

21.0 INTRODUCTION

The Federal Council on Environmental Quality’s (CEQ) regulations implementing the procedural provisions of the National Environmental Policy Act (NEPA), set forth in 40 C.F.R. §§ 1500 et seq., requires federal agencies to also consider the potential for indirect and cumulative effects from a proposed project. Similarly, the New York State Environmental Quality Review Act (SEQRA) regulations identify that the contents of an environmental impact statement (EIS) include an evaluation of cumulative impacts and secondary impacts (6 NYCRR § 617.9 [b][5][iii][a] and [d]). As discussed in Chapter 1, “Purpose and Need and Alternatives,” the Proposed Actions are one or more proposed initiatives intended to enhance coastal and social resiliency along the Tottenville shoreline of the South Shore of Staten Island. There are four Alternatives being studied in this EIS. Alternative 1 is the No Action alternative, and assumes that no new structural risk reduction projects or marine habitat restoration projects will be implemented in the project area; Alternative 2 consists of the implementation of two individual projects: the Breakwaters Project and the Shoreline Project; Alternative 3 includes only the Breakwaters Project component; and Alternative 4 includes only the Shoreline Project component. As discussed below, the Proposed Actions would not induce growth in Tottenville in the vicinity of the Project Area and would not result in indirect impacts generated by induced or secondary growth, nor would it result in negative indirect effects to natural resources, land use, socioeconomic condition or other resources. In consideration of the range of technical analyses presented in this EIS, the Proposed Actions would also have little or no potential to result in localized or regional cumulative effects.

This chapter examines the potential indirect and cumulative effects from the Proposed Actions.

21.1 INDIRECT EFFECTS

CEQ regulations implementing NEPA (40 C.F. R. §§ 1508.8) define “effects” to include direct and indirect effects, described as follows:

- Direct effects—those caused by the action and occur at the same time and place.
- Indirect effects—those caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Effects may be beneficial or detrimental.

SEQR defines a secondary (indirect) impact as one which is reasonably foreseeable, occurs at a later time or at a greater distance, and is likely the result of the action. There should be a reasonably close causal relationship between the action and the environmental impacts. Secondary impacts can be of a wide variety and may include growth inducing effects and other effects related to

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changes in the pattern of land use, population density or growth rate, and air and water and other natural systems, including ecosystems. Proposals that add substantial new land use, new residents, or new employment could induce additional development of a similar kind or of support uses (e.g., stores to serve new residential uses). Projects that introduce or greatly expand infrastructure capacity (e.g., sewers, central water supply) might also induce growth.

The *City Environmental Quality Review (CEQR) Technical Manual* indicates that the potential for growth inducing impacts in the City is limited, but that an analysis of the growth-inducing aspects of a proposed project may be appropriate when a proposal:

- Adds substantial new land use, new residents, or new employment that could induce additional development of a similar kind or of support uses, such as retail establishments to serve new residential uses; and/or
- Introduces or greatly expands infrastructure capacity.

As discussed in Chapter 2, “Land Use, Zoning, and Public Policy,” and Chapter 3, “Socioeconomic Conditions,” the Proposed Actions would occur on land owned by the City (New York City Department of Parks and Recreation [NYC Parks] or New York City Department of Transportation [NYCDOT]), and on underwater lands owned by NYC Parks and the State. All of the Shoreline Project elements and the proposed Water Hub element of the Breakwaters Project are consistent with the existing passive recreational and educational uses within Conference House Park and within the NYCDOT Surf Avenue right-of-way and would not add new uses, new residents, or employment that could induce additional development or support uses as retail establishments to serve new residents. As discussed in Chapter 11, “Sewer and Water Infrastructure,” the Proposed Actions would not result in any new public water, sanitary, or storm sewer infrastructure within the project area.

The implementation of Alternative 2 would not have a growth inducing effect, which generally refers to the potential for a proposed project or action to trigger additional development in areas outside of the project site. It would have the potential to result in enhanced open space resources within Conference House Park and reduce risks of property damage from wave action and erosion. However, it would not be expected to result in increases in property value that would result in significant residential displacement pressures within the vicinity of the project area because market conditions already reflect the close proximity of the waterfront as a valuable residential amenity and historically have not discounted value based on the risk posed by major storm events. Therefore, pre-Sandy levels of interest and investment would be maintained. In addition, most (approximately 80 percent) of the study area’s households reside in owner-occupied units, and homeowners are not vulnerable to displacement due to rent increases. Of the 20 percent of study area households who rent, most have incomes that suggest they could afford modest rent increases; study area rents are low relative to other areas in the borough and City, suggesting a small number of residents who would be vulnerable to displacement if rents were to increase. Even if all study area renters vulnerable to displacement from rent increases were to be displaced (which is not expected), the displaced population would represent a very small portion of the overall study area population. Therefore, the alternative would not result in displacement that could substantially alter the socioeconomic character of the neighborhood. Because the vast majority of existing businesses are located outside of the area that would benefit from reduced risk of damage caused by wave action, and retail businesses in the vicinity of the project area are not located in close proximity to the project area, the Proposed Actions would not have the potential to result in indirect business displacement or result in a substantial increase in consumer visits that in turn, could lead to increased rents.

Similarly, for the reasons discussed above for Alternative 2, Alternatives 3 and 4 would not induce additional growth, or result in other direct impacts to land use, zoning, or public policy, or to socioeconomic conditions. Therefore, for the reasons cited above, the Proposed Actions would not induce additional growth or result in other indirect impacts to land use, zoning, or public policy, or to socioeconomic conditions.

