Appendix G
NOAA NMFS Section 7 and EFH

RESPONSE LETTERS FROM NOAA NMFS
AND FURTHER CORRESPONDENCE

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

The City of New York
Office of Management and Budget
255 Greenwich Street, 8th Floor • New York, New York 10007

NOAA's National Marine Fisheries Service

James J. Howard Marine Sciences Laboratory

74 Magruder Road

Highlands, NJ 07732

Attn: Karen Greene

Re: **Response to NMFS Essential Fish Habitat Conservation Recommendations**
letter dated August 15, 2019 for the
East Side Coastal Resiliency Project
New York, New York
New York City Department of Design and Construction Capital Contract: SANDRESM1

Dear Ms. Greene,

In its letter dated August 15, 2019, NOAA NMFS listed two Essential Fish Habitat (EFH) Conservation Recommendations specific to the East Side Coastal Resiliency (ESCR) Project. These recommendations are intended to minimize adverse impacts to EFH for winter flounder and for migratory anadromous shad and herring (i.e., prey species for summer flounder and bluefish). Those recommendations are listed below:

1. Avoid installing cofferdams within winter flounder early life stage EFH between January 15 and May 31 to minimize impacts to winter flounder eggs and larvae.
2. Avoid pile driving, sheetpile installation and other in-water construction activities occurring outside of the cofferdams from March 1 to June 30 to minimize adverse effects to migrating anadromous fishes.

Response to First Conservation Recommendation

The first conservation recommendation identified by NMFS to avoid cofferdam installation in EFH between January 15 and May 31 "to the extent practicable" is intended to avoid the entrapment of winter flounder eggs and larvae within the work area when those life stages are present. As noted by NMFS, EFH for winter flounder eggs and larvae is defined, in part, as habitat with water depths less than 6 meters (20 feet). Cofferdams at locations where water depths are shallower than 6 meters would be installed outside of the recommended window from January 15 through May 31 to avoid trapping winter flounder eggs or larvae within the work area.

Response to Second Conservation Recommendation

Based on its review of the project description and EFH assessment for ESCR, as the second Conservation Recommendation for the project, NMFS indicated a restriction on in-water work from March 1 to June 30. During this window, pile driving, sheet pile installation, and other activities outside of the cofferdam would not be conducted to minimize impacts of underwater noise from pile driving, as well as turbidity caused by bottom disturbance, on migrating anadromous fish species, specifically river herring (alewife and blueback herring), American shad, and striped bass, in the East River. NMFS expressed concerns that high-intensity sounds produced during pile driving have the potential to affect migrating anadromous fish by potentially causing recoverable tissue damage, physiological stress, or behavioral changes. NMFS also noted that increases in turbidity due to sediment resuspension can degrade water quality and can impede fish migrations by constricting or obstructing migratory routes.

The timing restriction in this Conservation Recommendation was recommended given the uncertainty associated with the spatial extent of the river that would be impacted by underwater noise and turbidity and the potential adverse impacts to anadromous fishes during the upstream migration to their spawning grounds. NMFS stated in its response letter that "it is not clear how much of the river will be affected by sound or suspended sediments and at what levels", but that "the need for this conservation recommendation can be reevaluated…if additional information on the areal extent of elevated sound levels and turbidity are better defined."

Based on our understanding of these concerns, it would follow that if in-water work associated with pile driving, sheet pile installation, or other in-water construction activities occurring outside of cofferdams does not result in elevated underwater noise levels in the East River, beyond an extent that would obstruct migration, such that river herring, shad, and striped bass would be able to migrate past the project area with no detrimental physiological or behavioral effects, then an in-water, no-work window from March 1 to June 30 would not provide any benefit in terms of minimizing the potential effects of underwater noise. Similarly, if the suspended sediment concentrations produced by bottom disturbing activities were limited in areal extent such that an adequate zone of passage was maintained in the East River, this Conservation Recommendation would not be necessary.

Spatial extent of underwater noise during pile installation

In order to address the need for additional information on the areal extent of underwater noise, an evaluation of noise levels and spatial extent during pile driving was conducted. This evaluation used standard noise criteria for physiological and behavioral effects to fishes, as recommended by NMFS in its technical guidance. The underwater noise threshold for behavioral effects to fishes is 150 dB re: 1 µPa root-mean square sound pressure level (SPLrms). Noise levels at, or exceeding, this threshold may cause a behavioral response in fish, including disruption of foraging, resting, or migrating behaviors, temporary startle, or avoidance of an ensonified area. The distance from the noise source (e.g., the pile) to the noise level associated with behavioral avoidance by fish was estimated using the simplified attenuation model and noise levels from the NMFS Greater Atlantic Regional Fisheries Office Acoustics Tool. Scenarios for unattenuated vibratory pile driving of 19-inch AZ piles for the cut-off wall to replace the existing bulkhead and attenuated impact pile driving of 24-inch H-piles for CSO cofferdams were modeled. For the purposes of this analysis, noise levels for vibrated 24-inch steel sheet piles and impact-driven 24-inch steel pipe piles were used as a conservative approximation because noise levels for the proposed piles were not available. Noise levels for proxy projects are shown in **Tables 1 and 2**. Additional detail on the analysis is provided in the ESA evaluation for the project (see **Attachment 1**).

Based on this acoustic analysis, the extent of underwater noise levels exceeding the behavioral threshold is expected to range up to 40 meters (130 feet) from the pile during vibratory pile driving to install the cut-off wall and up to 103 meters (338 feet) from the pile during attenuated impact pile driving to install

cofferdams for CSO reconstruction (**Table 3; Figure 1**). Migratory fish within these distances would be exposed to underwater noise levels at or above the behavioral threshold. Beyond those distances, fish are not expected to change their behavior and fish migrations would not be adversely affected. The width of the East River in the project area ranges from 730 meters (2,400 feet) at the Williamsburg Bridge to 1,340 meters (4,400 feet) at East 23rd Street.

Based on the results of this analysis, the underwater noise levels produced during impact and vibratory pile driving would be confined to the near shore area of the East River within 103 meters of the bulkhead, which represents no more than 14 percent of the river width at the narrowest point in the project area. During impact pile driving to construct the cut-off wall, no more than 6 percent of the river width would be ensonified (**Figure 1**). Because of the very localized spatial extent of underwater noise associated with pile driving for cofferdam construction and construction of the cut-off wall, 86 percent to 94 percent of the East River at the narrowest point would not be ensonified allowing migratory fish to move through the project area unimpeded during these activities. Underwater noise levels produced during these activities would not exceed the threshold for the potential onset of recoverable physiological injury (i.e., 206 dB re: 1 µPa peak sound pressure level). The single-strike sound exposure criterion of 150 dB re: $1uPa^2 \cdot s$ would occur over a smaller areal extent within the area of behavioral avoidance meaning that migrating fish would avoid the area and would not experience sound exposure levels exceeding this injury threshold. Therefore, injury to fish (e.g., tissue damage, changes to stress hormones, hearing loss) would not occur as a result of exposure to underwater noise.

Extent of resuspended sediment plume during bottom disturbing activities

As discussed in the EFH assessment, temporary increases in resuspended sediments are expected during bottom disturbing activities, specifically foundation construction for the flyover bridge, cofferdam construction, and installation of sheet pile for the new cut-off wall along the bulkhead on the western edge of the river. Turbidity curtains would be deployed during these activities and would minimize the spatial extent of elevated turbidity.

Water quality monitoring conducted during impact and vibratory pile driving for 89 piles driven in the Hudson River channel at the Tappan Zee Bridge during construction of the new Governor Mario M. Cuomo Bridge in 2014 indicated that 95 percent of observations were less than 46 mg/L above ambient concentrations at a distance of 500 feet down-current from the pile (Tappan Zee Constructors 2015). It is reasonable to expect similar concentrations during pile driving in the East River. Ambient turbidity levels at New York City Department of Environmental Protection (DEP) water quality station E2 at East 23rd St East in the East River averaged 17 mg/L (95th percentile: 38 mg/L) during the 10-year period from 2010-2019. Therefore, turbidity levels within a similar plume in the East River would be 63 mg/L on average and 84 mg/L during 95 percent of the time. These levels are significantly less than those associated with adverse effects on the most sensitive fish species (580 mg/L; Burton 1993) and several orders of magnitude less than the thresholds for avoidance and lethal effects for common estuarine fish species. Some species, like striped bass did not avoid concentrations as high as 1,920 mg/L during migrations to spawning sites (Summerfelt and Mosier 1976, Burton 1993). Lethal effects were not observed for bluefish, Atlantic menhaden or white perch until concentrations exceeded 750 mg/L. More tolerant species like cunner, mummichog, silversides, and spot did not exhibit 50 percent mortality until suspended sediment concentrations reached 2,500 to 39,000 mg/L.

Because of the current velocities in the river, which approached 2.5 knots during 95 percent of the DEP monitoring, much of the resuspended sediment would be carried down-current and the width of the plume would be less than 500 feet. Therefore, 500 feet would be a conservative estimate of the areal extent of elevated suspended sediments in the vicinity of pile driving activities. As shown in **Figure 2**, a turbidity plume with a width of 500 feet would occupy approximately 21 percent of the river width at the narrowest point in the project area, which would leave 79 percent of the river width below these levels. Because the

width of the plume is likely to be less than 500 feet, the width of the river is greater than 2,400 feet within most of the project area, and the turbidity levels within that plume are likely to be well below the levels associated with adverse effects to fish, the areal extent of turbidity associated with pile driving is likely to be less than estimated here and is unlikely to impede the migration of anadromous fish through the project area.

As demonstrated here, the areal extent and levels of underwater noise and resuspended sediment associated with in-water construction activities for the ESCR project are unlikely to result in adverse effects to migrating anadromous fishes in the East River. Therefore, implementing the in-water work restrictions identified in the second Conservation Recommendation provided by NMFS is unlikely to further minimize the likelihood of adverse effects to migrating anadromous fishes. With the additional analysis presented here, the City is requesting that NMFS revise the Conservation Recommendations to remove the seasonal restriction for in-water work for pile driving, sheetpile installation and other in-water construction activities.

Sincerely,

Eram Qadri

Unit Head – Environmental Review, CDBG Disaster Recovery

New York City Mayor's Office of Management and Budget

Enclosures:

Attachment 1 – NOAA ESA Assessment

CC:

NOAA: L. Chiarella

HUD: T. Fretwell, D. Mahon

OMB: J. Jacobs

Parks: C. Anderson, E. Humes

DDC: T.L. Dinh, E. Ilijevich

Deputy Mayor's Office: M. De Coo

JV: J. Einhorn, C. Campbell, K. Mui, R. White

References Cited

Burton, W.H. 1993. Effects of bucket dredging on water quality in the Delaware River and the potential for effects on fisheries resources. Versar, Inc. 9200 Rumsey Road, Columbia, MD 21045

National Marine Fisheries Service (NMFS). 2018. GARFO Acoustics Tool: Analyzing the effects of pile driving on ESA-listed species in the Greater Atlantic Region. Accessed 30 August 2019. http://www.greateratlantic.fisheries.noaa.gov/protected/section7/guidance/ consultation/ index.html

Summerfelt, R.C. and D. Mosier. 1976 Evaluation of ultrasonic telemetry to track striped bass to their spawning grounds. Final Report, Dingell-Johnson Proj. F-29-R, Segments 5, 6, and 7. Okla. Dept. Wildl. Conserv. 101 pp.

Tappan Zee Constructors. 2015. Water Quality Monitoring Plan - Annual Monitoring Report - 2014 Monitoring Activities for the New NY Bridge Project. Revision 0. March 6, 2015. 24 pp. Accessed 30 August 2019. https://www.newnybridge.com/documents/water-quality/2014/2014-monitoring-activities-annual-report.pdf

Figure 1. Spatial extent of underwater noise equal to, or exceeding, the behavioral threshold for fish (150 dB SPLrms) during impact and vibratory pile driving associated with the construction of bulkhead and central sewer outfalls for the East Side Coastal Resiliency Project

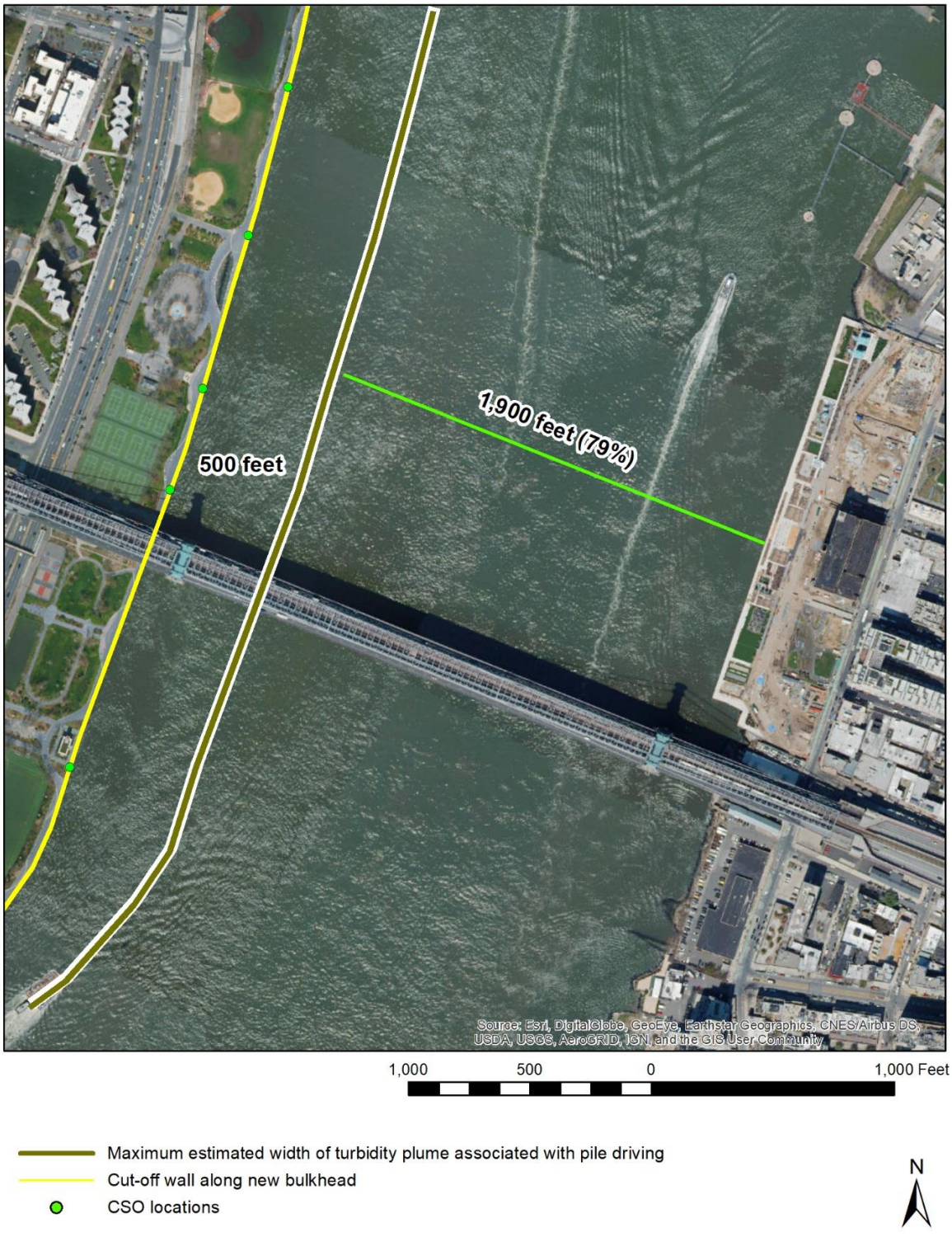


Figure 2. Spatial extent of elevated turbidity levels associated with pile driving during construction of bulkhead, cofferdams, and the flyover bridge for the East Side Coastal Resiliency Project

TABLE 1:

Proxy Projects for Estimating Underwater Noise

Project Location	Water Depth (m)	Pile Size (inches)	Pile Type	Hammer Type	Attenuation rate (dB/10m)
Loudest levels for this pile type and installation method, reported by Caltrans 2015 guidance	15	24"	AZ Steel Sheet	Vibratory	5
Rodeo, CA - San Francisco Bay	5	24"	Steel Pipe	Cushioned Impact	3

Source: NMFS 2018

TABLE 2:

Proxy-Based Estimates for Underwater Noise

Type of Pile	Hammer Type	Estimated Peak Noise Level (dB_{Peak})	Estimated Pressure Level (dB_{RMS})	Estimated Single Strike Sound Exposure Level (dB_{sSEL})
24" AZ Steel Sheet	Vibratory	182	165	165
24" Steel Pipe	Cushioned Impact	192	178	167

Source: NMFS 2018

TABLE 3:

Estimated Distances to Injury and Behavioral Thresholds for Fish

Type of Pile	Hammer Type	Distance (m) to 206dB_{Peak} (injury)	Distance (m) to sSEL of 150 dB (surrogate for 187 dBcSEL injury)	Distance (m) to Behavioral Disturbance Threshold (150 dB_{RMS})
24" AZ Steel Sheet	Vibratory	Not Applicable	40	40
24" Steel Pipe	Cushioned Impact	Not Produced	67	103

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

AUG 15 2019

Eram Qadri
Unit Head - Environmental Review, CDBG Disaster Recovery
New York City Mayor's Office of Management & Budget
255 Greenwich Street, 5th Floor
New York, NY 10007

RE: Essential Fish Habitat Assessment, East Side Coastal Resiliency Project
East River, New York, New York

Dear Ms. Qadri:

We have reviewed the Essential Fish Habitat (EFH) Assessment for the East Side Coastal Resiliency project (ESCR), located along the East River in the Borough of Manhattan, New York, New York. The ESCR project is a coastal flood protection system designed to protect the east side of Manhattan from coastal storm events. The project area extends along the East River waterfront, including East River Park, from Montgomery Street to East 25th Street. The preferred alternative is designed to increase the elevation of the entire East River Park by approximately 8 ft. The Delancey Street, East 10th Street, and Corlears Hook bridges would be reconstructed to provide universal accessibility. A new, shared-use flyover bridge would be also constructed. A portion of the park's underground water and drainage infrastructure, bulkhead, and esplanade will be repaired or reconstructed. Ten combined sewer outfalls (CSOs) would also be reconstructed. Two existing embayments along the East River esplanade will be relocated to allow for siting of active recreation fields within the park and to facilitate direct connection of the public with the water.

It has been determined that the proposed action is a major infrastructure project and that the One Federal Decision (OFD) policies of Executive Order 13807 apply.

The preferred alternative will result in both permanent and temporary impacts to shallow open water habitat including:

- Use of construction barges and the installation of temporary mooring spuds and monopile dolphins for stabilization resulting in approximately 160 sf of temporary disturbance.
- Installation of cofferdams for the reconstruction of ten CSOs resulting in approximately 0.23 acres of temporary disturbance.
    - 24-inch H-type steel pile installed with a cushioned impact hammer
- Demolition of the existing bulkhead for the installation of the cut-off wall, which will be installed by pile driving in the same alignment resulting in 0.17 acres of temporary disturbance.
    - 19-inch AZ steel piles installed with vibratory hammer

- Filling approximately 0.47 acres of two existing embayments and filling 0.06 acres behind the cutoff wall for the construction of new embayments (permanent disturbance).
- Demolition of the existing esplanade in areas where new embayments will be constructed resulting in 0.52 acres of temporary disturbance.
- Pile drilling for the installation of ten 8-foot diameter shafts and installation of five footings to be placed atop of the shafts for the shared use flyover bridge resulting in approximately 0.01 acres of permanent disturbance.
    - 48-inch diameter steel caissons and 12-inch steel micropiles installed with drill rig.

According to the EFH assessment, the embayments to be filled were created as part of the esplanade redesign in 2005–2008, are mostly rocky fill material, and consist of narrow areas that allow tidal water from the East River to flow beneath pedestrian bridges along the esplanade. These pedestrian bridges cause shading of significant portions of the water below. The relocated embayments would be of comparable or larger size then the originals with improved habitat conditions, including the elimination of bridges that shade aquatic habitat. In addition, the inclusion of habitat enhancements designed for the recruitment of shellfish and other aquatic life along East River Park is also being explored for these areas. Additional off-site wetland mitigation would also be undertaken with either the creation and/or rehabilitation of wetland habitat within the NY Harbor Estuary or the purchase of wetland mitigation credits through the Saw Mill Creek Wetland Mitigation Bank located on Staten Island, New York.

Magnuson Stevens Fishery Conservation and Management Act (MSA)
As discussed in our previous letter dated March 14, 2019, the project area has been designated as EFH for a number of federally managed species including Atlantic butterfish (*Peprilus triacanthus*), Atlantic mackerel (*Scomber scombrus*), Atlantic sea herring (*Clupea harengus*), bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), red hake (*Urophycis chuss*), scup (*Stenotomus chrysops*), summer flounder (*Paralichthys dentatus*), windowpane flounder (*Scophthalmus aquosus*), winter flounder (*Pseudopleuronectes americanus*), and others.

We note that the lead federal agency on this action, US Department of Housing and Urban Development (HUD) has designated your office as its non-federal representative to conduct the EFH consultation as permitted under our regulations. However, it is also important to note that the federal action agency, in this case HUD, remains ultimately responsible for compliance with sections 305(b)(2) and 305(b)(4)(B) of the MSA.

The EFH assessment prepared for this project includes an evaluation of five potential types of impacts with implementation of the preferred alternative:

- Habitat Loss
- Noise Impacts
- Water Quality Impacts
- Vessel Impacts
- Impacts to Prey Species

Overall, these potential types of impacts are adequately evaluated for most federally managed

species and their EFH. The assessment also identifies a number of measures that New York City (City) has committed to implement to minimize adverse effects anticipated to occur as a result of the construction of the preferred alternative. These mitigative measures include the use of cushion blocks when driving piles, pile driving ramp up to allow some warning to aquatic fauna prior to attaining peak noise levels, the use of bubble curtains, and the installation of turbidity curtains prior to any construction, where practicable. In addition, because sediments in the East River are anticipated to be contaminated due to historic land uses, all sediments removed from the flyover bridge support shaft casings will be handled, stored, and disposed of in accordance with all applicable health, safety, and sediment and waste management plans including a site specific Remedial Action Plan (RAP), a Construction Health and Safety Plan (CHASP), a NYSDEC approved stormwater pollution prevention plan (SWPPP), and a U.S. Environmental Protection Agency (USEPA) approved spill prevention control and countermeasures plan (SPCCP).

While the majority of the impacts to EFH are evaluated adequately, some are not. In particular, impacts to sensitive, or less mobile life stages of some species where not considered. For example, the project area has been designated as EFH for winter flounder eggs and larvae. Winter flounder have demersal eggs that sink and remain on the bottom until they hatch. After hatching, the larvae are initially planktonic, but following metamorphosis they assume an epibenthic existence. Winter flounder larvae are negatively buoyant, and are typically more abundant near the bottom. These life stages are less mobile and thus more likely to be affected adversely from the proposed construction and demolition activities.

In addition, the rationale used to conclude that impacts from the construction of the preferred alternative are not substantial is flawed. According to the EFH assessment, you have concluded that adverse impacts to EFH, federally managed species and their prey, as well as other NOAA trust resources considered under the FWCA are not substantial, in part, because the proposed project affects <0.1 percent of habitat within the NY Harbor Estuary and that the installation of footings shafts for shared-use flyover bridge and the new embayments could be new or improved habitat. When evaluating the significance of an adverse impact to EFH and whether or not EFH conservation recommendations are warranted to minimize those impacts, we focus on the direct, indirect, individual and cumulative effects of the proposed project, not what percentage of the habitat will be affected. Under section 305(b)(4)(A) of the MSA, we are required to provide EFH conservation recommendations for actions that would adversely affect EFH to avoid, minimize or offset those impacts.

Although the use of the percentage of habitat affected is not an appropriate rationale, the overall conclusion that the impacts to EFH will not be substantial is generally correct. This is due to the nature of the impacts, the measures that will be used to minimize construction related effects such as noise and water quality and the habitat characteristics of the areas impacted. However, we remain concerned about the impacts to winter flounder early life stages and their EFH if some of the construction activities are carried out when these life stages are present in the project area. Winter flounder enter spawning areas within Mid-Atlantic estuaries when water temperatures begin to decline in late fall and tend to return repeatedly to the same spawning grounds. Although the exact timing of spawning is temperature dependent and thus varies with latitude, spawning generally begins in January in the New York Harbor area. Larvae are generally found

through May. The EFH for these early life stages includes waters in the project area that are generally less than six meters deep, with sediments that include mud, muddy sand, sand, gravel, macroalgae, and submerged aquatic vegetation. Bottom habitats are unsuitable if exposed to excessive sedimentation which can reduce hatching success. The installation of the cofferdam while eggs and larvae are present will likely result in the entrapment of these life stages within the work area. As a result, to the extent practicable, the cofferdams located in waters less than six meters deep should be installed before January 15 of any year or after May 31. Work can occur above mean low water during this timing restriction when the work area is exposed during low tide cycles. Work within the cofferdams can also take place at any time once they are installed and they may be removed at any time provided the best management practices to minimize turbidity described in the EFH assessment are employed.

Anadromous fish species including alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*), collectively known as river herring, as well as American shad (*Alosa sapidissima*) and striped bass (*Morone saxatilis*) use the project area as migratory pathway to upstream spawning grounds and as forage and nursery habitat. Juvenile river herring and other Alosa species such American shad have all been identified as prey species for federally managed fishes such as bluefish, windowpane, and summer flounder. As a result, adverse impacts to these species can also be considered an adverse effect to EFH.

American shad, blueback herring, and alewife formerly supported the largest and most important commercial and recreational fisheries throughout their range, with fishing spanning rivers (both freshwater and saltwater), estuaries, tributaries, and the ocean. Commercial landings for these species have declined dramatically from historic highs. As a result of declining landings and declines in fish returning to spawn , river herring have been designated as Species of Concern by NOAA. Species of Concern are those about which we have concerns regarding their status and threats, but for which insufficient information is available to indicate a need to list the species under the Endangered Species Act (ESA). We wish to draw proactive attention and conservation action to these species.

The EFH assessment briefly discusses the effects of noise and turbidity on EFH and other species and outlines the measures that will be employed to minimize these effects, but from the information contained in the assessment, it is not clear how much of the river will be affected by sound or suspended sediments and at what levels. Anthropogenic-induced elevated levels of turbidity and sedimentation, above background levels, can lead to various adverse impacts on anadromous fish and their habitats. Increases in turbidity due to the resuspension of sediments into the water column during activities can degrade water quality, lower dissolved oxygen levels, and potentially release chemical contaminants bound to the fine- grained sediments. Suspended sediment can also mask pheromones used by migratory fishes to reach their spawning grounds, impede their migration, and can smother immobile benthic organisms and demersal newly-settled juvenile fish. Sound waves produced by construction activities can also cause temporary or permanent damage to fish including: damage to body tissues; physiological effects including changes in stress hormones, hearing capabilities, or sensing and navigation abilities; or changes in behavior. Behavioral responses could range from a temporary startle to avoidance of an ensonified area resulting in anadromous fish avoiding natural migration paths because of noise disturbances.

We recognize the measures the City has committed to implement to reduce water quality and sound impacts from the construction activities. However, because the EFH assessment does not discuss the anticipated sound levels or the area of the river that may be ensonified by the construction activities, it is not clear if the measures proposed by the City will be sufficient to prevent impacts to anadromous fish migration up the East River. As a result, we recommend pile driving, sheetpile/cofferdam installation and other construction activities occurring outside of the cofferdams be avoided from March 1 to June 30 to minimize adverse effects to migrating anadromous fishes. Work within the cofferdams can proceed at any time. The need for this conservation recommendation can be reevaluated as the project designs are further developed and if additional information on the areal extent of the elevated sounds levels and turbidity are better defined.

Essential Fish Habitat Conservation Recommendations

Pursuant to Section 305 (b) (4) (A) of the MSA, our EFH conservation recommendations are as follows to minimize adverse effects to EFH for winter flounder, summer flounder, bluefish and other federally managed species:

1. Avoid installing cofferdams within winter flounder early life stage EFH between January 15 and May 31 to minimize impacts to winter flounder eggs and larvae.
2. Avoid pile driving, sheetpile installation and other in-water construction activities occurring outside of the cofferdams from March 1 to June 30 to minimize adverse effects to migrating anadromous fishes.

Please note that Section 305(b)(4)(B) of the MSA requires you to provide us with a detailed written response to the EFH conservation recommendations, including a description of measures you have adopted to avoid, minimize or mitigate the impact of the project on EFH. In the case of a response that is inconsistent with these conservation recommendations, Section 305(b)(4)(B) of the MSA also indicates that you must explain your reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k).

Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(1) if new information becomes available or the project is revised in such a manner that affects the basis for the above EFH conservation recommendations. This includes any remediation for contamination at the site, for which project-specific details are not yet available.

Fish and Wildlife Coordination Act

As stated in our previous letter, the Fish and Wildlife Coordination Act (FWCA), as amended in 1964, requires that all federal agencies consult with us when proposed actions might result in modifications to a natural stream or body of water. It also requires that they consider effects that these projects would have on fish and wildlife, and must also provide for improvement of these resources.

The New York Harbor estuary provides habitat for one of the largest populations of striped bass on the East Coast, including an overwintering population in the upper New York Harbor and associated tributaries. After spawning in the freshwater reaches of the Hudson River, the young-of-year striped bass move into the lower reaches of the estuary. Late larvae and early juveniles favor shallow waters with sluggish currents. The movement of the young fish into the nearshore shallows may be due to the greater prey abundance of these areas and increased feeding success. In addition, striped bass of all age groups, but particularly juveniles younger than age three, overwinter in the upper Harbor and lower Hudson River in a relatively dormant, immobile state until water temperature rises in the spring. The mitigative measures discussed above, such as the use of a cushion block and ramping up when pile driving, turbidity barriers and bubble curtains, along with the seasonal restriction of March 1 to June 30 on certain in water construction activities will reduce adverse effects to this recreationally valuable species. As stated above, the need for seasonal in-water work restrictions can be reevaluated as the project designs are further developed and if additional information on the areal extent of the elevated sounds levels and turbidity are better defined.

