated, Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.3.4 Landward Alternative

Adverse Effects

No adverse effects to surface waters are anticipated with the landward alternative. During storm conditions, surface waters would be expected to rise and continue to flood the Harlem River Drive, as anticipated under the no action alternative. Any repairs to Harlem River Drive as a result of storm surge and damages would be anticipated to temporarily adversely effect surface waters. Therefore, this effects category is representative as no impact, with a corresponding score of -1.

During operations and maintenance, impacts to surface waters are not anticipated, Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

No beneficial effects of the landward alternative are anticipated, as the alternative would only temporarily raise surface waters during storms. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

During operations and maintenance, impacts to surface waters are not anticipated, Therefore, this effects category is representative as no impact, with a corresponding score of 0.

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

4.1.5 Sediment

4.1.5.1 Existing Conditions

Most unconsolidated sediment deposits found in the river valley are the result of glacial and postglacial depositional episodes. Differences in local patterns of deglaciation are responsible for the present location of the various glacial deposits. Within the Lower Hudson/East River Region south of NY/NJ northern border, the sediments coarsen appreciably. The coarse fraction of the sediments is

probably locally derived, although some may be supplied by the flood tide from New York Bay (USACE 2020a).

The Harlem Rivers 9-mile tidal strait separating Manhattan from the Bronx, connecting the Hudson and East Rivers—was once a network of tributaries, wetlands, and winding shores. It has been heavily altered by industrialization and urbanization. Today, 24 of its 25 original streams are buried. Shorelines have been hardened by development, and natural habitats have been lost. This has all lead to degraded sediment quality. A study from Queens College characterized the sediment types in the Project Area of the Harlem River as relatively clean, medium-grained sands with some gravel and the confluence with the Hudson River is underlain by fine-grained, muddy sands (Coch, Lenna, & Deely, 2017)

4.1.5.2 No Action Alternative

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 highly urbanized and dominated by building, concrete and roads. However, there are a few parks and other areas with soil available. Continued flooding will move sediments inland and within the river bottom. 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 Seaward Alternative

Adverse Effects

Temporary impacts to sediments include resuspension during foundation installation, removal during dredging and excavation, and change in type of sediment due to fill activities. Resuspension of contaminants from sediments during construction could occur; however, BMPs will be used to minimize redistribution of contaminants. 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 sediments. The site would continue to be monitored for establishment of the native habitat and the NBS to prevent the return on non-native habitat. Maintenance may include non-native plant management, such as herbicide application and removal. 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 add NBS which will include oyster reefs which help stabilize sediments. As well, the seaward alternative will prevent inland sediments from erosion and movement. Therefore, this effects category is representative as a low benefit, with a corresponding score of 1.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to sediments. The site would continue to be monitored for establishment of the native habitat and the NBS to prevent the return on non-native habitat. Maintenance may include non-native plant management, such as herbicide application and removal. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

4.1.5.4 Landward Alternative

Adverse Effects

The construction of landward alternative is anticipated to continue to have the surrounding sediment and soils vulnerable to the effects of coastal flood risk and damages as some of them are on the flood side of the alignment. The site is highly urbanized and dominated by building, concrete and roads. However, there are a few parks and other areas with soil available. Continued flooding will move sediments inland and within the river bottom. 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 sediments. The site would continue to be monitored for establishment of the native habitat and the NBS to prevent the return on non-native habitat. Maintenance may include non-native plant management, such as herbicide application and removal. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria 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.

No direct or indirect adverse effects from operation and maintenance of the site are anticipated to sediments. The site would continue to be monitored for establishment of the native habitat and the NBS to prevent the return on non-native habitat. Maintenance may include non-native plant management, such as herbicide application and removal. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

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

4.1.7 Land Use

4.1.7.1 Existing Conditions

The New York Metropolitan area with an estimated population of nearly 8 million people, dominates the shoreline of the estuary of the Lower Hudson/East River Region. As a result of the large population and need to protect property and land, over 10,100 acres of shoreline are engineered or hardened to limit erosion of sediment into the channel and prevent bank retreat (USACE, 2020).

The current land use in the Harlem River watershed includes the presence of hard structures, roads, parking lots, and other impervious surfaces alongside parkland, undeveloped open space, and other vegetated pervious surfaces. The current land use is attributable to historical urbanization and development within the watershed.

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 highly urbanized with buildings, parks, and roads. Land use would continue as is currently particularly since there are very few, if any, undeveloped spaces. 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.

4.1.7.3 Seaward Alternative

Adverse Effects

The seaward alternative is anticipated to continue to have the surrounding areas risk to flooding greatly reduced. Direct and indirect adverse effects are anticipated to be minimal. The tie-ins to the alignment may change some greenspace into hard structures depending on exact siting. However, this will not impact any parks. Tie-ins and gates may also impact the Harlem River Drive as they span the drive with the alignment. Evacuation routes and access the future waterfront development will need to be coordinated with local officials. While difficult to predict the adverse effects of such change over an extended period of time beyond the planning horizon of this Study for X-years, the effects within the x-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.

No adverse effects from operations and maintenance are anticipated with this alternative. Land use will continue except while the roads are closed during flooding which they would be unusable during flooding as well. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Beneficial direct and indirect effects of the seaward alternative are anticipated as the area would have reduced flooding risks. This would allow usage to continue during most flooding events. The Harlem River Dr. will also be protected however not available for use during closures. Residential and commercial structures will be protected by the alignment. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No beneficial effects from operations and maintenance are anticipated with this alternative. Land use will continue except while the roads are closed during flooding which they would be unusable during flooding as well. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.7.4 Landward Alternative

Adverse Effects

The landward alternative is anticipated to continue to have the surrounding areas risk to flooding greatly reduced. Direct and indirect adverse effects are anticipated to be minimal. The tie-ins to the alignment may change some greenspace into hard structures depending on exact siting. However, this will not impact any parks. Tie-ins and gates may also impact the Harlem River Drive as they span the drive with the alignment. Evacuation routes and access the future waterfront development will need to be coordinated with local officials. 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.

No adverse effects from operations and maintenance are anticipated with this alternative. Land use will continue except while the roads are closed during flooding which they would be unusable during

flooding as well evacuation routes and access the future waterfront development will need to be coordinated with local officials. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Beneficial direct and indirect effects of the landward alternative are anticipated as the area would have reduced flooding risks. This would allow usage to continue during most flooding events. Residential and commercial structures will be protected by the alignment. Currently unused greenspace on the protected and unprotected sides may be turned into public areas with walkways. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

No beneficial effects from operations and maintenance are anticipated with this alternative. Land use will continue except while the roads are closed during flooding which they would be unusable during flooding as well evacuation routes and access the future waterfront development will need to be coordinated with local officials. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

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

4.1.9 Bathymetry

4.1.9.1 Existing Conditions

Starting around Stony Point, New York and extending south, the river follows the contact between the Triassic rocks of the Newark Basin and the Lower Paleozoic/Precambrian rocks of the Manhattan Prong until it reaches the Upper New York Harbor. The river gradient for over 150 miles from the Troy Lock and Dam to the Battery, New York City, is small, roughly only 5 feet change while the river bottom at Albany is at sea level (USACE 2020a, Limburg et al., 1986, Cooper et al., 1988).

4.1.9.2 No Action Alternative

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 bathymetry of the river is not anticipated to change with the no action alternative. site is highly urbanized with buildings, parks, and roads. 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. The bathymetry of the river is not anticipated to change with the no action alternative. site is highly urbanized with buildings, parks, and roads Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.9.3 Seaward Alternative

Adverse Effects

Temporary and permanent adverse impacts to bathymetry are anticipated to be minimal if at all with the seaward alternative. Clearing and sediment excavation and fill and/or the presence of a new foundation or structure during the construction of the alternative are not anticipated to change the bathymetry appreciably. This alignment is collocated within an existing federal navigation channel that is authorized for dredging bank to bank, although it has not been dredged for some time, the bathymetry in this portion of the Harlem River is not natural, and has been manipulated by human influences from prior dredging activities and highway construction of the Harlem River Drive. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No adverse effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Temporary and permanent beneficial impacts to bathymetry are anticipated to be minimal if at all with the seaward alternative. Clearing and sediment excavation and fill and/or the presence of a new foundation or structure during the construction of all Shore-Based Measures are not anticipated to change the bathymetry appreciably. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.9.4 Landward Alternative

Adverse Effects

Temporary and permanent adverse impacts to bathymetry are not anticipated with the landward alternative as the alternative is completely on land. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No adverse effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Temporary and permanent beneficial impacts to bathymetry are not anticipated with the landward alternative as the alternative is completely on land. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No beneficial effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

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]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	0	0	0	0	0	0	**0**	**0**	**0**
O&M Assumptions	0	0	0	0	0	0	**0**	**0**	**0**
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*0*	*0*	*0*	***0***	***0***	***0***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**0**	**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).

4.1.11 Inland Hydrology

4.1.11.1 Existing Conditions

According to the U.S. Geologic Survey (USGS) New York County Soil Survey, groundwater in the vicinity of the Project Area would generally be expected to occur greater than 200 centimeters (6.6 feet) below ground surface. Groundwater in Manhattan is not used as a source of potable water (the municipal water supply relies on upstate reservoirs).

4.1.11.2 No Action Alternative

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. Inland hydrology is not anticipated to be impacted. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. Inland hydrology is not anticipated to be impacted. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.11.3 Seaward Alternative

Adverse Effects

Temporary and permanent adverse impacts to inland hydrology are not anticipated with the seaward alternative. Clearing and sediment excavation and fill and/or the presence of a new foundation or structure during the construction of the alternative will not impact the inland hydrology. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No adverse effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Temporary and permanent beneficial impacts to inland hydrology are not anticipated with the seaward alternative. Clearing and sediment excavation and fill and/or the presence of a new foundation or structure during the construction of the alternative will not impact the inland hydrology. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No beneficial effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.11.4 Landward Alternative

Adverse Effects

Temporary and permanent adverse impacts to inland hydrology are not anticipated with the landward alternative. Clearing and sediment excavation and fill and/or the presence of a new foundation or structure during the construction of the alternative will not impact the inland hydrology. Therefore, this

effects category is representative as no impact, with a corresponding score of 0.

No adverse effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Temporary and permanent beneficial impacts to inland hydrology are not anticipated with the landward alternative. Clearing and sediment excavation and fill and/or the presence of a new foundation or structure during the construction of the alternative will not impact the inland hydrology. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No beneficial effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

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]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	0	0	0	0	0	0	**0**	**0**	**0**
O&M Assumptions	0	0	0	0	0	0	**0**	**0**	**0**
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*0*	*0*	*0*	***0***	***0***	***0***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**0**	**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).

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 Harlem River is not a true river but rather a tidal strait.