As discussed in Chapter 5, “Historic and Cultural Resources,” the Proposed Actions would not have the potential to result in indirect effects to architectural resources within the Indirect Effect Area of Potential Effect (APE). The architectural resources in the Indirect Effect APE are located significantly away from most of the project components. The closest architectural resource—the Sam and Hannah Wood House—is located approximately 283 feet southeast of the Henry Hogg Biddle House and approximately 332 feet southeast of the Rutan-Beckett House. Since the DEIS was issued, in comments dated March 27, 2017, the New York State Historic Preservation Office (SHPO) determined that the Henry Hogg Biddle House and the Rutan-Beckett House are eligible for listing on the State/National Registers of Historic Places (S/NR-eligible). Should plans move forward to locate the Water Hub at either the Biddle House or the Rutan-Beckett House, the rehabilitation and adaptive use alterations would be limited to the interiors of the building. Consultation with SHPO would continue to be undertaken regarding any proposed alterations to the historic resource. Therefore, these changes would not result in any adverse effects to nearby architectural resources in the Indirect Effect APE. In addition, existing intervening landscaping elements and plantings, and the shoreline protection measures of the Shoreline Project, further limit any visual or contextual relationships between the architectural resources in the Indirect Effect APE and the Project components. Therefore, the Proposed Actions would not adversely affect any historic architectural resources in the Indirect Effect APE.

As discussed in Chapter 9, “Natural Resources,” Alternatives 2 and 3 would result in the placement of breakwater segments within Raritan Bay. The materials used for the breakwaters would be regionally sourced from an existing quarry and directly barged to the project area and would not, therefore, require a permit from USACE. Construction of the breakwaters would result in temporary and minor increases in suspended sediment. Since re-suspended sediments would be localized and would dissipate upon cessation of sediment disturbing activities, these indirect effects would not be significant and would not adversely affect other areas of Raritan Bay. Barges used during construction to install breakwaters materials and deliver materials would likely travel to the project site through the New York Harbor, which is an area of heavy commercial vessel traffic. In Raritan Bay, 26,459 commercial trips were made in 2014 from the ship channel near Sandy Hook to Raritan Bay and upriver through Arthur Kill and Kill Van Kull to Upper New York Bay. The additional vessel movement through these areas as a result of the project would be incremental and would not result in adverse indirect impacts to natural resources.

Under Alternatives 2 and 4, the eco-revetment between Brighton and Manhattan Streets would be constructed within the northern limit of the 0.8-acre delineated tidal wetland. An approximately 630 square-foot section of the hybrid dune/revetment would also be constructed in this wetland at its eastern limit. In total, approximately 6,270 square feet (0.14 acres) of this wetland would be impacted. Temporary indirect impacts to the portion of the wetland outside these areas would be minimized through the use of measures such as marsh mats or low ground-pressure equipment within the wetland, and installation of erosion and sediment control measures in accordance with the SWPPP prepared as required under the SPDES General Permit GP-0-15-002 for Stormwater Discharges from Construction Activity. Portions of the wetland disturbed during dune and eco-revetment construction would be restored as necessary (e.g., repair of ruts, stabilization of soil). Wetland vegetation would be planted to replace vegetation temporarily disturbed during

construction. With these measures in place, temporary indirect impacts to wetlands due to construction would not result in significant adverse effects to the delineated wetland. Erosion and sediment control measures (e.g., silt fencing and hay bales) implemented in accordance with the Stormwater Pollution Prevention Plan (SWPPP) prepared for the project as required by the SPDES General Permit GP-0-15-002 for Stormwater Discharges from Construction Activity would minimize indirect impacts to Raritan Bay and NYSDEC littoral zone tidal wetlands due to erosion and discharge of sediment during construction of the Shoreline Project.

Operation of Alternatives 2 and 3 would not result in adverse indirect impacts to water quality or aquatic resources of Raritan Bay. The breakwater system is designed and located to maintain and restore the beach while minimizing down-drift¹ impacts. The breakwaters would attenuate waves and alter the sediment transport along the shore for this purpose. Local sediment transport rates and accretion would be altered but the natural processes would not be blocked as there would still be sediment transport along the shore and tidal circulation around the breakwaters. Therefore, the breakwaters would not result in indirect impacts to the shoreline outside the Project Area.

Results of wave modeling indicates that under Alternatives 2 and 3, the breakwaters would not cause erosion or result in increased wave heights on adjacent areas. As the breakwaters are not intended to prevent flooding, they do not redirect flood waters. Shoreline modeling results indicate that the breakwaters would result in indirect impacts to the subtidal and intertidal habitats and NYSDEC littoral zone tidal wetlands due to the gradual sedimentation along the shoreline. The Mean High Water (MHW) line would move offshore in response to the lower wave energy in the lee of the breakwaters. However, the breakwaters have been located and spaced so that they would not result in the indirect impact of tombolos (connection to the shore).

One-time shoreline restoration between Manhattan and Loretto Streets would result in the loss of some shallow water habitat below MHW at equilibrium conditions. In addition, shoreline accretion encouraged by the breakwaters and enhanced by the addition of sediment to the system would occur gradually over a period of years or decades, allowing aquatic biota in the intertidal zone to adjust to slowly changing depths and beach slopes near the shoreline. This shoreline change will eventually reach an equilibrium point (typically at approximately 20 years into the future), after which the rate of shoreline change decreases such that the shoreline accretion will not continue indefinitely. The loss of shallow water habitat due to accretion would occur slowly over time and represent a small portion of the study area within Raritan Bay and similar habitat at equivalent water depths would continue to be available in the vicinity.

The breakwater segments have been designed to minimize changes to tidal flushing and water residence in order to avoid adverse impacts to water quality of Raritan Bay. This has been confirmed through simulations using the Delft 3-D software. As such, fines will continue to be flushed from the area between the breakwaters and shoreline during normal (and spring) tide events.

FLOW 3D modeling of localized currents and sediment movement around individual breakwater structures completed for the project indicates the potential for scour/deposition patterns to develop at the breakwater perimeter under ebb and flood tidal flows. The scour and deposition depths are modest under normal tidal and wave conditions. There is indication of reversal of the trends

¹ Down-drift erosion – when a headland, inlet, river, bay, canyon, reef or shoal blocks the natural longshore drift of materials, such as sand and gravel, by waves and currents, resulting in accumulation of sediments on the up-drift side, while a depletion of material occurs on the down-drift side (Bruun 1995).

between flood and ebb conditions for most areas. For fixed structures in tidal currents, scour and scour related deposition typically reach quasi-equilibrium states, including potentially some change in grain size to scour resistant diameters. The modeling results indicate that scour will be very localized, within 15 feet of the ends of the breakwater.