Endangered Species Act

Our Protected Resources Division will provide separate comments on this project. Further questions should be directed to Edith Carson-Supino at (978) 282-8490 or edith.carson-supino@noaa.gov .

Conclusion

We look forward to our continued coordination with your office on this project as it moves forward. If you have any questions or need additional information, please do not hesitate to contact Karen Greene at our Highlands, NJ field office at (732) 872-3023 or karen.greene@noaa.gov

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc: HUD: T. Fretwell, D. Mahon
NY OMB: J. Jacobs
NYD ACOE – S. Ryba
NMFS PRD – E. Carson-Supino
NMFS OPR – Younkins
NYDEC – S. Zahn
EPA – L. Knudson
FWS – S. Sinkevich

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

Eram Qadri
The City of New York
Office of Management and Budget
255 Greenwich Street
New York, NY 10007-2146

MAY 2 1 2019

Re: East Side Coastal Resiliency Project, NY, NY

Dear Ms. Qadri:

We have completed our consultation under section 7 of the Endangered Species Act (ESA) in response to your email received on May 13, 2019, regarding the above-referenced proposed project. We reviewed your consultation request document and related materials requesting reinitiation of consultation. Based on our knowledge, expertise, and your materials, we concur with your conclusion that reinitiation is necessary and that the new proposed action is not likely to adversely affect any National Marine Fisheries Service ESA-listed species or designated critical habitat. Therefore, no further consultation pursuant to section 7 of the ESA is required.

Reinitiation of consultation is required and shall be requested by the lead federal agency or by us, where discretionary federal involvement or control over the action has been retained or is authorized by law and: (a) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation; or, (c) If a new species is listed or critical habitat designated that may be affected by the identified action. No take is anticipated or exempted. If there is any incidental take of a listed species, reinitiation would be required. Should you have any questions about this correspondence please contact Edith Carson-Supino at (978) 282-8490 or by email (Edith.Carson-Supino@noaa.gov). For questions related to Essential Fish Habitat, please contact Ursula Howson with our Habitat Conservation Division at (732)-872-3116 or Ursula.Howson@noaa.gov.

Sincerely,

Michael J. Asaro, PhD
Acting Assistant Regional Administrator
for Protected Resources

cc: Howson, NMFS/HCD; Mahon, HUD; Fretwell, HUD
ECO: GARFO-2019-00514
File Code: H:\Section 7 Team\Section 7\Non-Fisheries\HUD\2019\Informals\Fast-41 HUD NYC DDC East Coast Resiliency Project Reinitiation

ESA/EFH CONSULTATIONS
FOR ALTERNATIVE 4, THE PREFERRED ALTERNATIVE

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

EFH/FWCA CONSULTATION

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

The City of New York
Office of Management and Budget
255 Greenwich Street • New York, New York 10007-2146

NOAA'S National Marine Fisheries Service

James J. Howard Marine Sciences Laboratory

74 Magruder Road

Highlands, NJ 07732

Attn: Ms. Karen Greene

Re: **Essential Fish Habitat Findings for the**
East Side Coastal Resiliency Project
New York, New York
New York City Department of Design and Construction Capital Contract: SANDRESM1

Dear Ms. Greene,

On behalf of the U.S. Department of Housing and Urban Development (HUD), the New York City (City) Office of Management and Budget (OMB) is requesting reinitiation of consultation and is providing the National Oceanic and Atmospheric Association (NOAA) National Marine Fisheries Service (NMFS) new design and construction information in a revised EFH assessment for the proposed East Side Coastal Resiliency (ESCR) project, located in New York City, New York (see **Attachment 1**). HUD has granted authority to OMB to act as the federal agency to prepare this consultation (see **Attachment 2**). OMB is requesting concurrence on our finding that the changes to design and construction of the proposed project would result in *effects to Essential Fish Habitat (EFH) that are not substantial*.

To implement the proposed project, the City is receiving funds from HUD, a federal agency, and is therefore subject to Section 7 of the Endangered Species Act as well as the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended. Requests for concurrence on findings regarding EFH were previously submitted to NMFS on January 25, 2016. A project update was provided on May 26, 2016 (with a follow up email transmitting these materials on May 27, 2016) to request additional guidance on the addition of a new potential project alternative that would create a more robust line of protection and eliminate the need for closure structures across the FDR (Alternative 5). The original consultation requests, all correspondence associated with those requests, and NMFS' responses are provided in **Attachment 3**.

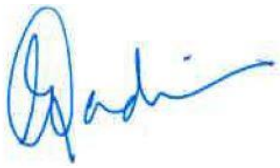
NMFS returned the results of the EFH consultation on April 14, 2016 and concurred with the findings that adverse effects associated with the proposed in-water activities would be minimal and did not recommend conservation measures be implemented.

As noted above, a project update was provided on May 26, 2016, to request additional guidance on the addition of a new potential project alternative and a response was received from NMFS on June 2, 2016 that concurred that the proposed modification would not increase effects to EFH and that no reinitiation for consultation was necessary.

The proposed revisions to the ESCR project will result in greater potential impacts to EFH habitat than were previously disclosed. On February 7, 2019, an EFH consultation was submitted to NMFS analyzing the new preferred alternative and a response was received on March 14, 2019 calling for additional information and analysis. The revised EFH assessment and worksheet, addressing the most recent comments from NMFS, are provided in **Attachment 1** and analyze any potential impacts due to the construction and operation of the proposed project.

Results of these consultation requests will be used to inform the FEIS, set to be published in September 2019, in order to comply with applicable National Environmental Protection Act (NEPA), New York State Environmental Quality Review Act (SEQRA), and New York City Environmental Quality Review (CEQR) standards. In the event that new design elements are developed that result in additional in-water construction activities not described in the attached assessment, OMB would notify NMFS of these changes as addenda to this submission. OMB is requesting an Abbreviated EFH Consultation for the new Preferred Alternative (Alternative 4) and concurrence with their findings that effects to EFH and FWCA managed species are not substantial. OMB also requests guidance on any Conservation Recommendations that NMFS may have for the proposed project.

Sincerely,



Eram Qadri

Unit Head – Environmental Review, CDBG Disaster Recovery

New York City Mayor's Office of Management and Budget

Enclosures:

Attachment 1 – EFH Assessment and Worksheet

Attachment 2 – Federal Representation Letter

Attachment 3 – Previous Correspondence with NMFS

CC:

NOAA: U. Howson

HUD: T. Fretwell, D. Mahon

OMB: E. Qadri, J. Jacobs

Parks: C. Anderson, E. Humes

DDC: T.L. Dinh, E. Ilijevich

Deputy Mayor's Office: M. De Coo

JV: J. Einhorn, C. Campbell, K. Mui, R. White

ATTACHMENT 1
EFH ASSESSMENT AND WORKSHEET

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

On behalf of the U.S. Department of Housing and Urban Development (HUD), the New York City (City) Office of Management and Budget (OMB) is providing the National Oceanic and Atmospheric Association (NOAA) National Marine Fisheries Service (NMFS) an Essential Fish Habitat (EFH) assessment covering new design and construction information for the proposed East Side Coastal Resiliency (ESCR) project, located in New York City, New York.

PROPOSED PROJECT

Hurricane Sandy, which made landfall in October 2012, greatly impacted New York City and surrounding areas, including the east side of Manhattan, highlighting existing deficiencies in the City's ability to adequately protect vulnerable populations and critical infrastructure during major storm events. Hurricane Sandy caused extensive inland flooding in the project area, resulting in damage to residential and commercial property; public open space; transportation; and critical power, water, and sewer infrastructure. Addressing the vulnerability of the project area by protecting critical infrastructure and resources on Manhattan's lower east side is essential to the City's resiliency planning.

In June 2013 HUD launched Rebuild by Design (RBD), a competition to respond to Hurricane Sandy's devastation in the northeast region of the United States. The winning proposals would be implemented using Community Development Block Grant – Disaster Recovery (CDBG-DR) funding as well as other public and private-sector funding sources. One of the winning proposals was an integrated flood protection system on the east side of southern Manhattan to reduce the risk of coastal flood hazards, which became the East Side Coastal Resiliency (ESCR) project. The flood protection system is comprised of a combination of floodwalls, 18 closure structures (i.e., swing and roller floodgates), and supporting infrastructure improvements that together would reduce risk of damage from coastal storms in the area proposed for protection. The project area spans from Montgomery Street on the south to East 25th Street on the north and is split into two segments for design purposes as shown in **Figure 1**.

In addition to providing a reliable flood protection system for this flood hazard area, the proposed project aims to improve and enhance access to the waterfront in East River Park and Stuyvesant Cove Park, which are located within the study area. As such, the City is proposing to construct and operate a flood protection system with integrated urban design features that will reduce flood hazards to a diverse and vulnerable residential population and safeguard critical energy, infrastructure, commercial, and transportation assets while enhancing access to the waterfront and parkland. Project construction is anticipated to commence in spring 2020 with an estimated 3.5-year construction schedule allowing the flood protection system to be in place in 2023.

Preferred Alternative (Alternative 4) – Flood Protection System with a Raised East River Park

Alternative 4, identified as the new Preferred Alternative, of the ESCR project proposes to provide flood protection by raising East River Park by approximately eight feet and installing below-grade floodwalls within the park to meet the design flood protection criteria of providing flood protection for both the park and the inland community. This alternative would enhance neighborhood connectivity to the East River Park by reconstructing the Delancey Street, East 10th Street, and Corlears Hook pedestrian bridges to provide universal accessibility. This alternative would require reconstructing the park's underground water supply and drainage infrastructure and the existing park structures and recreational features, including the park amphitheater, as well as relocating two embayments within East River Park. This alternative also includes construction of footings to accommodate a shared-use flyover bridge connecting the north end of East River Park to Captain Patrick J. Brown Walk to alleviate congestion in the East River Bikeway. Under this alternative, Murphy Brothers and Asser Levy Playgrounds would be reconstructed and protected by a floodwall that would connect the northern point of East River park to the existing VA Hospital flood protection system at East 25th Street.

Construction of the overall proposed project will require specific work to be conducted in federally and state regulated waters. The in-water construction activities detailed in the previous consultations are provided in **Attachment 3.** Some of the in-water components from the previous consultations remain a component of the Preferred Alternative, though with modified assumptions. The design of the Preferred Alternative is currently ongoing and therefore, this consultation assumes a reasonable worst-case scenario, specifically with respect to the in-water disturbances associated with the implementation of the Preferred Alternative. The primary in-water activities associated with the Preferred Alternative are described below and the area of impact summarized in **Table 1** and **Figure 2**:

- Use of construction barges and the installation of temporary mooring spuds and monopile dolphins for stabilization (resulting in approximately 160 square feet [0.003 acre] of temporary disturbance)
- Cofferdams for the reconstruction of ten combined sewer outfalls (resulting in approximately 10,000 square feet [0.23 acre] of temporary disturbance)
    - 24-inch H-type steel pile installed with cushioned impact hammer
- Demolition of the existing bulkhead for the installation of the cut-off wall, which will be installed by pile driving in the same alignment (resulting in 7,284 square feet [0.17 acre] of temporary disturbance)
    - 19-inch AZ steel piles installed with vibratory hammer
- Filling approximately 20,600 square feet [0.47 acre] of two existing embayments and filling 2,833 square feet [0.06 acre] behind the cutoff wall for the construction of new embayments (permanent disturbance)
- Demolition of the existing esplanade in areas where new embayments will be constructed (resulting in 22,764 square feet [0.52 acre] of temporary disturbance)
- Pile drilling for the installation of ten 8-foot diameter shafts and installation of five footings to be placed atop of the shafts for the shared use flyover bridge (resulting in approximately 652 square feet [0.01 acre] of permanent disturbance)
    - 48-inch diameter steel caissons and 12-inch steel micropiles installed with drill rig

The reasonable worst-case scenario assumes the use of barges for construction due to the site constraints of East River Park that include limited vehicular access and extent of ongoing construction activities in the park. Approximately 600,000 cubic yards of fill is estimated to be required for the construction under the Preferred Alternative. An average of 3 barge trips per day are anticipated throughout the 3.5-year construction period. East River is a busy maritime port with tour boats, tugs, barges, and recreational vessels traversing the waters 24 hours a day. The United States Coast Guard (USCG) operates a harbor surveillance system to help provide separation between large vessels. The maritime trips generated by construction of the proposed project are expected to be limited to tug-assisted barges for equipment and materials. All of these vessels are operated by captains licensed by USCG. The origin of the source material and vessel routes are not yet known. Temporary construction barging operations would primarily require the installation of mooring spuds and monopile dolphins on the East River floor that would resulting in approximately 160 square feet (0.003 acre) of temporary disturbance. The construction would likely involve the use of equipment such as barge-mounted cranes and a vibratory pile driver or other drilling equipment to place the mooring spuds and monopile dolphins. At the completion of construction, all barge components would be removed. Operations of the proposed project will not result in a permanent increase of vessel traffic in the area.

To relocate and reconstruct the ten sewer outfalls, a watertight cofferdam would be installed adjacent to the bulkhead at each sewer outfall location and the work area would be dewatered. The top of the cofferdam would be above the mean higher-high water line to isolate the work area from tidal influence. The work area would not contain standing water and approved dewatering measures would be installed, as necessary, and would discharge below the mean higher-high water line. A portable sediment tank or approved equivalent would be used to treat dewatering effluent. Approximately 1,000 square feet (0.02 acre) of temporary disturbance to regulated shallow open water between the cofferdams and East River bulkhead is anticipated for each sewer outfall for a total temporary disturbance area of 10,000 square feet (0.23 acre). Existing sewer infrastructure is anticipated to be filled with concrete and abandoned in place.

To install the new cut-off wall, the existing bulkhead must first be demolished. Turbidity curtains would be installed prior to the start of demolition activities along the entire length of the bulkhead. In the same alignment as the bulkhead, the cut-off wall sheet piles would be pile driven, initially vibrated down and then driven to final tip elevation. Where obstructions are encountered some pre-drilling may be needed prior to installing the cut-off wall sheet piles. In areas where the entire esplanade would be demolished to accommodate the construction of new embayments, debris nets would be utilized to minimize the amount of debris falling into the waterway. Any large debris would be retrieved and disposed of in accordance with applicable regulations and best practices.

At the existing embayments, the area inland of the cutoff wall would be backfilled, which would involve the loss of approximately 20,600 square feet (0.47 acre) of existing shallow open water (unconsolidated bottom). Significant consideration was given to the relocation of the embayments throughout the design process of East River Park. The existing embayments were created as part of the esplanade redesign in 2005–2008 to make the East River more accessible to park users and heighten their experience of the river and its currents and tidal flow. They consist of narrow areas that allow tidal water from the East River to flow beneath pedestrian bridges along the esplanade. These pedestrian bridges cause shading of significant portions of the water below. The majority of the existing embayments consist of rocky fill material that was placed as part of their recent construction to improve slope stabilization. The current design proposes to shift the location of

embayments along the shoreline of East River Park in order to site heavily utilized recreation elements and to preserve the important relationship of connecting the community to the water. Knowing the implications of altering aquatic habitat, the redesign has proposed that the relocated embayments would be of comparable or larger size (approximately 26,000 square feet [0.47 acre] in total) with improved habitat conditions, including the elimination of bridges that shade aquatic habitat, which can reduce benthic productivity and biomass. In addition, the provision of habitat enhancements designed for the recruitment of shellfish and other aquatic life along East River Park is also being explored.

To install the shafts and footings associated with the flyover bridge, the current assumption includes use of land-based drill rigs positioned in East River Park, the East River Greenway path and the Con Edison pier to install these support structures south of East 15th Street. Drilling for footings to be installed along Captain Patrick J Brown walk would be performed using barge mounted drill rigs. Pile drilling activities for the flyover bridge would involve the installation of a turbidity curtain and sinking of the pipe with a rotating cutter head to push the pipe into the river bed. After sinking the pipe, a rebar cage is lowered prior to installing a tremie pipe. Concrete is then pumped into the tremie pipe. As the tremie pipe is filled with concrete, river water and sediment within that pipe is gradually displaced or may require pumping to remove the sediment and water. In either case, the discharge material would be tested for quality before being discharged either to the river or the existing sewer system. Once the installation of these components is complete, the rebar cage, tremie pipe and any turbidity curtains would be removed.

Table 1

Temporary Disturbances and Permanent Impacts to Regulated Waters

Impact Type	Area of Disturbance or Impacts (Sq. Ft.)	
Temporary Disturbances	Reconstructed Sewer Outfalls	10,000
	Demolition of Bulkhead for Cut-off Wall Installation	7,284
	Demolition of Areas of Existing Esplanade	22,764
	Construction Barge Moorings	160
	Total	**40,208**
Permanent Impacts	Flyover Bridge Shafts	502
	Flyover Bridge Footings	150
	Filling Northern Embayment	16,000
	Filling Southern Embayment	4,600
	Filling Behind Cut-off Wall for New Embayments (Existing Esplanade)	2,833
	Total	**24,085**

Summary of Protective Measures

Design and construction phasing planning for the Preferred Alternative is ongoing. However, pile driving and pile drilling associated with installation of the support structures of the shared use flyover bridge, the cut-off wall in the alignment of the existing bulkhead, and the cofferdams to protect the work area of sewer outfall reconstruction are anticipated to take place adjacent to and within the East River. The noise generated by pile driving and pile drilling that would be associated with construction of the Preferred Alternative is known to cause behavioral and physiological impacts to fish. Due to the potential for adverse effects to fish, the City has committed to implementing conservation measures for in-water pile installation associated with the Preferred Alternative including:

- **Cushion blocks**. Cushion blocks are wooden blocks placed on the top of the pile and act as a buffer between the impact hammer and the pile, reducing total noise from each impact.
- **Pile driving ramp up**. Pile driving would begin with a series of low impact hits and gradually increase to normal impact levels. This method allows for some warning to aquatic fauna prior to attaining peak noise levels of the pile driving.
- **Bubble Curtains**. Bubble curtains are hoses or manifolds that are placed on the sea floor around the project impact area. Air compressors disburse air into the hoses and air bubbles then discharge up into the water column. Bubble curtains have been shown to be effective at reducing the sound level of pile driving to acceptable underwater levels. Where practicable, bubble curtains would be used during installation of support structures for the shared use flyover bridge.

Moreover, to reduce suspension of sediment into the water column to the greatest extent practicable, turbidity curtains would be installed prior to any construction, where practicable. Sediments in the East River are anticipated to be contaminated due to historic land uses. All sediments removed from the flyover bridge support shaft casings will be handled, stored, and disposed of in accordance with all applicable health, safety, and sediment and waste management plans including a site specific Remedial Action Plan (RAP), a Construction Health and Safety Plan (CHASP), a NYSDEC approved stormwater pollution prevention plan (SWPPP), and a U.S. Environmental Protection Agency (USEPA) approved spill prevention control and countermeasures plan (SPCCP).

Disturbances due to the construction associated with the reconstruction of the sewer outfalls, replacement of the existing bulkhead with a new cut-off wall, demolition of areas of the esplanade, and the use of construction barges would be temporary in nature. Turbidity curtains and debris nets would be utilized as practicable to prevent loosened sediment and debris from entering the waterway. Upon completion of construction, the spuds, barges, turbidity curtains and debris nets would be removed, and the affected area would be allowed to naturally restore to pre-construction conditions. The temporary adverse effects would not affect the classification of the East River; would likely not diminish the habitat for a resident or migratory endangered, threatened or rare animal or plant species or species of special concern; would not contribute to a cumulative loss of habitat or function which diminishes the ability of Littoral Zone habitat to perform its primary function; would not affect a resources that is large, unusual or singular; or noticeably decrease this resource's ability to serve its various functions.

Alternatives Assessed

Three other "with action" alternatives were assessed alongside the Preferred Alternative. The Flood Protection System on the West Side of East River Park – Baseline Alternative, referred to as Alternative 2, The Flood Protection System on the West Side of East River Drive – Enhanced Park and Access Alternative (Alternative 3), and The Flood Protection System East of FDR Drive (Alternative 5). While the first two alternatives mentioned would have fewer in-water construction components than the Preferred Alternative, the construction period would be longer (5 years as compared to 3.5 years), which would constitute a longer time of construction related impacts such as construction barging. The last "with action" alternative includes the same in-water construction elements as the Preferred Alternative with additional fill required in the East River to accommodate the substructure for the raised FDR platform.

The City evaluated and reviewed the proposed alternatives' conceptual design against the principal objectives of the project, including providing a reliable flood protection system for the protected area, improving access to and enhancing open space resources along the waterfront, and meeting HUD funding deadlines for federal spending, along with the goal to minimize potential environmental effects and disruptions to the community. With the implementation of the Preferred Alternative, which is described above, East River Park would experience significant risk reduction from flooding and inundation from sea level rise in addition to substantial enhancements to its value as a recreational resource and providing flood protection to the inland communities. East River Park is crucial parkland in a neighborhood that is already deficient in open space resources when compared to the City's guidelines and optimal planning goals for ratios of open space acreage per 1000 residents. Protecting East River Park by installing the flood protection near the shoreline aims to ensure that this valuable resource is resilient to future storms and sea level rise, and available for community use rapidly following a storm event.

Park user experience would be enhanced with the reconstruction of East River Park and the reconstruction of pedestrian bridges to improve access. Additionally, a long-standing deficiency along the East River Greenway at the Con Edison 13th Street Generating Station would be remedied with the construction of a shared-use pedestrian/bicyclist flyover bridge linking East River Park and Captain Patrick J. Brown Walk, substantially improving the City's greenway network. In addition, Stuyvesant Cove Park, Murphy Brothers Playground, and Asser Levy Playground would be reconstructed and improved, resulting in enhanced recreational spaces throughout the project area. The selection of this alternative also allows for a shorter construction duration and park closure, earlier deployment of the flood protection system (which is expected to be completed in mid-2023), and reduced construction disruption along the FDR Drive.

CONSULTATION HISTORY TO DATE

To implement the proposed project, the City is receiving funds from HUD, a federal agency, and is therefore subject to Section 7 of the Endangered Species Act as well as the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended. Requests for concurrence on findings regarding threatened and endangered species and EFH were previously submitted to NMFS on January 25, 2016. A project update was provided on May 26, 2016 (with a follow up email transmitting these materials on May 27, 2016) to request additional guidance on the addition of a new potential project alternative that would create a more robust line of protection

and eliminate the need for closure structures across the FDR (Alternative 5). The original consultation requests, all correspondence associated with those requests, and NMFS' responses are provided in **Attachment 3**.

The in-water work for the project at that time included:

- Installation of a turbidity curtain prior to installing the cofferdam.
- Installation of 24-inch steel sheet piles to be used as a cofferdam. The sheet piles were installed via a vibratory or impact hammer, depending on subsurface conditions. The area enclosed by the sheet piles was anticipated to measure approximately 300 square feet (0.006 acre).
- Removal of the piles after the completion of the project.
- The construction of an outfall that occurred in a dewatered cofferdam.

NMFS returned the results of the EFH consultation on April 14, 2016 and concurred with the findings that adverse effects associated with the proposed in-water activities would be minimal and did not recommend conservation measures be implemented.

As noted above, a project update was provided on May 26, 2016, to request additional guidance on the addition of a new potential project alternative and a response was received from NMFS on June 2, 2016 that concurred that the proposed modification would not increase effects to EFH and that no reinitiation for consultation was necessary..

Due to the larger portion of habitat that will be impacted or modified in the current proposed project, we are requesting reinitiation of consultation.

DESCRIPTION OF ACTION AREA

The action area is comprised of "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50CFR§402.02). The action area for this analysis of EFH includes the area of direct impact, and all noise, water quality, and vessel traffic stressors. Based on this, the action area includes a 400-foot buffer surrounding the project areas and includes 127 acres of water and 2.2 miles of shoreline of the East River that abuts the project areas. For the purpose of this consultation, the action area is limited to the East River, and the center point is located at 40^{0}43'28.084" North, 73^{0}58'27.401" West.

The area of direct impact is comprised of the following elements:

- Construction barge moorings – 160 square feet (0.003 acre) (temporary)
- Cofferdams for sewer outfall reconstruction – 10,000 square feet (0.23 acre) (temporary)
- Demolition of bulkhead for cut-off wall installation – 7,284 square feet (0.17 acre) (temporary)
- Filling of existing embayments – 20,600 square feet (0.47 acre) (permanent)
- Demolition of existing esplanade – 22,764 square feet (0.52 acre) (temporary)
- Filling behind cut-off wall for the construction of the new embayments – 2,833 square feet (0.06 acre) (permanent)
- Flyover bridge substructure – 652 square feet (0.01 acre) (permanent)

The East River is a tidal strait that connects New York Harbor with Long Island Sound. The river is approximately 16 miles long and generally ranges between 600 to 4,000 feet wide. The lower East River, which runs from the Battery in Manhattan to Hell Gate in Queens, is narrower and deeper than the upper East River, which runs from Hell Gate in Queens to Long Island Sound. Mean depth of the lower East River is approximately 30 feet below mean low water (Blumberg and Pritchard, 1997); however, depth varies and can be as deep as approximately 65 feet below mean low water (USACE, 2015).

Surface Water Resources

The East River's circulation and salinity structure are largely determined by conditions in the Upper Harbor and Long Island Sound. Currents in the East River are swift and can approach 8 feet/second (Bowman, 1976). The strong currents are a result of the width of the East River, its channelization and bottom topography, and the influence of tidal water from the Hudson River, Harlem River, and Long Island Sound. Ebb tides are particularly powerful. A large difference in water surface elevation from the Long Island Sound to The Battery also contributes to the strong currents (Blumberg and Pritchard, 1997).

Freshwater input into the East River consists of several systems: the Bronx River, Westchester Creek, and the Hudson River. Additionally, overland flow, combined sewer overflow, and point source discharges from wastewater treatment plants account for freshwater inputs into the East River. There are over 100 combined sewer overflow outfalls in the lower East River, with 23 occurring along the shoreline of Project Area One and Project Area Two (OASIS, 2014).

Wetland Resources

The entire East River shoreline within the action area is bulkheaded. The East River is mapped by The National Wetlands Inventory as estuarine subtidal wetlands with an unconsolidated bottom (E1UBL) (**Figure 3**). Subtidal estuarine wetlands are defined by United States Fish and Wildlife Service as deep-water tidal habitats and adjacent tidal wetlands that are influenced by water runoff, often enclosed by land, that have low energy and variable salinity. Unconsolidated bottoms have at least 25 percent cover of particles smaller than six to seven centimeters and less than 30 percent vegetative cover (Cowardin et. al., 1979).

The action area also includes New York State Department of Environmental Conservation (NYSDEC) regulated littoral zone tidal wetland (**Figure 4**). Littoral zone is defined as "the tidal wetland zone that includes all lands under tidal waters which are not included in any other category. There shall be no littoral zone under waters deeper than six feet at mean low water (6NYCRR Part 661)." NYSDEC tidal wetland maps indicate that the entire East River constitutes littoral zone. However, much of the East River exceeds depths of six feet below mean low water. Based on observations made during the low tide shoreline surveys, it is anticipated that there are portions of the East River adjacent to or underneath the bulkhead that are six feet deep or less at mean low water and, therefore, have the littoral zone classification. This includes two existing embayments, which are areas where the shoreline curves inward, located along the East River just north and south of the Houston Street entrance to the park. These embayments were created as part of the esplanade redesign in 2005–2008 to make the East River more accessible to park users and heighten their experience of the river and its currents and tidal flow. They consist of small areas that allow tidal water from the East River to flow beneath short

pedestrian bridges along the esplanade onto a rip rap slope that ends at the bulkhead (**Figure 5**). The existing northern and southern embayments were constructed with pedestrian bridges spanning across the embayment, shading significant portions of the water below. The majority of both embayments consist of rocky fill material that was placed as part of the recent reconstruction to improve slope stabilization. The southern embayment is approximately 4,600 square feet (0.10 acre), of which approximately 3,600 square feet (0.08 acre, 78 percent) is shaded by the short pedestrian bridge; the northern embayment is approximately 16,000 square feet (0.37 acre), of which approximately 5,200 square feet (0.12 acre, 32 percent) is shaded.

Water Quality

Title 6 NYCRR Part 701 is the regulatory framework that classifies surface water and groundwater in New York State. The lower portion of the East River within the action area is a Class I saline surface water body. Class I water bodies are best suited for secondary contact, which includes fishing and recreational activities. Wildlife species should be capable of establishing successful habitats in these waters. Prolonged physical contact, such as swimming in these waters, is not advised. Consumption of fish from this classification of water body is restricted or not advised.

DEP has monitored New York Harbor water quality since 1909 through the Harbor Survey. Over the past twenty years, Harbor Survey data show that the water quality of New York Harbor has improved significantly as a result of measures undertaken by the City (DEP 2012). These measures include eliminating 99 percent of raw dry-weather sewage discharges, reducing illegal discharges, increasing the capture of wet-weather related floatables, and reducing the toxic metals loadings from industrial sources by 95 percent (DEP 2002). The 1999 and 2000 Interstate Environmental Commission (IEC) 305(b) reports also indicate that the year-round disinfection requirement for discharges to waters within its district (including New York Harbor) has contributed significantly to water quality improvements since the requirement went into effect in 1986 (IEC 2000, 2001). In the 2012 State of the Harbor Report, seven of the eight water quality performance metrics showed an improvement in the Inner Harbor (DEP 2012).

Dissolved oxygen in the water column is necessary for respiration by all aerobic forms of life, including fish and invertebrates such as crabs, clams, and zooplankton. The bacterial breakdown of high organic loads from various sources can deplete dissolved oxygen to low levels and persistently low dissolved oxygen can degrade habitat and cause a variety of sublethal or, in extreme cases, lethal effects. Consequently, dissolved oxygen is one of the most common indicators of overall water quality in aquatic systems. Dissolved oxygen concentrations in the Inner Harbor area have increased over the past 30 years from an average of below 3 mg/L in 1970 to above 5 mg/L in 2001, a value supportive of ecological productivity (DEP 2002). Dissolved oxygen concentrations in the study area at Harbor Survey Station E2, adjacent to the proposed project area, ranged from 4.03 to 10.67 mg/l at the surface and from 3.80 to 10.71 mg/l in bottom waters in 2017 (DEP 2017). The lower dissolved oxygen values were recorded during the summer months.