4.1.13.2 No Action Alternative

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. Coastal Hydrology, Currents, and Circulations are not anticipated to be impacted. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. Coastal Hydrology, Currents, and Circulations are not anticipated to be impacted. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.13.3 Seaward Alternative

Adverse Effects

Direct and indirect adverse effect are not anticipated with the seaward alternative. The tidal channel will be lessened with this alternative however the impact with be negligible. Coastal Hydrology, Currents, and Circulations are not anticipated to be impacted. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No adverse effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Direct and indirect beneficial effect are not anticipated with the seaward alternative. Coastal Hydrology, Currents, and Circulations are not anticipated to be impacted. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No beneficial effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.13.4 Landward Alternative

Adverse Effects

Direct and indirect adverse effect are not anticipated with the landward alternative. This alternative is

all on land and has no features within the river. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No adverse effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Direct and indirect beneficial effect are not anticipated with the landward alternative. This alternative is all on land and has no features within the river. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No beneficial effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.14 Coastal Hydrology, Currents, and Circulation 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.

Coastal Hydrology, Currents, and Circulations Qualitative Rating	Adverse Effects			Beneficial Effects			NO ACTION TOTAL SCORE[1]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	0	0	0	0	0	0	**0**	**0**	**0**
O&M Assumptions	0	0	0	0	0	0	**0**	**0**	**0**
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*0*	*0*	*0*	***0***	***0***	***0***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**0**	**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).

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 tide in these regions is semi-diurnal, meaning that two high tides and two low tides occur every twenty-four hours, making the Hudson River one of the few major tidally influenced rivers of the North Atlantic coast (USFWS, 1997). This stretch of river is naturally turbid, with limited primary productivity and moderate to high salinity levels (USACE 2020b).

4.1.15.2 No Action Alternative

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. Tides, Tidal Exchange, and Tidal Range are not anticipated to be impacted. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No adverse effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. Tides, Tidal Exchange, and Tidal Range are not anticipated to be impacted. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No beneficial effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.15.3 Seaward Alternative

Adverse Effects

Direct and indirect adverse effect are not anticipated with the seaward alternative. The tidal channel will be lessened with this alternative however the impact with be negligible. Tides, Tidal Exchange, and Tidal Range are not anticipated to be impacted. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No adverse effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Direct and indirect adverse effect are not anticipated with the seaward alternative. The tidal channel will be lessened with this alternative however the impact with be negligible. Tides, Tidal Exchange, and Tidal Range are not anticipated to be impacted. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No beneficial effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.15.4 Landward Alternative

Adverse Effects

Direct and indirect adverse effect are not anticipated with the landward alternative. This alternative is all on land and has no features within the river. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No adverse effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Direct and indirect beneficial effect are not anticipated with the landward alternative. This alternative is all on land and has no features within the river. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No beneficial effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

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]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	0	0	0	0	0	0	**0**	**0**	**0**
O&M Assumptions	0	0	0	0	0	0	**0**	**0**	**0**
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*0*	*0*	*0*	***0***	***0***	***0***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**0**	**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).

4.1.17 Sediment Transport

4.1.18 Existing Conditions

A 1999 study (Geyer et al 2001) on sediment transport in the Hudson River estuary discussed findings that supported a prior study conducted in 1969, stating that:

"…under normal flow conditions estuaries tend to import sediment from the seaward direction. The observations also indicate that the direction of sediment flux is controlled by the river flow while its magnitude is controlled by the spring-neap variation in tidal amplitude. Sediment export from estuaries is expected to occur when spring tides coincide with strong river outflow. During the 1999 observations, the peak river flow occurred during neap tides, and there was virtually no export of sediment from the estuary. The trapping of sediment within the estuary observed in 1999 is consistent with the long-term morphological equilibrium of the estuary, which is evident from historical bathymetric data extending over the last 150 years. Major sediment export events must occur episodically, in order to maintain the estuary at a roughly uniform depth. The events most likely to accomplish the major episodes of sediment export are large freshet events that occur during spring tides."

An assessment of sediment transport in the Hudson River estuary as a result of extreme storm events found that Tropical Storms Irene and Lee caused approximately 5 times the long-term annual average of sediment input into the Hudson River (Ralston et al 2013). The newly transported sediment remained within the river's tidal freshwater for over a month after the storms, with approximately one fifth of that new sediment reaching the saline estuary. Further, modeling results indicated that high sediment concentrations were attributed to bed resuspension from the storms (Ralston et al 2013).

4.1.18.1 No Action Alternative

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. Due to the highly urbanized area, there is no sediment transport from the landward project area. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. Due to the highly urbanized area, there is no sediment transport from the inland project area. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.18.2 Seaward Alternative

Adverse Effects

Minor direct adverse effects from the seaward alternative are anticipated. During construction sediment will be resuspended locally. Best Management Practices such as sediment barriers will minimize sediment transport. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No adverse effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

No direct or indirect beneficial effects from the seaward alternative is anticipated. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No beneficial effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.18.3 Landward Alternative

Adverse

No direct or indirect adverse effects from the seaward alternative is anticipated. Due to the highly urbanized area, the sediment available on land is minimal and will not be transported in the river. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No adverse effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

No direct or indirect beneficial effects from the seaward alternative is anticipated. Due to the highly urbanized area, the sediment available on land is minimal and will not be transported in the river. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

No beneficial effects from operations and maintenance are anticipated with this alternative. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.19 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]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	0	0	0	0	0	0	**0**	**0**	**0**
O&M Assumptions	0	0	0	0	0	0	**0**	**0**	**0**
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*0*	*0*	*0*	***0***	***0***	***0***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**0**	**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).

4.1.20 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.

4.1.20.1 Existing Conditions

The Harlem and River is classified as Class 1: Fishing and Boating. The NYSDEC has proposed reclassification of the Harlem River from Class I to SB; swimmable and fishable, with limited suspension of standards protective of swimming during wet weather events. Below are water quality data from the Harlem and East Rivers.

- **Salinity:** Salinity levels in the East River are reported to fluctuate a small amount between approximately 22.11 and 27.43. The small fluctuation can be attributed to the fact that the East River has limited freshwater input (Li and Meseck).
- **Dissolved Oxygen**: DO levels in the East and Harlem Rivers are not overly depleted, and fish in this region are not consistently stressed. In 2012, there were uncharacteristically low levels of DO recorded. Between 2010 and 2017, the percent of time DO samples were less than 4 mg/L was between 0-28% for surface DO and 0-22% for bottom DO (Da Silva, Dujardin, White, Christiana, Pirani, Strehlau 2021).
- **Nitrogen and Chlorophyll-a:** In the HWQMR, between 2010 and 2017, the summer means for total nitrogen were reported to range between 0.39 and 2.62 mg/L, fluctuating in and out

the threshold for healthy levels. Chlorophyll- a in this region showed concentrations below 5 µg/L, which indicates conditions for healthy habitat for fish survival.

- **Contamination/ Pathogens:** Major contamination sources in the East and Harlem Rivers include CSO, contaminated sediments, industrial point source discharges, municipal discharges/WWTPs, spills/unpermitted discharges, and stormwater runoff. According to the HWQMR the average geomean for fecal coliform in this region is 70.7 cfu/100mL (Da Silva, Dujardin, White, Christiana, Pirani, Strehlau 2021).

4.1.20.2 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. Water quality can be impaired with the continued flooding due to urban runoff as described above. 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 water quality will not improve. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.20.3 Seaward Alternative

Adverse Effects

Minor direct and indirect adverse effects from the seaward alternative are anticipated. During construction sediment will be resuspended locally. Best Management Practices such as sediment barriers will minimize sediment transport. 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 water quality. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

Minor direct and indirect beneficial effects from the seaward alternative are anticipated. The construction of the NBS may have beneficial local water quality impacts however that impact is anticipated to be minimal. The alignment will also prevent urban runoff from flowing into the river by physically stopping it however that impact is anticipated to be minimal if at all. If oysters which naturally filter water are placed, a larger food pyramid with the improved water conditions would also occur. Therefore, this effects category is representative as low effect, with a corresponding score of +1.

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

4.1.20.4 Landward Alternative

Adverse Effects

No direct and indirect adverse effects from the landward alternative are anticipated to water quality, as the alignment would not have measures in the water, and construction would be conducted under a construction stormwater pollution prevention plan. 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 water quality. Therefore, operations and maintenance effects are anticipated to have no impact, represented by a corresponding rating criteria score of 0.

Beneficial Effects

No direct and indirect beneficial effects from the landward alternative are anticipated. Therefore, this effects category is representative as no beneficial effect, with a corresponding score of 0.

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

4.1.21 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[1]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	-1	-1	0	0	+1	0	**-1**	**0**	**0**
O&M Assumptions	0	0	0	0	0	0	**0**	**0**	**0**
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*0*	*+1*	*0*	***-1***	***0***	***0***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**

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

4.1.22 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 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 2024a). 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 4-2 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.

4.1.22.1 Existing Conditions

The USEPA NEPAssist tool (accessed May 2025) was used to determine if the Harlem River Actionable Element Site falls within non-attainment and maintenance zones. The site is located in New York 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 4-3. 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 2023c). 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.

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

4.1.22.2 No Action Alternative

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. Although the no action would continue on the existing condition trajectory, frequency of storms may increase over time, as may RSLC. Air quality effects with 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 associated with the project, but may from other entities during repair of storm damages to infrastructure in the area. 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 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.

4.1.22.3 Seaward 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 construction of either the landward or seaward CSRM line of protect, which will likely include the use of land based mobile equipment such as diesel-powered generators, compactors, compressors, dozers, excavators, loaders, and graders, as well as off-road trucks, and water –based equipment such as barges and mechanical (not hydraulic) excavators. Emissions associated with the construction of the land-based alternative are accommodated within the New York State Implementation Plan (see Record of Non-Applicability (RONA)), while the seaward based alternative emissions estimates are not yet ripe for analyses since the equipment list, staging and schedules are not available for analyses. Based upon knowledge gained and established by New York District's chairmanship of the Regional Air Team (RAT) since 2000 and its informing of Clean Air Act (CAA) compliance and mitigation needs applicable to our entire Civil Works Program, it is anticipated that emissions associated with the seaward alternative will not exceed regulated criteria pollutant thresholds as established under the General Conformity Rule for the New York-New Jersey-Long Island-Connecticut Non-attainment Area (NTNJLICT NAA) and will, therefore, result in a Record of Non-Applicability (RONA) for this Actionable Element Site. Upon determination of the construction equipment required based upon further design elements of this alternative, an emissions analyses will be conducted to confirm the Districts conclusion. If the General Conformity Rule is triggered, the District will execute compliance, including public notification and development of a mitigation plan, accordingly. A Conditional Record of Non-Applicability, based upon this, 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 anticipated to be 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.

No operations and maintenance assumption emissions are anticipated. Therefore, all qualitative scores are rated “0” for no effect.

Beneficial Effects

No beneficial effects of the seaward alternative 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.