The spacing, orientation, and design of the breakwaters would minimize the potential indirect and down-drift impacts of altered sedimentation. While they would create small changes in flow around the structures, the breakwaters would not significantly disrupt existing currents in Raritan Bay. By design, the breakwaters would reduce and attenuate wave energy before it reaches the coast, thereby reducing the risk for wave damage during storm conditions. The breakwaters are designed to dissipate wave energy rather than redirect the wave to another location. Even under increased water depths that occur during a storm surge, the structures would continue to dissipate wave energy and provide risk reduction for landward properties. The breakwaters would continue to attenuate waves even when the crests are submerged up to a depth of approximately 70 percent of the approaching wave heights.

By design, the Breakwaters Project would incorporate ecological enhancements expected to benefit the target species groups, which include existing aquatic organisms currently using and that have historically used the portion of Raritan Bay within the project area. The ecological design features of the breakwaters (i.e., varying levels of elevation, inclination, bio-enhancing materials, textures, interstitial spaces, water retaining elements, reef streets, and grain sizes) would facilitate the recruitment of a rich benthic community of habitat-forming encrusting invertebrates and algae, while providing suitable sheltering and foraging habitat for fish and benthic invertebrates that occur in Raritan Bay. The availability of refugia and foraging habitats could lead to higher survival of juvenile fish and establishment of an aquatic community extending from benthic invertebrate to upper trophic level predators. The provision of additional foraging habitat within and among the breakwater structures would lead to greater utilization of the study area for foraging by a number of species (e.g., black sea bass, summer flounder, bluefish, etc.). An increase in the presence of these species may result in an increase in the numbers of individuals caught via recreational fishing in Raritan Bay. The additional foraging habitat provided by the breakwaters would lead to higher survival of juveniles, which are not within the length range of fish that are landed through recreational fishing. With higher survival of juveniles, the added fishing pressure would not be expected to deplete the stock of any species in the study area.

While the breakwaters would convert open water and sand/gravel substrate to structured habitat, this converted area would be small compared to the extensive open water and sand/gravel bottom habitat currently available within the study area and Raritan Bay as a whole. Additionally, the structures would not hinder the movement of fish and other aquatic biota through the water column, nor would they disrupt water circulation in Raritan Bay. Fish and other aquatic biota, including anadromous species and early life stages, would be able to pass (either actively or passively) around the individual breakwater segments at any given time.

The Shoreline Project would not have the potential to result in indirect impacts to natural resources. Therefore, Alternatives 2 and 3 would not result in adverse indirect impacts to natural resources, and would be expected to result in beneficial impacts to target species groups within Raritan Bay. Alternative 4, which would implement only the Shoreline Project, would not result in the placement of structures within Raritan Bay and would not have the potential to result in adverse or beneficial impacts to natural resources of the bay.

The increased shoreline stability and accretion provided by Alternatives 2 and 3, including the shoreline restoration between Manhattan Street and Loretto Street, would likely result in a

beneficial indirect impact to spawning horseshoe crabs and other organisms that use beach habitat, as well as to people using Conference House Park. Deposition of sediments along the shoreline would occur gradually, allowing time for infaunal organisms (e.g., clams) to adjust to appropriate depths in the substrate. Hard clams, for example, which occur in the study area, can escape up to 50 centimeters of overburden if the deposited sediment is similar to its surroundings, and would easily adjust to gradually changing conditions. Additional indirect benefits to aquatic organisms would result from long-term changes in the vicinity of the breakwater segments that would likely include the accumulation of broken shells and other calcium carbonate materials originating from sessile and encrusting marine organisms that accumulate on the structure. Such “halos” of biogenic material were observed in the survey of existing artificial habitats in the study area, and observations suggest that the breakwaters will provide the conditions to support the creation of similar “halos” of coarse, biogenic material, which could provide additional habitat heterogeneity.

As discussed in Chapter 11, “Sewer and Water Infrastructure,” under Alternatives 2 and 3, the Breakwaters Project is not anticipated to interfere in the current functionality of the existing outfalls (maintained by the New York City Department of Environmental Protection [NYCDEP] in accordance with current maintenance practices and future practices under the NYC Stormwater Management Program Plan [Draft for public review, April 2018], to be implemented pursuant to NYC’s Municipal Separate Storm Sewer Systems [MS4] permit). Additionally, the Shoreline Project (Alternatives 2 and 4) has integrated measures such as bioswales into the design for the eco-revetment and the raised edge where possible to minimize potential impacts to storm sewers. Similarly, the parking lot design for the Water Hub (if located at Potential Location 1) would incorporate green infrastructure measures. Other green infrastructure measures will be considered, as necessary, as design progresses to ensure that the Proposed Actions would not have the potential to result in adverse indirect impacts to the storm sewer collection system. Therefore, Alternatives 2, 3, and 4 would not result in adverse indirect impacts to sewer and water infrastructure.

Collectively, activities associated with the Water Hub and the Shoreline Project are not expected to generate incremental traffic, transit, or pedestrian trips that would exceed the CEQR Technical Manual Level 1 screening analysis thresholds for any peak hour of daily operations during the weekday or weekend day. Therefore, Alternatives 2, 3, and 4 are not expected to result in any significant adverse transportation impacts, direct or indirect, or any associated indirect impacts to air quality.

21.2 CUMULATIVE EFFECTS

Under NEPA (40 C.F. R. §§ 1508.7) and SEQR (6 NYCRR § 617.9 (b)(5)(iii)(a)) and EIS must consider cumulative impacts. A cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts occur when multiple actions affect the same resource(s). These impacts can result from a single action or from a number of individually minor but collectively significant actions taking place over a period of time. Cumulative impacts may include indirect and secondary impacts. Cumulative impacts must be assessed when actions are proposed, or can be foreseen as likely, to take place simultaneously or sequentially in a way that the combined impacts may be significant. Assessment of cumulative impacts should be limited to consideration of reasonably foreseeable impacts, not speculative ones.