Secchi transparency measures the clarity of surface waters. Transparency greater than five feet is indicative of clear water. Decreased clarity can be caused by high suspended solid concentrations or blooms of plankton. Secchi transparencies less than three feet are generally indicative of poor water quality conditions. Average secchi readings in the Inner Harbor area have remained relatively consistent since measurement of this parameter began in 1986, ranging

between about 3.5 and 5.5 feet (DEP 2012). For the Harbor Survey Monitoring Program in 2017, secchi transparency at Station E2, located within the action area averaged 3.3 feet (DEP 2017).

Aquatic Resources

The East River is an urban water body situated along the shores of the boroughs of Queens, Manhattan, and Brooklyn. The variation in sources of runoff affect the type of biota that can exist in the river where a wide array of conditions must be tolerated.

Phytoplankton/Zooplankton

Phytoplankton are microscopic plants whose movements are largely dictated by prevailing tides and currents. Light penetration, turbidity, and nutrient concentrations are important in determining phytoplankton productivity and biomass. Organisms found in Long Island Sound and Hudson River are also usually found in the East River due to the proximity of these waterbodies to each other and strong currents.

Zooplankton are an integral component of aquatic food webs. They are primary grazers on phytoplankton and detritus material and are themselves used by organisms of higher trophic levels as a food source. The higher-level consumers of zooplankton typically include forage fish, such as bay anchovy, as well as commercially and recreationally important species, such as striped bass (*Morone saxatilis*) and white perch (*Morone americana*) during their early life stages.

Submerged Aquatic Vegetation and Benthic Algae

Submerged aquatic vegetation (SAV) refers to rooted aquatic plants that are often found in shallow areas of estuaries. These organisms are important because they provide nursery and refuge habitat for fish. Benthic algae can be large multicellular plants that can be important primary producers in the aquatic environment. They are often seen on rocks, jetties, pilings, and sandy or muddy bottoms (Hurley 1990). Since these organisms require sunlight as their primary source of energy, the limited light penetration of New York Harbor limits their distribution to shallow areas. Light penetration, turbidity, and nutrient concentrations are all important in determining SAV and benthic algae productivity and biomass. Surveys conducted in the action area documented sea lettuce and rockweed, which are species of benthic algae, occurring on intertidal riprap at several locations along the shoreline including just north of Pier 42, the riprap coves at Stanton Street and East 4th Street, and at Stuyvesant Cove Park. No SAV was observed within the action area.

Benthic Invertebrates

Over 100 benthic invertebrate taxa (mostly crustaceans or polychaete worms) have been identified in the East River (Coastal Environmental Services 1987). Two benthic invertebrate sub-communities were identified in the East River in the vicinity of the proposed project on the basis of substrate hardness (Hazen and Sawyer 1983). The hard substrate community is characterized by organisms that are either firmly attached to rocks and other hard objects (e.g., mussels or barnacles), or that build or live in tubes. Species of polychaete worms, amphipods, and several other species have adapted to the East River's hard bottoms and rapid currents by living within the abandoned tubes of other species. The soft substrate community occurs in the more protected areas within the East River where detritus, clay, silt, and sand have accumulated

in shallow, low velocity areas near piers and pilings. Common soft substrate organisms included oligochaete worms, the soft-shelled clam *Mya arenaria*, and a variety of flatworms, nemerteans, polychaetes, and crustaceans (Hazen and Sawyer 1985). Recent benthic and epibenthic sampling by DEP in the lower East River documented nine benthic macroinvertebrate taxa, including annelids, arthropods, and mollusks. The annelid *Haploscoloplos robustus* and mollusks *Melampus bidentatus* and *Mulinia lateralis* were found in the highest densities (DEP 2007). Benthic macroinvertebrates sampled between Piers 6 and 9 on the Manhattan shoreline of the East River south of the proposed project area in 2002 found mostly pollution-tolerant taxa (primarily polychaetes in the families *Capitellidae* and *Spionidae*), although some pollution-sensitive species (e.g., *Ampelisca* spp.) were also found. Other invertebrates collected were mussels, crabs, shrimp, isopods, and nematodes (AKRF 2002).

Fish

The finfish community in Upper New York Harbor, including the lower East River, is typical of large coastal estuaries and inshore waterways along the Mid-Atlantic Bight, supporting a variety of estuarine, marine, and diadromous fish species that use this area as spawning grounds, a migratory pathway, or nursery/foraging habitat. American eel (*Anguilla rostrata*), blueback herring (*Alosa aestivalis*), alewife (*Alosa pseudoharengus*), American shad (*Alosa sapidissima*), hickory shad (*Alosa mediocris*), striped bass, tomcod, Atlantic sturgeon (*Acipenser oxyrhynchus oxyrhynchus*), and rainbow smelt (*Osmerus mordax*) are diadromous fish that may pass through the East River during migration to and from spawning areas in the upper Hudson River and its tributaries (NOAA 2001). Transient shortnose sturgeon (*Acipenser brevirostrum*) also have the potential to occur briefly in the East River (Bain 1997). Examples of marine species found in the East River from spring through fall include bluefish (*Pomatomus saltatrix*), scup (*Stenotomus chrysops*), black sea bass (*Centropristis striata*), tautog, and weakfish (*Cynoscion regalis*) (NOAA 2001). Overall, the East River's fish community is spatially and seasonally dynamic.

NMFS ESSENTIAL FISH HABITAT AND FISH AND WILDLIFE COORDINATION ACT SPECIES

Essential Fish Habitat Species

The action area is located within the Hudson River Estuary EFH. 16 species of fish in one or multiple life stages have EFH identified in this region. **Table 2** indicates the potential life stages present and these species are described in greater detail below.

Table 2

Species with Essential Fish Habitat within the Natural Resources Study Area

Species	Eggs	Larvae	Juveniles	Adults
Red hake (*Urophycis chuss*)	N/A	X	X	X
Winter flounder (*Pseudopleuronectes americanus*)	X	X	X	X
Windowpane flounder (*Scophthalmus aquosus*)	X	X	X	X
Atlantic herring (*Clupea harengus*)	N/A	X	X	X
Bluefish (*Pomatomus saltatrix*)	N/A	N/A	X	X
Atlantic butterfish (*Peprilus triacanthus*)	N/A	X	X	X
Summer flounder (*Paralichthys dentatus*)	N/A	X	X	X
Black sea bass (*Centropristis striata*)	N/A	N/A	X	X

Table 2 Cont.
Species with Essential Fish Habitat within the Natural Resources Study Area

King mackerel (*Scomberomorus cavalla*)	X	X	X	X
Spanish mackerel (*Scomberomorus maculatus*)	X	X	X	X
Cobia (*Rachycentron canadum*)	X	X	X	X
Atlantic mackerel (*Scomber scombrus*)	X	X	X	X
Scup (*Stenotomus chrysops*)	X	X	X	X
Little skate (*Leucoraja erinacea*)	N/A	N/A	X	X
Clearnose skate (*Raja eglanteria*)	N/A	N/A	X	X
Winter skate (*Leucoraja ocellata*)	N/A	N/A	X	X

Notes:
X = Lifestage is present in study area.
N/A = The species does not have this lifestage in its life history or has no EFH designation for this lifestage.
Source:
National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the internet at http://www.greateratlantic.fisheries.noaa.gov/hcd/STATES4/conn_li_ny/40407350.html
NOAA. 2019. Correspondence from Karen Greene received on March 14, 2019.

Red hake (Urophycis chuss)
EFH for red hake larva consists of surface waters of the Gulf of Maine, Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras, North Carolina. Generally, the following conditions exist where red hake larvae are found: sea surface temperatures below 19°C, water depths less than 200 meters, and a salinity greater than 0.5 ppt (NMFS, 1998b). Red hake larvae have been reported from the Hudson-Raritan Estuary; however, they are most abundant at the middle and outer continental shelf throughout the Middle Atlantic Bight (Steimle et al., 1999).

EFH for red hake juveniles consists of bottom habitats with a substrate of shell fragments, including areas with an abundance of live scallops in the Gulf of Maine, on Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras. Generally, the following conditions exist where red hake juveniles are found: water temperatures below 16°C, depths less than 100 meters, and a salinity range from 31–33 ppt (NMFS, 1998b). Shelter is considered crucial for juvenile red hake (Steimle et al., 1999).

EFH for red hake adults consists of bottom habitats in depressions with a substrate of sand and mud in the Gulf of Maine, on Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras. Generally, the following conditions exist where non-spawning red hake adults are found: water temperatures below 12°C, depths from 10–130 meters, and a salinity range from 33–34 ppt (NMFS, 1998b). This salinity is above the range found in the East River. Additionally, non-spawning red hake are abundant in the Long Island Sound, but not in the Hudson-Raritan Estuary (Steimle et al., 1999). Spawning adult red hake are known to use the New York Bight primarily in May–June and will utilize waters with salinity less than 25 ppt. The East River meets this salinity range, however both non-spawning and spawning adults do not inhabit water with dissolved oxygen (DO) less than 3 parts per million (ppm). DO in the East River is at or below 3.0 ppm periodically during the summer (NYCDEP, 2015).

High-quality EFH for larval and juvenile red hake is not found in the East River, and red hake larvae and juveniles that occur in the East River are most likely transient. Adult red hake are known to occur in the East River from impingement and entrainment studies conducted at the Ravenswood Power Plant on the Queens side of the East River (Normandeau Associates, 1994).

However, adult red hake are not abundant in the Hudson-Raritan Estuary during any season (Stiemle et al., 1999a). Therefore, spawning and non-spawning adult red hake have the potential to occur in the East River but would most likely be transient individuals. Adult red hake would not be anticipated to be found in the East River during the summer when DO is periodically low.

Winter flounder (Pleuronectes americanus)

EFH for winter flounder eggs consists of bottom waters with a substrate of sand, muddy sand, mud and gravel on Georges Bank, the inshore areas of the Gulf of Maine, southern New England, and the middle Atlantic south to the Delaware Bay. Generally, the following conditions exist where winter flounder eggs are found: water temperatures less than 10°C, salinities between 10 to 30 ppt, and water depths less than 5 meters (NMFS, 1998c).

Winter flounder larvae EFH consists of pelagic and bottom waters of Georges Bank, the inshore areas of the Gulf of Maine, southern New England, and the middle Atlantic south to the Delaware Bay. Generally, the following conditions exist where winter flounder larvae are found: sea surface temperatures less than 15°C, salinities between 4–30 ppt, and water depths less than 6 meters (NMFS, 1998c).

EFH for winter flounder juveniles consists of bottom waters with a substrate of mud or fine-grained sand on Georges Bank, the inshore areas of the Gulf of Maine, southern New England, and the middle Atlantic south to the Delaware Bay. Young-of-the-year juveniles generally persist where the following conditions are found: water temperatures below 28°C, depths from 0.1–10.0 meters, and salinities between 5–33 ppt. Juveniles over one year old are generally found where the following conditions exist: water temperatures below 25°C, depths from 1–50 meters, and salinities between 10–30 ppt (NMFS, 1998c).

Adult winter flounder EFH consists of bottom waters with a substrate of mud, sand, and gravel on Georges Bank, the inshore areas of the Gulf of Maine, southern New England, and the middle Atlantic south to the Delaware Bay. Generally, the following conditions exist where winter flounder adults are found: water temperatures below 25°C, depths from 1–100 meters, and salinities between 15–33 ppt (NMFS, 1998c). Adults found in the Hudson-Raritan Estuary are known to utilize waters with salinities as low as 15 ppt, although most were found at salinities less than 22 ppt (Pereira et al. 1999). Spawning winter flounder are typically found in shallower, cooler bottom waters where the temperature is below 15°C, depth is less than 6 meters, and salinity is between 5.5–36 ppt (NMFS, 1998c). Winter flounder spawn between February and April in waters with temperatures lower than 15°C, salinities between 10 and 32 ppt, and on substrates like sand, gravel, or mud in depths less than 6 meters. Spawning winter flounder have the potential to be present in shallow areas of the East River. Winter flounder were collected during impingement and entrainment studies at the Ravenswood power plant on the Queens side of the East River and found to be the most abundant fish at the site (Normandeau Associates, 1994).

Windowpane flounder (Scopthalmus aquosus)

Windowpane flounder, also called sand flounder, is found from the Gulf of St. Lawrence to South Carolina and has its maximum abundance in the New York Bight. EFH for windowpane flounder eggs consists of surface waters around the perimeter of the Gulf of Maine, on Georges Bank, southern New England, and the middle Atlantic south to Cape Hatteras. Generally,

windowpane flounder eggs are found where sea surface temperatures are less than 20°C and water depths are less than 70 meters (NMFS, 1998d).

EFH for windowpane flounder larvae consists of pelagic waters (i.e., the water column of open coastal waters) around the perimeter of the Gulf of Maine, on Georges Bank, southern New England, and the middle Atlantic south to Cape Hatteras. Generally, windowpane flounder larvae are found where sea surface temperatures are less than 20°C, and water depths are less than 70 meters (NMFS, 1998d). Based on collections from southern New Jersey, it appears that settlement of spring-spawned individuals occurs both in estuaries and on the continental shelf, while settlement of autumn-spawned individuals occurs primarily on the continental shelf (Chang et al., 1999).

EFH for juvenile windowpane flounder consists of bottom habitats with a substrate of mud or fine-grained sand around the perimeter of the Gulf of Maine, on Georges Bank, southern New England and the middle Atlantic south to Cape Hatteras (NMFS, 1998d). Generally, the following conditions exist where windowpane flounder juveniles are found: water temperatures below 25°C, depths between 1–100 meters, and salinities between 5.5–36 ppt (NMFS, 1998d). In the Hudson-Raritan Estuary, juveniles were fairly evenly distributed throughout the estuary, but were most abundant in the deeper channels in winter and summer (Wilk et al., 1996).

EFH for adult windowpane flounder consists of bottom habitats with a substrate of mud or fine-grained sand around the perimeter of the Gulf of Maine, on Georges Bank, southern New England and the middle Atlantic south to the Virginia-North Carolina border. Generally, the following conditions exist where windowpane flounder adults are found: water temperatures below 21°C, depths between 1–75 meters, and salinities between 5.5–36 ppt. Adult windowpane flounder are sensitive to hypoxic conditions and have been found to avoid conditions where DO levels were less than 3 ppm (Howell and Simpson 1994). During the summer, DO in the water column and bottom waters of the East River can be reduced to less than 3 ppm, making this unsuitable habitat for windowpane flounder.

Atlantic herring (Clupea harengus)

EFH for Atlantic herring larvae consists of pelagic waters in the Gulf of Maine, Georges Bank, and southern New England. Generally, the following conditions exist where Atlantic herring larvae are found: sea surface temperatures below 16°C, water depths from 50–90 meters, and salinities around 32 ppt (NMFS, 1998e). The East River does not contain suitable depth or salinity for Atlantic herring larvae. Therefore, no substantial effects to Atlantic herring larvae EFH are anticipated as a result of the proposed project.

EFH for Atlantic herring juveniles and adults consists of pelagic waters and bottom habitats in the Gulf of Maine, Georges Bank, southern New England, and the middle Atlantic south to Cape Hatteras. Generally, the following conditions exist where Atlantic herring juveniles and adults are found: water temperatures below 10°C, water depths from 15–135 meters, and a salinity range from 26–32 ppt. The East River is on the low end of the preferred salinity for juvenile and adult Atlantic herring (NMFS, 1998e).

Atlantic herring juveniles and adults are known to occur in the Hudson-Raritan Estuary in winter and spring from bottom trawling surveys (Stevenson and Scott, 2005) and have been collected during entrainment studies at the Ravenswood power plant in Queens (Normandeau Associates, 1994). However, water temperatures in other seasons in the East River would likely be too high to support juvenile and adult Atlantic herring. Juvenile and adult Atlantic herring prefer DO in bottom habitats between 6–12 ppm. Water quality monitoring in the East River shows DO at the

bottom of the East River is only suitable for Atlantic herring in the winter and spring (NYCDEP, 2015). Atlantic herring could potentially utilize the East River during winter and spring when DO and water temperatures are suitable.

Bluefish (Pomatomus saltatrix)

EFH for juvenile bluefish consists of pelagic waters over the continental shelf from Nantucket Island south to Key West, and estuaries from Penobscot Bay south to coastal Florida. Generally, juvenile bluefish prefer water temperatures between 19–24°C and salinities between 23–36 ppt (NMFS, 1998f). Trawl surveys in the Hudson-Raritan Estuary found juvenile bluefish throughout the area in all depths sampled during the summer and fall, and no occurrences of juvenile bluefish during the winter and spring (Fahay et al., 1999).

Adult bluefish EFH consists of pelagic waters over the continental shelf from Nantucket Island south through Key West, and estuaries from Penobscot Bay, Maine south to Key West, Florida. Generally, juvenile bluefish prefer water temperatures between 14–16°C and salinities greater than 25 ppt (NMFS, 1998f). Adult bluefish are highly migratory and occur seasonally in Mid-Atlantic estuaries from April to October (Fahay et al., 1999). Due to their migratory tendencies, any adult bluefish that occur in the East River would be anticipated to be transient individuals.

Atlantic butterfish (Peprilus triacanthus)

EFH for Atlantic butterfish larvae consists of pelagic waters over the continental shelf from the Gulf of Maine to Cape Hatteras, and estuaries from Boston Harbor south to the Chesapeake Bay. Generally, the following conditions exist where Atlantic butterfish larvae are found: water temperatures between 9–19°C, salinities between 6.4–37 ppt, and water depths between than 10–1,829 meters (NMFS, 1998f).

Juvenile Atlantic butterfish EFH consists of pelagic waters over the continental shelf from the Gulf of Maine through Cape Hatteras, and estuaries from Boston Harbor south to the James River in Virginia. Generally, the following conditions exist where Atlantic butterfish juveniles are found: water temperatures between 3–28°C, salinities between 3–37 ppt, and water depths between 10–365 meters (though most are found at depths less than 120 meters) (NMFS, 1998f).

EFH for Atlantic butterfish adults consists of pelagic waters over the continental shelf from the Gulf of Maine through Cape Hatteras, and estuaries from Boston Harbor south to the James River in Virginia. Generally, the following conditions exist where Atlantic butterfish juveniles are found: water temperatures between 3–28°C, salinities between 4–26 ppt, and water depths between 10–365 meters (though most are found at depths less than 120 meters) (NMFS, 1998f). Adults are most common in the New York Harbor in the summer and have been found over shallow flats, estuaries, and may congregate on the bottom during the day.

In Hudson-Raritan trawl surveys, juvenile and adult Atlantic butterfish were collected at water temperatures ranging from 8–26ºC, depths ranging from 3–23 meters, salinities ranging from 19–32 ppt, and DO levels ranging from 3–10 ppm (Cross et al, 1999). Atlantic butterfish is primarily a pelagic species (Woodhead, 1990), and although Atlantic butterfish may be present in the East River, it is primarily anticipated to use the East River as a migratory route and therefore their presence would be transient.

Summer flounder (Paralicthys dentatus)
EFH for summer flounder larvae consists of pelagic waters over the continental shelf from the Gulf of Maine south to the east coast of Florida, and estuaries from the Waquoit Bay, Massachusetts south to the Indian River, Florida. Generally, the following conditions exist where summer flounder larvae are found: water temperatures between 9–12°C, salinities between 23–33 ppt, and water depths between 10–70 meters (NMFS, 1998f).

EFH for summer flounder juveniles consists of bottom habitat with mud or sand substrates in continental shelf waters from Gulf of Maine south to the east coast of Florida, and estuaries from the Waquoit Bay south to the Indian River. Generally, the following conditions exist where summer flounder juveniles are found: water temperatures greater than 11°C, salinities between 10–30 ppt, and water depths between 0.5–5 meters (NMFS, 1998f).

EFH for summer flounder adults consists of bottom habitat with mud or sand substrates in continental shelf waters from Gulf of Maine south to the east coast of Florida, and estuaries from the Buzzards Bay, Massachusetts south to the Indian River (NMFS, 1998f). Generally, adults are found at depths up to 25 meters and in temperatures ranging from 9–26°C in the autumn, 4–13°C in the winter, 2–20°C in the spring, and 9–27°C in the summer. Salinity is known to have minimal effect on distribution in comparison to substrate preference. Trawl surveys from 1992 to 1997 found adult summer flounder to be present in moderate numbers throughout the Hudson-Raritan Estuary in all seasons except winter (Packer et al., 1999; Zetlin et. al., 1999).

Black sea bass (Centropristus striata)
EFH for black sea bass juveniles consists of demersal waters over the continental shelf from the Gulf of Maine to Cape Hatteras, and estuaries from Buzzards Bay south to the James River. Generally, juvenile black sea bass are found in waters warmer than 6°C with salinities greater than 18 ppt, and depths between 1–28 meters. Juvenile black sea bass are found in the estuaries in the summer and spring and overwinter offshore from New Jersey and south. Juvenile black sea bass require structural complexity in both offshore and inshore substrates including rough bottoms, shellfish and eelgrass beds, and man-made structures in sandy-shelly areas. Offshore clam beds and shell patches may also be used during the wintering (NMFS, 1998h; Drohan et al., 2007). Black sea bass were captured during impingement and entrainment studies at the Ravenswood power plant in Queens (Normandeau Associates, 1994).

EFH for black sea bass adults consists of demersal waters over the continental shelf from the Gulf of Maine to Cape Hatteras, and estuaries from Buzzards Bay south to the James River. Black sea bass adults are generally found in estuaries from May through October and overwinter offshore south of New York to North Carolina from November through April. Generally, adult sea bass are found in waters warmer than 6°C with salinities greater than 20 ppt, and depths between 20–50 meters. Structured habitats (natural and man-made), sand and shell rocky reefs, cobble and rock fields, stone coral patches, exposed stiff clay, and mussel beds are usually the substrate preference (NMFS, 1998h; Drohan et al., 2007). Spawning occurs in the Mid-Atlantic Bight in April through October. Black sea bass are only present in the inshore areas of the New York Harbor in the winter months. Due to the preference of black sea bass for structured habitats, they are not uncommonly found underneath man-made structures such as docks and piers. Therefore, it is likely that black sea bass juvenile and adults are present in the study area.

King mackerel (Scomberomorus cavalla)
King mackerel are marine species of fish that can occur as far north as Rhode Island and south to Brazil. They are most common in warmer waters around the Chesapeake Bay southward. EFH for King mackerel eggs, larvae, juveniles, and adults consists of sandy shoals of capes and offshore bars, high profile rocky bottom and barrier-island ocean-side waters from the surf to the shelf break zone, from the Gulf Stream shoreward, including *Sargassum*, coastal inlets, and all state-designated nursery habitats of particular importance to coastal migratory pelagic species (NMFS, 1998i). King mackerel generally favor deeper and warmer waters than are typically found in the East River. Any king mackerel in the East River would be anticipated to be rare and transient individuals.

Spanish mackerel (Scomberomorus maculatus)
Spanish mackerel are marine species of fish that can occur as far north as Connecticut and south to the Yucatan Peninsula. They are most common between the Chesapeake Bay and the Gulf of Mexico. Spanish mackerel overwinter in waters off of south Florida. EFH for Spanish mackerel eggs, larvae, juveniles, and adults consists of sandy shoals of capes and offshore bars, high profile rocky bottom and barrier-island ocean-side waters from the surf to the shelf break zone, from the Gulf Stream shoreward, including *Sargassum*, coastal inlets, and all state-designated nursery habitats of particular importance to coastal migratory pelagic species (NMFS, 1998i). Spanish mackerel generally favor higher salinities (greater than 30 ppt) and warmer waters (18°C or more). Any Spanish mackerel in the East River would be anticipated to be rare and transient individuals.

Cobia (Rachycentron canadum)
Cobia is a large, highly migratory species that is known to occur from Cape Cod, Massachusetts to Argentina (ESS, 2013). EFH for cobia eggs, larvae, juveniles, and adults consists of sandy shoals of capes and offshore bars, high profile rocky bottom and barrier-island ocean-side waters from the surf to the shelf break zone, from the Gulf Stream shoreward, including *Sargassum*, coastal inlets, high-salinity bays, estuaries, and seagrass habitat. Information about the distribution of cobia lifestages on the East Coast is limited. However, cobia are most abundant in the Gulf of Mexico where they spawn and then leave the Gulf to commence extreme migrations. No cobia lifestages were documented in entrainment studies at the Ravenswood power plant (Normandeau Associates, 1994). Any cobia in the East River would be anticipated to be rare and transient individuals.

Atlantic mackerel (Scomber scombrus)
Atlantic mackerel are found in the western Atlantic Ocean from Laborador, Canada to Cape Lookout, North Carolina and is extremely common occurring in huge sholas in the pelagic zone down to about 200 meters (NOAA, 2019a). EFH for all life stages of Atlantic mackerel is pelagic habitats in inshore estuaries and embayments. It spends the warmer months close to shore and near the ocean surface, appearing along the coast in spring and departing for deeper and more southern water in fall and winter. Juvenile and adult Atlantic mackerel feed primarily on pelagic organisms such as crustaceans, fish, and squid. The Atlantic mackerel is an active fish that must keep in constant motion to bring in enough oxygen for survival. Atlantic mackerel are fast growers and can reach 16.5 inches and 2.2 pounds. There are two major spawning groups in the western Atlantic: the southern group spawns primarily in the Mid-Atlantic Bight, which includes the proposed project area, from April to May and the northern group spawns in the Gulf of St. Lawrence in June and July.

Scup (Stenotomus chrysops)
Scup is a migratory, schooling, coastal fish species that occurs from Nova Scotia to South Carolina, but is most common between Cape Cod, Massachusetts, and Cape Hatteras, North Carolina. Spawning occurs annually from May to August with a peak in June in deep parts of large bays and coastal areas between New Jersey and Massachusetts. Eggs are pelagic as are larvae in coastal waters. Scup settle to inshore bottom habitat during the late larval stage starting in early July. Juveniles reside in high salinity waters until the early fall. Juveniles and adults overwinter on the mid- and outer shelf between New Jersey and Cape Hatteras during which time, little is known about habitat preferences. During spring and summer, juveniles and adults migrate north and inshore to coastal and estuarine areas where they use a variety of bottom types including various sands, mud, and mussel and eelgrass beds.

Little skate (Leucoraja erinacea)
The little skate is found only in the northwest Atlantic Ocean where it ranges from southeastern Newfoundland to the Scotian Shelf, the Bay of Fundy, and Georges Bank southward to North Carolina (Fisheries and Oceans Canada, 2019b). The little skate is sympatric with the winter skate sharing its distribution throughout its range. The little skate is a benthic species that lives primarily on the continental shelf over sand and gravel bottom often in shallow waters less than 111 meters. The little skate can tolerate a relatively wide range of temperatures (1.2–21°C). Little skate has been classified as "winter periodic," moving inshore in the winter and offshore into deeper water in the summer.

The little skate is one of the fastest growing species of northwest Atlantic skates. Studies on age, growth, and maturity have demonstrated that this species matures at a smaller size and earlier age and is less long-lived than other species of skate that inhabit the northwest Atlantic Ocean. Little skate along the US northeast coast exhibit a partially defined annual reproductive cycle with peaks in reproductive activity and egg deposition in June-July and late October-January.

Clearnose skate (Raja eglanteria)
The clearnose skate is found in the northwest Atlantic Ocean where it ranges from Massachusetts to southern Florida and into the Gulf of Mexico from mid-Florida to eastern Texas (Miller 2019). The clearnose skate is a benthic species that lives primarily on the continental shelf over sand and gravel bottom often in shallow waters less than 111 meters. The little skate can tolerate a relatively wide range of temperatures (5–27°C) and salinities (12–35 ppt). Clearnose skate vary their habitat and water depth mainly to remain within their preferred temperature range moving inshore in the winter and offshore into deeper water in the summer.

Winter skate (Leucoraja ocellate)
The range of the winter skate is restricted to the northwest Atlantic Ocean (Fisheries and Oceans Canada, 2019a). The northern most limit of the winter skate is the south coast of Newfoundland from which it ranges south into the Gulf of St. Lawrence along the Scotian shelf, the Bay of Fundy, and Georges Bank southward to Cape Hatteras, North Carolina. The winter skate is a benthic species living over sand or gravel bottoms usually in depths less than 111 meters. The preferred temperature range for winter skate is -1.2 to 15°C. In the southern parts of its range, the winter skate appears to move shoreward in autumn and offshore in the summer suggesting a preference for cooler temperatures (i.e., winter periodic). Winter skate eat mostly amphipods and polychaete worms but also consume fish, decapods, isopods, and bivalves.

Studies on age, growth, and maturity in winter skate have demonstrated that this species is a slow growing, late-maturing, and long-lived species. Of particular concern is the late age at maturity reached by females relative to the maximum observed age, leaving very few total lifetime spawning episodes for each individual female.

Fish and Wildlife Coordination Act Species

The New York Harbor Estuary and the East River are highly productive habitat for a wide variety of NOAA trust resources covered by the Fish and Wildlife Coordination Act (FWCA). In coordination with NOAA NMFS, FWCA species have been identified that include the following forage species (NOAA 2019):

River herring: Alewife (Alosa psuedoharengus) and Blueback herring (Alosa aestivalis)
Two species of fish—the alewife (*Alosa psuedoharengus*) and the blueback herring (*A. aestivalis*)—are known collectively as river herring. River herring are anadromous, meaning that they mature in the ocean and then migrate up coastal rivers to estuarine and freshwater rivers, ponds, and lake habitats to spawn. Adult river herring generally live in the ocean for two years (mid-Atlantic states) to four years (Northeast states) before returning to freshwater rivers to spawn (RiverHerring.com, 2018). While some adults die after spawning, most return to the ocean until the following year's spawning. Alewife and blueback herring can live up to eight years.