4.1.22.4 Landward 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 construction of either the landward or seaward CSRM line of protect, which will likely include the use of land based mobile equipment such as diesel-powered generators, compactors, compressors, dozers, excavators, loaders, and graders, as well as off-road trucks, and water –based equipment such as barges and mechanical (not hydraulic) excavators. Emissions associated with the construction of the land-based alternative are accommodated within the New York State Implementation Plan (see Record of Non-Applicability (RONA)), while the seaward based alternative emissions estimates are not yet ripe for analyses since the equipment list, staging and schedules are not available for analyses. Based upon knowledge gained and established by New York District’s chairmanship of the Regional Air Team (RAT) since 2000 and its informing of Clean Air Act (CAA) compliance and mitigation needs applicable to our entire Civil Works Program, it is anticipated that emissions associated with the seaward alternative will not exceed regulated criteria pollutant thresholds as established under the General Conformity Rule for the New York-New Jersey-Long Island-Connecticut Non-attainment Area (NTNJLICT NAA) and will, therefore, result in a Record of Non-Applicability (RONA) for this Actionable Element Site. Upon determination of the construction equipment required based upon further design elements of this alternative, an emissions analyses will be conducted to confirm the Districts conclusion. If the General Conformity Rule is triggered, the District will execute compliance, including public notification and development of a mitigation plan, accordingly. A Conditional Record of Non-Applicability, based upon this, 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 anticipated to be 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.

No operations and maintenance assumption emissions are anticipated. Therefore, all qualitative scores are rated “0” for no effect.

Beneficial Effects

No beneficial effects of the landward alternative 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.

4.1.23 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]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	0	0	0	0	0	0	**0**	**0**	**0**
O&M Assumptions	0	0	0	0	0	0	**0**	**0**	**0**
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*0*	*0*	*0*	***0***	***0***	***0***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**0**	**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

4.1.24 Climate and RSLC

4.1.24.1 Existing Conditions

The climate of these Planning Regions is characterized by long, cold winters and short warm summers. The mean annual temperature for this region is approximately 40° F. The normal annual temperature during the winter months is about 25° F, and during the summer months it is about 70° F to 75° F. Annual precipitation, in rainfall, for much of these Planning Regions is approximately 41

inches. This area receives about 10.5 inches of precipitation during the spring and again in the fall, about 9 inches during the winter, and 11.5 inches during the summer. The mean annual snowfall for the entire Hudson River Basin varies from about 100 inches in the northern regions to about 20 inches in the lower reaches near New York City. Storms occurring in this region are transcontinental and extratropical. The transcontinental storms come from the Gulf of [America] (formerly Mexico) and the west, often in the spring, while tropical storms and hurricanes generally occur in the fall, from the Atlantic Ocean. Thunderstorms and cloudbursts usually occur during the summer months (USACE 2020a).

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 Harlem River Actionable Element Site for comparison purposes:

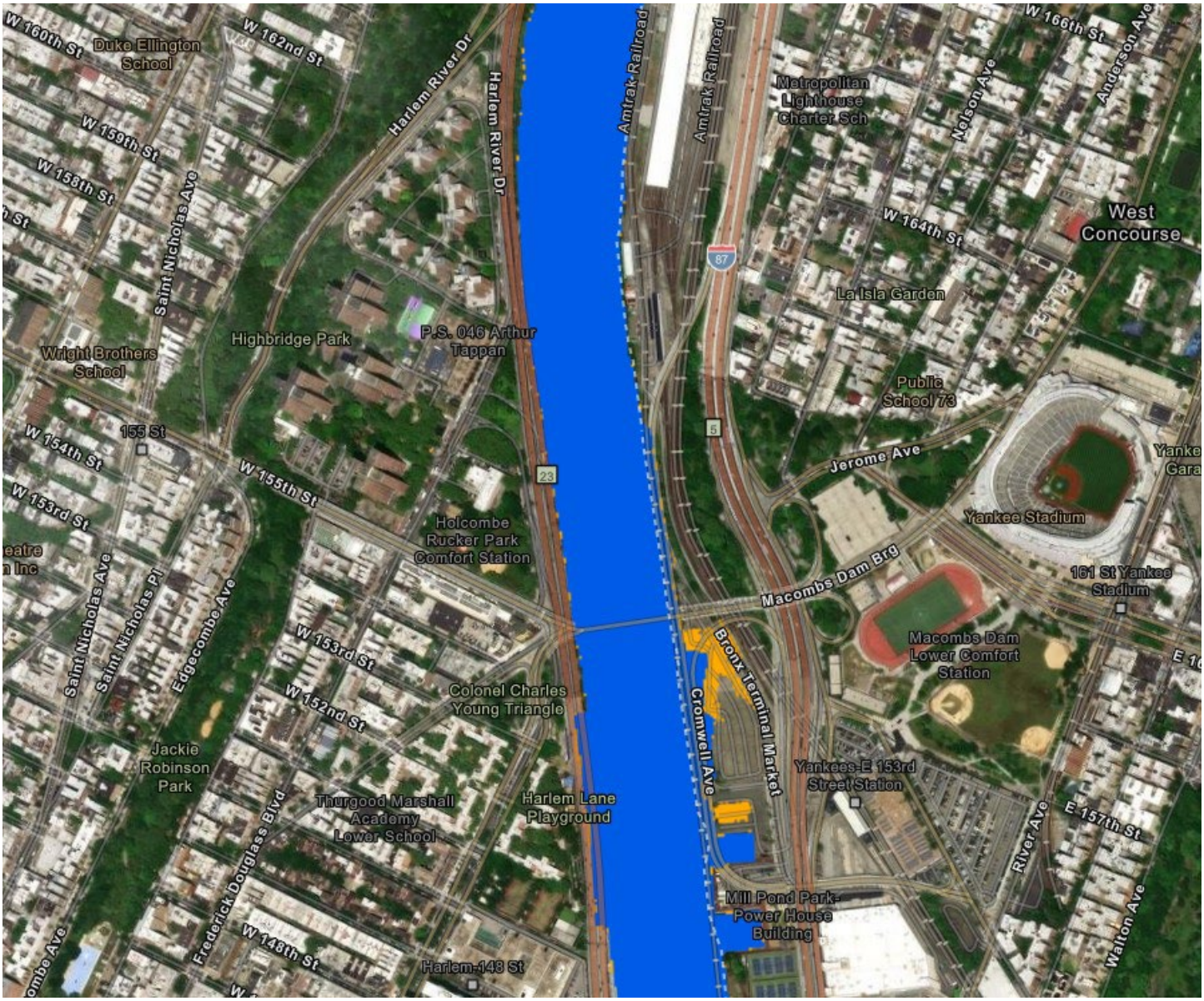


Figure 4. Low RSLC Scenario Projection for the Harlem River Actionable Element Site (1-foot)

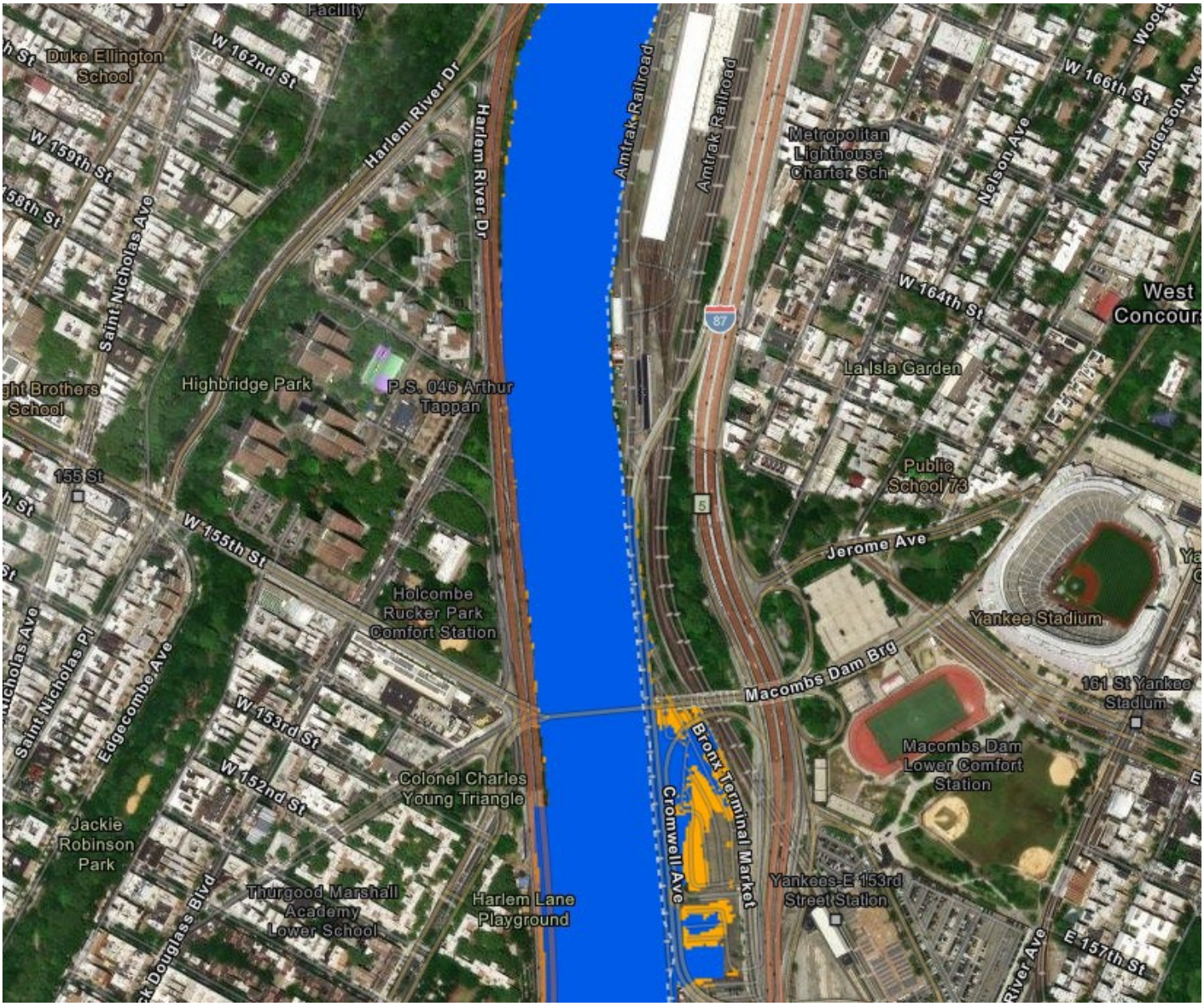


Figure 5. Intermediate RSLC Scenario Projection for Harlem River Actionable Element Site (2 feet)

Figure 6. High RSLC Scenario Projection for Harlem River Actionable Element Site (5 feet)

4.1.24.2 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. 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). A comparison of the low, intermediate, and high RSLC projection scenarios over the next 100-years exhibit minimal threat from the low and intermediate scenario of which estimates the RSLC will be primarily observed contained in the Harlem River, while the high scenario shows some overlap

with Harlem River Drive and the inland community. 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. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.24.3 Seaward 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.