21.2.1 ACTIONS CONSIDERED IN THE CUMULATIVE ANALYSIS

The various technical analyses in this EIS address cumulative effects by comprehensively defining the environmental setting expected in the No Action Alternative, including a discussion of projects expected to be completed independently of the Proposed Actions by 2020. These projects or actions represent the reasonably foreseeable future actions and their impacts to environmental, socioeconomic and cultural resources in the future have been evaluated as appropriate and considered in the assessment of the potential impacts from the Proposed Actions in each technical analysis.

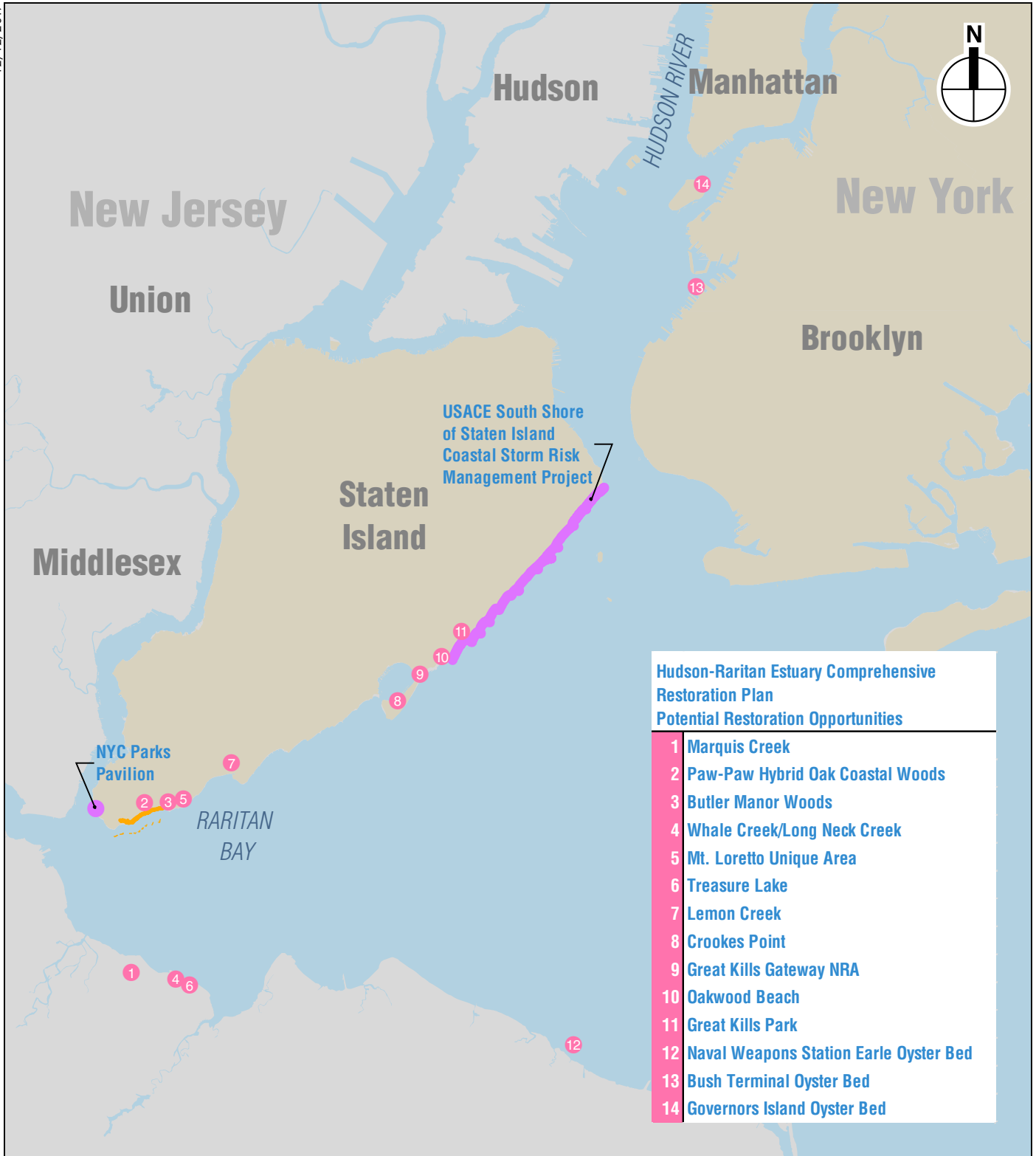
PAST PROJECTS

Past projects in the area include the establishment of Conference House Park, the development of the Federal Navigation Channel and the installation of temporary dunes, constructed by NYC Parks as interim protective measures post-Sandy. The Proposed Actions (under Alternatives 2, 3, and 4) would have a beneficial effect on Conference House Park as they would reduce the risk of wave action and coastal erosion along the park's shoreline and include improvements and amenities consistent with existing park uses. A temporary dune system stretches from approximately Swinnerton Street to Sprague Avenue along the park's shoreline. The Proposed Actions would remove and replace this system for this stretch of the shoreline under Alternatives 2 and 4. With respect to the Federal Navigation Channel, the Proposed Actions would not have the potential to affect its functionality, as the vast majority of the breakwater structures (Alternatives 2 and 3) would be located more than 1,700 feet from the channel with the closest breakwater segment located more than 700 feet from the channel.

PRESENT AND REASONABLY FORESEEABLE FUTURE ACTIONS

Present and reasonably foreseeable future actions within or in proximity to the study area that may contribute to cumulative impacts during construction and operation of the Proposed Actions are as follows (see **Figure 21-1**):

- NYC Parks projects within Conference House Park—NYC Parks will be reconstructing the Pavilion, located along the shoreline within Conference House Park, which has been closed to the public since 2011 due to weather damage to the roof and deck. Reconstruction started in 2017 and is expected to extend into early 2019. The Pavilion will be reconstructed within the existing footprint and elevated five feet above the 100-year flood elevation (i.e., Base Flood Elevation). Other park improvements include invasive plant removal and maritime forest restoration, and possible wetland restoration and coastal grassland and wet meadow creation.
- Hudson-Raritan Estuary Comprehensive Restoration Plan (HRE-CRP)—Completed in 2009 by the US Army Corps of Engineers (USACE) in partnership with the Port Authority of New York and New Jersey and the New York-New Jersey Harbor Estuary Program, it aims to achieve eleven “Target Ecosystem Characteristics” of a successfully restored and healthy estuary. The HRE-CRP identified 296 sites for potential acquisition and/or restoration, and set measurable objectives for 2015 and 2050. Several of these sites are within or along Raritan Bay, and ongoing or planned HRE-CRP projects at these sites were evaluated for their potential to benefit natural resources within the study area and the bay as a whole.
- City-wide initiatives, including Vision 2020, New York City's Green Infrastructure Plan, PlaNYC, OneNYC, and MillionTreesNYC—Focal areas of these plans include expanded