River herring spawn over a wide range of substrates such as gravel, sand, detritus, and submerged vegetation. In areas where alewife and blueback herring co-exist, blueback herring will exhibit more variety in spawning site selection including shallow areas covered in vegetation, swampy areas, and small tributaries upstream from the tidal zone. In the mid-Atlantic region, alewife herring spawn from late February through April, whereas blueback herring spawn from late March through mid-May (NOAA, 2009). Spawning is generally initiated when water temperatures reach approximately 5°C to 10°C and spawning generally takes place when water temperatures are between 16°C and 19°C (NOAA, 2009).

Silversides (Menidia spp.)
Atlantic silversides can be found along the Atlantic Coast of North America from the Gulf of St. Lawrence, Canada to the northeast part of Florida (Chesapeake Bay Program, 2019a). They can tolerate a wide range in salinities and can be found in dense feeding schools along the shoreline in summer or in beds of underwater grasses hiding from predators. In winter they migrate to deeper, warmer waters. Atlantic silversides are small fish that grow no bigger than six inches. They breed from May to July. Atlantic silversides eat algae and small invertebrates including crustaceans, polychaete worms, zooplankton, and fish. Predators of Atlantic silversides include large predatory fish such as bluefish, mackerel, and striped bass as well as shorebirds. Smaller fish like mummichog eat their eggs and larvae.

Killifish (Fundulus spp.)
Killifish are found on the Atlantic Coast of North America from Laborador, Canada, to Mexico (Chesapeake Bay Program, 2019b). The prefer muddy marshes, tidal creeks, and grass flats along sheltered shorelines in summer. During colder months they often retreat to deeper waters or burrow into bottom mud or silt. Killifish are opportunistic feeders eating a range of items

including algae, plants, insects, insect larvae, worms, small crustaceans, mollusks, and other fish. Predators of killifish include larger fish, wading birds, and seabirds.

Menhaden (Brevoortia tyrannus)
Menhaden inhabit estuaries along the western Atlantic coast, forming large schools that swim just below the water's surface from spring through fall and then migrate to deeper, warmer waters in winter (Chesapeake Bay Program, 2019c). Spawning occurs over the mid-Atlantic continental shelf in spring and autumn. Eggs hatch at sea and larvae spend about two months there before drifting into estuaries. Larvae eventually move into brackish waters where they grow rapidly throughout the summer. Menhaden are an important source of food for larger predators, including bluefish, weakfish, striped bass, sharks, mackerels, and fish-eating seabirds and mammals.

Anchovies (Anchoa spp.)
Anchovies also inhabit estuaries along the western Atlantic coast, forming large schools and are generally abundant throughout the year (Chesapeake Bay Program, 2019d). They are an important food source for larger predators including bluefish, weakfish, striped bass, sharks, mackerels, and fish-eating seabirds and mammals.

American eel (Anguilla rostrate)
American eels can be found along the Atlantic coast from Greenland to northern South America. American eels spawn in the Sargasso Sea. After hatching, larvae float and drift for about a year until they develop into glass eels and migrate into fresh and brackish tributaries including rivers, streams, creeks, lakes, and ponds (Chesapeake Bay Program, 2019e). Once they reach freshwater, they develop pigment. Eels may spend anywhere from 10 to 40 years in freshwater before returning to the Sargasso Sea to spawn.

Striped bass (Morone saxatilis)
Striped bass range along the western Atlantic coast from the St. Lawrence River and southern Gulf of St. Lawrence, Canada to the St. Johns River, Florida (Atlantic States Marine Fisheries Commission, 2019a). In Atlantic coast rivers from Albermarle Sound, North Carolina north, many adult striped bass are migratory, travelling annually from the ocean to riverine spawning grounds and back again to the ocean. Upon returning to the ocean, they undertake a northern summer migration and southward winter migration. However, some adults in the Mid-Atlantic region remain in or near their areas of origin.

Young and juvenile fish are generally found over clean, sandy bottoms in shallow water with salinities between 0.2 and 16 ppt. Adults occur over a wide variety of substrates including rock, gravel, sand, submerged aquatic vegetation and mussel beds. Atlantic striped bass have formed the basis of one of the most important fisheries on the Atlantic coast for centuries. However, overfishing and poor environmental conditions lead to the collapse of the fishery in the 1980s.

Tautog (Tautoga onitis)
Tautog are found from Nova Scotia, Canada, to South Carolina but are most abundant from Cape Cod to the Chesapeake Bay (Atlantic States Marine Fisheries Commission, 2019b). Tagging studies show that tautog do not migrate north and south along the coast but make inshore/offshore seasonal migrations triggered by changes in bottom water temperatures. In late fall when water temperatures fall below 10°C, adult tautog migrate to deep (25 to 45 meters) offshore wintering areas. In spring when water temperatures warm to 11°C, they migrate inshore to spawn in the vicinity of estuaries and inshore marine waters. The most important habitat parameter affecting the distribution and abundance of juvenile and adult tautog is the availability of cover. They depend on shelter for protection from predation during the night when they are not foraging. Shelter may consist of rock reefs, rock outcrops, gravel, eelgrass beds, and kelp or sea lettuce beds.

Weakfish (Cynoscion regalis)
Weakfish are found along the western Atlantic coast from Massachusetts to southern Florida and are occasionally occurring up to Nova Scotia, Canada and into the eastern Gulf of Mexico (Atlantic States Marine Fisheries Commission, 2019c). They are most abundant from New York to North Carolina. Adults migrate both north and south and onshore/offshore seasonally along the Atlantic coast. Warming waters in spring keys migration inshore and northwards to bays, estuaries, and sounds. Weakfish spawn in estuarine and nearshore habitats throughout its range. Principal spawning areas are from North Carolina to Montauk, New York. Nursery habitat also includes estuarine and nearshore waters.

ASSESSMENT OF IMPACTS

Project Specific Impacts

An evaluation of five potential types of impacts with implementation of the Preferred Alternative are presented to determine effects to EFH and FWCA species.

- Habitat Loss
- Noise Impacts
- Water Quality Impacts
- Vessel Impacts
- Impacts to Prey Species

Habitat Loss

The Preferred Alternative proposes the installation of the permanent support structures for the shared use flyover bridge, and fill placed within the existing embayments and behind the cutoff wall at the edges of the proposed embayments. With this alternative, 24,085 square feet (0.55 acre) of existing habitat (see **Table 1**) would no longer support nearshore species and may impose a direct impact on certain EFH and FWCA species. As a mitigation measure, new embayments are proposed that may constitute an improvement over the existing embayments. They would be of comparable or larger size (approximately 26,000 square feet [0.6 acre]) with improved habitat conditions and foraging opportunities. The new embayments would not have

pedestrian bridges that shade aquatic habitat, which can reduce benthic productivity and biomass. The provision of habitat enhancements designed for the recruitment of shellfish and other aquatic life along East River Park is also being explored. Additional off-site wetland mitigation would also be undertaken with either the creation and/or rehabilitation of wetland habitat within the NY Harbor Estuary or the purchase of wetland mitigation credits through the Saw Mill Creek Wetland Mitigation Bank located on Staten Island, New York.

Noise Impacts

The Preferred Alternative includes noise-producing, in-water construction work for installing the substructure for the flyover bridge, installing a new cut-off wall in the approximate alignment of the existing bulkhead, and installing a temporary water-tight cofferdam for the reconstruction of the sewer outfalls. The installation of the flyover bridge substructure will be done using a drill rig. The cofferdam will be installed with 24" H-type steel piles using an impact hammer, and the cut-off wall will be installed with 19" AZ steel sheet piles using a vibratory hammer.

Construction plans for the proposed project include commitments to use cushion blocks to attenuate the noise from impact hammers along with the precautionary measure of ramping up pile driving activities to provide sufficient warning for fish to leave the area before injury-producing noise levels are reached. Bubble curtains will also be used where practicable to reduce the sound levels of pile driving. As pile driving activities are progressively ramped up, it is expected that fish will modify their behavior and swim away from the ensonified area. Due to the precautionary measures proposed and the relatively small action area (<0.1 percent of New York Harbor Estuary waters) the effects from pile driving activities would not be substantial.

Water Quality Impacts

It is expected that turbidity would increase temporarily during pile driving activities associated with the construction of the support structure for the shared-use flyover bridge, the cofferdams for reconstructing sewer outfalls, and the installation of the cut-off wall in the alignment of the existing bulkhead. Turbidity curtains would be utilized for each of these operations to prevent the loosened sediment from entering the larger waterbody of the East River. The curtains will also prevent fish from entering the area and thus, will prevent them from being exposed to the turbid water.

The installation of piles will disturb bottom sediments and may cause a temporary increase in suspended sediment in the action area. Using available information collected from a project in the Hudson River, pile driving activities are expected to produce total suspended sediment (TSS) concentrations of approximately 5.0 to 10.0 mg/L above background levels within approximately 300 feet (91 meters) of the pile being driven (FHWA 2012). Using a clamshell to extract piles allows sediment attached to the pile to move vertically through the water column until gravitational forces cause it to slough off under its own weight. The small resulting sediment plume is expected to settle out of the water column within a few hours. Studies of the effects of turbid water on fish suggest that concentrations of suspended sediment can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton 1993). The TSS levels expected for pile driving or removal (5.0 to 10.0 mg/L) are below those shown to have adverse effect on fish (580.0 mg/L for the most sensitive species, with 1,000.0 mg/L more typical; see summary of scientific literature in Burton 1993) and benthic communities (390.0

mg/L (EPA 1986)). TSS is most likely to affect fish if a plume causes a barrier to normal behaviors. However, we expect fish to either swim through the plume with no adverse effects or make small evasive movements to avoid it. Due to the proposed turbidity conservation measures in waters where suspended solids baseline conditions are generally moderate to poor according to secchi transparency readings (DEP 2017), effects to water quality from pile driving activities would be too small to be meaningfully measured or detected and therefore not substantial.

Other impacts to water quality were also assessed and screened from the analysis. The reconstruction of sewer outfalls along the East River Park bulkhead is not anticipated to change stormwater effluent from the current baseline conditions. During reconstruction, effluent will continue to flow through the existing outfalls until the new system comes online. The flyover bridge would represent new impervious surface in the study area that would drain to East River Park and eventually into the East River. The new impervious surface would be approximately 15,000 square feet (0.34 acre); however, this represents a small increase in impervious area within the study area and there would be no vehicular traffic and therefore no associated contaminants to be mobilized by stormwater runoff; therefore, any effects on the water quality of the East River are expected to be discountable.

Vessel Impacts

The vessel impacts analysis considered three elements: (1) the existing baseline conditions, (2) the action and what it adds to existing baseline conditions, and (3) new baseline conditions (the existing baseline conditions and the action together). From the analysis, it is anticipated that vessel traffic added to baseline conditions as a result of the proposed project is not likely to adversely affect EFH and FWCS species for the following reasons.

Adding project vessels to the existing baseline will not increase the risk that any vessel in the area will strike an individual, or will increase it to such a small extent that the effect of the action (i.e., any increase in risk of a strike caused by the project) cannot be meaningfully measured or detected. The baseline risk of a vessel strike within East River is unknown. The increase in traffic associated with the proposed project is extremely small. During the project activities, an estimate of 3 project vessels per day will be added to the baseline. The addition of project vessels will also be intermittent, temporary, and restricted to a small portion of the overall action area on any given day. As such, any increased risk of a vessel strike caused by the project will be too small to be meaningfully measured or detected. As a result, the effect of the action on the increased risk of a vessel strike in the action area is not substantial.

The flood protection system will reduce risk of damage from coastal storms in the area. Allowing protection of critical infrastructure is not expected to change the number of vessels that use the action area; thus, preserving the status quo with regard to vessel routes and vessel numbers will not change the risk of a vessel strike. Any slight increase in risk from altered patterns of use would be too small to be detected or measured, and effects are, therefore, not substantial.

Impacts to Prey Species (Habitat Modification)

The Preferred Alternative proposes the installation of the permanent support structures for the shared use flyover bridge, and fill placed within the existing embayments and behind the cutoff wall at the edges of the proposed embayments. With this alternative, 40,208 square feet (0.92

acre) of existing habitat will only be temporarily disturbed. Also, 24,085 square feet (0.55 acre) of existing habitat (see **Table 1**) would no longer support benthic organisms and prey species and may impose an indirect impact on certain EFH and FWCA species, however, the action area constitutes a very small portion of the available benthic foraging habitat within the New York Harbor Estuary waters (<0.1 percent). In addition, the installation of new embayments may constitute an improvement over the existing embayments. The proposed embayments would be of comparable or larger size (approximately 26,000 square feet [0.6 acre]) with improved habitat conditions and foraging opportunities. In addition, the new embayments would not have pedestrian bridges that shade aquatic habitat, which can reduce benthic productivity and biomass. The provision of habitat enhancements designed for the recruitment of shellfish and other aquatic life along East River Park is also being explored. Additional off-site wetland mitigation would also be undertaken with either the creation and/or rehabilitation of wetland habitat within the NY Harbor Estuary or the purchase of wetland mitigation credits through the Saw Mill Creek Wetland Mitigation Bank located on Staten Island New York.

Shading effects from barging as well as reduced habitat from installation of cofferdams and the cut-off wall would be temporary. Prey species would be expected to avoid the action area during construction activities and relocate to nearby available habitat. Upon completion of construction, the affected area would be recolonized and be anticipated to return to pre-construction conditions. As a result, temporary and permanent effects to EFH habitat and prey species would not be substantial.

Impacts to Essential Fish Habitat Species

The effects to EFH could potentially be adverse for one or more lifestages of winter flounder, windowpane flounder, summer flounder, Atlantic herring, scup, black sea bass, clearnose skate, little skate, and winter skate. Several species (cobia, Spanish mackerel, king mackerel, Atlantic mackerel, bluefish, Atlantic butterfish) listed as potentially occurring in the study area are either at the extreme limit of their known range or are highly migratory and are therefore anticipated to occur in the East River only as uncommon or transient individuals. The remaining species evaluated (red hake) would not be anticipated to be found in the East River due to unsuitable environmental conditions, unsuitable depths, and unsuitable substrates or other habitat features. Conservation and mitigation measures designed to reduce or eliminate the potential impacts to EFH are discussed below in the Mitigation section.

Benthic Species EFH

EFH for benthic species such as winter flounder, windowpane flounder, summer flounder, little skate, clearnose skate, and winter skate generally include bottom waters on sand, mud and gravel substrates. Noise from pile driving and pile drilling could potentially have an adverse effect on these species in the immediate vicinity of the proposed project area pile installation and could prevent them from utilizing that area for the duration of construction. Construction plans for the proposed project include commitments to use the precautionary measure of using cushioned impact hammers and ramping up pile driving activities to provide sufficient warning for fish to leave the area before injury-producing noise levels are reached. Bubble curtains will also be used where practicable to reduce the sound levels of pile driving.

Disturbance of substrate and the water column due to activities associated with barging, construction of the combined sewer outfalls, and construction of the shared use flyover bridge support structures could potentially cause a temporary increase in turbidity and result in temporary effects to benthic species EFH. The proposed filling of the existing embayments and the installation of the flyover bridge support structures would represent a permanent loss of EFH for these benthic species as well as a loss of benthic habitat that would support their prey species. The study area constitutes a very small portion of the available EFH for these benthic species. Therefore, while some temporary construction related effects to EFH could occur, no substantial adverse effects to EFH for any lifestage of these species are anticipated as a result of the proposed project. Turbidity curtains will be utilized for all pile driving activities to limit suspended materials from entering the water column. The temporary and permanent effects to the EFH of benthic fish species resulting from the proposed project are provided in **Table 3.**

Table 3
Potential Effects to EFH for Benthic Species

Common Name	Scientific Name	Potential for Occurrence within Study Area	Analysis of Potential Effect	Conclusion of Potential Effects*
Winter flounder	*Pseudopleuronectes americanus*	Bottom-dwelling species with potential to occur	Affected area is <0.1 percent of EFH within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial
Windowpane flounder	*Scophthalmus aquosus*	Bottom-dwelling species with potential to occur; DO in East River in summer months can be reduced to unacceptable levels	Affected area is <0.1 percent of EFH within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial
Summer flounder	*Paralichthys dentatus*	Bottom-dwelling species with potential to occur	Affected area is <0.1 percent of EFH within NY Harbor Estuary; new embayments likely to result in improved habitat	Not substantial
Little skate	*Leucoraja erinacea*	Bottom-dwelling species with potential to occur	Affected area is <0.1 percent of EFH within NY Harbor Estuary; new embayments likely to result in improved habitat	Not substantial
Clearnose skate	*Raja eglanteria*	Bottom-dwelling species with potential to occur	Affected area is <0.1 percent of EFH within NY Harbor Estuary; new embayments likely to result in improved habitat	Not substantial
Winter skate	*Leucoraja ocellata*	Bottom-dwelling species with potential to occur	Affected area is <0.1 percent of EFH within NY Harbor Estuary; new embayments likely to result in improved habitat	Not substantial

Pelagic Species EFH

EFH for pelagic species such as bluefish, Atlantic herring, Atlantic butterfish, and Atlantic mackerel generally includes pelagic waters over the Continental Shelf and in estuaries while EFH for red hake, black sea bass, and scup are demersal waters over the Continental Shelf and estuaries. King mackerel, Spanish mackerel, and cobia are marine species that would be rare or transient in the East River. Temporary increases in turbidity or shading due to barging and outfall construction activities are not anticipated to have substantial adverse effect on pelagic species EFH as they would be readily able to avoid the work areas. Turbidity curtains, as described above, would mitigate any substantial effects due to loosened sediment being released into the water column.

Noise from pile driving and pile drilling could potentially have minimal adverse effects to pelagic species in the immediate vicinity of the pile installation and could prevent them from utilizing that area for the duration of construction. Similarly, as described for benthic species, protective measures such as cushioned impact hammers, ramping up of pile driving, and use of bubble curtains will both warn nearby fish and attenuate the noise produced from pile driving.

Black sea bass prefer structured habitats and are commonly found underneath man-made structures such as docks and piers. Therefore, it is likely that black sea bass juvenile and adults are present in the study area and inhabit areas where piles and support structures for the existing esplanade exist. Construction activities involving the removal of the existing esplanade are therefore likely to temporarily effect black sea bass EFH and make the area of the construction activities unsuitable for black sea bass for the duration of construction.

The study area constitutes a very small portion of the available EFH for these pelagic species, therefore, some temporary construction related adverse effects to their EFH could occur, however no substantial adverse effects to EFH for any lifestage of these species are anticipated as a result of the proposed project. It is expected that habitat in the action area that is temporarily disturbed will return to pre-construction conditions. Newly created habitat through the on- and off-site mitigation would populate with marine species similar to what occurs within the action area in its current conditions. The temporary and permanent effects to the EFH of pelagic fish species resulting from the proposed project are provided in **Table 4**.

Table 4
Potential Effects to EFH for Pelagic Species

Common Name	Scientific Name	Potential for Occurrence within Study Area	Analysis of Potential Effect	Conclusion of Potential Effects*
Red hake	*Urophycis chuss*	Transient	High-quality EFH for larval and juvenile red hake is not found in the East River.	No effect
Atlantic herring	*Clupea harengus*	The East River does not contain suitable depth or salinity for Atlantic herring larvae, and is on the low end of the preferred salinity for juvenile and adult Atlantic herring	Affected area is <0.1 percent of EFH within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial

Table 4 Cont.
Potential Effects to EFH for Pelagic Species

Common Name	Scientific Name	Potential for Occurrence within Study Area	Analysis of Potential Effect	Conclusion of Potential Effects*
Bluefish	*Pomatomus saltatrix*	Transient	Habitat unlikely to be affected as bluefish is not a bottom-dwelling species.	No effect
Atlantic butterfish	*Peprilus triacanthus*	Transient	Habitat unlikely to be affected as Atlantic butterfish is not a bottom-dwelling species.	No effect
Black sea bass	*Centropristis striata*	Likely to occur under docks, piers	Affected area is <0.1 percent of EFH within NY Harbor Estuary; installation of footings/ shafts for shared-use flyover bridge could be new habitat	Not substantial
King mackerel	*Scomberomorus cavalla*	Rare and transient	Generally, favors deeper and warmer waters than are typically found in the East River	No effect
Spanish mackerel	*Scomberomorus maculatus*	Rare and transient	Limited EFH within study area; generally, favors higher salinities and warmer waters than found in the East River	No effect
Cobia	*Rachycentron canadum*	Rare and transient	No cobia lifestages documented within East River; limited EFH within study area	No effect
Atlantic mackerel	*Scomber scombrus*	Transient	Affected area is <0.1 percent of habitat within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial
Scup	*Stenotomus chrysops*	Bottom-dwelling species with potential to occur	Affected area is <0.1 percent of EFH within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial

Impacts to Fish and Wildlife Coordination Act Species

Under the Preferred Alternative, there is potential for adverse effects to trust resources covered by the FWCA. With this alternative, 24,085 square feet (0.55 acre) of habitat would be filled and would no longer support benthic organisms that may provide a foraging habitat for certain FWCA fish. However, 48,170 square feet (1.1 acres) of additional habitat would be created and/or restored both on- and off-site to mitigate for this habitat loss, as discussed in the mitigation section below. River herring, menhaden, and anchovies are pelagic species capable of avoiding the proposed work area and would be anticipated to be transient within the East River. The East River in the vicinity of the proposed project provides suboptimal habitat for silversides and killifish and individuals of this species would also be anticipated to be transient. American eels would be capable of avoiding the proposed work area during their migration from seawater to freshwater. Temporary increases in turbidity or shading due to barging and outfall construction activities are not anticipated to have a substantial adverse effect on striped bass and weakfish due to their transient nature in the East River and the relatively small action area in

relation to available habitat in the East River. Noise from pile driving and pile drilling could potentially have minimal adverse effects to these species in the immediate vicinity of the pile installation and could prevent them from utilizing that area for the duration of construction. The removal of potential habitat for the remaining species – tautog – would constitute a very small portion of the available EFH for this species within the New York Harbor Estuary waters (<0.1 percent), and new habitat would be created through the installation of the new embayments. Therefore, these effects would not be considered substantial for FWCA trust species. These conclusions are summarized in **Table 5**. Conservation and mitigation measures designed to reduce or eliminate the potential impacts to FWCA trust species are discussed below in the Mitigation section.

Table 5
Potential Effects to FWCA Species

Common Name	Scientific Name	Potential for Occurrence within Study Area	Analysis of Potential Effect	Conclusion of Potential Effects*
Alewife	*Alosa psuedoharengus*	Transient	Affected area is <0.1 percent of habitat within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial
Blueback herring	*Alosa aestivalis*	Transient	Affected area is <0.1 percent of habitat within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial
Silversides	*Menidia spp.*	Transient	Affected area is <0.1 percent of habitat within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial
Killifish	*Fundulus spp*	Transient	Affected area is <0.1 percent of habitat within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial
Menhaden	*Brevoortia tyrannus*	Transient	Affected area is <0.1 percent of habitat within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial
American eel	*Anguilla rostrate*	Transient	Affected area is <0.1 percent of habitat within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial
Striped bass	*Morone saxatilis*	Transient	Affected area is <0.1 percent of habitat within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial

Table 5 Cont.
Potential Effects to FWCA Species

Common Name	Scientific Name	Potential for Occurrence within Study Area	Analysis of Potential Effect	Conclusion of Potential Effects*
Tautog	*Tautoga onitis*	Likely to occur under docks, piers	Affected area is <0.1 percent of habitat within NY Harbor Estuary; installation of footings / shafts for shared-use flyover bridge could be new habitat	Not substantial
Weakfish	*Cynoscion regalis*	Transient	Affected area is <0.1 percent of habitat within NY Harbor Estuary; new embayments likely to result in improved habitat.	Not substantial

MITIGATION

While the proposed project would result in a total of 24,085 square feet (0.55 acre) of permanent adverse effects to shallow open water (unconsolidated bottom) habitat, it would be mitigated for in accordance with all NYSDEC and United States Army Corps of Engineers (USACE) permit conditions which would conform with applicable regulations, including CWA, Section 10 of the Rivers and Harbors Act, ECL Article 25, NYCRR Part 661, and ECL Article 15, NYCRR Part 608 which typically require a 2:1 impact to mitigation ratio. Therefore, 48,170 square feet (1.10 acres) of wetland mitigation would be required (**Table 6**). On-site, in-kind wetland mitigation would consist of constructing two new embayments within the project area which would restore approximately 26,000 square feet (0.6 acre) of the adversely affected shallow open water with an unconsolidated bottom. As the project design progresses, the proposed embayments would provide improved habitat type over what currently exists in the embayments that are to be filled by omitting bridges that shade aquatic habitat, which can reduce benthic productivity and biomass and providing habitat enhancements designed for the recruitment of shellfish and other aquatic life. This design feature is consistent with New York City's WRP policies of protecting and enhancing sensitive resources, such as wetlands. The remaining 22,170 square feet (0.51 acre) of required mitigation would be accomplished through either the purchase of wetland mitigation bank credits from the Saw Mill Creek Wetland Mitigation Bank located in Staten Island, New York or with off-site wetland restoration or creation. It is anticipated that the purchase of wetland mitigation bank credits or the design and construction of the off-site wetland would be completed by the proposed construction end date of 2023.

Table 6

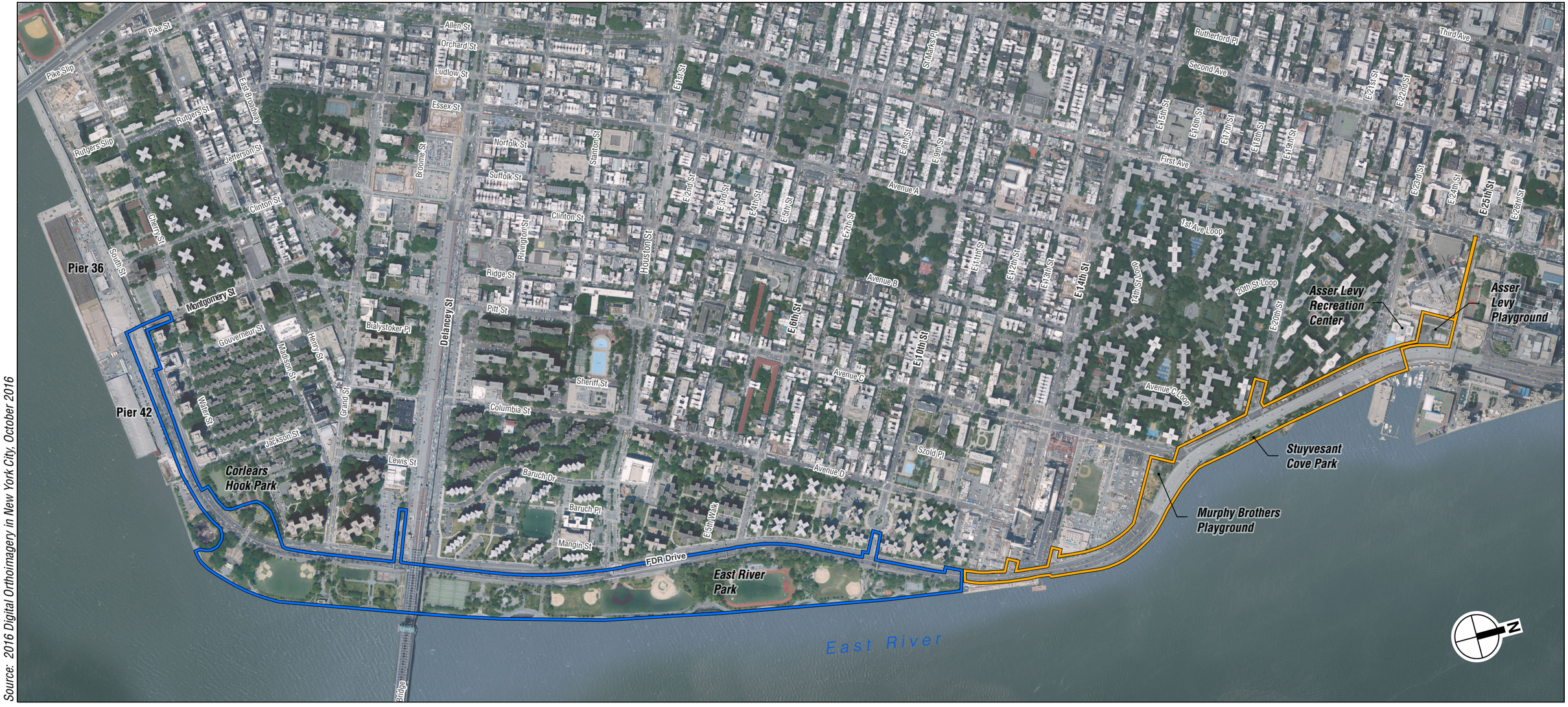
Temporary Disturbance and Permanent Impacts - Required Restoration and Mitigation

Capital Project	Impact Type	Area of Disturbance or Impact (Sq. Ft.)	NYSDEC Restoration/ Mitigation Ratio	Required Restoration for Temporary Disturbance (Sq. Ft.)	Required Mitigation for Permanent Impacts (Sq. Ft.)	
SANDRESM1 EAST SIDE COASTAL RESILIENCY PROJECT	Temporary	40,208	1:1	40,208	N/A	
	Permanent	24,085	2:1	N/A	48,170	Onsite 26,000
						Offsite 22,170

CONCLUSION

A NOAA Greater Atlantic Regional Fisheries Office EFH Assessment Worksheet for Federal Agencies is provided below. Due to the planned implementation of protective measures, Best Management Practices, and mitigatory measures to compensate for the loss of shallow open water (unconsolidated bottom) habitat, the impact on EFH and FWCA managed species would be largely minimized. Temporary impacts include the disturbance of 40,208 square feet (0.92 acre) of shallow open water (unconsolidated bottom). These impacts to EFH and FWCA species would be minimized through the use of protective measures such as turbidity curtains, water-tight cofferdams, and cushion block pile drivers. Permanent impacts include the loss of 24,085 square feet (0.55 acre) of shallow open water (unconsolidated bottom) habitat but would be mitigated with the construction of new embayments on-site and off-site wetland mitigation within the NY Harbor Estuary, together creating 48,170 square feet (1.1 acres) of new habitat. Additionally, most adult fish are mobile and will actively avoid any direct impacts from the construction related activities. Some impairment in the ability of EFH and FWCA species to find prey items or the reduction in available prey items may occur, however, this is also anticipated to be temporary in nature and limited to the immediate vicinity of the proposed construction activities, which constitutes a very small portion of available habitat within the New York Harbor Estuary.