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

Beneficial Effects

No beneficial effects of seaward alternative are anticipated, as RSLC will persist under any project scenario, Therefore, this effects category is representative as no benefit, with a corresponding score of 0.

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

4.1.24.4 Landward 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.

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

Beneficial Effects

No beneficial effects of seaward alternative are anticipated, as RSLC will persist under any project scenario, Therefore, this effects category is representative as no benefit, with a corresponding score of 0.

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

4.1.25 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]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	0	0	0	0	0	0	**0**	**0**	**0**
O&M Assumptions	0	0	0	0	0	0	**0**	**0**	**0**
Subtotal of Adverse and Beneficial Effects	*0*	*0*	*0*	*0*	*0*	*0*	***0***	***0***	***0***

Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**0**	**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).

4.1.26 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.

4.1.27 Existing Conditions

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), more than 17 National Register listed or eligible resources are in the study area. This includes 1 archaeological site (NYSM archaeological area), 7 individual aboveground historic resources (2 listed and 4 eligible properties), and 9 historic districts (8 listed and 1 eligible). There are no 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 records for 0 archaeological sites and 1archaeological 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.

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). The NR-Listed NYC LPC Landmarked Jackie Robinson Park is adjacent to the study area, approximately 360 meters west of the Inland alignment.

Approximately 3 NYC Landmark individual properties and historic districts have been identified as partially in or adjacent to the 100-m Direct APEs for the project alternatives.

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, Operation & Maintenance
- Impact Types: Adverse (Negative) Effects, Beneficial Effects

Evaluation Factors:

- Impact Magnitude (Intensity/Extent)
- Geographic Scope (Local/Regional)
- Temporal Scope (Short-/Long-Term)
- Regulatory Thresholds (e.g., NEPA, NRHP eligibility, Section 106 compliance
- Mitigation Potential (Avoidance, Minimization, Treatment, Enhancement)

Table 4-4 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.

Table 4-5 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.

4.1.27.1 No Action

Adverse Effects

The No Action or No-Build Alternative was assessed in relation to the project's purpose and need. Under this scenario, no measures would be implemented to address future flood risks, which are anticipated to worsen due to relative sea level rise. As a result, this alternative would leave existing aesthetic, visual, historical, and cultural resources vulnerable to damage. Dozens of archaeological

sites and aboveground historic resources 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.

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 impact score of 0.

4.1.27.2 Seaward Alternative

Adverse Effects

Despite its benefits, the seaward alignment results in low adverse effects to historic viewsheds due to the introduction of a hardened edge along the river. While less visually intrusive than a landward wall in some areas, the project may still alter the relationship between the city and river historically important to the area's development.

Impacts to submerged archaeological resources are assessed as low adverse, due to high levels of past disturbance from dredging, bulkhead construction, and other marine activities. However, the potential for buried shipwrecks or waterfront structures remains, warranting archaeological review. While unlikely to yield significant finds, best practices would recommend a remote sensing survey prior to construction to confirm absence of intact features.

Beneficial Effects

The seaward alignment, featuring a seawall extending approximately 25-feet into the Harlem River, tied into landward floodwalls at either end, provides moderate beneficial effects to historic structures by creating a buffer zone between vulnerable riverfront assets and storm surge. This design limits the need for intrusive measures within the historic urban core and reduces long-term flood damage risk to historic buildings along the shoreline.

The fill area between Harlem River Drive and the seawall can serve as a protective layer, further shielding inland historic resources and possibly creating space for interpretive elements or public access that supports heritage education and visibility.

4.1.27.3 Inland Alternative

Adverse Effects

The landward alignment results in moderate to high adverse effects to historic viewsheds, especially where the floodwall introduces vertical visual barriers not currently present in the streetscape. These changes may diminish the historic character of key corridors and obscure sightlines to landmarks and the Harlem River.

There is also moderate adverse potential to below-ground archaeological resources, particularly in the small, vegetated segment of the alignment. Though much of the footprint follows disturbed urban

surfaces, any remaining intact archaeological deposits may be deeply buried beneath layers of fill or pavement. Construction-related excavation could pose a risk without appropriate testing or monitoring.

Beneficial Effects

The landward alignment, consisting of a 7–12-foot AMSL floodwall along existing roads, medians, and sidewalks (with deployable gates at Harlem River Drive onramps), offers moderate beneficial effects to historic structures. By staying within the current built environment and avoiding direct intrusion on historic buildings, the alignment helps preserve structural integrity while reducing flood exposure. This risk reduction contributes to long-term preservation of historic assets in adjacent neighborhoods.

Additionally, the use of deployable gates instead of permanent barriers at critical access points allows for continued circulation and potentially reversible design, which supports the historic spatial relationships within the area.

4.1.28 Cultural Resources within Visual Impact Area (Indirect Effects)

The measures included in the study could disrupt or enhance existing viewscapes, depending on location and scale. Construction of structural measures may affect scenic byways, diminish, or lose existing residential views, and/or obstruct 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

USACE 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.

A Measures proposed for the AE will involve the construction of structures that have a potential to indirectly affect historic properties, most prominently by altering 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 northeast Harlem, Washington Heights and the Bronx, New York City. As of this writing, this preliminary visual impact analysis is an initial screening of impacted historic properties and may be refined in subsequent iterations.

A visibility analysis that takes the built environment and vegetation into account are beyond the scope of the Study. Additional discussion and evaluation of the visual impacts from each Alternative is available in the Cultural Resource SubAppendix.

4.1.29 Cultural Resources Impact 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]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	-1	-1	-2	0	+3	+3	**-1**	**+2**	**+1**
O&M Assumptions	0	-1	-1	0	+2	+1	**0**	**+1**	**0**
Subtotal of Adverse and Beneficial Effects	*-1*	*-2*	*-3*	*0*	*+5*	*+4*	***-1***	***+3***	***+1***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**-1**	**+3**	**+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 – Viewshed/Historic Setting Qualitative Rating	Adverse Effects			Beneficial Effects			NO ACTION TOTAL SCORE[1]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	-1	-1	-4	0	+4	+1	**-1**	**+3**	**-3**
O&M Assumptions	0	-1	-2	0	+2	+1	**0**	**+1**	**-1**
Subtotal of Adverse and Beneficial Effects	*-1*	*-2*	*-6*	*0*	*+6*	*+2*	***-1***	***+4***	***-3***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**-1**	**+4**	**-3**

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

Cultural Resources – Submerged Archaeological	Adverse Effects	Beneficial Effects		SEAWARD TOTAL	LANDWARD

Resources Qualitative Rating	No Action	Seaward	Landward	No Action	Seaward	Landward	NO ACTION TOTAL SCORE[1]	SCORE[2]	TOTAL SCORE[3]
Construction/Footprint	-1	-1	0	0	0	0	**-1**	**-1**	**0**
O&M Assumptions	0	0	0	0	0	0	**0**	**0**	**0**
Subtotal of Adverse and Beneficial Effects	*-1*	*-1*	*0*	*0*	*0*	*0*	***-1***	***-1***	***0***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**-1**	**-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 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. The Stockbridge Munsee consider Papscanee Island, located on the Hudson River just two miles south of Albany and within the Capital District Region, to be a traditional historic property of religious and cultural significance and the New York State Office of Parks, Recreation and Historic Preservation has, under those criteria, determined the site eligible for the National Register of Historic Places. There are no Native American lands within or near the Actionable Element Site; therefore, an effects analysis is not applicable.

4.1.31 Hazardous, Toxic, and Radioactive Waste

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 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; 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.

4.1.31.1 Existing Conditions

The Study Area exists in a heavily 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:

- A history of placing fill of unknown origins to advance the shore of the Harlem River and further development. There exists the potential that certain project features will necessitate excavation through this placed fill.
- A history of industrial activity (e.g., railyards, coal, ash, factories, etc.) in the vicinity of the Study Area.
- Documented environmental database listings in the immediate vicinity of the Study Area, most notably:
    - RCRA LQG: NYCDOT - FDR Dr Viaduct Ave C to 23rd St (ID# NYR000251975)
    - RCRA SQG: Macombs Dam Bridge NYCDOT (ID# NYR000028712)
    - RCRA VSQG: NYCPR - Asser Levy Recreation Center (ID# NYR000154195)
    - NYSDEC BCP: 280 West 155th Street Development (ID# C231138)
    - PBS Facility: Ralph J. Rangel Houses (ID# 2-474940)

Environmental listings and concerns are ubiquitous with the New York Metropolitan Area particularly along the waterfront where industrial activities historically took place. 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.

4.1.31.2 No Action Alternative

Adverse Effects

The no action is anticipated to continue to have the surrounding area vulnerable to coastal flood risk and damages. Storm damage to a significantly urbanized area, such as the Lower Hudson/East River 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. Although the no action would continue from the existing condition trajectory, frequency of storms and severity of storms may increase over time, as may RSLC. While difficult to predict the adverse effects of such change over an extended period 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.

4.1.31.3 Seaward Alternative

Adverse Effects

While encountering HTRW during construction is not anticipated at this time, any intrusive subsurface work associated 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, 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.

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

Beneficial Effects

Direct beneficial effects from construction include reduced CSRM flooding to the surrounding area

that would be protected by the landward alternative. With reduced CSRM flooding risk, 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. Therefore, this effects category is representative as low benefit, with a corresponding score of +1.

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

4.1.31.4 Landward Alternative

Adverse Effects

While encountering HTRW during construction is not anticipated at this time, any intrusive subsurface work associated 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, 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.

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

Beneficial Effects

Direct beneficial effects from construction include reduced CSRM flooding to the surrounding area that would be protected by the landward alternative. With reduced CSRM flooding risk, 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. Therefore, this effects category is representative as low benefit, with a corresponding score of 1.

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

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

4.1.33 Navigation and Traffic

4.1.33.1 Existing Conditions

While the Lower Hudson/East River Region encompasses the entirety of the highly urbanized city of Manhattan with the remainder of the Hudson River on the Western side and the East River on the Eastern side. New York District maintains a federal navigation channel in the Hudson River from Troy Lock and Dam to the New York-New Jersey Harbor, and periodically dredges the channel between Albany and New York City to a depth of 32 feet. River obstructions that created topographic relief, like reefs, shallows, and rocks, were dredged or blasted to create a continuous, navigable channel through Hell Gate (USACE 2020a). The Harlem River is also designated as a federal navigation channel from bank-to-bank; however, it hasn't been dredged or maintained for some time.

The Harlem River is used by a variety of boats, including recreational rowboats, racing shells, and commercial vessels, including the Circle Line ferry. Rowing is a prominent activity on the river, with several universities and community programs utilizing it for training and competition. The Harlem River navigation channel is authorized to a depth of 15 ft bank-to-bank. The MTA subway lines B, D, and 3 travel under the Harlem River through the Actionable Element Site.