— Living Breakwaters and Tottenville Shoreline Projects

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usage of green infrastructure throughout the city, reduced pollution from stormwater runoff, improved flushing of constrained water bodies, and optimization of existing sewer systems through improvements to drainage, interceptors, and tide gates. Another initiative of PlaNYC and Vision 2020 is to increase public access to the city's waterfronts, including in the Tottenville section of Staten Island. The PlaNYC Special Initiative for Rebuilding and Resiliency included several storm protection strategies for the southern shore of Staten Island, such as beach nourishment, continued implementation and investment in Bluebelts, enhancement of maritime forests, and construction of living breakwaters. The MillionTreesNYC initiative of PlaNYC has included ongoing reforestation of treeless areas of Conference House Park.

- USACE South Shore of Staten Island Coastal Storm Risk Management Project— (CSRMP) spans approximately 5.3 miles from Fort Wadsworth to Oakwood Beach on the eastern side of the south shore of Staten Island.² The CSRMP includes a Line of Protection (LOP) consisting of a buried seawall/armored levee along 80 percent of the Fort Wadsworth to Oakwood Beach reach that would protect the coast against severe coastal surge flooding and wave forces. The remaining 20 percent of the reach would include a vertical floodwall, levee, and a mosaic of tidal wetland, maritime forest/scrub/shrub, low marsh, and high marsh improvements.
- New York Harbor Foundation's Billion Oyster Project (BOP)—The Billion Oyster Project is an ecosystem restoration and education project aimed at restoring the New York Harbor Estuary through the creation of oyster reef habitat and the establishment of sustainable oyster populations. BOP partners with the Urban Assembly New York Harbor School, where students help to raise and set oyster larvae, operate and maintain vessels, build and operate oyster nurseries, design underwater monitoring equipment, and conduct long-term research projects in the Harbor. Through these efforts and in collaboration with many regional partners, BOP hopes to counter the effects of overharvesting, dredging, and pollution, and bring oysters and their dynamic reef habitat back to the Harbor. As of 2017, the BOP has restored over 25 million oysters to the NY Harbor.
- New York/New Jersey Baykeeper—New York/New Jersey Baykeeper's Restoration Program focuses on reintroducing oysters to the New York and New Jersey waterways through a variety of measures, including aquaculture, reef building and monitoring, and the construction of living shorelines. Baykeeper raises juvenile oysters at an aquaculture facility, where they attach, set, and grow on shell substrate or structures such as oyster castles prior to being placed onto reefs. Once oysters are placed, Baykeeper monitors survivorship and growth, water quality and biodiversity in and around the reef. Baykeeper manages a 10.7- acre site along with a 0.9-acre living shoreline project site at Naval Weapons Station Earle in NJ and a 1-acre oyster reef in the Bronx River. These projects provide substrate for new oysters, add habitat to increase species diversity, and provide a breakwater for shoreline protection. The Bronx River site provides opportunities for public education and stewardship. Baykeeper introduces between 200,000 and 500,000 oysters to the Harbor annually. In 2017, natural set was found at the Naval Weapons Station Earle project site.
- Active fisheries management plans or harvest regulations—Many aquatic species in the region have management plans that have been implemented to promote the long-term productivity of

² http://www.nan.usace.army.mil/Portals/37/docs/civilworks/projects/ny/coast/StatenIsland/SSIFinRep/AppendixVI_FinalEnvironmentalImpactStatementSep2016.pdf?ver=2016-09-16-125524-490

these resources and sustainability of the fisheries in New York's coastal waters and along the Atlantic coast. Management plans and/or harvest regulations for certain species found in Raritan Bay are developed by the Mid-Atlantic Fisheries Management Council, the New England Fisheries Management Council, and the Atlantic States Marine Fisheries Commission. The United States Food and Drug Administration (USFDA) sets strict industry standards for States' shellfish industries.

21.2.2 POTENTIAL CUMULATIVE IMPACTS

LAND USE, ZONING, AND PUBLIC POLICY

As described in Chapter 1, "Purpose and Need and Alternatives," with the exception of a small portion of the Shoreline Project proposed within an unbuilt portion of the NYCDOT Surf Avenue right-of-way, all on-shore project components under Alternatives 2, 3, and 4 would be constructed within the boundaries of Conference House Park. All of the interventions in Conference House Park under the Proposed Actions would be compatible with a New York City park. None of the actions associated with City-wide initiatives and NYC Parks projects within Conference House Park would change the evaluation of potential impacts to land use presented in the EIS; actions of these projects are complementary and consistent with the Proposed Actions. The Proposed Actions respond directly to the City's Coastal Protection Initiative 15, and Progress on this initiative has been tracked and reported in the OneNYC 2016 Progress Report. The Proposed Actions would help to advance virtually all of the goals of Vision 2020. The measures proposed by the USACE as part of the South Shore of Staten Island Coastal Storm Risk Management project risk reduction USACE are located far north of the study area between Fort Wadsworth to Oakwood Beach (Figure 21-1) and would not have the potential to result in cumulative impacts to land use for Alternatives 2, 3, and 4. No other land use changes have been proposed within the park or in the vicinity of the project area that would result in cumulative impacts to land use for Alternatives 2, 3, and 4.