Results of these consultation requests will be used to inform the FEIS, set to be published in September 2019, in order to comply with applicable National Environmental Protection Act (NEPA), New York State Environmental Quality Review Act (SEQRA), and New York City Environmental Quality Review (CEQR) standards. In the event that new design elements are developed that result in additional in-water construction activities not described above, OMB would notify NMFS of these changes as addenda to this submission. OMB is requesting an Abbreviated EFH Consultation for the new Preferred Alternative (Alternative 4) and concurrence with their findings that effects to EFH and FWCA managed species are not substantial. OMB also requests guidance on any Conservation Recommendations that NMFS may have for the proposed project.



Source: 2016 Digital Orthoimagery in New York City, October 2016

Project Area One

Project Area Two

0 1,000 FEET

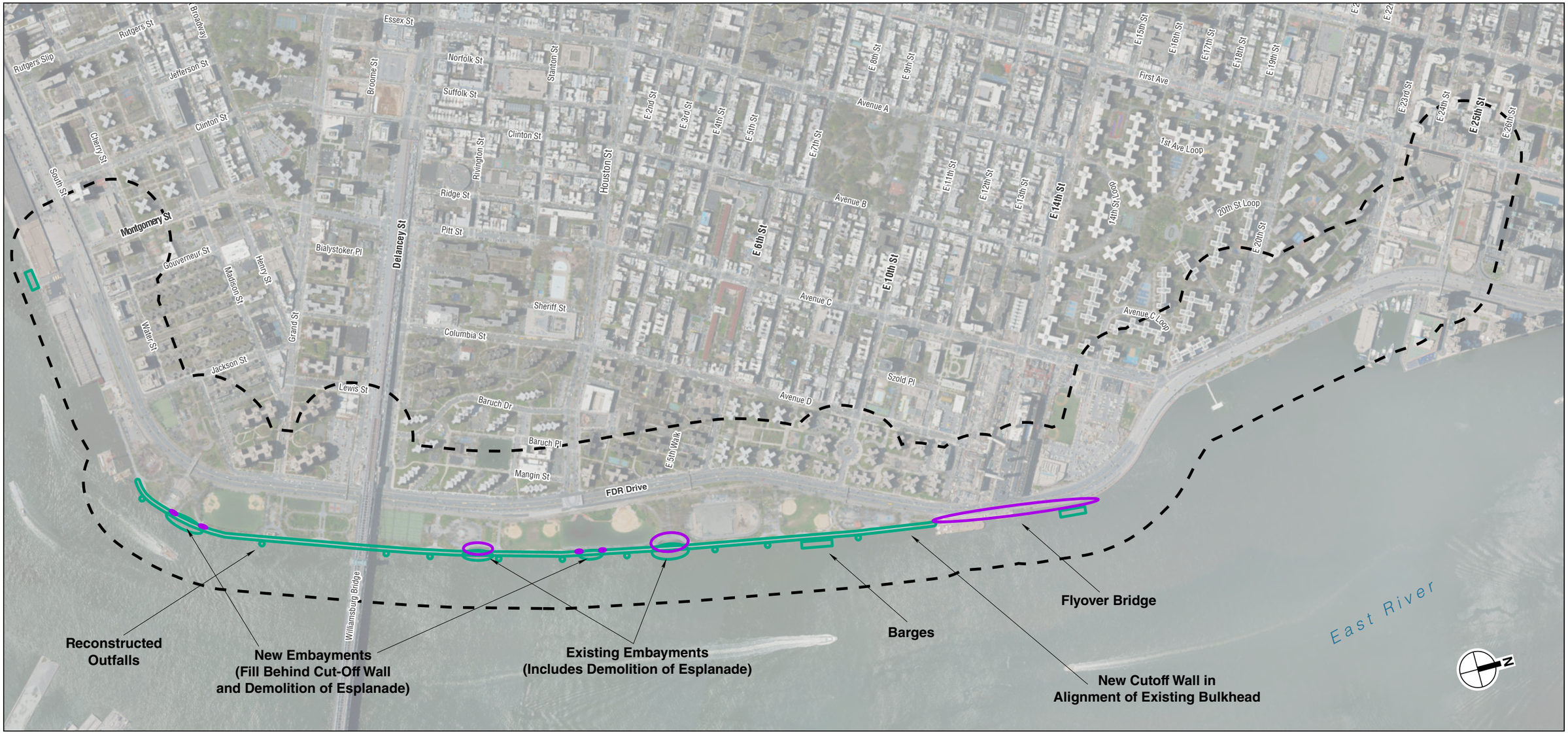
Capital Project SANDRESM1

EAST SIDE COASTAL RESILIENCY PROJECT

Proposed Project Area Aerial Map

Figure 1

4/30/2019



Natural Resources Study Area (400-Foot Study Area Radius)

Approximate Locations of Permanent In-Water Impacts

Approximate Locations of Temporary In-Water Disturbances

0 1,000 FEET

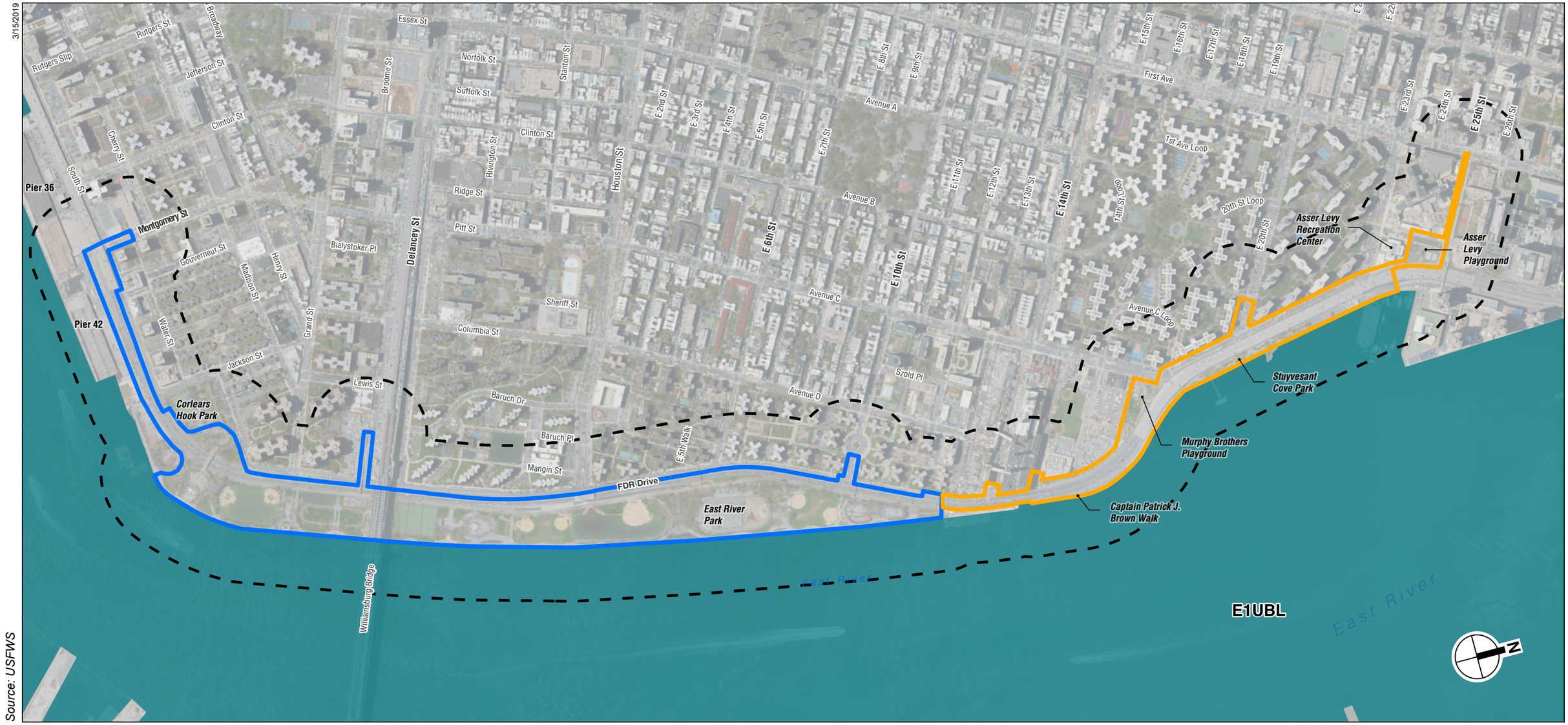
Capital Project SANDRESM1

EAST SIDE COASTAL RESILIENCY PROJECT

Approximate Locations of In-Water Construction

Figure 2

3/15/2019



Source: USFWS

Project Area One

Project Area Two

Natural Resources Study Area (400-Foot Study Area Radius)

Estuarine and Marine Deepwater (Estuarine Subtidal Wetlands with an Unconsolidated Bottom- E1UBL)

0 1,000 FEET

Capital Project SANDRESM1

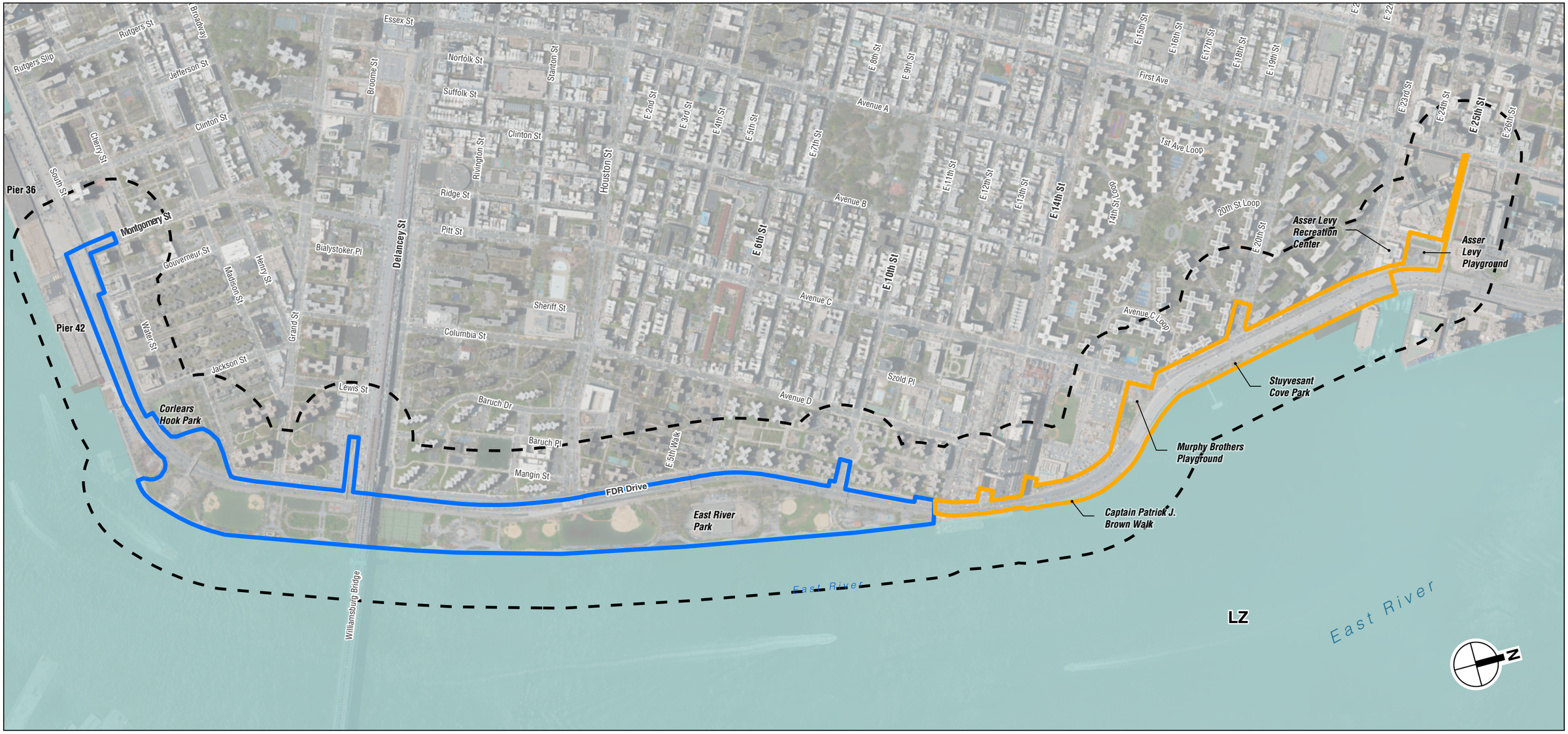
EAST SIDE COASTAL RESILIENCY PROJECT

National Wetlands Inventory Map

Figure 3

3/15/2019

Source: Tidal Wetlands, NYS Department of Environmental Conservation, 1974



Project Area One

Project Area Two

Natural Resources Study Area (400-Foot Study Area Radius)

Littoral Zone

0 1,000 FEET

Capital Project SANDRESM1

EAST SIDE COASTAL RESILIENCY PROJECT

NYSDEC Tidal Wetlands Map

Figure 4

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY PROJECT

Existing Conditions at Embayments
Figure 5

NOAA FISHERIES
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
Essential Fish Habitat (EFH) Consultation Guidance
EFH ASSESSMENT WORKSHEET

Introduction:

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) mandates that federal agencies conduct an essential fish habitat (EFH) consultation with NOAA Fisheries regarding any of their actions authorized, funded, or undertaken that may adversely affect EFH. An adverse effect means any impact that reduces the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

This worksheet has been designed to assist in determining whether a consultation is necessary and in preparing EFH assessments. This worksheet should be used as your EFH assessment or as a guideline for the development of your EFH assessment. At a minimum, all the information required to complete this worksheet should be included in your EFH assessment. If the answers in the worksheet do not fully evaluate the adverse effects to EFH, we may request additional information in order to complete the consultation.

An expanded EFH assessment may be required for more complex projects in order to fully characterize the effects of the project and the avoidance and minimization of impacts to EFH. While the EFH worksheet may be used for larger projects, the format may not be sufficient to incorporate the extent of detail required, and a separate EFH assessment may be developed. However, regardless of format, the analysis outlined in this worksheet should be included for an expanded EFH assessment, along with additional information that may be necessary. This additional information includes:

- the results of on-site inspections to evaluate the habitat and site-specific effects
- the views of recognized experts on the habitat or the species that may be affected
- a review of pertinent literature and related information
- an analysis of alternatives to the action that could avoid or minimize the adverse effects on EFH.

Your analysis of adverse effects to EFH under the MSA should focus on impacts to the habitat for all life stages of species with designated EFH, rather than individual responses of fish species. Fish habitat includes the substrate and benthic resources (e.g., submerged aquatic vegetation, shellfish beds, salt marsh wetlands), as well as the water column and prey species.

Consultation with us may also be necessary if a proposed action results in adverse impacts to other NOAA-trust resources. Part 6 of the worksheet is designed to help assess the effects of the action on other NOAA-trust resources. This helps maintain efficiency in our interagency coordination process. In addition, further consultation may be required if a proposed action impacts marine mammals or threatened and endangered species for which we are responsible. Staff from our Greater Atlantic Regional Fisheries Office, Protected Resources Division should be contacted regarding potential impacts to marine mammals or threatened and endangered species.

Instructions for Use:

Federal agencies must submit an EFH assessment to NOAA Fisheries as part of the EFH consultation. Your EFH assessment must include:

1) A description of the proposed action.
2) An analysis of the potential adverse effects of the action on EFH, and the managed species.
3) The federal agency's conclusions regarding the effects of the action on EFH.
4) Proposed mitigation if applicable.

In order for this worksheet to be considered as your EFH assessment, you must answer the questions in this worksheet fully and with as much detail as available. Give brief explanations for each answer.

Federal action agencies or the non-federal designated lead agency should submit the completed worksheet to NOAA Fisheries Greater Atlantic Regional Fisheries Office, Habitat Conservation Division (HCD) with the public notice or project application. Include project plans showing existing and proposed conditions, all waters of the U.S. on the project site, with mean low water (MLW), mean high water (MHW), high tide line (HTL), and water depths clearly marked and sensitive habitats mapped, including special aquatic sites (submerged aquatic vegetation, saltmarsh, mudflats, riffles and pools, coral reefs, and sanctuaries and refuges), hard bottom habitat areas and shellfish beds, as well as any available site photographs.

For most consultations, NOAA Fisheries has 30 days to provide EFH conservation recommendations once we receive a complete EFH assessment. Submitting all necessary information at once minimizes delays in review and keeps review timelines consistent. Delays in providing a complete EFH assessment can result in our consultation review period extending beyond the public comment period for a particular project.

The information contained on the HCD Consultation website and NOAA's EFH Mapper will assist you in completing this worksheet. Please note that the Mapper is currently being up-dated with new designations and EFH maps and text descriptions for many species are temporarily missing. When you open the Mapper, read the WARNING that pops up when you click on the Greater Atlantic Region. It will direct you to a document with maps and text descriptions for each of the missing New England Species and to the Mapper's Data Inventory where a data layer for all the missing species is available for downloading into GIS software. Once the Mapper is up-dated, you can do a Location Query for your project location, but until then, the only way to easily generate a list of the missing species and life stages is to use your own GIS software. Before you fill out the worksheet, we recommend that you check with the appropriate HCD staff member to ensure that your list is complete and accurate. They will be able to answer any questions that you have.

Also note that a number of new Habitat Areas of Particular Concern (HAPCs) have been designated in the Greater Atlantic Region. HAPC maps will also be added to the Mapper the next time it is up-dated. Currently, they can be viewed by following the instructions on the warning page for the region. We expect the Mapper to be fully up-dated and functional later this spring.

EFH ASSESSMENT WORKSHEET FOR FEDERAL AGENCIES (modified 3/2016)

PROJECT NAME: EAST SIDE COASTAL RESILIENCY

DATE: 06/17/2019

PROJECT NO.: SANDRESM1

LOCATION (Water body, county, physical address):
EAST RIVER, NEW YORK COUNTY, NEW YORK CITY, NEW YORK

PREPARER: JESSICA EINHORN, HAZEN AND SAWYER

Step 1: Use NOAA's EFH Mapper to generate the list of designated EFH for federally-managed species and life stages for the geographic area of interest. Use this list as part of the initial screening process to determine if EFH for those species occurs in the vicinity of the proposed action. The list can be included as an attachment to the worksheet. Make a preliminary determination on the need to conduct an EFH consultation.

1. INITIAL CONSIDERATIONS

EFH Designations	Yes	No
Is the action located in or adjacent to EFH designated for eggs? **List the species:** WINTER FLOUNDER, WINDOWPANE FLOUNDER, KING MACKEREL, SPANISH MACKEREL, COBIA, ATLANTIC MACKEREL, SCUP	✓	
Is the action located in or adjacent to EFH designated for larvae? **List the species:** RED HAKE, WINTER FLOUNDER, WINDOWPANE FLOUNDER, ATLANTIC HERRING, ATLANTIC BUTTERFISH, SUMMER FLOUNDER, KING MACKEREL, SPANISH MACKEREL, COBIA, ATLANTIC MACKEREL, SCUP	✓	
Is the action located in or adjacent to EFH designated for juveniles? **List the species:** RED HAKE, WINTER FLOUNDER, WINDOWPANE FLOUNDER, ATLANTIC HERRING, BLUEFISH, ATLANTIC BUTTERFISH, SUMMER FLOUNDER, BLACK SEA BASS, KING MACKEREL, SPANISH MACKEREL, COBIA, ATLANTIC MACKEREL, SCUP, LITTLE SKATE, CLEARNOSE SKATE, WINTER SKATE	✓	

Is the action located in or adjacent to EFH designated for adults or spawning adults? List the species: RED HAKE, WINTER FLOUNDER, WINDOWPANE FLOUNDER, ATLANTIC HERRING, BLUEFISH, ATLANTIC BUTTERFISH, SUMMER FLOUNDER, BLACK SEA BASS, KING MACKEREL, SPANISH MACKEREL, COBIA, ATLANTIC MACKEREL, SCUP, LITTLE SKATE, CLEARNOSE SKATE, WINTER SKATE	✓	

If you answered 'no' to all questions above, then an EFH consultation is not required - go to Section 5.

If you answered 'yes' to any of the above questions, proceed to Section 2 and complete the remainder of the worksheet.

Step 2: In order to assess impacts, it is critical to know the habitat characteristics of the site before the activity is undertaken. Use existing information, to the extent possible, in answering these questions. Identify the sources of the information provided and provide as much description as available. These should not be yes or no answers. Please note that there may be circumstances in which new information must be collected to appropriately characterize the site and assess impacts. Project plans that show the location and extent of sensitive habitats, as well as water depths, the HTL, MHW and MLW should be provided.

2. SITE CHARACTERISTICS

Site Characteristics	Description
Is the site intertidal, sub-tidal, or water column?	The East River within the project area includes both sub-tidal and water column areas as well as a very small area (~6,200 square feet) of intertidal area.
What are the sediment characteristics?	Sediment in the East River within the shallower areas of the project is primarily sand, gravel, and riprap. Sediment in the greater East River have been reported to be silty mud.
Is there submerged aquatic vegetation (SAV) at or adjacent to project site? If so describe the SAV species and spatial extent.	There is no SAV (e.g. eel grass) in the project area. However, green algae (Ulva spp.) and rockweed (Ascophyllum spp.) are present on riprap in small areas of intertidal zone abutting the bulkhead.
Are there wetlands present on or adjacent to the site? If so, describe the spatial extent and vegetation types.	There are NYSDEC regulated Littoral Zone tidal wetlands adjacent to the project area. These Littoral Zone wetlands are adjacent to the shoreline over the extent of the project area. Shoreline surveys conducted during low tide found three locations within the study area where the substrate of the East River is either visible or exposed. These areas are classified by NYSDEC as Coastal Shoals, Bars, and Mudflats. There is no SAV in these surveyed areas, however, green algae and rockweed are present on riprap in small areas of intertidal zone abutting the bulkhead.

Is there shellfish present at or adjacent to the project site? If so, please describe the spatial extent and species present.	No shellfish were observed during site surveys and no literature documenting shellfish on the hardened western shore of the East River was found.
Are there mudflats present at or adjacent to the project site? If so please describe the spatial extent.	Shoreline surveys conducted during low tide found three locations within the study area where the substrate of the East River is either visible or exposed. These areas are classified by NYSDEC as coastal shoals, bars, and mudflats.
Is there rocky or cobble bottom habitat present at or adjacent to the project site? If so, please describe the spatial extent.	The substrate of the East River is primarily sand and gravel in shallow areas and silty-mud in deeper areas. There may be rocky areas within the channel of the East River, but none that are inside the study area.
Is Habitat Area of Particular Concern (HAPC) designated at or near the site? If so for which species, what type habitat type, size, characteristics?	No HAPC is designated at the project area
What is the typical salinity, depth and water temperature regime/range?	Salinity generally ranges between 19-25 parts per thousand. According to NOAA National Centers for Environmental Information, annual temperatures at both the Battery (south of the project site) and Willets Point (north of the project site) range from 34-74 degrees Fahrenheit.
What is the normal frequency of site disturbance, both natural and man-made?	Heavy daily boat traffic of both large and small vessels pass by the project area. Development at the waterfront is common. Ambient noise in the area is generally high, including boats, traffic from the nearby FDR Drive, helicopters, and train traffic on the Williamsburg Bridge. The site is a hardened shoreline of Manhattan.
What is the area of proposed impact (work footprint & far afield)?	The current existing project area spans from Montgomery Street to the south to East 25th Street to the north. Within this area, barging would occur at a limited number of locations, embayments would be filled and relocated adjacent to East River park, the bulkhead would be removed and replaced with a new cut-off wall in the same alignment spanning the project site, shafts and footings for a shared use flyover bridge would be placed adjacent to the Con Edison facility near East 15th Street, and combined sewer outfalls would be constructed along the cut-off wall within the project area. (See Figure 2 in Consultation Letter)

Step 3: This section is used to describe the anticipated impacts from the proposed action on the physical/chemical/biological environment at the project site and areas adjacent to the site that may be affected.

3. DESCRIPTION OF IMPACTS

Impacts	Y	N	Description
Nature and duration of activity(s). Clearly describe the activities proposed and the duration of any disturbances.			See EFH Impacts Discussion in Consultation Letter
Will the benthic community be disturbed? If no, why not? If yes, describe in detail how the benthos will be impacted.	✓		See EFH Impacts Discussion in Consultation Letter
Will SAV be impacted? If no, why not? If yes, describe in detail how the SAV will be impacted. Consider both direct and indirect impacts. Provide details of any SAV survey conducted at the site.		✓	There is no SAV present in the East River in the vicinity of the proposed project
Will salt marsh habitat be impacted? If no, why not? If yes, describe in detail how wetlands will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?		✓	There is no salt marsh habitat present in the vicinity of the proposed project.

Will mudflat habitat be impacted? If no, why not? If yes, describe in detail how mudflats will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?		✓	There is no mudflat habitat present within the vicinity of the proposed project
Will shellfish habitat be impacted? If so, provide in detail how the shellfish habitat will be impacted. What is the aerial extent of the impact? Provide details of any shellfish survey conducted at the site.		✓	There is no shellfish habitat in the viicinity of the proposed project.
Will hard bottom (rocky, cobble, gravel) habitat be impacted at the site? If so, provide in detail how the hard bottom will be impacted. What is the aerial extent of the impact?		✓	The substrate in the study area is primarily sand and small gravel in the shallower areas and silty mud in the deeper areas.
Will sediments be altered and/or sedimentation rates change? If no, why not? If yes, describe how.	✓		Sedimentation would be temporarily elevated during construction due to the disturbance to the benthic environment. Potential impacts will be minimized through the use of turbidity curtains.
Will turbidity increase? If no, why not? If yes, describe the causes, the extent of the effects, and the duration.	✓		Turbidity would temporarily increase during construction due to disturbance to the benthic environment. Potential impacts will be minimized through the use of turbidity curtains. There would not be any operational conditions that generate turbidity.

Will water depth change? What are the current and proposed depths?	☐	☑	The topography of the East River would not be altered and water depths would remain the same as existing conditions.
Will contaminants be released into sediments or water column? If yes, describe the nature of the contaminants and the extent of the effects.	☑	☐	Contamination is anticipated to be present in the East River sediments due to historic land uses. Turbidity curtains would be installed surrounding all work areas where benthic disturbance would occur.
Will tidal flow, currents, or wave patterns be altered? If no, why not? If yes, describe in detail how.	☐	☑	No construction activity proposed would alter tidal flow or currents. New piles and shafts are proposed, however, these would be placed in areas already containing numerous piles and hardened structures.
Will water quality be altered? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration of the impact.	☑	☐	Water quality has the potential to be temporarily affected due to increased turbidity associated with disturbance to the benthic environment. Effects to water quality would be temporary and mitigated through the use of turbidity curtains.
Will ambient noise levels change? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration and degree of impact.	☑	☐	Ambient noise levels will be changed during construction due to pile driving activities. See "Description of In-Water Components" in the consultation letter for details, and "Proposed Protective Measures" in the consultation letter for proposed mitigatory measures.
Does the action have the potential to impact prey species of federally managed fish with EFH designations?	☐	☑	Prey species are not anticipated to be significantly impacted by the proposed action. See "Assessment of Impacts" in consultation letter for details.

Step 4: This section is used to evaluate the consequences of the proposed action on the functions and values of EFH as well as the vulnerability of the EFH species and their life stages. Identify which species (from the list generated in Step 1) will be adversely impacted from the action. Assessment of EFH impacts should be based upon the site characteristics identified in Step 2 and the nature of the impacts described within Step 3. NOAA's EFH Mapper should be used during this assessment to determine the ecological parameters/ preferences associated with each species listed and the potential impact to those parameters.

4. EFH ASSESSMENT

Functions and Values	Y	N	Describe habitat type, species and life stages to be adversely impacted
Will functions and values of EFH be impacted for:			
Spawning **If yes, describe in detail how, and for which species. Describe how adverse effects will be avoided and minimized.**	✓		Winter flounder, windowpane flounder, summer flounder, little skate, clearnose skate, winter skate (See EFH Assessment in Consultation Letter)
Nursery **If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.**	✓		Winter, windowpane, summer flounder: eggs, larvae, juveniles Atlantic herring: larvae, juveniles Atlantic butterfish: juveniles Black sea bass: juveniles Atlantic mackerel: eggs, larvae, juveniles Scup: larvae Little, clearnose, winter skate: juveniles (See EFH Assessment in Consultation Letter)
Forage **If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.**	✓		Winter, windowpane, summer flounder: larvae, juveniles, adults Atlantic herring: larvae, juveniles, adults Bluefish: juveniles, adults Atlantic butterfish: juveniles, adults Black sea bass: juveniles, adults Atlantic mackerel: larvae, juveniles, adults Scup: larvae, juveniles, adults Little, clearnose, winter skate: juveniles, adults (See EFH Assessment in Consultation Letter)
Shelter **If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.**	✓		Black sea bass: juveniles, adults (See EFH Assessment in Consultation Letter)

Will impacts be temporary or permanent? Please indicate in description box and describe the duration of the impacts.			Temporary in water construction impacts will occur within the 3.5-year construction timeline, which is projected to break ground in March of 2020. Permanent in water impacts will be mitigated at a 2:1 ratio (See EFH Assessment in Consultation Letter)
Will compensatory mitigation be used? If no, why not? Describe plans for mitigation and how this will offset impacts to EFH. Include a conceptual compensatory mitigation plan, if applicable.	✓		Yes. Permanent in water impacts to tidal wetlands will be mitigated at a 2:1 ratio to compensate for impacts to EFH (See EFH Assessment in Consultation Letter)

<u>Step 5</u>: This section provides the federal agency's determination on the degree of impact to EFH from the proposed action. The EFH determination also dictates the type of EFH consultation that will be required with NOAA Fisheries.