The Harlem River Drive runs parallel to the Harlem River from north-to-south, with several on/off ramps for business and community access, and emergency response vehicle use.

4.1.33.2 No Action Alternative

Adverse Effects

No adverse effects of no action are anticipated to navigation, as the area would continue to be vulnerable to coastal flood risk and damages. Traffic related effects would be anticipated from continued storm-related damages to infrastructure and road flooding, as the Harlem River Drive is within the floodplain and exposed to coastal storm risk. Continued storm related damages to Harlem River Drive may require repairs over time, incurring temporary construction 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.

4.1.33.3 Seaward Alternative

Adverse Effects

Direct and indirect impacts during construction to navigation are anticipated from the seaward alternative. The navigation channel will need to be deauthorized on the western bank. However, this should not present an issue as the river contains bridge landings in the center effectively controlling the width and height of a navigation vessels accessing the river. During construction, notices to mariners will be issued to warn of the construction hazard. Northbound traffic along the Harlem River Drive may need to be reduced to one lane during construction and detoured or reduced while constructing the deployable barriers and tie-ins. A construction traffic plan will be developed during the PED phase with local officials and neighbors. Therefore, this effects category is representative as low impact, with a corresponding score of -1.

During operations and maintenance, adverse impacts to navigation are not anticipated. The Harlem River Drive will not be usable during storm events while the deployable gate is closed; however, access would be limited even without the project, as the road is within the floodplain and susceptible to coastal storm flooding that would also impair vehicular access and use. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Direct beneficial effects of the seaward alternative are not anticipated to navigation, but are anticipated to traffic. Harlem River Drive and local roads near the site will have a reduced risk of flooding and damage during storm events. Therefore, this effects category is representative as low to moderate beneficial effect, with a corresponding score of +2.

During operations and maintenance, beneficial effects to navigation are not anticipated; however would be anticipated to vehicular traffic. When the deployable barrier gates are closed, this portion of Harlem River Drive and local roads near the site will incur managed risk of flooding during storm

events, and the presence of the in-water measure would further reduce risk of damages and storm related flooding to this portion of Harlem River Drive. Therefore, this effects category is representative as low impact, with a corresponding score of +1.

4.1.33.4 Landward Alternative

Adverse Effects

Direct and indirect impacts during construction to navigation are anticipated under the landward alternative. Traffic along the Harlem River Drive. will need to be detoured or reduced during construction. Local travel will also need to be detoured during construction. A construction traffic plan will be developed during the PED phase with local officials and neighbors. This alignment would not provide a reduced risk of storm damages and flood risk to Harlem River Drive. Therefore, this effects category is representative as low impact, with a corresponding score of -2.

During operations and maintenance, impacts to navigation are not anticipated. Vehicles and traffic that would frequent Harlem River Drive will not be usable during storm events; however, access would be closed anyway as the road floods currently without the project. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Minor direct beneficial effects of the landward alternative are anticipated, not to navigation but to the smaller on/off ramps of the Harlem River Drive that provide access to businesses and communities further west. These local roads near the site would have managed risk during storm events. Therefore, this effects category is representative as low impact, with a corresponding score of +1.

During operations and maintenance, beneficial impacts to navigation are not anticipated, and minor beneficial effects would be anticipated when the deployable barrier gates are closed, managing risk to local roads west of the alignment during storm events. Therefore, this effects category is representative as low impact, with a corresponding score of +1.

4.1.34 Navigation 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.

Navigation Qualitative Rating	Adverse Effects			Beneficial Effects			NO ACTION TOTAL SCORE[1]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
	No Action	Seaward	Landward	No Action	Seaward	Landward			
Construction/Footprint	-1	-1	-2	0	+2	+1	**-1**	**+1**	**-1**
O&M Assumptions	0	0	0	0	+1	+1	**0**	**+1**	**+1**

Subtotal of Adverse and Beneficial Effects	*0*	*-1*	*-2*	*0*	*+3*	*+2*	***0***	**+2**	***0***
Mitigation (if applicable, otherwise 0)	0	0	0	0	0	0	**0**	**0**	**0**
ACTION TOTAL SCORE (calculated, additive, with mitigation if applicable)							**0**	**+2**	**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).

4.1.35 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 4-6 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
Firecrackers	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).

4.1.35.1 Existing Conditions

Ambient noise levels within the Lower Hudson/East River Region would likely be in the low to mid-range, as much of the region encompasses high-density residential communities, parks, traffic, and the Harlem River. The primary sources of noise in the Actionable Element are anticipated to originate from vehicular traffic of pedestrian and commercial vehicles, commuter train traffic of the New York MTA subway lines, periodic concerts, festivals, street fairs, music, and air traffic from helicopters and nearby airports. The Harlem River Dr. contributes are large portion of the noise. Potential sensitive receptors in the Actionable Element include residential areas. 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, and construction. Potential sources of vibration to sensitive receptors may include automobiles, large motor vehicles, train traffic, boat traffic, and construction.

4.1.35.2 No Action Alternative

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.

4.1.35.3 Seaward Alternative

Adverse Effects

Direct and indirect adverse impacts are anticipated with the seaward 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. Wildlife are anticipated to avoid areas of active construction, noise, and vibration, moving to nearby suitable habitat until construction is complete. Because of the highly urbanized environment with moderate ambient sounds, much of the construction noise will be similar to existing conditions. 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.

No adverse effects of the operations and maintenance are anticipated. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

Beneficial Effects

Beneficial effects from the seaward alternative are anticipated. Noise from the river may be reduced from land and noise on land may be reduced on the river. Therefore, this effects category is representative as low adverse effect, with a corresponding score of 1.

No beneficial effects of the operation and maintenance are anticipated. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

4.1.35.4 Landward Alternative

Adverse Effects

Direct and indirect adverse impacts are anticipated with the landward 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. Wildlife are anticipated to avoid areas of active construction, noise, and vibration, moving to nearby suitable habitat until construction is complete. Because of the highly urbanized environment with moderate ambient sounds, much of the construction noise will be similar to existing conditions. 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.

No adverse effects of the landward alternative are anticipated. Therefore, this effects category is representative as no adverse effect, with a corresponding score of 0.

Beneficial Effects

Direct beneficial effects of the landward alternative are anticipated. Much of the noise from the Harlem River and traffic from the Harlem River Drive would be reduced for the businesses and residents in the area. Therefore, this effects category is representative as low beneficial effect, with a corresponding score of +1.

No beneficial effects of the operation and maintenance are anticipated. Therefore, this effects category is representative as no impact, with a corresponding score of 0.

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

4.1.37 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.

4.1.37.1 Existing Conditions

The community near the Harlem River Actionable Element primarily consists of the New York City Housing Authority (NYCHA) Rangel Houses. This community experiences heightened social vulnerability due to significantly higher percentages of residents with limited English proficiency and poverty rates exceeding national and state averages. This experience is further underscored by below-median life expectancies, reflecting myriad difficult-to-quantify cumulative vulnerabilities. Community infrastructure in this area include the Arthur Tappan School (Public School 46), which serves pre-kindergarten to eighth, the Harlem Center for Opportunity, which offers transitional housing, the Rangel Community Center and the Rangel Pharmacy, both at the NYCHA Rangel Houses.

4.1.37.2 No Action Alternative

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.

4.1.37.3 Seaward Alternative

Adverse Effects

The Seaward Alignment of the Harlem River Actionable Element would create temporary construction-related noise and vibration from heavy machinery used for excavation, grading, and installation of infrastructure. Noise and vibrations would be primarily water-based. Best management practices will be utilized to reduce the effects of noise and vibration on surrounding communities, including adherence to local noise ordinance construction windows and implementation of environmental windows to minimize disturbance. Removal of greenspace is anticipated at tie-ins; however, this area is not currently utilized for recreation or leisure. Complementary NBS will create new areas of natural space and aquatic habitat beneficial to aquatic species and migratory birds.

Beneficial Effects

The Seaward Alignment of the Harlem River Actionable Element presents several moderate long-term benefits that support the preservation of Harlem's historic character and resilience by safeguarding adjacent historic structures and fabric from storm-related flooding. Crucially, this alignment manages risk to vital community institutions within the area, including the Arthur Tappan School (Public School 46), the Harlem Center for Opportunity, and the NYCHA Rangel Houses (including the Rangel Community Center and the Rangel Pharmacy). Protecting these cornerstones of the community preserves not only physical assets but also the social fabric and networks essential for community well-being and resilience, ensuring continued access to critical support and fostering social interaction. Additionally, the creation of new natural space and aquatic habitat through NBS offers potential for new recreation benefits.

4.1.37.4 Landward Alternative

Adverse Effects

The Landward Alignment of the Harlem River Actionable Element would create temporary construction-related noise and vibration from heavy machinery used for excavation, grading, and installation of infrastructure. Noise and vibrations would be primarily land-based, with potential localized disturbance during work near roadways and residential areas. Construction fencing would restrict access to the work area during construction, impacting pedestrian and vehicular traffic flow

until construction is complete. Best management practices will be utilized to reduce the effects of noise and vibration on surrounding communities, including adherence to local noise ordinance construction windows and implementation of environmental windows to minimize disturbance. Removal of greenspace along the alignment is anticipated, though it is low-quality habitat with non-native invasive species.

Beneficial Effects

The Landward Alignment of the Harlem River Actionable Element will help prevent flood risk and therefore protect the longevity of vital community institutions within the risk management area, including the Arthur Tappan School (Public School 46), the Harlem Center for Opportunity, and the NYCHA Rangel Houses (including the Rangel Community Center and Pharmacy). Protecting these cornerstones of the community preserves not only physical assets but also the social fabric and networks essential for community well-being and resilience, ensuring continued access to critical support and fostering social interaction. In accordance with USACE policy, post-construction site restoration efforts offer the potential to re-establish the remaining greenspace into quantifiable native nature space or park space, creating new opportunities for community recreation and leisure and enhancing the quality of life for local residents.

4.1.38 Socioeconomics and Demographics (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:

Table 5-1 Environmental Commitments, Compliance, and Mitigation

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. Continued coordination with respective regulatory Agencies.
Special Status Areas	Erosion and sediment control BMP, 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 BMP, water quality certificate recommendations/BMP
Air Quality and Clean Air Act	Air emissions from construction of the Actionable Element Site 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, LPC, 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/Traffic	Navigation construction safety BMPs. Develop traffic control plans.
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 BMP considerations may be tailored to the community concerns.

Avoidance, Mitigation, and Best Management Practices Considerations:

Action Alternative – Seaward Alignment

As the anticipated adverse effects of this Actionable Element are low ("-1" and "-2") additional mitigation beyond avoidance is not necessary to sustain low adverse effect qualitative rating. 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.