Although portions of Conference House Park would temporarily be closed during construction of the on-shore elements of Alternatives 2, 3, and 4, access to the waterfront areas not under construction would continue to be maintained. Construction activities would be phased to minimize the duration of construction at any particular location within Conference House Park. As project components are completed, those sections of the park would be re-opened for use. As such, at any particular time during construction, the majority of Conference House Park and other open space resources in the area would continue to accommodate the largely passive activities displaced from the affected construction areas. As described above, NYC Parks will be reconstructing the Pavilion, located along the shoreline within Conference House Park. This project is anticipated to be complete in January 2019, prior to the start of construction of the Proposed Actions. However, in the event that construction activities of these actions overlap, given the distance between the Pavilion and the Shoreline Project and Breakwaters Project (at least 0.6 miles), cumulative impacts to open space resources within Conference House Park would not occur. The limited disturbance (e.g., vegetation clearing and construction of ADA access should the water access in the vicinity of the existing NYC Parks structures be selected) that would result from development of water access for Water Hub Potential Location 2 under Alternatives 2 and 3 would not result in cumulative impacts to open space resources within Conference House Park during the short period of time that these activities may be concurrent with the Pavilion reconstruction. Therefore, construction under Alternative 2, 3, or 4 would not result in cumulative impacts on open space.

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SOCIOECONOMIC CONDITIONS AND ENVIRONMENTAL JUSTICE

The actions considered, in particular the City-wide actions and the goals of the HRE-CRP to increase recreational, educational and public access while also increasing the resiliency of the shoreline, would complement and be consistent with Alternatives 2, 3, and 4 and would have the potential to result in positive cumulative impacts to socioeconomic conditions due to the increased resiliency of the area and reduced risk of damage caused by wave action and business closures from major storm events.

HISTORIC AND CULTURAL RESOURCES

The actions considered would not result in cumulative impacts to historic and cultural resources. The reconstruction of the Pavilion and maritime forest restoration are consistent with the existing uses and condition within the park and would not have the potential to result in cumulative impacts to historic and cultural resources and would not change the impacts to these resources presented in this EIS under Alternatives 2, 3, and 4.

URBAN DESIGN AND VISUAL RESOURCES

The actions considered would not result in cumulative impacts to urban design and visual resources. The reconstruction of the Pavilion and maritime forest restoration are consistent with the existing uses and condition within the park and would not have the potential to result in cumulative impacts to urban design and visual resources and would not change the impacts to these resources presented in this EIS under Alternatives 2, 3, and 4. Construction activities would be temporary in nature and would be phased to minimize the duration of construction at any particular location so as to lessen the effects of construction on the surrounding communities. Given the distance between the Pavilion and the Shoreline Project and Breakwaters Project (at least 0.6 miles), cumulative impacts to visual resources would not occur if Pavilion reconstruction and construction under Alternatives 2, 3, and 4 were to overlap. Therefore, construction under Alternative 2, 3, or 4 would not result in significant adverse impacts to visual resources.

SHADOWS

The actions considered would not have the potential to result in cumulative impacts due to shadows under Alternatives 2, 3, and 4.

HAZARDOUS MATERIALS

The actions considered would not result in cumulative impacts to the environment due to hazardous materials. Demolition of the Pavilion and disposal of demolition materials would be conducted in accordance with applicable city, state and federal requirements, would not have the potential to result in negative cumulative impacts due to hazardous materials and would not change the impacts due to hazardous materials presented in this EIS under Alternatives 2, 3, and 4.

NATURAL RESOURCES

Groundwater

The actions considered would not have the potential to result in cumulative impacts to groundwater under Alternatives 2, 3, and 4.

Wetlands

The actions considered, such as the Bluebelt Project and wetland restoration within Conference House Park, would complement and be consistent with Alternatives 2, 3, and 4 and would have the potential to result in positive cumulative impacts to wetlands resources under these alternatives. Elements of the PlaNYC Special Initiative for Rebuilding and Resiliency for the southern shore of Staten Island (i.e., coastal protection strategies to minimize upland wave zones that include beach nourishment, protection of coastal forests, and construction of living breakwaters) are achieved by the elements of Alternatives 2, 3, and 4. Therefore, these actions do not have the potential to result in cumulative impacts to NYSDEC littoral zone tidal wetlands under Alternatives 2, 3, and 4. Other elements of the PlaNYC Special Initiative for Rebuilding and Resiliency for the southern shore of Staten Island, such as the expansion of the borough's Bluebelt stormwater management system have the potential to result in positive cumulative impacts to wetlands with the wetland enhancement measures that would be implemented within the delineated wetland under Alternatives 2 and 4.

Aquatic Resources

The actions considered would complement and be consistent with Alternatives 2, 3, and 4 and would have the potential to result in positive cumulative impacts to aquatic resources. Several of the 296 sites selected for inclusion in the HRE-CRP are located along the southern shore of Staten Island and northern shore of New Jersey and have the potential to benefit the aquatic resources of Raritan Bay in such ways as improving the quality of water entering the bay as runoff or from tributaries, maintaining or enhancing natural shorelines, restoring salt marshes and other coastal and estuarine habitats, reestablishing oyster reefs, and removing contaminants. The HRE-CRP within the Lower Bay Planning Area aims to “develop a mosaic of habitats that provides society with renewed and increased benefits from the estuary environment” and represents the results of a large scale effort to coordinate the several completed, ongoing and planned conservation and restoration programs in the area in order to strategically address specific objectives in this most urban section of the Estuary.

HRE-CRP sites³ in the Lower Bay that are closest to the proposed Breakwaters and Shoreline Projects and would provide direct or indirect benefits to the overall aquatic resources of the area include Mt. Loretto Unique Area, Butler Manor Woods, Paw-paw Hybrid Oaks Coastal Woods, Lemon Creek, Crookes Point, Great Kills Gateway NRA and Great Kills Park in Staten Island, and Treasure Lake, Whale Creek/Long Neck Creek, and Marquis Creek in New Jersey (see Figure 21-1). HRE-CRP projects at these sites typically include one or more of the following activities: coastal and upland land acquisition and protection, coastal habitat restoration, restoration of tidal connections of tributaries, restoration and protection of riparian and upland areas around the bay's tributaries, debris removal, and/or contaminated sediment removal. These actions would not have the potential to result in cumulative impacts to aquatic biota due to the loss of aquatic habitat above Mean High Water (MHW). The HRE-CRP also recommends oyster reef restoration off of the Great Kills Park peninsula's shoreline in Staten Island, a few miles northeast from the study area. The entire project site for the Proposed Actions is within an area recommended by the HRE-CRP as high opportunity for oyster restoration. The City-wide initiatives, including New York City's Green Infrastructure Plan, PlaNYC, and OneNYC would also result in positive cumulative impacts to aquatic resources. Focal areas of these plans include expanded usage of green

³ http://www.nan.usace.army.mil/Portals/37/docs/harbor/CRP%20Planning%20Regions/PR_Lower%20Bay_8_2014.pdf

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infrastructure throughout the city, reduced pollution from stormwater runoff, improved flushing of constrained water bodies, and optimization of existing sewer systems through improvements to drainage, interceptors, and tide gates. These actions would result in positive cumulative benefits to aquatic resources, wetlands, and coastal communities under Alternatives 2, 3, and 4.