Please note: if information provided in the worksheet is insufficient to allow NOAA Fisheries to complete the EFH consultation additional information will be requested.

5. DETERMINATION OF IMPACT

Federal Agency's EFH Determination		
Overall degree of adverse effects on EFH (not including compensatory mitigation) will be: **(check the appropriate statement)**		**There is no adverse effect on EFH or no EFH is designated at the project site.** **EFH Consultation is not required.**
		The adverse effect on EFH is not substantial. This means that the adverse effects are either no more than minimal, temporary, or that they can be alleviated with minor project modifications or conservation recommendations. **This is a request for an abbreviated EFH consultation.**
		The adverse effect on EFH is substantial. **This is a request for an expanded EFH consultation.**

Step 6: Consultation with NOAA Fisheries may also be required if the proposed action results in adverse impacts to other NOAA-trust resources, such as anadromous fish, shellfish, crustaceans, or their habitats as part of the Fish and Wildlife Coordination Act Some examples of other NOAA-trust resources are listed below. Inquiries regarding potential impacts to marine mammals or threatened/endangered species should be directed to NOAA Fisheries' Protected Resources Division.

6. OTHER NOAA-TRUST RESOURCES IMPACT ASSESSMENT

Species known to occur at site (list others that may apply)	Describe habitat impact type (i.e., physical, chemical, or biological disruption of spawning and/or egg development habitat, juvenile nursery and/or adult feeding or migration habitat). Please note, impacts to federally listed species of fish, sea turtles, and marine mammals must be coordinated with the GARFO Protected Resources Division.
alewife	Alewife are pelagic species capable of avoiding the proposed work area. In addition, any river herring in the East River would be anticipated to be transient. Therefore, no significant adverse effects to any lifestage of alewife are anticipated as a result of the proposed project.
American eel	American eels are would be capable of avoiding the proposed work area during their migration from seawater to freshwater. Any American eels in the East River in the vicinity of the proposed project would be anticipated to be transient individuals. Therefore, no significant adverse effects to any lifestage of American eels are anticipated as a result of the proposed project.
American shad	N/A
Atlantic menhaden	Menhaden are pelagic species capable of avoiding the proposed work area. In addition, any menhaden in the East River in the vicinity of the proposed project would be anticipated to be transient individuals. Therefore, no significant adverse effects to any lifestage of menhaden are anticipated as a result of the proposed project.
blue crab	N/A
blue mussel	N/A
blueback herring	Blueback herring are pelagic species capable of avoiding the proposed work area. In addition, any river herring in the East River would be anticipated to be transient. Therefore, no significant adverse effects to any lifestage of blueback herring are anticipated as a result of the proposed project.

Eastern oyster	N/A
horseshoe crab	N/A
quahog	N/A
soft-shell clams	N/A
striped bass	Temporary increases in turbidity or shading due to barging and outfall construction activities are not anticipated to have a significant adverse effect on striped bass. Noise from pile driving and pile drilling could potentially have minimal adverse effects to striped bass in the immediate vicinity of the pile installation and could prevent them from utilizing that area for the duration of construction. Conservation measures to limit the noise of the pile driving and drilling to the greatest extent practicable would be implemented. These include using a cushion block to dampen the impact of the pile hammer, ramping up pile driving gradually to give fish opportunities to vacate the construction area, and a bubble curtain would be implemented, as practicable, for installation of the flyover bridge support shafts. The study area constitutes a very small portion of the available habitat for this species within the New York Harbor Estuary and East River. Therefore, while some temporary construction related effects to striped bass could potentially occur, no significant adverse effects to any lifestage or the fishery of striped bass are anticipated as a result of the proposed project.
other species:	(See Fish and Wildlife Coordination Act Species Assessment in Consultation Letter)

Useful Links

National Wetland Inventory Maps

EPA's National Estuaries Program

Northeast Regional Ocean Council (NROC) Data

Mid-Atlantic Regional Council on the Ocean (MARCO) Data

Resources by State:

Maine
Eelgrass maps

Maine Office of GIS Data Catalog

Casco Bay Estuary Partnership

Maine GIS Stream Habitat Viewer

New Hampshire
New Hampshire's Statewide GIS Clearinghouse, NH GRANIT

New Hampshire Coastal Viewer

Massachusetts
Eelgrass maps

MADMF Recommended Time of Year Restrictions Document

Massachusetts Bays National Estuary Program

Buzzards Bay National Estuary Program

Massachusetts Division of Marine Fisheries

Massachusetts Office of Coastal Zone Management

Rhode Island
Eelgrass maps

Narraganset Bay Estuary Program

Rhode Island Division of Marine Fisheries

Rhode Island Coastal Resources Management Council

Connecticut

Eelgrass Maps

Long Island Sound Study

CT GIS Resources

CT DEEP Office of Long Island Sound Programs and Fisheries

CT Bureau of Aquaculture Shellfish

Maps CT River Watershed Council

New York

Eelgrass report

Peconic Estuary Program

NY/NJ Harbor Estuary

New Jersey

Submerged Aquatic Vegetation mapping

Barnegat Bay Partnership

Delaware

Partnership for the Delaware Estuary

Center for Delaware Inland Bays

Maryland

Submerged Aquatic Vegetation mapping

MERLIN

Maryland Coastal Bays Program

Virginia

Submerged Aquatic Vegetation mapping

LITERATURE CITED

AKRF, Inc. 2002. Second Avenue Subway Environmental Impact Statement. New York, NY.

Atlantic States Marine Fisheries Commission, 2019a. Species Profile: Striped Bass. http://www.asmfc.org/species/atlantic-striped-bass

Atlantic States Marine Fisheries Commission, 2019b. Species Profile: Tautog. http://www.asmfc.org/species/tautog

Atlantic States Marine Fisheries Commission, 2019c. Species Profile: Weakfish. http://www.asmfc.org/species/weakfish

Bain, M.B. 1997. Atlantic and shortnose sturgeons of the Hudson River: common and divergent life history attributes. Environmental Biology of Fishes 48:347-358.

Blumberg, A. F., & Pritchard, D. W. (1997). Estimates of the transport through the East River, New York. Journal of Geophysical Research: Oceans (1978–2012), 102(C3), 5685-5703.

Bowman, M.J. (1976). The Tides of the East River, New York. Journal of Geophysical Research: 81:1609-1616.

Burton, W.H. 1993. Effects of bucket dredging on water quality in the Delaware River and the potential for effects on fisheries resources. Versar, Inc., 9200 Rumsey Road, Columbia, Maryland 21045.

S, Berrien PL, Johnson DL, Morse WW. 1999. Essential fish habitat source document: Windowpane, Scophthalmus aquosus, life history and habitat characteristics. NOAA Tech Memo NMFS NE 137; 32 p.

Chesapeake Bay Program, 2019a. Species Profile: Atlantic Silversides. https://www.chesapeakebay.net/discover/field-guide/entry/atlantic_silverside

Chesapeake Bay Program, 2019b. Species Profile: Mummichog. https://www.chesapeakebay.net/discover/field-guide/entry/mummichog

Chesapeake Bay Program, 2019c. Species Prfile: Menhaden. https://www.chesapeakebay.net/discover/field-guide/entry/atlantic_menhaden

Chesapeake Bay Program, 2019d. Species Profile: Anchovy. https://www.chesapeakebay.net/discover/field-guide/entry/bay_anchovy

Chesapeake Bay Program, 2019e. Species Profile: American Eel. https://www.chesapeakebay.net/discover/field-guide/entry/american_eel

Coastal Environmental Services. 1987. Television City Project: Characterization of the Aquatic Ecology of the Site and Assessment of Potential Impacts of the Project on the Aquatic biota. Prepared for Berle, Kass, and Case, New York, New York; McKeown and Franz, Inc., New York, NY; and The Trump Organization, New York, NY.

Cowardin, L. M., Carter, V., Golet, F. C., & LaRoe, E. T. (1979). Classification of wetlands and deepwater habitats of the United States. US Department of the Interior, US Fish and Wildlife Service.

Cross JN, Zetlin CA, Berrien PL, Johnson DL, McBridge C. 1999. Essential fish habitat source document: Butterfish, Peprilus triacanthus, life history and habitat characteristics. NOAA Tech Memo NMFS NE 145; 42 p.

Dadswell, M.J., B.D. Taubert, T.S. Squiers, D. Marchette, and J. Buckley. 1984. Synopsis of biological data on shortnose sturgeon, Acipenser brevirostrum LeSueur 1818. National Oceanic and Atmospheric Administration Technical Report NMFS 14, Washington, DC.

Dunton, K.J., A. Jordan, K.A. McKown, D.O. Conover, M.G. Frisk. 2010. Abundance and distribution of Atlantic sturgeon within the Northwest Atlantic Ocean determined from five fishery-independent surveys. Fishery Bulletin 108:450-465.

Drohan AF, Manderson JP, and Packer DB. 2007. Essential fish habitat source document: Black sea bass, Centropristis striata, life history and habitat characteristics. Second Edition. NOAA Tech Memo NMFS NE 143; 42 p.

EPA (Environmental Protection Agency). 1986. Quality Criteria for Water. EPA 440/5-86-001.

ESS Group, Inc. (ESS). 2013. ESSENTIAL FISH HABITAT ASSESSMENT West Point In-River Transmission Cable Project Hudson River, New York. Accessed from http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B9A8C2628-6A7F-4EB6-A620-BFA9ECF9C3CE%7D

Fahay MP, Berrien PL, Johnson DL, Morse WW. 1999. Essential fish habitat source document: Bluefish, Pomatomus saltatrix, life history and habitat characteristics. NOAA Tech Memo NMFS NE 144; 64 p.

FHWA (Federal Highway Administration). 2012. Tappan Zee Hudson River Crossing Project. Final Environmental Impact Statement. August 2012.

Fisheries and Oceans Canada, 2019a. Species Profile: Winter Skate. http://dfo-mpo.gc.ca/species/profiles/winterskate.html

Fisheries and Oceans Canada, 2019b. Species Profile: Little Skate. http://dfo-mpo.gc.ca/species/profiles/littleskate.html

Hatin, D., R. Fortin, and F. Caron. 2002. Movements and aggregation areas of adult Atlantic sturgeon (Acipenser oxyrinchus) in the St. Lawrence River estuary, Québec, Canada. Journal of Applied Ichthyology 18:586-594.

Hatin, D., J. Munro, F. Caron, and R. D. Simons. 2007. Movements, home range size, and habitat use and selection of early juvenile Atlantic sturgeon in the St. Lawrence estuarine transition zone. American Fisheries Society Symposium 56:129-155.

Hazen and Sawyer. 1983. Newtown Creek Water Pollution Control Plant. Revised application for modification of the requirements of secondary treatment under Section 301(h), PL 97-117. Prepared for the City of New York, Department of Environmental Protection.

Hazen and Sawyer. 1985. Newtown Creek water pollution control plant. Revised application for modification of the requirements of secondary treatment. VII: Additional biologic and toxics information. Prepared for the City of New York, Department of Environmental Protection.

Howell, P. and D. Simpson. 1994. Abundance of marine resources in relation to dissolved oxygen in Long Island Sound. Estuaries 17: 394-402.

Hurley, L.M. 1990. Field Guide to the Submerged Aquatic Vegetation of Chesapeake Bay. U.S. Fish and Wildlife Service, Chesapeake Bay Estuary Program, Annapolis, MD.

Jenkins, W.E., T.I. Smith, L.D. Heyward, and D.M. Knott. 1993. Tolerance of shortnose sturgeon juveniles to different salinity and dissolved oxygen concentrations. Proceedings of the Annual Conference of the Southeast Association of Fish and Wildlife Agencies 47:476- 484

Kynard, B. 1997. Life history, latitudinal patterns, and status of the shortnose sturgeon, Acipenser brevirostrum. Environmental Biology of Fishes 48:319-334.

National Oceanic and Atmospheric Administration (NOAA). 2001. Essential Fish Habitat Protection. https://www.habitat.noaa.gov/protection/efh/efhmapper/

National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS). 2016. ESCR ESA Consultation. (Records located in Attachment 2)

National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS). 2019. ESCR EFH Response Letter from Karen Greene. (Records located in Attachment 2)

National Marine Fisheries Service (NMFS). 2019. Species Profile: Scup. Accessed from https://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/images/species-results/pdfs/Scup.pdf

National Marine Fisheries Service (NMFS). 1998b. Essential Fish Habitat Description Red hake (Urophycis chuss). Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/red-hake.pdf

National Marine Fisheries Service (NMFS). 1998c. Essential Fish Habitat Description Winter flounder (Pseudopleuronectes americanus). Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/winter.pdf

National Marine Fisheries Service (NMFS). 1998d. Essential Fish Habitat Description Windowpane flounder (Scophthalmus aquosus). Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/windowpane.pdf

National Marine Fisheries Service (NMFS). 1998e. Essential Fish Habitat Description Atlantic herring (Clupea harengus). Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/herring.pdf

National Marine Fisheries Service (NMFS). 1998f. Summary of Essential Fish Habitat (EFH) and General Habitat Parameters for Federally Managed Species. Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/efhtables.pdf

National Marine Fisheries Service (NMFS). 1998h. Essential Fish Habitat Description Black sea bass (Centropristis striata). Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/blackseabass.htm

National Marine Fisheries Service (NMFS). 1998i. Essential Fish Habitat Description Coastal Migratory Pelagics. Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/mackcobia.htm

National Oceanic and Atmospheric Administration (NOAA). 2001. Essential Fish Habitat Protection. https://www.habitat.noaa.gov/protection/efh/efhmapper/

National Oceanic and Atmospheric Administration, 2009. http://www.nmfs.noaa.gov/pr/species/concern

National Oceanic and Atmospheric Administration. 2019a. Species Profile: Atlantic Mackerel. https://www.fisheries.noaa.gov/species/atlantic-mackerel.

National Oceanic and Atmospheric Administration. 2019b. Correspondence on the Preliminary Draft Environmental Impact Statement and Draft Essential Fish Habitat Assessment, East side Coastal Resiliency Project, East River, New York dated March 14, 2019.

New York City Department of Environmental Protection (DEP). 2002. New York Harbor Water Quality Report. New York, NY. http://www.nyc.gov/html/dep/pdf/hwqs2002.pdf

New York City Department of Environmental Protection (DEP). 2007. East River and Open Waters Waterbody/Watershed Facility Plan Report. New York, NY.

New York City Department of Environmental Protection (DEP). 2012. State of the Harbor Report. New York, NY. http://www.nyc.gov/html/dep/pdf/hwqs2012.pdf

New York City Department of Environmental Protection (DEP). 2015. Harbor Water Sampling Data. Accessed from http://www.nyc.gov/html/dep/html/harborwater/harbor_water_sampling_results.shtml

New York City Department of Environmental Protection (DEP). 2017. Harbor Water Quality Survey Data 2017. New York, NY. http://www.nyc.gov/html/dep/html/harborwater/harbor_water_sampling_results.shtml

Normandeau Associates. 1994. Ravenswood Generating Station Impingement and Entrainment Report, February 1993 through January 1994.

Open Accessible Space Information System (OASIS). 2014. Combined Sewer Outfalls. Accessed 8/18/2015 from http://www.oasisnyc.net/map.aspx

Packer DB, Griesbach SJ, Berrien PL, Johnson DL, Zetlin CA, Morse WW. 1999. Essential fish habitat source document: Summer Flounder, Paralichthys denatus, life history and habitat characteristics. NOAA Tech Memo NMFS NE 151; 88 p.

RiverHerring.com, 2018. Species Profile: River Herring. http://www.riverherring.com/

Savoy, T. and D. Pacileo. 2003. Movements and important habitats of subadult Atlantic sturgeon in Connecticut waters. Transactions of the American Fisheries Society 132:1-8.

Steimle FW, Morse WW, Berrien PL, Johson DL. 1999a. Essential fish habitat source document: Red Hake, Urophycis chuss, life history and habitat characteristics. NOAA Tech Memo NMFS NE 133; 34 p.

Stevenson DK and Scott ML.2005. Essential fish habitat source document: Atlantic herring, Clupea harengus, life history and habitat characteristics. Second Edition. NOAA Tech Memo NMFS NE 126; 48 p.

Tomechik, C.; Colby, J.; Adonizio, M. (2015). *Improvements to Probabilistic Tidal Turbine-Fish Interaction Model Parameters*. Paper Presented at the 3rd Marine Energy Technology Symposium (METS), Washington DC, USA.

U.S. Army Corps of Engineers (USACE). 2015. Controlling Depth Reports and Surveys: East River, Battery to Throgs Neck Bridge, NY. Accessed 8/18/2015 from http://www.nan.usace.army.mil/Missions/Navigation/ControllingDepthReports.aspx

Waldman, J.R., J. Hart & I. Wirgin. 1996. Stock composition of the New York Bight Atlantic sturgeon fishery, based on analysis of mitochondrial DNA. Trans. Amer. Fish. Soc. 125: 364–371.

Wilk, S.J., E.M. MacHaffie, D.G. McMillan, A.L. Pacheco, R.A. Pikanowski, and L.L. Stehlik. 1996. Fish, megainvertebrates, and associated hydrographic observations collected in the Hudson-Raritan Estuary, January 1992-December 1993. U.S. Natl. Mar. Fish. Serv., Northeast Fish. Sci. Cent. Ref. Doc. 96-14. 95 p.

Woodhead, P.M.J. 1990. The Fish Community of New York Harbor: Spatial and temporal Distribution of major Species. Report to the New York – New Jersey Harbor Estuary Program, New York, NY.

Zetlin CA, Johnson DL, Morse WW. 1999. Essential fish habitat source document: Summer Flounder, Paralichthys dentatus, life history and habitat characteristics. NOAA Tech Memo NMFS NE 151; 88 p.

ATTACHMENT 2
FEDERAL REPRESENTATION LETTER

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

U.S. Department of Housing and Urban Development
New York State Office
Jacob K. Javits Federal Building
26 Federal Plaza, Suite 3541
New York, New York 10278-0068
Office (212) 264-8000, Fax (212) 264- 0993
TTY (212) 264-0927

28 March 2019

Edith Carson-Supino, M.Sc.
Section 7 Fish Biologist
NOAA Fisheries
U.S. Department of Commerce
Greater Atlantic Regional Fisheries Office
55 Great Republic Dr.
Gloucester, MA 01930

Re: Responsible Entity Certification for Section 7 Review for U.S. Department of Housing and Urban Development Community Development Block Grant-Disaster Recovery Housing Assistance Program, administered by New York City Office of Management and Budget

Dear Ms. Carson-Supino:

The Department of Housing and Urban Development (HUD) has authorized New York City Office of Management and Budget (NYCOMB) to implement the HUD Community Development Block Grant – Disaster Recovery (CDBG-DR) Housing Assistance Program (Program) in accordance with the *New York City Action Plan for Community Development Block Grant Program Disaster Recovery*, dated May 2013 (Federal Register Docket # FR-5696-N-01). In accordance with prior coordination agreements between HUD and the FWS, HUD certifies that NYCOMB shall assume federal responsibilities for all National Environmental Policy Act and all related environmental laws and authorities as identified in HUD regulation 24 CFR 58.5. Consultations arising from activities funded under this Program will be conducted directly by NYCOMB in accordance with the assumption authority of 24 CFR 58.4

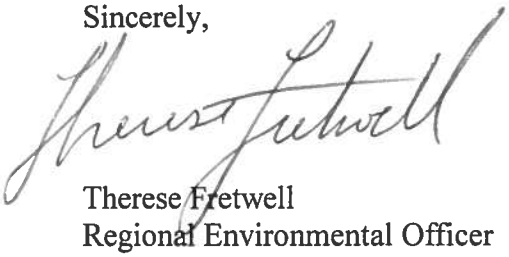
According to HUD regulations at 24 CFR §58.4, state and local governments that receive HUD funds assume the status of 'responsible entity,' and act as the federal action agency for all necessary consultations and other compliance measures. The assumption of federal status for environmental review purposes extends to substantive and procedural compliance with Section 7 of the Endangered Species Act, per 24 CFR §58.5.

For all Section 7 consultations arising from HUD-funded activities under any of the programs listed at 24 CFR §58.1(b), the New York City Office of Management and Budget has been

granted authority to act as the federal action agency. These governments should alert the Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS) when seeking a HUD Release of Funds for a project that requires Section 7 consultation. The FWS and NMFS may notify HUD if the State or local government has not fulfilled its Section 7 requirements, and HUD will not release the funds in those instances.

Please contact Regional Environmental Officer Therese Fretwell at 212-542-7445 if you have any questions regarding HUD's designation of New York City for Section 7 purposes under the CDBG-DR program, or HUD's general regulations concerning assumption of federal authority for Section 7 consultations.

Sincerely,



Therese Fretwell
Regional Environmental Officer
Department of Housing and Urban Development
26 Federal Plaza, Room 3513
New York, NY 10278

c. Mark Brown Murray, Section 7 Coordinator

SECTION 7 CONSULTATION

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

The City of New York
Office of Management and Budget
255 Greenwich Street • New York, New York 10007-2146

NOAA's National Marine Fisheries Service
Protected Resources Division
55 Great Republic Drive
Gloucester, MA 01930

Attn: Dr. Michael J. Asaro

Re: Request for Endangered Species Act (ESA) Concurrence
East Side Coastal Resiliency Project
New York, New York
New York City Department of Design and Construction Capital Contract: SANDRESM1

Dear Dr. Asaro,

On behalf of the U.S. Department of Housing and Urban Development (HUD), the New York City (City) Office of Management and Budget (OMB) is requesting re-initiation of consultation and is providing the National Oceanic and Atmospheric Association (NOAA) National Marine Fisheries Service (NMFS) new design and construction information for the proposed East Side Coastal Resiliency (ESCR) project, located in New York City, New York. HUD has granted authority to OMB to act as the federal agency to prepare this consultation (see **Attachment 1**). OMB is requesting concurrence on our finding that the current design and construction plans of the proposed project *may affect but is not likely to adversely affect* any species listed as threatened or endangered by NMFS under the ESA of 1973, as amended. Our supporting analysis is provided below.

PROPOSED PROJECT

Hurricane Sandy, which made landfall in October 2012, greatly impacted New York City and surrounding areas, including the east side of Manhattan, highlighting existing deficiencies in the City's ability to adequately protect vulnerable populations and critical infrastructure during major storm events. Hurricane Sandy caused extensive inland flooding in the study area, resulting in damage to residential and commercial property; public open space; transportation; and critical power, water, and sewer infrastructure. Addressing the vulnerability of the study area by protecting critical infrastructure and resources on Manhattan's lower east side is essential to the City's resiliency planning.

In June 2013, the U.S. Department of Housing and Urban Development (HUD) launched Rebuild by Design (RBD), a competition to respond to Hurricane Sandy's devastation in the northeast region of the United States. The winning proposals would be implemented using Community Development Block Grant –

Disaster Recovery (CDBG-DR) funding as well as other public and private-sector funding sources. One of the winning proposals was an integrated flood protection system on the east side of southern Manhattan to reduce the risk of coastal flood hazards, which became the East Side Coastal Resiliency (ESCR) project. The flood protection system is comprised of a combination of floodwalls, 18 closure structures (i.e., swing and roller floodgates), and supporting infrastructure improvements that together would reduce risk of damage from coastal storms in the area proposed for protection. The project area spans from Montgomery Street on the south to East 25th Street on the north and is split into two segments for design purposes as shown in **Figure 1**.

In addition to providing a reliable flood protection system for this flood hazard area, the proposed project aims to improve and enhance access to the waterfront in East River Park and Stuyvesant Cove Park, which are located within the study area. As such, the City is proposing to construct and operate a flood protection system with integrated urban design features that will reduce flood hazards to a diverse and vulnerable residential population and safeguard critical energy, infrastructure, commercial, and transportation assets while enhancing access to the waterfront and parkland. Project construction is anticipated to commence in spring 2020 with an estimated 3.5-year construction schedule allowing the flood protection system to be in place in 2023.

Preferred Alternative (Alternative 4) – Flood Protection System with a Raised East River Park

Alternative 4, identified as the new Preferred Alternative, of the ESCR project proposes to provide flood protection by raising East River Park by approximately eight feet and installing below-grade floodwalls within the park to meet the design flood protection criteria, providing flood protection for both the park and the inland community. This alternative would enhance neighborhood connectivity to the East River Park by reconstructing the Delancey Street, East 10th Street, and Corlears Hook pedestrian bridges to provide universal accessibility. This alternative would require reconstructing the park's underground water supply and drainage infrastructure and the existing park structures and recreational features, including the park amphitheater, as well as relocating two embayments within East River Park. This alternative also includes construction of footings to accommodate a shared-use flyover bridge connecting the north end of East River Park to Captain Patrick J. Brown Walk to alleviate congestion in the East River Bikeway. Under this alternative, Murphy Brothers and Asser Levy Playgrounds would be reconstructed and protected by a floodwall that would connect the northern point of East River park to the existing VA Hospital flood protection system at East 25th Street.

Description of In-Water Components

Construction of the overall proposed project will require specific work to be conducted in federally and state regulated waters. The in-water construction activities detailed in the previous consultations are provided in **Attachment 2.** Some of the in-water components from the previous consultations remain a component of the Preferred Alternative, though with modified assumptions. The design of the Preferred Alternative is currently underway and in the conceptual stage at present; therefore, this consultation assumes a reasonable worst-case scenario, specifically with respect to the in-water disturbances associated with the implementation of the Preferred Alternative. The primary in-water activities associated with the Preferred Alternative are described below and the area of impact summarized in **Table 1** and **Figure 2**:

- Use of construction barges and the installation of temporary mooring spuds and monopile dolphins for stabilization (resulting in approximately 160 square feet of temporary disturbance)
- Cofferdams for the reconstruction of ten combined sewer outfalls (resulting in approximately 10,000 square feet of temporary disturbance)
    - 24-inch H-type steel pile installed with cushioned impact hammer
- Demolition of the existing bulkhead for the installation of the cut-off wall, which will be installed by pile driving in the same alignment (resulting in 7,284 square feet of temporary disturbance)
    - 19-inch AZ steel piles installed with vibratory hammer
- Filling approximately 20,600 square feet of two existing embayments and filling 2,833 square feet behind the cutoff wall for the new embayments (permanent disturbance)
- Demolition of the existing esplanade in areas where new embayments will be constructed (resulting in 22,764 square feet of temporary disturbance)
- Pile drilling for the installation of ten 8-foot diameter shafts and installation of five footings to be placed atop of the shafts for the shared use flyover bridge (resulting in approximately 652 square feet of permanent disturbance)
    - 48-inch diameter steel caissons and 12-inch steel micropiles installed with drill rig

The reasonable worst-case scenario assumes the use of barges for construction due to the site constraints of East River Park that include limited vehicular access and extent of ongoing construction activities in the park. Approximately 600,000 cubic yards of fill is estimated to be required for the construction under the Preferred Alternative. An average of 3 barge trips per day are anticipated throughout the 3.5-year construction period. East River is a busy maritime port with tour boats, tugs, barges, and recreational vessels traversing the waters 24 hours a day. The United States Coast Guard (USCG) operates a harbor surveillance system to help provide separation between large vessels. The maritime trips generated by construction of the proposed project are expected to be limited to tug-assisted barges for equipment and materials. All of these vessels are operated by captains licensed by USCG. The origin of the source material and vessel routes are not yet known. Temporary construction barging operations would primarily require the installation of mooring spuds and monopile dolphins on the East River floor that would result in approximately 160 square feet of temporary disturbance. The construction would likely involve the use of equipment such as barge-mounted cranes and a vibratory pile driver or other drilling equipment to place the mooring spuds and monopile dolphins. At the completion of construction, all barge components would be removed. Operations of the proposed project will not result in a permanent increase of vessel traffic in the area.

To relocate and reconstruct the 10 sewer outfalls, a watertight cofferdam would be installed adjacent to the bulkhead at each sewer outfall location and the work area would be dewatered. The top of the cofferdam would be above the mean higher-high water line to isolate the work area from tidal influence. The work area would not contain standing water and approved dewatering measures would be installed, as necessary, and would discharge below the mean higher-high water line. A portable sediment tank or approved equivalent would be used to treat dewatering effluent. Approximately 1,000 square feet of temporary disturbance to regulated tidal wetlands between the cofferdams and East River bulkhead is anticipated for each sewer outfall for a total temporary disturbance area of 10,000 square feet. Existing sewer infrastructure is anticipated to be filled with concrete and abandoned in place.

To install the new cut-off wall, the existing bulkhead must first be demolished. Turbidity curtains would be installed prior to the start of demolition activities along the entire length of the bulkhead. In the same alignment as the bulkhead, the cut-off wall sheet piles would be pile driven, initially vibrated down and driven to final tip elevation. Where obstructions are encountered some pre-drilling may be needed prior to installing the cut-off wall sheet piles. In areas where the entire esplanade would be demolished to accommodate the new embayments, debris nets would be utilized to minimize the amount of debris falling

into the waterway. Any large debris would be retrieved and disposed of in accordance with applicable regulations and best practices.

At the existing embayments, the area inland of the cutoff wall would be backfilled, which would involve the loss of approximately 20,600 square feet of existing tidal wetlands. These embayments were created as part of the esplanade redesign in 2005–2008 to make the East River more accessible to park users and heighten their experience of the river and its currents and tidal flow. They consist of narrow areas that allow tidal water from the East River to flow beneath short pedestrian bridges along the esplanade, which causes the shading of significant portions of the water below. The bulkhead edge includes rocky fill material that was placed as part of the recent reconstruction to improve slope stabilization. The proposed relocated embayments would be of comparable or larger size (approximately 26,000 square feet in total) with improved habitat conditions, including the elimination of bridges that shade aquatic habitat, which can reduce benthic productivity and biomass. In addition, the provision of habitat enhancements designed for the recruitment of shellfish and other aquatic life along East River Park is also being explored.