Action Alternative – Landward Alignment

As the anticipated adverse effects of this Actionable Element are low ("-1" and "-2") additional mitigation beyond avoidance is not necessary to sustain low adverse effect qualitative rating. 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. An exception to this generalization is the acknowledgement of the greenspace (although degraded by urban influences and non-native invasives) that would be permanently removed. In accordance with USACE policy, post-construction site restoration efforts offer the potential to re-establish the remaining greenspace into quantifiable native nature space or park space, creating new opportunities for community recreation and leisure and enhancing the quality of life for local residents. Refer to the Environmental Appendices for supporting detail and individual resource effect rating score cards.

5.1 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 are anticipated to be below 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.

5.2 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. 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) New York District 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 New York District avoid, minimize, and mitigate impacts to wetlands.

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

5.3 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 Site is within Federal and State mapped CZMA zones; therefore, a CZMA assessment was prepared, provided in the CZMA Subappendix.

5.4 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 Site, provided in the ESA Subappendix for USFWS and NOAA-NMFS.

5.5 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. 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 Site. 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.

5.6 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 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.

5.7 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 Site 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.

5.8 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA)

The Actionable Element Site 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 Appendix) 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 USACE 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.

5.9 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 Subappendix.

5.10 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.

5.11 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 Site.

5.12 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 Harlem River 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 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 resource effect rating score cards.

NATURAL ENVIRONMENT SCORECARD HARLEM RIVER Qualitative Rating Score	NO ACTION TOTAL SCORE[1]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
WILDLIFE AND VEGETATION			
Wildlife	**-1**	**0**	**-2**
Fish	**0**	**+4**	**0**
Migratory Fish	**0**	**+4**	**0**
Terrestrial Vegetation	**0**	**0**	**0**
Submerged Aquatic Vegetation	**NA**	**NA**	**NA**
Invasive and Aquatic Nuisance Species	**0**	**+1**	**+1**
SPECIAL STATUS SPECIES			
Threatened and Endangered Species (Terrestrial)	**0**	**+1**	**+1**

Threatened and Endangered Species (Aquatic)	**0**	**0**	**0**
Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act Species	**0**	**+1**	**+1**
Marine Mammal Protection Act Species	**NA**	**NA**	**NA**
Sea Turtles	**NA**	**NA**	**NA**
Essential Fish Habitat and EFH-Designated Species	**-1**	**+1**	**0**
SPECIAL STATUS AREAS			
Wetlands	**0**	**+2**	**0**
Floodplains	**0**	**0**	**0**
Wild and Scenic Rivers	**NA**	**NA**	**NA**
Designated Critical Habitat	**NA**	**NA**	**NA**
Critical Environmental Areas	**NA**	**NA**	**NA**
Marine Protected Areas	**NA**	**NA**	**NA**
Coastal Zone Management Act Areas	**-2**	**+2**	**+1**
Coastal Barrier Resources Act Areas	**NA**	**NA**	**NA**
National Park Service Land	**NA**	**NA**	**NA**
Wildlife Refuge Land	**NA**	**NA**	**NA**
Commercial and Recreational Fishing	**0**	**+1**	**0**
Subtotal Scores (additive, for calculation)	*-4*	*+17*	*+2*
TOTAL AVERAGED SCORE (calculated, averaged. Subtotal divided by total number of resources applicable and scored):	**-0.30**	**+1.30**	**+0.15**
TOTAL HIGHEST ADVERSE EFFECT ESCALATED SCORE (for comparison purposes)	**-2**	**-1**	**-2**
TOTAL HIGHEST BENEFICIAL EFFECT ESCALATED SCORE (for comparison purposes)	**+1**	**+4**	**+3**

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). 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 relative sea level change (RSLC). Although the no action would continue from the existing condition trajectory, frequency of storms and severity of storms may increase over time, as may RSLC. Wildlife and vegetation disturbance, displacement, and, in severe cases casualties, could occur, as could degradation and/or removal of associated habitat for foraging and shelter.

Action Alternative – Seaward Alignment

During construction, 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. Wildlife in this area are accustomed to noise, vibration, and the activity of city life. Direct adverse effects from operations and maintenance impacts would be temporary and associated with upkeep of the complementary NBS and seawall and deployable barrier closures before a storm, of which the activity and noise would encourage wildlife to disperse. Vegetation and trees along the riverfront and tie-ins may have to be removed. Operations and maintenance activities are anticipated to be negligible.

Action Alternative – Landward Alignment

Direct adverse effects from construction may cause temporary displacement, noise, vibrations, and disturbances that would make existing habitat temporarily unusable. Wildlife is expected to move to areas of nearby suitable habitat and avoid active construction, returning once construction is complete. Construction in areas of vegetation will remove wildlife habitat temporary particularly for small mammals and birds. 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. Wildlife in this area are accustomed to noise, vibration, and the activity of city life. Direct adverse effects to terrestrial vegetation include the removal of existing vegetative habitat along the footprint of the alignment and staging areas (if placed on vegetative areas). Most of the vegetation planted for this alternative would be on the western side and the floodwall could hinder growth of vegetation reducing available sunlight. Indirect adverse effects include habitat conversion from vegetation to floodwall losing habitat for terrestrial species. 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 and RSLC. The no action is anticipated to continue to have the surrounding area vulnerable to the effects of coastal flood risk and damages. 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.

Action Alternative – Seaward Alignment

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 that are relevant to the terrestrial environment portions of the alignment (such as the floodwall tie-ins to high ground) are highly urban. It is likely species potentially present in this area are accustomed to urban environments (e.g. bats). While Atlantic and Shortnose Sturgeon may be present in the Harlem River, there is no anticipated sustaining habitat along this portion of the river. Direct effects from construction will cause temporary and localized noise, vibration, and turbidity disturbances for species passing through, which will be mitigated through appropriate construction windows, and the utilization of other BMPs to reduce adverse effects. Operations and maintenance activities are anticipated to be negligible.

Action Alternative – Landward Alignment

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 that is highly urban. 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 best management practices. 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 -2 (low to moderate adverse effect) primarily due to the coastal storm risk and RSLC.

Action Alternative – Seaward Alignment

During construction, the Action Alternative adverse effects range from 0, or no adverse effect, to -2 (low to moderate 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

Action Alternative – Landward Alignment
During construction, the Action Alternative adverse effects range from 0, or no adverse effect, to -2 (low to moderate 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 – Seaward Alignment
Beneficial effects of the Seaward Alignment are primarily focused on the management of coastal storm risk and wave attenuation, as well as the additional related ecological benefits that provide qualitative, and quantifiable, benefits to several natural resources. The proposed project would add complementary NBS. These NBS would create more friendly habitat for wildlife such as fish and birds increasing the availability of foraging and sheltering areas for wildlife in the vicinity, as well as species migrating through the area. This alternative would reduce risk to the more inland vegetation maintaining wildlife habitat during storm events. Therefore, many of the wildlife and vegetation resources would incur a range of “+1” to “+3” score depending on the individual resource.

Action Alternative – Landward Alignment
Beneficial effects of the Action Alternative are primarily focused on the management of coastal storm risk. This alignment may deter wildlife from accessing Harlem River Drive, decreasing incidents with traffic. The entire degraded greenspace may be replaced by native, pollinator friendly species, improving wildlife habitat and promote success of the native plantings through removal of all invasives in the greenspace. Direct beneficial effects from construction include reduced CSRM to vegetative damages. Indirect beneficial effect includes native habitat creation for wildlife with the conversion from invasive to native vegetation. Therefore, many of the wildlife and vegetation resources would incur a range of “0” to “+1” score depending on the individual resource, often with net outcomes of “0” that account for both adverse and beneficial effects.

6.1.3.2 Special Status Species

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

Action Alternative – Seaward Alignment
There are no effects anticipated to terrestrial threatened and endangered species during construction of the alignment therefore effects are represented by a corresponding rating criteria score of 0. Beneficial effects to aquatic threatened and endangered species are anticipated to be moderate, as the complementary NBS will provide newly created habitat aquatic species to forage and shelter

where none existed before. However, due to the limit in special status species habitat and presence anticipated for threatened and endangered species, a corresponding overall score of “0” to “+1” is anticipated.

Action Alternative – Landward Alignment
Beneficial effects to special status species are anticipated to be low, as existing degraded habitat will be replaced with native habitat, that may consider pollinator friendly species and encourage migratory birds or other special status species to forage. However, due to the limit in special status species habitat and presence anticipated for threatened and endangered species, a corresponding overall net score of “0” to “+1” is anticipated.

6.1.3.3 Special Status Areas

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

Action Alternative – Seaward Alignment
The seaward alternative would have beneficial effects to special status areas through the creation of the NBS such as oyster reefs, tidal wetlands, tide pools, and seawall panels, armor blocks, and or pile encapsulations that support aquatic marine organism growth. Direct and indirect beneficial effects from operation and maintenance of the site are anticipated due to the NBS. The site would continue to be monitored for establishment of the NBS. Maintenance may include non-native plant management. 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 low benefit. Many of the special status area resources would incur a range of “0” to “+3” score depending on the individual resource, with the greatest benefit to wetlands and Coastal Zone Management Act areas, with a net outcome of “0” to “+2”.

Action Alternative – Landward Alignment
Beneficial effects to special status areas from the landward alignment are limited due to the lack of existing designated areas, but are anticipated to be highest for the Coastal Zone Management Act zone. The alignment will reduce coastal storm risk to the Harlem River waterfront area from the impacts associated with sea level change, storm surges, and coastal flooding. The landward alignment would reduce risk to the environment, life, property, and infrastructure from the impacts of coastal storms in the area. This alignment would remove invasive species from the degraded greenspace and may replace them with native, pollinator-friendly species, which would improve the existing wildlife habitat and promote the success of native plantings. Many of the special status area resources would incur a range of “0” to “+3” score depending on the individual resource, with the greatest benefit to Coastal Zone Management Act areas, with a net outcome of “0” to “+2”.

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 HARLEM RIVER Qualitative Rating Score	NO ACTION TOTAL SCORE[1]	SEAWARD TOTAL SCORE[2]	LANDWARD TOTAL SCORE[3]
PHYSICAL RESOURCES			
Topography and Geology	**0**	**+1**	**+1**
Surface Waters	**-1**	**0**	**-1**
Sediment	**-1**	**0**	**-1**
Land Use	**0**	**0**	**0**
Hydrological Resources			
Bathymetry	**0**	**0**	**0**
Inland Hydrology	**0**	**0**	**0**
Coastal Hydrology, Currents, and Circulation	**0**	**0**	**0**
Tides, Tidal Exchange, and Tidal Range	**0**	**0**	**0**
Sediment Transport	**0**	**0**	**0**
Water Quality	**-1**	**0**	**0**
Air Quality	**0**	**0**	**0**
Climate and Relative Sea Level Change	**0**	**0**	**0**
CULTURAL RESOURCES			
Historic Structures[1]	**-1**	**+3**	**+1**
Viewshed / Historic Setting[1]	**-1**	**+4**	**-3**
Terrestrial Archaeological Resources[1]	**-1**	**+2**	**-2**
Submerged Archaeological Resources[1]	**-1**	**-1**	**0**
Native American Land	**NA**	**NA**	**NA**
Hazardous, Toxic, Radioactive Waste	**-1**	**0**	**0**
Navigation and Traffic	**0**	**+2**	**0**

Noise and Vibration	**0**	**0**	**+1**
Socioeconomics and Demographics	**NS**	**NS**	**NS**
Subtotal Scores (additive, for calculation)	*-8*	*+11*	*-4*
TOTAL AVERAGED SCORE (calculated, averaged. Subtotal divided by total number of resources applicable and scored):	**-0.42**	**0.57**	**-0.21**
TOTAL HIGHEST ADVERSE EFFECT ESCALATED SCORE (for comparison purposes)	**-1**	**-1**	**-4**
TOTAL HIGHEST BENEFICIAL EFFECT ESCALATED SCORE (for comparison purposes)	**0**	**+4**	**+3**

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 and RSLC.