Oyster restoration associated with the HRE-CRP recommendations would have the potential to result in additional conversion of soft bottom habitat to hard bottom habitat. By design, the Breakwaters Project would create complex reef-like habitat that would help to establish communities of macroalgae and encrusting organisms, and provide refugia and foraging habitat for macroinvertebrates and juvenile fish in an area of Raritan Bay where such habitat is not currently available. This is consistent with the goal of the HRE-CRP to enhance aquatic habitat across 12 Target Ecosystem Characteristics and the actions listed above. The breakwaters would offer sheltering and/or foraging habitat for HRE-CRP target species, including black sea bass, striped bass, American eel, and blue crab, and the one-time shoreline restoration could enhance spawning habitat for horseshoe crab. Stabilization of the shoreline and reduction or reversal of erosion that would result from the Proposed Actions would be consistent with efforts to restore and protect coastal habitats in Raritan Bay under the HRE-CRP actions (e.g., wetland restoration, coastal forest protection, marsh improvements) and would be consistent with the goal of the HRE-CRP to control erosion and sediment retention.

The USACE's South Shore of Staten Island CSRMP would also complement the Proposed Actions and would have the potential to result in positive cumulative impacts to aquatic resources through wetland improvements. Both the CSRMP and the Proposed Actions would reduce the risk of wave action and coastal erosion, address the impacts of coastal flooding, and increase the resiliency of the communities.

The gradual improvements in water quality in Raritan Bay that are expected as a result of the actions considered would result in positive cumulative impacts to aquatic resources under Alternatives 2 and 3. These actions would improve living conditions for aquatic biota, would enhance the diversity of aquatic biota, and would further improve water quality. Similarly, the active fisheries management plans and harvest regulations would also complement the Proposed Actions and result in positive cumulative impacts to aquatic biota under Alternatives 2 and 3 through the protection and management of these resources. The complex structured habitat provided by the breakwaters would lead to improved survival for juvenile fish, which may lead to a greater number of certain species occurring in the study area, including those currently targeted by recreational fishing in Raritan Bay (e.g., summer flounder, striped bass). The active fisheries management plans for these species would continue to protect their populations through sustainable harvest regulations, and the Proposed Actions would not result in depletion of the stocks. These actions promote the long-term productivity of these resources and sustainability of the fisheries in New York's coastal waters and along the Atlantic coast.

In summary, the Proposed Actions would not adversely affect the continued improvements to water quality of Raritan Bay, nor would it affect future improvements resulting from these regional programs. The continued improvements in water quality in the New York Harbor and Raritan Bay resulting from the programs listed above, along with the habitat conversion provided by the reef-like structure of the breakwaters, would result in positive cumulative impacts to aquatic resources within Raritan Bay. The breakwaters would convert soft bottom habitat to complex hard substrate that would serve as refugia and foraging habitat for juvenile fish, consistent with the goals of the HRE-CRP. The breakwaters would offer sheltering and/or foraging habitat for HRE-CRP target species, including black sea bass, striped bass, American eel, and blue crab, and the one-time

shoreline restoration could enhance spawning habitat for horseshoe crab. The intertidal and emergent portions of the breakwaters would also provide some habitat for waterbirds. There would be an increase in foraging opportunities due to the establishment of encrusting organisms, macroalgae, and benthic macroinvertebrates on and among the breakwaters, and the survival of these organisms would be aided by the continued improvements in water quality. Stabilization of the shoreline and reduction or reversal of erosion that would result from the Proposed Actions would be consistent with efforts to restore and protect coastal habitats in Raritan Bay (e.g., wetland restoration, coastal forest protection, marsh improvements) and would be in line with the goals of the HRE-CRP.

Terrestrial Resources

The actions considered, such as the maritime forest restoration within Conference House Park, possible wetland restoration, and invasive species removal, as well as maritime forest and coastal habitat restoration actions associated with HRE-CRP sites, would result in positive cumulative impacts to ecological communities and wildlife under Alternatives 2 and 4 when considered with the proposed landscaping of the Shoreline Project. In the event that the reconstruction of the Conference House Park Pavilion overlaps with the activities associated with the Proposed Actions, with the exception of the Water Hub Potential Location 2, construction effects resulting from the reconstruction of the Pavilion within Conference House Park are separated from the Shoreline Project and Breakwaters Project construction areas by a sufficient distance (at least 0.6 miles) that cumulative construction effects to wildlife would not occur. The limited disturbance (e.g., vegetation clearing and construction of ADA access should the water access in the vicinity of the existing NYC Parks structures be selected) that would result from development of water access for Water Hub Potential Location 2 under Alternatives 2 and 3 would not result in cumulative impacts to wildlife resources during the short period of time that these activities may be concurrent with the Pavilion reconstruction. Therefore, the cumulative effects of the Pavilion reconstruction and the rehabilitation and adaptive reuse activities associated with the Water Hub at Potential Location 2 are expected to be minimal. The potential short-term impacts to wildlife due to noise and increased human activity during construction activities associated with these actions and Alternatives 2, 3, and 4, would not be expected to result in negative cumulative impacts that would change the impacts to terrestrial resources in this EIS under Alternatives 2, 3, and 4. Sufficient available habitat would still be available for wildlife individuals that may be affected by concurrent construction activities within Conference House Park.