To install the shafts and footings associated with the flyover bridge, the current assumption includes use of land-based drill rigs positioned in East River Park, the East River Greenway path and the Con Edison pier to install these support structures south of East 15th Street. Drilling for footings to be installed along Captain Patrick J Brown walk would be performed using barge mounted drill rigs. Pile drilling activities for the flyover bridge would involve the installation of a turbidity curtain and sinking of the pipe with a rotating cutter head to push the pipe into the river bed. After sinking the pipe, a rebar cage is lowered prior to installing a tremie pipe. Concrete is then pumped into the tremie pipe. As the tremie pipe is filled with concrete, river water and sediment within that pipe is gradually displaced or may require pumping to remove the sediment and water. In either case, the discharge material would be tested for quality before being discharged either to the river or the existing sewer system. Once the installation of these components is complete, the rebar cage, tremie pipe and any turbidity curtains would be removed.

Table 1

Temporary Disturbances and Permanent Impacts to Tidal Wetlands

Capital Project	Impact Type	Area of Disturbance or Impacts (Sq. Ft.)	
SANDRESM1 East Side Coastal Resiliency Project	Temporary Disturbances	Reconstructed Sewer Outfalls	10,000
		Demolition of Bulkhead for Cut-off Wall Installation	7,284
		Demolition of Areas of Existing Esplanade	22,764
		Construction Barge Moorings	160
		Total	**40,208**
	Permanent Impacts	Flyover Bridge Shafts	502
		Flyover Bridge Footings	150
		Filling Northern Embayment	16,000
		Filling Southern Embayment	4,600
		Filling Behind Cut-off Wall for New Embayments (Existing Esplanade)	2,833
		Total	**24,085**

Summary of Protective Measures

Design and construction phasing planning for the Preferred Alternative is ongoing. However, pile driving and pile drilling associated with installation of the support structures of the shared use flyover bridge, the cut-off wall in the alignment of the existing bulkhead, and the cofferdams to protect the work area of sewer outfall reconstruction is anticipated to take place adjacent to and within the East River. The noise generated by pile driving and pile drilling that would be associated with construction of the Preferred Alternative is known to cause behavioral and physiological impacts to fish. Due to the potential for adverse effects to fish, the City has committed to implementing conservation measures for in-water pile installation associated with the Preferred Alternative including:

- **Cushion blocks**. Cushion blocks are wooden blocks placed on the top of the pile and act as a buffer between the impact hammer and the pile, reducing total noise from each impact.
- **Pile driving ramp up**. Pile driving would begin with a series of low impact hits and gradually increase to normal impact levels. This method allows for some warning to aquatic fauna prior to attaining peak noise levels of the pile driving.
- **Bubble Curtains**. Bubble curtains are hoses or manifolds that are placed on the sea floor around the project impact area. Air compressors disburse air into the hoses and air bubbles then discharge up into the water column. Bubble curtains have been shown to be effective at reducing the sound level of pile driving to acceptable underwater levels. Where practicable, bubble curtains would be used during installation of support structures for the shared use flyover bridge.

Moreover, to reduce suspension of sediment into the water column to the greatest extent practicable, turbidity curtains would be installed prior to any construction, where practicable. Sediments in the East River are anticipated to be contaminated due to historic land uses. All sediments removed from the flyover bridge support shaft casings will be handled, stored, and disposed of in accordance with all applicable health, safety, and sediment and waste management plans including a site specific Remedial Action Plan (RAP), a Construction Health and Safety Plan (CHASP), a NYSDEC approved stormwater pollution prevention plan (SWPPP), and a U.S. Environmental Protection Agency (USEPA) approved spill prevention control and countermeasures plan (SPCCP).

Wetland mitigatory measures have the potential to provide new and improved habitat within the action area and at off-site wetland areas. The proposed embayments within East River Park to replace the existing embayments would be of comparable or larger size with improved habitat conditions, including the elimination of bridges that shade aquatic habitat, which can reduce benthic organism productivity and biomass. Moreover, the provision of habitat enhancements designed for the recruitment of shellfish and other aquatic life along East River Park is also being explored as design advances. Additional off-site tidal wetland creation and/or rehabilitation would also be undertaken to satisfy NYSDEC mitigation requirements of a 2:1 square footage ratio and would be sited within the NY Harbor Estuary.

Alternatives Assessed

Three other "with action" alternatives were assessed alongside the Preferred Alternative. The Flood Protection System on the West Side of East River Park – Baseline Alternative, referred to as Alternative 2, The Flood Protection System on the West Side of East River Drive – Enhanced Park and Access Alternative (Alternative 3), and The Flood Protection System East of FDR Drive (Alternative 5). While the first two alternatives mentioned would have fewer in-water construction components than the Preferred Alternative,

the construction period would be longer (5 years as compared to 3.5 years), which would constitute a longer time of construction related impacts such as construction barging. The last "with action" alternative includes the same in-water construction elements as the Preferred Alternative with additional fill required in the East River to accommodate the substructure for the raised FDR platform. Design is currently progressing solely for the Preferred Alternative. Should another alternative be chosen for implementation, this consultation will be reinitiated to address any new in-water elements or impacts that have not already been analyzed.

The City evaluated and reviewed the proposed alternatives' conceptual design against the principal objectives of the project, including providing a reliable flood protection system for the protected area, improving access to and enhancing open space resources along the waterfront, and meeting HUD funding deadlines for federal spending, along with the goal to minimize potential environmental effects and disruptions to the community. With the implementation of the Preferred Alternative, which is described above, East River Park would experience significant risk reduction from flooding and inundation from sea level rise in addition to substantial enhancements to its value as a recreational resource and providing flood protection to the inland communities. East River Park is crucial parkland in a neighborhood that is already deficient in open space resources when compared to the City's guidelines and optimal planning goals for ratios of open space acreage per 1000 residents. Protecting East River Park by installing the flood protection near the shoreline aims to ensure that this valuable resource is resilient to future storms and sea level rise, and available for community use rapidly following a storm event.

Park user experience would be enhanced with the reconstruction of East River Park and the reconstruction of pedestrian bridges to improve access. Additionally, a long-standing deficiency along the East River Greenway at the Con Edison 13th Street Generating Station would be remedied with the construction of a shared-use pedestrian/bicyclist flyover bridge linking East River Park and Captain Patrick J. Brown Walk, substantially improving the City's greenway network. In addition, Stuyvesant Cove Park, Murphy Brothers Playground, and Asser Levy Playground would be reconstructed and improved, resulting in enhanced recreational spaces throughout the project area. The selection of this alternative also allows for a shorter construction duration and park closure, earlier deployment of the flood protection system (which is expected to be completed in mid-2023), and reduced construction disruption along the FDR Drive.

CONSULTATION HISTORY TO DATE

To implement the proposed project, the City is receiving funds from HUD, a federal agency, and is therefore subject to Section 7 of the Endangered Species Act as well as the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended. Requests for concurrence on findings regarding threatened and endangered species and Essential Fish Habitat (EFH) were previously submitted to NMFS on January 25, 2016. A project update was provided on May 26, 2016 (with a follow up email transmitting these materials on May 27, 2016) to request additional guidance on the addition of a new potential project alternative that would create a more robust line of protection and eliminate the need for closure structures across the FDR (Alternative 5). The original consultation requests, all correspondence associated with those requests, and NMFS' responses are provided in **Attachment 2**.

The in-water work for the project at that time included:

- Installation of a turbidity curtain prior to installing the cofferdam.

- Installation of 24-inch steel sheet piles to be used as a cofferdam. The sheet piles were installed via a vibratory or impact hammer, depending on subsurface conditions. The area enclosed by the sheet piles was anticipated to measure approximately 300 square feet.
- Removal of the piles after the completion of the project.
- The construction of an outfall that occurred in a dewatered cofferdam.

NMFS returned the results of the Section 7 consultation on March 18, 2016 and concurred with the findings that the proposed limited in-water construction activities, including pile driving a 24-inch sheet pile cofferdam with an impact hammer for a 300-square foot area, is not likely to adversely affect species listed as threatened or endangered.

As noted above, a project update was provided on May 26, 2016, to request additional guidance on the addition of a new potential project alternative. A response was received from NMFS on June 2, 2016 that concurred that the proposed modification would not increase effects to ESA-listed species and that no reinitiation for consultation was necessary. Due to the larger portion of habitat that will be impacted or modified in the current proposed project, we are requesting reinitiation of consultation.

DESCRIPTION OF ACTION AREA

The action area is comprised of "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50CFR§402.02). The action area for this analysis of natural resources includes the area of direct impact, all areas surrounded by turbidity curtains or cofferdams, and a 103.3 meter radius to account for the acoustic behavior threshold for sturgeon, and all routes traveled by the project vessels. Based on this, the action area includes a 400-foot buffer surrounding the project areas and includes 127 acres of water and 2.2 miles of shoreline of the East River that abuts the project areas. This area is expected to encompass all of the effects of the proposed project. For the purpose of this consultation, the action area is limited to the East River, and the center point is located at $40^{0}43'28.084"$ North, $73^{0}58'27.401"$ West.

The area of direct impact is comprised of the following elements:

- Construction barge moorings – 160 square feet (temporary)
- Cofferdams for sewer outfall reconstruction – 10,000 square feet (temporary)
- Demolition of bulkhead for cut-off wall installation – 7,284 square feet (temporary)
- Filling of existing embayments – 20,600 square feet (permanent)
- Demolition of existing esplanade – 22,764 square feet (temporary)
- Filling behind cut-off wall for new embayments – 2,833 square feet (permanent)
- Flyover bridge substructure – 652 square feet (permanent)

Beyond the areas of direct impact, the action area was defined as the 400-foot buffer utilized in the Draft Environmental Impact Statement (DEIS), which encompasses the noise, water quality, and vessel traffic stressors, including the maximum extent of noise impacts to sturgeon from the loudest expected in-water construction (103.3 meters / 339 feet), as cited in the noise analysis below. Significant impacts from turbidity are not expected due to the use of turbidity curtains for all pile-driving operations. Vessel traffic impacts, while still being determined as project design advances, will be temporary and are not expected to represent a significant increase in vessel traffic in an already heavily used navigational channel.

The East River is a tidal strait that connects New York Harbor with Long Island Sound. The river is approximately 16 miles long and generally ranges between 600 to 4,000 feet wide. The lower East River, which runs from the Battery in Manhattan to Hell Gate in Queens, is narrower and deeper than the upper East River, which runs from Hell Gate in Queens to Long Island Sound. Mean depth of the lower East River is approximately 30 feet below mean low water (Blumberg and Pritchard, 1997); however, depth varies and can be as deep as approximately 65 feet below mean low water (USACE, 2015).

Surface Water Resources

The East River's circulation and salinity structure are largely determined by conditions in the Upper Harbor and Long Island Sound. Currents in the East River are swift and can approach 8 feet/second (Bowman, 1976). The strong currents are a result of the width of the East River, its channelization and bottom topography, and the influence of tidal water from the Hudson River, Harlem River, and Long Island Sound. Ebb tides are particularly powerful. A large difference in water surface elevation from the Long Island Sound to The Battery also contributes to the strong currents (Blumberg and Pritchard, 1997).

Freshwater input into the East River consists of several systems: the Bronx River, Westchester Creek, and the Hudson River. Additionally, overland flow, combined sewer overflow, and point source discharges from wastewater treatment plants account for freshwater inputs into the East River. There are over 100 combined sewer overflow outfalls in the lower East River, with 23 occurring along the shoreline of Project Area One and Project Area Two (OASIS, 2014).

Wetland Resources

The entire East River shoreline within the action area is bulkheaded. The East River is mapped by The National Wetlands Inventory as estuarine subtidal wetlands with an unconsolidated bottom (E1UBL) (**Figure 3**). Subtidal estuarine wetlands are defined by United States Fish and Wildlife Service as deep-water tidal habitats and adjacent tidal wetlands that are influenced by water runoff, often enclosed by land, that have low energy and variable salinity. Unconsolidated bottoms have at least 25 percent cover of particles smaller than six to seven centimeters and less than 30 percent vegetative cover (Cowardin et. al., 1979).

The action area also includes New York State Department of Environmental Conservation (NYSDEC) regulated littoral zone tidal wetland (**Figure 4**). Littoral zone is defined as "the tidal wetland zone that includes all lands under tidal waters which are not included in any other category. There shall be no littoral zone under waters deeper than six feet at mean low water (6NYCRR Part 661)." NYSDEC tidal wetland maps indicate that the entire East River constitutes littoral zone. However, much of the East River exceeds depths of six feet below mean low water. Based on observations made during the low tide shoreline surveys, it is anticipated that there are portions of the East River adjacent to or underneath the bulkhead that are six feet deep or less at mean low water and, therefore, have the littoral zone classification. This includes two existing embayments, which are areas where the shoreline curves inward, located along the East River just north and south of the Houston Street entrance to the park. These embayments were created as part of the esplanade redesign in 2005–2008 to make the East River more accessible to park users and heighten their experience of the river and its currents and tidal flow. They consist of small areas that allow tidal water from the East River to flow beneath short pedestrian bridges along the esplanade onto a rip rap slope that

ends at the bulkhead (**Figure 5**). The existing northern and southern embayments were constructed with pedestrian bridges spanning across the embayment, shading significant portions of the water below. The majority of both embayments consist of rocky fill material that was placed as part of the recent reconstruction to improve slope stabilization. The southern embayment is approximately 4,600 square feet, of which approximately 3,600 square feet (78 percent) is shaded by the short pedestrian bridge; the northern embayment is approximately 16,000 square feet, of which approximately 5,200 square feet (32 percent) is shaded.

Water Quality

Title 6 NYCRR Part 701 is the regulatory framework that classifies surface water and groundwater in New York State. The lower portion of the East River within the action area is a Class I saline surface water body. Class I water bodies are best suited for secondary contact, which includes fishing and recreational activities. Wildlife species should be capable of establishing successful habitats in these waters. Prolonged physical contact, such as swimming in these waters, is not advised. Consumption of fish from this classification of water body is restricted or not advised.

DEP has monitored New York Harbor water quality since 1909 through the Harbor Survey. Over the past twenty years, Harbor Survey data show that the water quality of New York Harbor has improved significantly as a result of measures undertaken by the City (DEP 2012). These measures include eliminating 99 percent of raw dry-weather sewage discharges, reducing illegal discharges, increasing the capture of wet-weather related floatables, and reducing the toxic metals loadings from industrial sources by 95 percent (DEP 2002). The 1999 and 2000 Interstate Environmental Commission (IEC) 305(b) reports also indicate that the year-round disinfection requirement for discharges to waters within its district (including New York Harbor) has contributed significantly to water quality improvements since the requirement went into effect in 1986 (IEC 2000, 2001). In the 2012 State of the Harbor Report, seven of the eight water quality performance metrics showed an improvement in the Inner Harbor (DEP 2012).

Dissolved oxygen in the water column is necessary for respiration by all aerobic forms of life, including fish and invertebrates such as crabs, clams, and zooplankton. The bacterial breakdown of high organic loads from various sources can deplete dissolved oxygen to low levels and persistently low dissolved oxygen can degrade habitat and cause a variety of sublethal or, in extreme cases, lethal effects. Consequently, dissolved oxygen is one of the most common indicators of overall water quality in aquatic systems. Dissolved oxygen concentrations in the Inner Harbor area have increased over the past 30 years from an average of below 3 mg/L in 1970 to above 5 mg/L in 2001, a value supportive of ecological productivity (DEP 2002). Dissolved oxygen concentrations in the study area at Harbor Survey Station E2, adjacent to the proposed project area, ranged from 4.03 to 10.67 mg/l at the surface and from 3.80 to 10.71 mg/l in bottom waters in 2017 (DEP 2017). The lower dissolved oxygen values were recorded during the summer months.

Secchi transparency measures the clarity of surface waters. Transparency greater than five feet is indicative of clear water. Decreased clarity can be caused by high suspended solid concentrations or blooms of plankton. Secchi transparencies less than three feet are generally indicative of poor water quality conditions. Average secchi readings in the Inner Harbor area have remained relatively consistent since measurement of this parameter began in 1986, ranging between about 3.5 and 5.5 feet (DEP 2012). For the Harbor Survey Monitoring Program in 2017, secchi transparency at Station E2 averaged 3.3 feet (DEP 2017).

Aquatic Resources

The East River is an urban water body situated along the shores of the boroughs of Queens, Manhattan, and Brooklyn. The variation in sources of runoff affect the type of biota that can exist in the river where a wide array of conditions must be tolerated.

Phytoplankton/Zooplankton

Phytoplankton are microscopic plants whose movements are largely dictated by prevailing tides and currents. Light penetration, turbidity, and nutrient concentrations are important in determining phytoplankton productivity and biomass. Organisms found in Long Island Sound and Hudson River are also usually found in the East River due to the proximity of these waterbodies to each other and strong currents.

Zooplankton are an integral component of aquatic food webs. They are primary grazers on phytoplankton and detritus material and are themselves used by organisms of higher trophic levels as a food source. The higher-level consumers of zooplankton typically include forage fish, such as bay anchovy, as well as commercially and recreationally important species, such as striped bass (*Morone saxatilis*) and white perch (*Morone americana*) during their early life stages.

Submerged Aquatic Vegetation and Benthic Algae

Submerged aquatic vegetation (SAV) refers to rooted aquatic plants that are often found in shallow areas of estuaries. These organisms are important because they provide nursery and refuge habitat for fish. Benthic algae can be large multicellular plants that can be important primary producers in the aquatic environment. They are often seen on rocks, jetties, pilings, and sandy or muddy bottoms (Hurley 1990). Since these organisms require sunlight as their primary source of energy, the limited light penetration of New York Harbor limits their distribution to shallow areas. Light penetration, turbidity, and nutrient concentrations are all important in determining SAV and benthic algae productivity and biomass. Surveys conducted in the action area documented sea lettuce and rockweed, which are species of benthic algae, occurring on intertidal riprap at several locations along the shoreline including just north of Pier 42, the riprap coves at Stanton Street and East 4th Street, and at Stuyvesant Cove Park. No SAV was observed within the action area.

Benthic Invertebrates

Over 100 benthic invertebrate taxa (mostly crustaceans or polychaete worms) have been identified in the East River (Coastal Environmental Services 1987). Two benthic invertebrate sub-communities were identified in the East River in the vicinity of the proposed project on the basis of substrate hardness (Hazen and Sawyer 1983). The hard substrate community is characterized by organisms that are either firmly attached to rocks and other hard objects (e.g., mussels or barnacles), or that build or live in tubes. Species of polychaete worms, amphipods, and several other species have adapted to the East River's hard bottoms and rapid currents by living within the abandoned tubes of other species. The soft substrate community occurs in the more protected areas within the East River where detritus, clay, silt, and sand have accumulated in shallow, low velocity areas near piers and pilings. Common soft substrate organisms included oligochaete worms, the soft-shelled clam *Mya arenaria*, and a variety of flatworms, nemerteans, polychaetes, and crustaceans (Hazen and Sawyer 1985). Recent benthic and epibenthic sampling by DEP in the lower East River documented nine benthic macroinvertebrate taxa, including annelids, arthropods, and mollusks. The annelid *Haploscoloplos robustus* and mollusks *Melampus bidentatus* and *Mulinia lateralis* were found in the highest densities (DEP 2007). Benthic macroinvertebrates sampled between Piers 6 and 9 on the Manhattan shoreline of the East River south of the proposed project area in 2002 found mostly pollution-tolerant taxa (primarily polychaetes in the families *Capitellidae* and *Spionidae*), although some pollution-sensitive species (e.g., *Ampelisca* spp.) were also found. Other invertebrates collected were mussels, crabs, shrimp, isopods, and nematodes (AKRF 2002).

Fish

The finfish community in Upper New York Harbor, including the lower East River, is typical of large coastal estuaries and inshore waterways along the Mid-Atlantic Bight, supporting a variety of estuarine, marine, and diadromous fish species that use this area as spawning grounds, a migratory pathway, or nursery/foraging habitat. American eel (*Anguilla rostrata*), blueback herring (*Alosa aestivalis*), alewife (*Alosa pseudoharengus*), American shad (*Alosa sapidissima*), hickory shad (*Alosa mediocris*), striped bass, tomcod, Atlantic sturgeon (*Acipenser oxyrhynchus*), and rainbow smelt (*Osmerus mordax*) are diadromous fish that may pass through the East River during migration to and from spawning areas in the upper Hudson River and its tributaries (NOAA 2001). Transient shortnose sturgeon (*Acipenser brevirostrum*) also have the potential to occur briefly in the East River (Bain 1997). Examples of marine species found in the East River from spring through fall include bluefish (*Pomatomus saltatrix*), scup (*Stenotomus chrysops*), black sea bass (*Centropristis striata*), tautog, and weakfish (*Cynoscion regalis*) (NOAA 2001). Overall, the East River's fish community is spatially and seasonally dynamic.

NMFS LISTED SPECIES IN THE ACTION AREA

There are two endangered fish with the potential to occur in the action area:

Shortnose sturgeon (*Acipenser brevirostrum*)(32 FR 4001; Recovery plan: NMFS 1998)

Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)(77 FR 5880 and 77 FR 5914)

Atlantic Sturgeon

There are four DPSs of Atlantic sturgeon listed as endangered (New York Bight, Chesapeake Bay, Carolina, and South Atlantic) and one DPS listed as threatened (Gulf of Maine) under the ESA. The marine range for all five DPSs includes marine waters, coastal bays, and estuaries from the Labrador Inlet in Labrador, Canada to Cape Canaveral, Florida. The sub-adult and adult Atlantic sturgeon travel within the marine environment, coastal bays, sounds, and ocean waters (Erickson et al. 2011). Atlantic sturgeon originating from any of the five DPSs could occur in the action area. Atlantic sturgeon belonging to the New York Bight DPS spawn in freshwater sections of the Hudson River and overwinter throughout the Bight, off the south shore of Long Island, and throughout Long Island Sound (Bain 1997, Savoy and Pacileo 2003). Because the water in the East River is mainly saline, no spawning or early life stages of Atlantic sturgeon are expected to be present in the action area.

The Atlantic waters off of Rockaway Peninsula and Sandy Hook are a significant concentration area of wintering Atlantic sturgeon (Dunton et al. 2010) and transients moving between Hudson River spawning grounds and these overwintering areas must pass through Upper Bay and may pass through the East River. Telemetry receivers in the lower East River and on the east and west sides of Roosevelt Island have recently detected tagged Atlantic sturgeon moving through this area (Tomechik et al. 2015). Occurrences of Atlantic sturgeon in the East River are likely brief, as these individuals are strictly transients. Atlantic sturgeon prefer open, marine waters and greater water depths than those of the East River for overwintering, but have been known to also occur in shallower waters, potentially for foraging of benthic resources (Hatin et al. 2002, 2007; Savoy and Pacileo 2003, Dunton et al. 2010). Migrating and opportunistically foraging Atlantic sturgeon are most abundant in these waters from late September to late March (Dunton et al. 2010), however, adult and subadult species may be found in the East River year round (NOAA 2019).

Shortnose Sturgeon

The shortnose sturgeon is an anadromous fish that is endangered throughout their range from the Minas Basin, Nova Scotia, Canada, to northeastern Florida. They spawn, develop, and usually overwinter in the upper Hudson River. Because the water in the East River is mainly saline, no spawning or early life stages of shortnose sturgeon are expected to be present in the action area. Shortnose sturgeon are also found in the Connecticut River and, based on known movement patterns and a history of a few tagged individuals migrating from the Hudson to the Connecticut River, it is expected that on rare occasion sturgeon may travel through the East River and the proposed action area (NOAA 2016). It is believed that the occurrence of shortnose sturgeon in shallow waters would be due to the presence of benthic resources for foraging, however, there is limited benthic resources and no SAV within the action area. Additionally, waters below the Tappan Zee Bridge are suboptimal due to their high salinities (Bain 1997). Migrating and opportunistically foraging adult shortnose sturgeon, therefore, have limited potential to occur in the lower East River, and only on rare and brief occasions as transients emigrating from the Hudson River (Waldman et al. 1996, Kynard 1997).

Critical Habitat

There is no designated critical habitat for these species within the action area.

EFFECTS DETERMINATION

An evaluation of four potential types of impacts with implementation of the Preferred Alternative are presented to determine effects to ESA species.

- Noise Impacts
- Water Quality Impacts
- Vessel Impacts
- Impacts to Prey Species (Habitat Modification)

Noise Impacts

The Preferred Alternative includes noise-producing, in-water construction work for installing the substructure for the flyover bridge, installing a new cut-off wall in the approximate alignment of the existing bulkhead, and installing a temporary water-tight cofferdam for the reconstruction of the sewer outfalls. The installation of the flyover bridge substructure will be done using a drill rig. Noise impacts associated with the drill rig are expected to be lower than pile driving activities, therefore, it is omitted from the acoustic analysis below.

Pile driving activities to install the cut-off wall in the approximate alignment of the existing bulkhead will use 19-inch AZ steel sheet piles with a vibratory hammer. For the purpose of analyzing a reasonable worst-case scenario, a larger, 24-inch steel pile was utilized in the acoustic analysis as shown in **Table 2.** The cofferdams for the reconstruction of the sewer outfalls will be installed with 24” H-type steel piles using a cushioned impact hammer. For the purpose of the acoustic analysis, the steel pipe pile type was selected to provide a reasonable worst-case scenario related to noise impacts.

The Greater Atlantic Fisheries Office (GARFO) of NOAA has supplied an acoustic tool to aid in the analysis of noise impacts to ESA species. The tool defines estimated noise and pressure levels of pile driving activities associated with proxy projects, threshold values for physiological and behavioral impacts to ESA species, and attenuation rates. It is expected that the in-water construction of the cofferdam will produce the loudest noises estimated at a peak level of 192 decibels (dB_{Peak}) (**Table 3**). **Table 4** calculates the distances from the origin of the noise producing element to the area where the sturgeon would not be affected by the in-water construction.

Table 2
Proxy Projects for Estimating Underwater Noise

Project Location	Water Depth (m)	Pile Size (inches)	Pile Type	Hammer Type	Attenuation rate (dB/10m)
Rodeo, CA - San Francisco Bay, CA	5	24"	Steel Pipe	Cushioned Impact	3
Not Available	15	24"	AZ Steel Sheet	Vibratory	5

Table 3
Proxy-Based Estimates for Underwater Noise

Type of Pile	Hammer Type	Estimated Peak Noise Level (dB_{Peak})	Estimated Pressure Level (dB_{RMS})	Estimated Single Strike Sound Exposure Level (dB_{sSEL})
24" Steel Pipe	Cushioned Impact	192	178	167
24" AZ Steel Sheet	Vibratory	182	165	165

Table 4
Estimated Distances to Sturgeon Injury and Behavioral Thresholds

Type of Pile	Hammer Type	Distance (m) to 206dB_{Peak} (injury)	Distance (m) to sSEL of 150 dB (surrogate for 187 dBcSEL injury)	Distance (m) to Behavioral Disturbance Threshold (150 dB_{RMS})
24" Steel Pipe	Cushioned Impact	NA	66.7	103.3
24" AZ Steel Sheet	Vibratory	NA	40.0	40.0

Exposure to underwater noise levels of 206 dBpeak and 187 cSEL can result in injury to sturgeon. In addition to the "peak" exposure criteria, which relates to the energy received from a single pile strike, the potential for injury exists for multiple exposures to noise over a period of time; this is accounted for by the cSEL threshold. The cSEL is not an instantaneous maximum noise level but is a measure of the accumulated energy over a specific period of time (e.g., the period of time it takes to install a pile). When it is not possible to accurately calculate the distance to the 187 dBcSEL isopleth, we calculate the distance to the 150 dBsSEL isopleth. The farther a fish is away from sheet piles being driven, the more strikes it must be exposed to in order to accumulate enough energy to result in injury. At some distance from the pile, a fish is far enough away that, regardless of the number of strikes it is exposed to, the energy accumulated is low enough that there is no potential for injury. For this project, the distance to the 150 dBsSEL isopleth is no greater than 66.7 meters. In order to be exposed to potentially injurious levels of noise during installation of the piles, a sturgeon would need to be within 66.7 meters of the pile being driven to be exposed to this noise for any prolonged time period. This is extremely unlikely to occur as it is expected that sturgeon would modify

their behavior at 103.3 meters from the installed piles and quickly move away from the area before cumulative injury levels are reached.

Behavioral effects, such as avoidance or disruption of foraging activities, may occur in sturgeon exposed to noise above 150 dBRMs. It is expected that underwater noise levels would be below 150 dBRMS at distances beyond approximately 103.3 meters from the pile being installed. Should sturgeon move into the action area where the 150 dBRMS isopleth extends, as described above, it is reasonable to assume that a sturgeon, upon detecting underwater noise levels of 150 dBRMS, will modify its behavior such that it redirects its course of movement away from the ensonified area and therefore, away from the project site. If any movements away from the ensonified area do occur, it is extremely unlikely that these movements will affect essential sturgeon behaviors (e.g., spawning, resting, and migration), as the area is not a spawning or overwintering area, and the rest of the East River is sufficiently large enough to allow sturgeon to avoid the ensonified area while continuing to forage and migrate. Given the small distance a sturgeon would need to move to avoid the disturbance levels of noise, any effects will not be able to be meaningfully measured or detected. Therefore, the effects of noise on sturgeon are insignificant.

Water Quality Impacts

It is expected that turbidity would increase temporarily during pile driving activities associated with the construction of the support structure for the shared-use flyover bridge, the cofferdams for reconstructing sewer outfalls, and the installation of the cut-off wall in the alignment of the existing bulkhead. Turbidity curtains would be utilized for each of these operations to prevent the loosened sediment from entering the larger waterbody of the East River. The curtains will also prevent sturgeon from entering the area and thus, will prevent them from being exposed to the turbid water.