Action Alternative – Seaward Alignment

Minimal adverse effects are anticipated, as the area is highly urbanized with minimal amounts of soils available on the surface and topography dominated with buildings and roads. Temporary adverse impacts to surface waters will occur during the construction of seaward alternative. The in-water measure would be anticipated to be placed approximately 25-feet into the river, which would result in the Harlem River being less wide in this portion of the river. Given the river has limited use beyond vessels passing through and some recreational fishing, this effect is not anticipated to be significant. Temporary impacts to sediments include resuspension during foundation installation, removal during dredging and excavation, and change in type of sediment due to fill activities. Clearing and sediment excavation and fill and/or the presence of a new foundation or structure during the construction of the alternative are not anticipated to change the bathymetry appreciably.

Action Alternative – Landward Alignment

Minimal adverse effects are anticipated, as the area is highly urbanized with minimal amounts of soils available on the surface and topography dominated with buildings and roads. During storm conditions, surface waters would be expected to rise and continue to flood the Harlem River Drive, as anticipated under the no action alternative. The tie-ins to the alignment may change some greenspace into hard structures depending on exact siting. However, this will not impact any parks. Tie-ins and gates may also impact the Harlem River Drive as they span the drive with the alignment. Evacuation routes and access the future waterfront development will need to be coordinated with local officials.

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 and RSLC. Water quality can be impaired with the continued flooding due to urban runoff.

Action Alternative – Seaward Alignment
Minor direct and indirect adverse effects from the seaward alternative are anticipated. During construction sediment will be resuspended locally. Best Management Practices such as sediment barriers will minimize sediment transport. Emissions from construction of the Action Alternative are anticipated to be below the de minimis levels on a yearly basis. The sole impact producing factor to air quality is regulated air emissions, which will be below General Conformity significance.

Action Alternative – Landward Alignment
No direct and indirect adverse effects from the landward alternative are anticipated to water quality, as the alignment would not have measures in the water, and construction would be conducted under a construction stormwater pollution prevention plan. Emissions from construction of the Action Alternative are anticipated to be below the de minimis levels on a yearly basis. The sole impact producing factor to air quality is regulated air emissions, which will be below General Conformity significance.

6.1.5.3 Cultural Resources

No Action Alternative
The No Action or No-Build Alternative was assessed in relation to the project's purpose and need. Under this scenario, no measures would be implemented to address future flood risks, which are anticipated to worsen due to relative sea level rise. As a result, this alternative would leave existing aesthetic, visual, historical, and cultural resources vulnerable to damage. Dozens of archaeological sites and aboveground historic resources 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.

Action Alternative – Seaward Alignment
Despite its benefits, the seaward alignment results in low adverse effects to historic viewsheds due to the introduction of a hardened edge along the river. While less visually intrusive than a landward wall in some areas, the project may still alter the relationship between the city and river historically important to the area’s development.

Impacts to submerged archaeological resources are assessed as low adverse, due to high levels of past disturbance from dredging, bulkhead construction, and other marine activities. However, the potential for buried shipwrecks or waterfront structures remains, warranting archaeological review. While unlikely to yield significant finds, best practices would recommend a remote sensing survey prior to construction to confirm absence of intact features.

Action Alternative – Landward Alignment
The landward alignment results in moderate to high adverse effects to historic viewsheds, especially where the floodwall introduces vertical visual barriers not currently present in the streetscape. These changes may diminish the historic character of key corridors and obscure sightlines to landmarks and the Harlem River.

There is also moderate adverse potential to below-ground archaeological resources, particularly in the small, vegetated segment of the alignment. Though much of the footprint follows disturbed urban surfaces, any remaining intact archaeological deposits may be deeply buried beneath layers of fill or pavement. Construction-related excavation could pose a risk without appropriate testing or monitoring.

Visual Impact Area
The measures included in the study could disrupt or enhance existing viewscapes, depending on location and scale. Construction of structural measures may affect scenic byways, diminish, or lose existing residential views, and/or obstruct 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 Actionable Element will involve the construction of structures that have a potential to indirectly affect historic properties, most prominently by altering 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 northeast Harlem, Washington Heights and the Bronx, New York City. As of this writing, this preliminary visual impact analysis is an initial screening of impacted historic properties and ~~will~~may be refined in subsequent iterations.

A visibility analysis that takes the built environment and vegetation into account are beyond the scope of the Study. Additional discussion and evaluation of the visual impacts from the Alternative is available in the Cultural Resource Sub-Appendix.

6.1.5.4 Hazardous, Toxic, Radioactive Waste

No Action Alternative
The no action is anticipated to continue to have the surrounding area vulnerable to coastal flood risk and damages. Storm damage to a significantly urbanized area, such as the Lower Hudson/East River 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.

Action Alternative – Seaward Alignment
While encountering HTRW during construction is not anticipated at this time, any intrusive subsurface work associated 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, 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.

Action Alternative – Landward Alignment

While encountering HTRW during construction is not anticipated at this time, any intrusive subsurface work associated 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, 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.

6.1.5.5 Navigation and Traffic

No Action Alternative

No adverse effects of no action are anticipated to navigation, as the area would continue to be vulnerable to coastal flood risk and damages. Traffic related effects would be anticipated from continued storm-related damages to infrastructure and road flooding, as the Harlem River Drive is within the floodplain and exposed to coastal storm risk. Continued storm related damages to Harlem River Drive may require repairs over time, incurring temporary construction effects.

Action Alternative – Seaward Alignment

Direct and indirect impacts during construction to navigation are anticipated from the seaward alternative. The navigation channel will need to be deauthorized on the western bank. However, this should not present an issue as the river contains bridge landings in the center effectively controlling the width and height of a navigation vessels accessing the river. During construction, notices to mariners will be issued to warn of the construction hazard. Northbound traffic along the Harlem River Drive may need to be reduced to one lane during construction and detoured or reduced while

constructing the deployable barriers and tie-ins. A construction traffic plan will be developed during the PED phase with local officials and neighbors.

Action Alternative – Landward Alignment
Direct and indirect impacts during construction to navigation are anticipated under the landward alternative. Traffic along the Harlem River Drive will need to be detoured or reduced during construction. Local travel will also need to be detoured during construction. A construction traffic plan will be developed during the PED phase with local officials and neighbors. This alignment would not provide a reduced risk of storm damages and flood risk to Harlem River Drive.

6.1.5.6 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 – Seaward Alignment
Direct and indirect adverse impacts are anticipated with the seaward 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. Wildlife are anticipated to avoid areas of active construction, noise, and vibration, moving to nearby suitable habitat until construction is complete. Because of the highly urbanized environment with moderate ambient sounds, much of the construction noise will be similar to existing conditions.

Action Alternative – Landward Alignment
Direct and indirect adverse impacts are anticipated with the landward 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. Wildlife are anticipated to avoid areas of active construction, noise, and vibration, moving to nearby suitable habitat until construction is complete. Because of the highly urbanized environment with moderate ambient sounds, much of the construction noise will be similar to existing conditions.

6.1.5.7 Socioeconomics and Demographics

No Action Alternative
The community near the Harlem River Actionable Element primarily consists of the New York City Housing Authority (NYCHA) Rangel Houses. This community experiences heightened social vulnerability due to significantly higher percentages of residents with limited English proficiency and poverty rates exceeding national and state averages. This experience is further underscored by below-median life expectancies, reflecting myriad difficult-to-quantify cumulative vulnerabilities. Community infrastructure in this area include the Arthur Tappan School (Public School 46), which serves pre-kindergarten to eighth, the Harlem Center for Opportunity, which offers transitional housing, the Rangel Community Center and the Rangel Pharmacy, both at the NYCHA Rangel Houses. 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 – Seaward Alignment

The Seaward Alignment of the Harlem River Actionable Element would create temporary construction-related noise and vibration from heavy machinery used for excavation, grading, and installation of infrastructure. Noise and vibrations would be primarily water-based. Best management practices will be utilized to reduce the effects of noise and vibration on surrounding communities, including adherence to local noise ordinance construction windows and implementation of environmental windows to minimize disturbance. Removal of greenspace is anticipated at tie-ins; however, this area is not currently utilized for recreation or leisure. Complementary NBS will create new areas of natural space and aquatic habitat beneficial to aquatic species and migratory birds.

Action Alternative – Landward Alignment

The Landward Alignment of the Harlem River Actionable Element would create temporary construction-related noise and vibration from heavy machinery used for excavation, grading, and installation of infrastructure. Noise and vibrations would be primarily land-based, with potential localized disturbance during work near roadways and residential areas. Construction fencing would restrict access to the work area during construction, impacting pedestrian and vehicular traffic flow until construction is complete. Best management practices will be utilized to reduce the effects of noise and vibration on surrounding communities, including adherence to local noise ordinance construction windows and implementation of environmental windows to minimize disturbance.

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 – Seaward Alignment

Direct and indirect beneficial effects from construction are anticipated to be minimal. Soils may be protected as erosion through coastal storm will be reduced. The proposed project would add complementary NBS and create habitat for fish and benthic fauna to flourish. This would create breeding and foraging habitat for species that previously had no option in this river. Reef effect of the in-water structure also provides subsurface feeding opportunities further enhancing habitat. If oysters which naturally filter water are placed, a larger food pyramid with the improved water conditions would also occur. These effects would be anticipated to beneficially effect surface water conditions and quality of the river. The proposed project would add NBS which will include oyster reefs which help stabilize sediments. As well, the seaward alternative will prevent inland sediments from erosion and movement.

Action Alternative – Landward Alignment

Direct and indirect beneficial effects from construction are anticipated to be minimal. Soils may be protected as erosion through coastal storm will be reduced.

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 and water quality will not improve.

Action Alternative – Seaward Alignment
Minor direct and indirect beneficial effects from the seaward alternative are anticipated. The construction of the NBS may have beneficial local water quality impacts however that impact is anticipated to be minimal. The alignment will also prevent urban runoff from flowing into the river by physically stopping it however that impact is anticipated to be minimal if at all. If oysters which naturally filter water are placed, a larger food pyramid with the improved water conditions would also occur.