Threatened or Endangered Species and Essential Fish Habitat

The actions considered would have the potential to result in positive cumulative impacts to terrestrial threatened or endangered species for the reasons discussed above under “Terrestrial Resources.” Similarly, as discussed above under “Aquatic Resources,” the actions evaluated would have the potential to result in positive cumulative impacts to aquatic threatened or endangered species, such as Atlantic sturgeon and sea turtles, or Essential Fish Habitat (EFH) through improved water quality. Both sturgeon and sea turtles are most likely to occur in the study area as transient individuals. Atlantic sturgeon would mainly occur in the deeper waters near the navigation channel, rather than in the waters around the breakwaters. Sea turtles rarely occur in the study area, and only as transients rather than for long-term occupation for breeding, wintering, or growth and development.

As discussed in Chapter 9, “Natural Resources,” during in-water construction activities for the Proposed Actions, temporary and localized increases in suspended sediment and loss of bottom

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habitat and benthic invertebrates would not result in significant adverse impacts to Atlantic sturgeon or sea turtles. There are no other projects currently planned that would result in additional resuspended sediments off the Tottenville shoreline. If present, these species would avoid increases in suspended sediment and underwater activities in favor of similar habitat in the vicinity.

Oyster restoration associated with the HRE-CRP recommendations would have the potential to result in additional conversion of soft bottom habitat to hard bottom habitat. The conversion of 11.4 acres of sandy substrate to hard rocky structure in the footprint of the breakwaters would be minimal compared to the amount of similar foraging habitat in the study area. Additionally, the conversion of this area would occur sequentially rather than all at once, and if present, Atlantic sturgeon, sea turtles and species with designated EFH within the study area would be able to continue foraging in the area during construction. The breakwaters would support the establishment of macroalgae, benthic invertebrates, and encrusting organisms, which would ultimately result in an increase in diversity of foraging habitat and water quality (through filtering by bivalves) at the project site. The breakwaters would provide complex hard substrate that would offer sheltering and/or foraging habitat for HRE-CRP target species, including black sea bass, striped bass, American eel, and blue crab, and the one-time shoreline restoration could enhance spawning habitat for horseshoe crab.

The Proposed Actions would not adversely affect the continued improvements to water quality of Raritan Bay, nor would it affect future improvements in EFH resulting from the considered actions. The intertidal and emergent portions of the breakwaters would also provide some habitat for waterbirds. Stabilization of the shoreline and reduction or reversal of erosion that would result from the Proposed Actions would be consistent with efforts to restore and protect coastal habitats in Raritan Bay (e.g., wetland restoration, coastal forest protection, marsh improvements) and would be in line with the goals of the HRE-CRP.

FLOODPLAINS AND COASTAL EROSION HAZARD AREAS

None of the actions associated with City-wide initiatives and NYC Parks projects within Conference House Park would change the evaluation of potential impacts to floodplains and coastal erosion hazard areas presented in the EIS; actions of these projects are complementary and consistent with the Proposed Actions. The measures proposed by the USACE as part of the South Shore of Staten Island Coastal Storm Risk Management project risk reduction USACE are located far north of the study area between Fort Wadsworth to Oakwood Beach and would not have the potential to result in cumulative impacts to floodplains and coastal erosion hazard areas under Alternatives 2, 3, and 4.

SEWER AND WATER INFRASTRUCTURE

The actions associated with NYCDEP's Bluebelt project would not change the impacts presented in this EIS but would have the potential to result in positive cumulative impacts to storm sewer infrastructure and water quality of the Raritan Bay under Alternatives 2, 3, and 4 through enhanced stormwater management.

TRANSPORTATION

The actions considered would not have the potential to result in cumulative impacts to transportation within the study area under Alternatives 2, 3, and 4 during construction and operation of the Proposed Actions. Incremental traffic, transit, and pedestrian trips during peak construction activities

would not exceed the *CEQR Technical Manual* analysis thresholds for any hour for all three alternatives. Therefore, the Proposed Actions would not result in any significant adverse traffic, parking, transit, or pedestrian impacts during construction for any of the three Alternatives and would not result in cumulative transportation impacts if construction of the Proposed Actions with the Pavilion reconstruction.

AIR QUALITY

The actions considered would not have the potential to result in cumulative impacts to air quality within the study area under Alternatives 2, 3, and 4. During construction, Alternatives 2, 3, and 4 would not result in any significant adverse local (microscale) and (mesoscale) air quality impacts. The annual emissions generated during the construction activities associated with each of the alternatives would be lower than the *de minimis* rates defined in the general conformity regulations and would not result in cumulative air quality impact if construction of the Proposed Actions is concurrent with the Pavilion reconstruction.

GREENHOUSE GAS EMISSIONS

The actions considered would not have the potential to result in cumulative impacts to greenhouse gas emissions under Alternatives 2, 3, and 4.

CLIMATE CHANGE ADAPTATION AND RESILIENCE

The actions considered would have the potential to result in positive cumulative impacts with respect to climate change adaption and resilience. The USACE South Shore of Staten Island Coastal Storm Risk Management project would result in improved resilience of the northern portion of the south shore of Staten Island, which combined with Alternatives 2, 3, and 4, would result in increased resilience for this portion of Staten Island.

NOISE

The actions considered would not have the potential to result in cumulative impacts that would change the noise impacts presented in this EIS under Alternatives 2, 3, and 4. The potential noise effects resulting from the reconstruction of the Pavilion within Conference House Park are separated from the Shoreline Project and Breakwaters Project construction areas by a sufficient distance (at least 0.6 miles) such that cumulative noise impacts would not occur if the Pavilion reconstruction and construction under Alternatives 2, 3, and 4 occur concurrently. The limited construction noise that would result from development of water access for Water Hub Potential Location 2 under Alternatives 2 and 3 would not result in cumulative noise impacts if these activities occur concurrently with the Pavilion reconstruction.

PUBLIC HEALTH

The actions considered would not have the potential to result in cumulative impacts to public health under Alternatives 2, 3, and 4.

NEIGHBORHOOD CHARACTER

The actions considered would not have the potential to result in cumulative impacts to neighborhood character under Alternatives 2, 3, and 4. The actions would reinforce the community's already strong relationship with the natural environment and with Raritan Bay in particular. *