Action Alternative – Landward Alignment
No direct and indirect beneficial effects from the landward alternative are anticipated.

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 impact score of 0.

Action Alternative – Seaward Alignment
The seaward alignment, featuring a seawall extending approximately 25-feet into the Harlem River, tied into landward floodwalls at either end, provides moderate beneficial effects to historic structures by creating a buffer zone between vulnerable riverfront assets and storm surge. This design limits the need for intrusive measures within the historic urban core and reduces long-term flood damage risk to historic buildings along the shoreline.

The fill area between Harlem River Drive and the seawall can serve as a protective layer, further shielding inland historic resources and possibly creating space for interpretive elements or public access that supports heritage education and visibility.

Action Alternative – Landward Alignment
The landward alignment, consisting of a 7–12-foot AMSL floodwall along existing roads, medians, and sidewalks (with deployable gates at Harlem River Drive onramps), offers moderate beneficial effects to historic structures. By staying within the current built environment and avoiding direct intrusion on historic buildings, the alignment helps preserve structural integrity while reducing flood exposure. This risk reduction contributes to long-term preservation of historic assets in adjacent neighborhoods.
Additionally, the use of deployable gates instead of permanent barriers at critical access points allows for continued circulation and potentially reversible design, which supports the historic spatial relationships within the area.

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 – Seaward Alignment
Direct beneficial effects from construction include reduced CSRM flooding to the surrounding area that would be protected by the landward alternative. With reduced CSRM flooding risk, 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.

Action Alternative – Landward Alignment
Direct beneficial effects from construction include reduced CSRM flooding to the surrounding area that would be protected by the landward alternative. With reduced CSRM flooding risk, 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.

6.1.6.5 Navigation and Traffic

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 – Seaward Alignment
Direct beneficial effects of the seaward alternative are not anticipated to navigation, but are anticipated to traffic. Harlem River Drive and local roads near the site will have a reduced risk of flooding and damage during storm events.

Action Alternative – Landward Alignment
Minor direct beneficial effects of the landward alternative are anticipated, not to navigation but to the smaller on/off ramps of the Harlem River Drive that provide access to businesses and communities further west. These local roads near the site would have managed risk during storm events.

6.1.6.6 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, and existing conditions for noise and vibrations would remain unchanged.

Action Alternative – Seaward Alignment

Beneficial effects from the seaward alternative are anticipated. Noise from the river may be reduced from land and noise on land may be reduced on the river.

Action Alternative – Landward Alignment

Direct beneficial effects of the landward alternative are anticipated. Much of the noise from the Harlem River and traffic from the Harlem River Drive would be reduced for the businesses and residents in the area.

6.1.6.7 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, and existing conditions for noise and vibrations would remain unchanged.

Action Alternative – Seaward Alignment

The Seaward Alignment of the Harlem River Actionable Element presents several moderate long-term benefits that support the preservation of Harlem's historic character and resilience by safeguarding adjacent historic structures and fabric from storm-related flooding. Crucially, this alignment manages risk to vital community institutions within the area, including the Arthur Tappan School (Public School 46), the Harlem Center for Opportunity, and the NYCHA Rangel Houses (including the Rangel Community Center and the Rangel Pharmacy). Protecting these cornerstones of the community preserves not only physical assets but also the social fabric and networks essential for community well-being and resilience, ensuring continued access to critical support and fostering social interaction. Additionally, the creation of new natural space and aquatic habitat through NBS offers potential new recreation benefits.

Action Alternative – Landward Alignment

The Landward Alignment of the Harlem River Actionable Element will help prevent flood risk and therefore protect the longevity of vital community institutions within the risk management area, including the Arthur Tappan School (Public School 46), the Harlem Center for Opportunity, and the NYCHA Rangel Houses (including the Rangel Community Center and Pharmacy). Protecting these cornerstones of the community preserves not only physical assets but also the social fabric and networks essential for community well-being and resilience, ensuring continued access to critical support and fostering social interaction. In accordance with USACE policy, post-construction site restoration efforts offer the potential to re-establish some greenspace with native species creating new opportunities for community recreation and leisure and enhancing the quality of life for local residents.

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 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. 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. Refer to Table 7 for the definitions to support impact rating tables to identify which resources were combined into one overarching resource category.

Table 6-1 Definitions of Resource Categories to Support Effects Rating

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

HARLEM RIVER Qualitative Rating Total Scores (calculated, with mitigation if applicable)	NO ACTION SCORE	SEAWARD SCORE	LANDWARD SCORE
NATURAL AND PHYSICAL ENVIRONMENT			
Wildlife and Vegetation[A]	**-0.20**	**+1.8**	**-0.2**
Special Status Species (Terrestrial)[B]	**0**	**+1**	**+1**
Special Status Species (Aquatic)[C]	**-0.5**	**+0.5**	**0**
Special Status Areas[D]	**-0.66**	**+1.33**	**0.33**
Commercial and Recreational Fishing	**0**	**+1**	**0**
Physical Resources[E]	**-0.50**	**+0.25**	**-0.25**
Hydrological Resources[F]	**0**	**0**	**0**
Water Quality	**-1**	**0**	**0**
Air Quality	**0**	**0**	**0**
Climate and Relative Sea Level Change	**0**	**0**	**0**
Cultural Resources[G]	**-1**	**+2**	**-1**
Native American Land	**NA**	**NA**	**NA**
Hazardous, Toxic, and Radioactive Waste	**-1**	**0**	**0**
Navigation	**0**	**+2**	**0**
Noise and Vibration	**0**	**0**	**+1**
Socioeconomics and Demographics	**NS**	**NS**	**NS**
Subtotal Scores (additive for calculation)	*-4.86*	*9.88*	*0.88*
TOTAL SCORE AVERAGED (calculated, additive and averaged):	**-0.37**	**+0.7**	**+0.06**

Highest Adverse Effect Scores, Escalated

HARLEM RIVER Qualitative Rating Total Scores (calculated, with mitigation if applicable)	NO ACTION SCORE	SEAWARD SCORE	LANDWARD SCORE
NATURAL AND PHYSICAL ENVIRONMENT			
Wildlife and Vegetation[A]	**-1**	**-1**	**-2**
Special Status Species (Terrestrial)[B]	**0**	**-1**	**-1**
Special Status Species (Aquatic)[C]	**-1**	**-1**	**0**
Special Status Areas[D]	**-2**	**-1**	**-2**
Commercial and Recreational Fishing	**-1**	**-1**	**0**
Physical Resources[E]	**-1**	**-1**	**-1**
Hydrological Resources[F]	**0**	**0**	**0**
Water Quality	**-1**	**-1**	**0**
Air Quality	**0**	**0**	**0**
Climate and Relative Sea Level Change	**0**	**0**	**0**
Cultural Resources[G]	**-1**	**-1**	**-4**
Native American Land	**NA**	**NA**	**NA**
Hazardous, Toxic, and Radioactive Waste	**-1**	**-1**	**-1**
Navigation	**0**	**-1**	**-2**
Noise and Vibration	**0**	**-1**	**-1**
Socioeconomics and Demographics	**NS**	**NS**	**NS**
Subtotal Scores (additive for comparison)	*-9*	*-11*	*-14*
TOTAL SCORE HIGHEST ESCALATED:	**-2**	**-1**	**-4**

Highest Beneficial Effect Scores, Escalated

HARLEM RIVER Qualitative Rating Total Scores (calculated, with mitigation if applicable)	NO ACTION SCORE	SEAWARD ACTION	LANDWARD ACTION
NATURAL AND PHYSICAL ENVIRONMENT			
Wildlife and Vegetation[A]	**0**	**+3**	**+1**
Special Status Species (Terrestrial)[B]	**0**	**+1**	**+1**
Special Status Species (Aquatic)[C]	**0**	**+2**	**0**
Special Status Areas[D]	**0**	**+3**	**+3**
Commercial and Recreational Fishing	**0**	**+1**	**0**
Physical Resources[E]	**0**	**+1**	**+1**
Hydrological Resources[F]	**0**	**0**	**0**
Water Quality	**0**	**+1**	**0**
Air Quality	**0**	**0**	**0**
Climate and Relative Sea Level Change	**0**	**0**	**0**
Cultural Resources[G]	**0**	**+4**	**+3**
Native American Land	**NA**	**NA**	**NA**
Hazardous, Toxic, and Radioactive Waste	**0**	**+1**	**+1**
Navigation	**0**	**+2**	**+1**
Noise and Vibration	**0**	**+1**	**+2**
Socioeconomics and Demographics	**NS**	**NS**	**NS**
Subtotal Scores (additive for comparison)	*0*	*+20*	*+13*
TOTAL SCORE HIGHEST ESCALATED:	**0**	**+4**	**+3**

Qualitatively, the No Action and Action Alternative are anticipated to have potential adverse effects, while the Action Alternative also anticipates potential beneficial effects, depending on resource and existing conditions present at this Actionable Element Site. As gathered from the Individual Resource scorecards presented in Appendix A that have been combined into Resource Categories and presented on the tables above, adverse effects range from no to low (“0” to “-1”) for the vast majority of resources present, and beneficial effects range from no to moderate (“0” to “+3”). There is;

however, a more adverse effect anticipated to Cultural Resources, Viewshed/Historic Setting from the Landward Alignment, anticipated to be moderate-high, with a corresponding adverse effect score of -4, that would need to be addressed under a Programmatic Agreement. On the contrary, there is a more beneficial effect anticipated to Cultural Resources, Viewshed/Historic Properties from the Seaward Alignment, anticipated to be moderate-high beneficial effect, with a corresponding score of +4. Refer to the Cultural Resource sections of the Harlem River Appendix, and Cultural Resources SubAppendix for additional detail. The majority, if not all, of the adverse effects are derived from construction related effects and anticipated to be temporary and manageable thorough avoidance and best management practices. Some operations and maintenance adverse effects are also anticipated, depending on resource and alignment; however, those are also anticipated to be temporary and manageable. The beneficial effects are qualitatively derivative from the conversion from low-quality degraded non-native habitat to native habitat and managing coastal storm risk to the areas behind each alignment that provides additional access, foraging, and sheltering to wildlife, as well as additional greenspace access and noise reduction from the landward alignment, or aquatic habitat creation for the seaward alignment's complementary nature-based solutions.

All Alternatives exhibit beneficial impacts either from the construction and/or placement of the structural measures, the operations and maintenance assumptions, and/or associated mitigated outcome (including best management practices). Those beneficial effects, depending on resource, measure, and existing conditions include the placement of in-water hard structures creating a "reef effect" for numerous species of algae, shellfish, and other invertebrates, the in-water and shore-based measures providing reduced risk of coastal flood damages to resources including cultural sites of significance, parks, habitat, and HTRW sites, reduced storm related erosion, social vulnerability and effects to communities, and health and safety.

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 Seaward Alignment presents both the most favorable average score, as well as the highest escalated benefit score, with adverse effects that are no greater than -1, or 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

Matthew 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

Sophie Killy, 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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