The installation of piles will disturb bottom sediments and may cause a temporary increase in suspended sediment in the action area. Using available information collected from a project in the Hudson River, we expect pile driving activities to produce total suspended sediment (TSS) concentrations of approximately 5.0 to 10.0 mg/L above background levels within approximately 300 feet (91 meters) of the pile being driven (FHWA 2012). Using a clamshell to extract piles allows sediment attached to the pile to move vertically through the water column until gravitational forces cause it to slough off under its own weight. The small resulting sediment plume is expected to settle out of the water column within a few hours. Studies of the effects of turbid water on fish suggest that concentrations of suspended sediment can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton 1993). The TSS levels expected for pile driving or removal (5.0 to 10.0 mg/L) are below those shown to have adverse effect on fish (580.0 mg/L for the most sensitive species, with 1,000.0 mg/L more typical; see summary of scientific literature in Burton 1993) and benthic communities (390.0 mg/L (EPA 1986)). TSS is most likely to affect sturgeon if a plume causes a barrier to normal behaviors. However, we expect sturgeon to either swim through the plume with no adverse effects or make small evasive movements to avoid it. Due to the proposed turbidity conservation measures in waters where suspended solids baseline conditions are generally moderate to poor according to secchi transparency readings (DEP 2017), effects to water quality from pile driving activities would be too small to be meaningfully measured or detected and are insignificant.

Other impacts to water quality were also assessed and screened from the analysis. The reconstruction of sewer outfalls along the East River Park bulkhead is not anticipated to change stormwater effluent from the current baseline conditions. During reconstruction, effluent will continue to flow through the existing outfalls until the new system comes online. The flyover bridge would represent new impervious surface in

the study area that would drain to East River Park and eventually into the East River. The new impervious surface would be approximately 15,000 square feet; however, this represents a small increase in impervious area within the study area and there would be no vehicular traffic and therefore no associated contaminants to be mobilized by stormwater runoff. Because the effluent will continue to be rapidly diluted to within minimum water quality standards or to non-detectable levels, it would have discountable effects on water depth, water flow, dissolved oxygen levels, salinity, temperature, or the ability for sturgeon to migrate in the action area.

Vessel Impacts

In our analysis we considered three elements: (1) the existing baseline conditions, (2) the action and what it adds to existing baseline conditions, and (3) new baseline conditions (the existing baseline conditions and the action together). We have determined that vessel traffic added to baseline conditions as a result of the proposed project is not likely to adversely affect ESA-listed species for the following reasons.

Adding project vessels to the existing baseline will not increase the risk that any vessel in the area will strike an individual, or will increase it to such a small extent that the effect of the action (i.e., any increase in risk of a strike caused by the project) cannot be meaningfully measured or detected. The baseline risk of a vessel strike within East River is unknown. The increase in traffic associated with the proposed project is extremely small. During the project activities, an estimate of 3 project vessels per day will be added to the baseline. The addition of project vessels will also be intermittent, temporary, and restricted to a small portion of the overall action area on any given day. As such, any increased risk of a vessel strike caused by the project will be too small to be meaningfully measured or detected. As a result, the effect of the action on the increased risk of a vessel strike in the action area is insignificant.

The flood protection system will reduce risk of damage from coastal storms in the area. Allowing protection of critical infrastructure is not expected to change the number of vessels that use the action area; thus, preserving the status quo with regard to vessel routes and vessel numbers will not change the risk of a vessel strike. Any slight increase in risk from altered patterns of use would be too small to be detected or measured, and effects are, therefore, insignificant.

Impacts to Prey Species (Habitat Modification)

The Preferred Alternative proposes the installation of the permanent support structures for the shared use flyover bridge and fill placed within the existing embayments and behind the cutoff wall at the edges of the proposed embayments. With this alternative, 40,208 square feet of existing habitat will only be temporarily disturbed. Also, 24,085 square feet of existing habitat (see **Table 1**) would no longer support benthic organisms that may provide a foraging habitat for certain fish, however, the project area constitutes a very small portion of the available benthic foraging habitat within the action area (the project area, plus a 103.3 meter radius, and all routes traveled by the project vessels). In addition, the installation of the proposed new embayments are anticipated to constitute an improvement over the existing embayments. The proposed embayments would be of comparable or larger size (approximately 26,000 square feet in total) with improved habitat conditions, including the elimination of pedestrian bridges that shade aquatic habitat, which can reduce benthic productivity and biomass. In addition, the provision of habitat enhancements designed for the recruitment of shellfish and other aquatic life along East River Park is also being explored. Additional off-site tidal wetland mitigation would also be undertaken with either the creation and/or

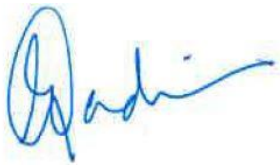
rehabilitation of tidal wetland habitat within the NY Harbor Estuary or the purchase of wetland mitigation credits through the Saw Mill Creek Wetland Mitigation Bank located on Staten Island New York.

Shading effects from barging as well as reduced habitat from installation of cofferdams and the cut-off wall would be temporary. Due to the lack of SAV present in these areas, impacts to flora are anticipated to be minimal or non-existent. Prey species would be expected to avoid the action area during construction activities and relocate to nearby available habitat. Upon completion of construction, the affected area would be recolonized and be anticipated to return to existing conditions. As a result, temporary and permanent effects to habitat and prey species would be too small to be meaningfully measured or detected and are, therefore, insignificant.

CONCLUSION

Based on the analysis that all effects of the proposed action when added to the baseline will be insignificant or discountable, we have determined that the effects of the East Side Coastal Resiliency Project may affect but is not likely to adversely affect any listed species or critical habitat under NMFS' jurisdiction. We certify that we have used the best scientific and commercial data available to complete this analysis. We request your concurrence with this determination.

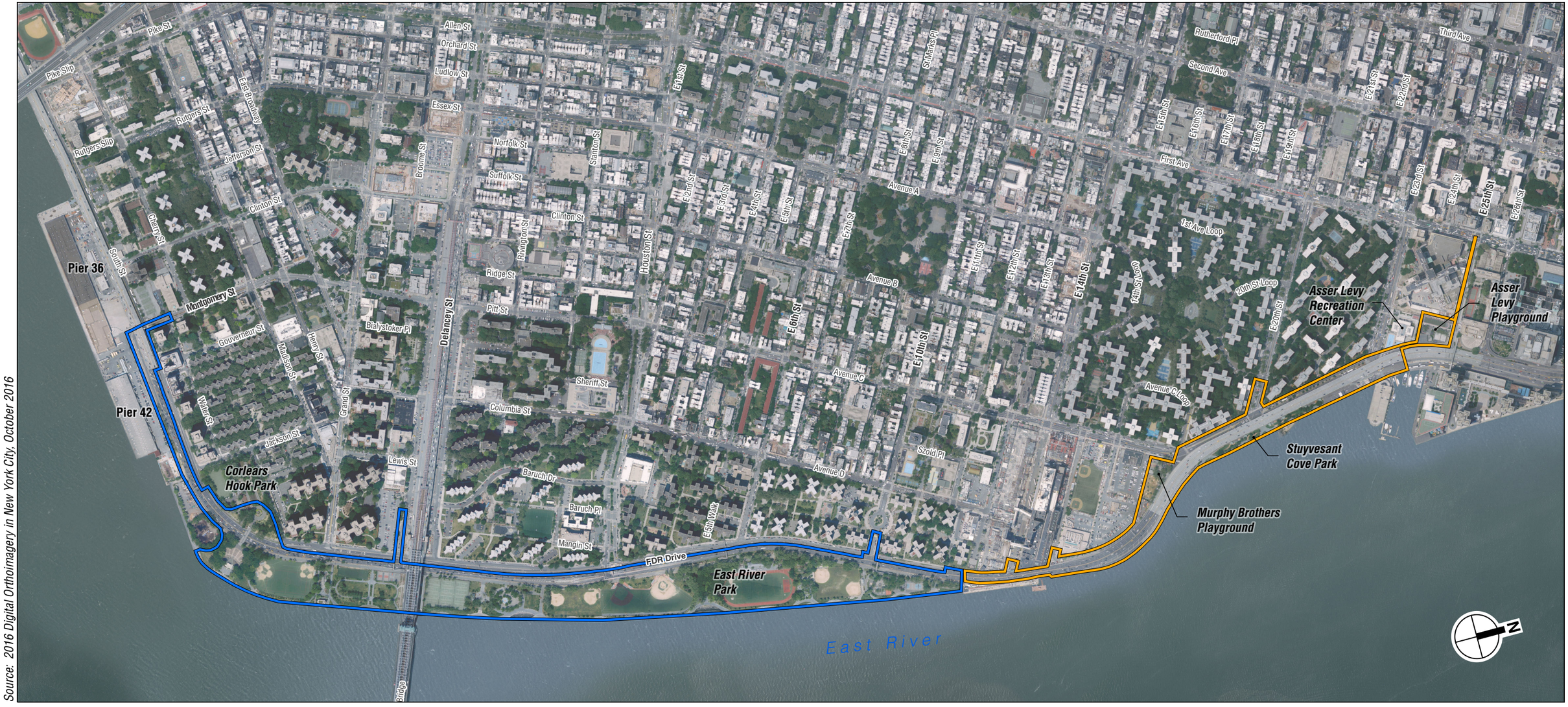
Sincerely,



Eram Qadri

Unit Head – Environmental Review, CDBG Disaster Recovery

New York City Mayor's Office of Management and Budget



Source: 2016 Digital Orthoimagery in New York City, October 2016

Project Area One

Project Area Two

0 1,000 FEET

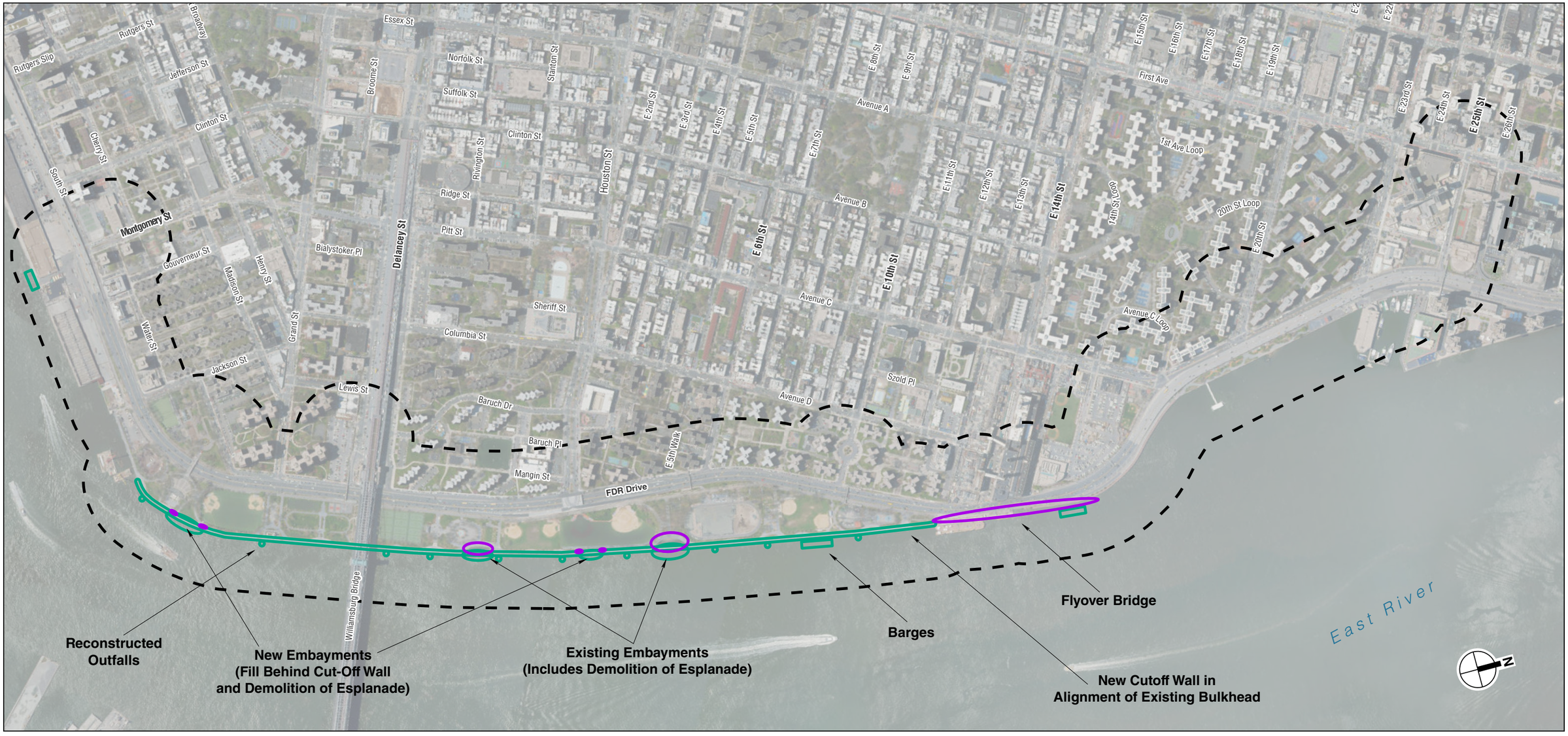
Capital Project SANDRESM1

EAST SIDE COASTAL RESILIENCY PROJECT

Proposed Project Area Aerial Map

Figure 1

4/30/2019



Natural Resources Study Area (400-Foot Study Area Radius)

Approximate Locations of Permanent In-Water Impacts

Approximate Locations of Temporary In-Water Disturbances

0 1,000 FEET

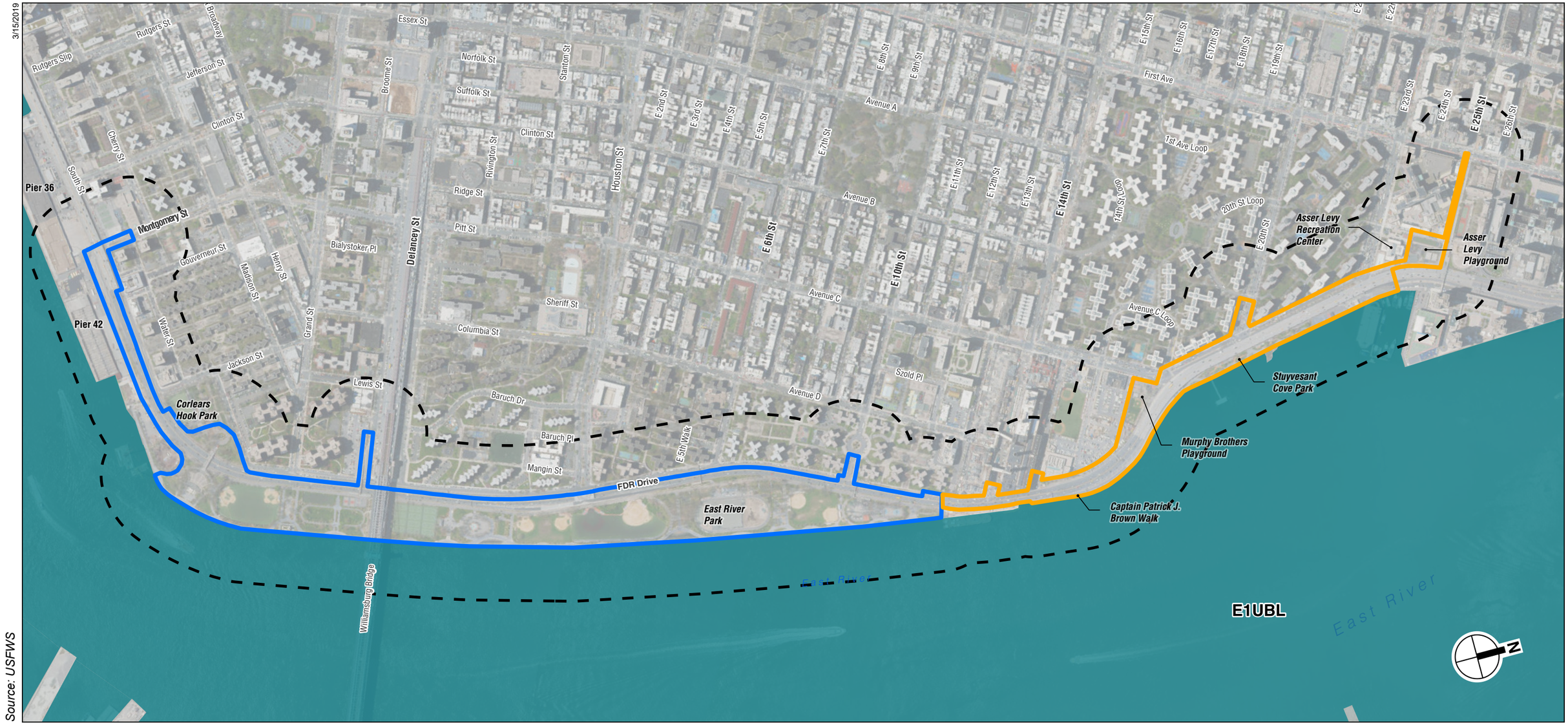
Capital Project SANDRESM1

EAST SIDE COASTAL RESILIENCY PROJECT

Approximate Locations of In-Water Construction

Figure 2

3/15/2019



Source: USFWS

Project Area One

Project Area Two

Natural Resources Study Area (400-Foot Study Area Radius)

Estuarine and Marine Deepwater (Estuarine Subtidal Wetlands with an Unconsolidated Bottom- E1UBL)

0 1,000 FEET

Capital Project SANDRESM1

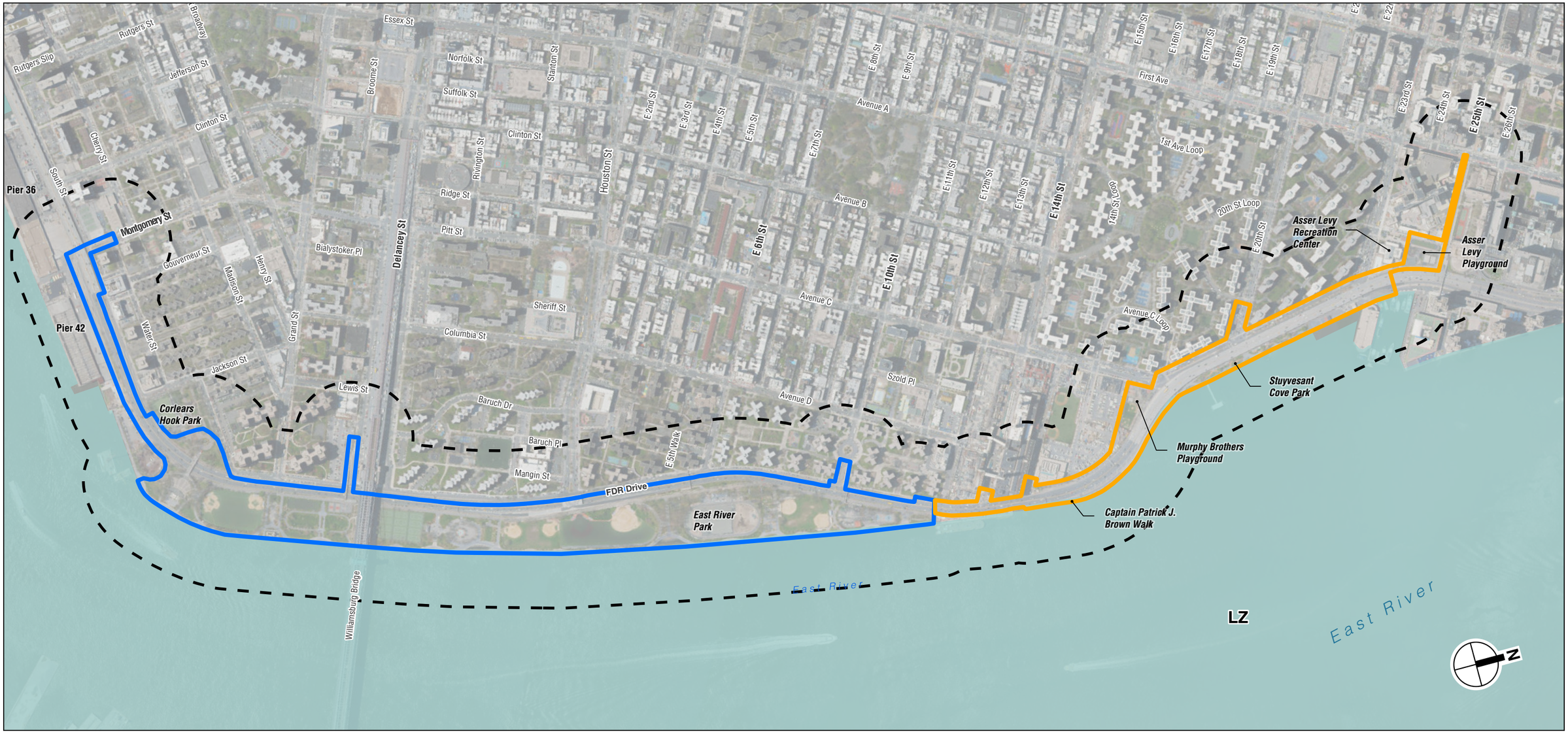
EAST SIDE COASTAL RESILIENCY PROJECT

National Wetlands Inventory Map

Figure 3

3/15/2019

Source: Tidal Wetlands, NYS Department of Environmental Conservation, 1974



Project Area One

Project Area Two

Natural Resources Study Area (400-Foot Study Area Radius)

Littoral Zone

0 1,000 FEET

Capital Project SANDRESM1

EAST SIDE COASTAL RESILIENCY PROJECT

NYSDEC Tidal Wetlands Map

Figure 4

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY PROJECT

Existing Conditions at Embayments
Figure 5

LITERATURE CITED

AKRF, Inc. 2002. Second Avenue Subway Environmental Impact Statement. New York, NY.

Bain, M.B. 1997. Atlantic and shortnose sturgeons of the Hudson River: common and divergent life history attributes. Environmental Biology of Fishes 48:347-358.

Blumberg, A. F., & Pritchard, D. W. (1997). Estimates of the transport through the East River, New York. Journal of Geophysical Research: Oceans (1978–2012), 102(C3), 5685-5703.

Bowman, M.J. (1976). The Tides of the East River, New York. Journal of Geophysical Research: 81:1609-1616.

Burton, W.H. 1993. Effects of bucket dredging on water quality in the Delaware River and the potential for effects on fisheries resources. Versar, Inc., 9200 Rumsey Road, Columbia, Maryland 21045.

Coastal Environmental Services. 1987. Television City Project: Characterization of the Aquatic Ecology of the Site and Assessment of Potential Impacts of the Project on the Aquatic biota. Prepared for Berle, Kass, and Case, New York, New York; McKeown and Franz, Inc., New York, NY; and The Trump Organization, New York, NY.

Cowardin, L. M., Carter, V., Golet, F. C., & LaRoe, E. T. (1979). Classification of wetlands and deepwater habitats of the United States. US Department of the Interior, US Fish and Wildlife Service.

Dadswell, M.J., B.D. Taubert, T.S. Squiers, D. Marchette, and J. Buckley. 1984. Synopsis of biological data on shortnose sturgeon, Acipenser brevirostrum LeSueur 1818. National Oceanic and Atmospheric Administration Technical Report NMFS 14, Washington, DC.

Dunton, K.J., A. Jordan, K.A. McKown, D.O. Conover, M.G. Frisk. 2010. Abundance and distribution of Atlantic sturgeon within the Northwest Atlantic Ocean determined from five fishery-independent surveys. Fishery Bulletin 108:450-465.

EPA (Environmental Protection Agency). 1986. Quality Criteria for Water. EPA 440/5-86-001.

Erickson et al. 2011. Use of pop-up satellite archival tags to identify oceanic-migratory patterns for adult Atlantic sturgeon, *Acipenser oxyrinchus oxyrinchus*. Mitchell, 1815. J Appl. Ichthyol. 27:356-365.

FHWA (Federal Highway Administration). 2012. Tappan Zee Hudson River Crossing Project. Final Environmental Impact Statement. August 2012.

Hatin, D., R. Fortin, and F. Caron. 2002. Movements and aggregation areas of adult Atlantic sturgeon (Acipenser oxyrinchus) in the St. Lawrence River estuary, Québec, Canada. Journal of Applied Ichthyology 18:586-594.

Hatin, D., J. Munro, F. Caron, and R. D. Simons. 2007. Movements, home range size, and habitat use and selection of early juvenile Atlantic sturgeon in the St. Lawrence estuarine transition zone. American Fisheries Society Symposium 56:129-155.

Hazen and Sawyer. 1983. Newtown Creek Water Pollution Control Plant. Revised application for modification of the requirements of secondary treatment under Section 301(h), PL 97-117. Prepared for the City of New York, Department of Environmental Protection.

Hazen and Sawyer. 1985. Newtown Creek water pollution control plant. Revised application for modification of the requirements of secondary treatment. VII: Additional biologic and toxics information. Prepared for the City of New York, Department of Environmental Protection.

Hurley, L.M. 1990. Field Guide to the Submerged Aquatic Vegetation of Chesapeake Bay. U.S. Fish and Wildlife Service, Chesapeake Bay Estuary Program, Annapolis, MD.

Jenkins, W.E., T.I. Smith, L.D. Heyward, and D.M. Knott. 1993. Tolerance of shortnose sturgeon juveniles to different salinity and dissolved oxygen concentrations. Proceedings of the Annual Conference of the Southeast Association of Fish and Wildlife Agencies 47:476- 484

Kynard, B. 1997. Life history, latitudinal patterns, and status of the shortnose sturgeon, Acipenser brevirostrum. Environmental Biology of Fishes 48:319-334.

National Marine Fisheries Service (NMFS). 1998a. Final Recovery Plan for the Shortnose Sturgeon (*Acipenser brevirostrum*).

National Oceanic and Atmospheric Administration (NOAA). 2001. Essential Fish Habitat Protection. https://www.habitat.noaa.gov/protection/efh/efhmapper/

National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS). 2016. ESCR ESA Consultation. (Records located in Attachment 2)

National Oceanic and Atmospheric Administration (NOAA). 2019. Section 7 Mapper. https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=1bc332edc5204e03b250ac11f9914a27

New York City Department of Environmental Protection (DEP). 2002. New York Harbor Water Quality Report. New York, NY. http://www.nyc.gov/html/dep/pdf/hwqs2002.pdf

New York City Department of Environmental Protection (DEP). 2007. East River and Open Waters Waterbody/Watershed Facility Plan Report. New York, NY.

New York City Department of Environmental Protection (DEP). 2012. State of the Harbor Report. New York, NY. http://www.nyc.gov/html/dep/pdf/hwqs2012.pdf

New York City Department of Environmental Protection (DEP). 2017. Harbor Water Quality Survey Data 2017. New York, NY. http://www.nyc.gov/html/dep/html/harborwater/harbor_water_sampling_results.shtml

Open Accessible Space Information System (OASIS). 2014. Combined Sewer Outfalls. Accessed 8/18/2015 from http://www.oasisnyc.net/map.aspx

Savoy, T. and D. Pacileo. 2003. Movements and important habitats of subadult Atlantic sturgeon in Connecticut waters. Transactions of the American Fisheries Society 132:1-8.

Tomechik, C.; Colby, J.; Adonizio, M. (2015). *Improvements to Probabilistic Tidal Turbine-Fish Interaction Model Parameters*. Paper Presented at the 3rd Marine Energy Technology Symposium (METS), Washington DC, USA.

U.S. Army Corps of Engineers (USACE). 2015. Controlling Depth Reports and Surveys: East River, Battery to Throgs Neck Bridge, NY. Accessed 8/18/2015 from http://www.nan.usace.army.mil/Missions/Navigation/ControllingDepthReports.aspx

Waldman, J.R., J. Hart & I. Wirgin. 1996. Stock composition of the New York Bight Atlantic sturgeon fishery, based on analysis of mitochondrial DNA. Trans. Amer. Fish. Soc. 125: 364–371.

ATTACHMENT 1
FEDERAL REPRESENTATION LETTER

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

U.S. Department of Housing and Urban Development
New York State Office
Jacob K. Javits Federal Building
26 Federal Plaza, Suite 3541
New York, New York 10278-0068
Office (212) 264-8000, Fax (212) 264- 0993
TTY (212) 264-0927

28 March 2019

Edith Carson-Supino, M.Sc.
Section 7 Fish Biologist
NOAA Fisheries
U.S. Department of Commerce
Greater Atlantic Regional Fisheries Office
55 Great Republic Dr.
Gloucester, MA 01930

Re: Responsible Entity Certification for Section 7 Review for U.S. Department of Housing and Urban Development Community Development Block Grant-Disaster Recovery Housing Assistance Program, administered by New York City Office of Management and Budget

Dear Ms. Carson-Supino:

The Department of Housing and Urban Development (HUD) has authorized New York City Office of Management and Budget (NYCOMB) to implement the HUD Community Development Block Grant – Disaster Recovery (CDBG-DR) Housing Assistance Program (Program) in accordance with the *New York City Action Plan for Community Development Block Grant Program Disaster Recovery*, dated May 2013 (Federal Register Docket # FR-5696-N-01). In accordance with prior coordination agreements between HUD and the FWS, HUD certifies that NYCOMB shall assume federal responsibilities for all National Environmental Policy Act and all related environmental laws and authorities as identified in HUD regulation 24 CFR 58.5. Consultations arising from activities funded under this Program will be conducted directly by NYCOMB in accordance with the assumption authority of 24 CFR 58.4

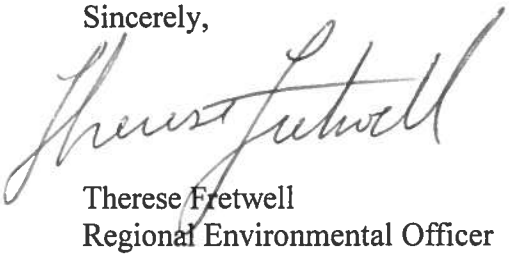
According to HUD regulations at 24 CFR §58.4, state and local governments that receive HUD funds assume the status of 'responsible entity,' and act as the federal action agency for all necessary consultations and other compliance measures. The assumption of federal status for environmental review purposes extends to substantive and procedural compliance with Section 7 of the Endangered Species Act, per 24 CFR §58.5.

For all Section 7 consultations arising from HUD-funded activities under any of the programs listed at 24 CFR §58.1(b), the New York City Office of Management and Budget has been

granted authority to act as the federal action agency. These governments should alert the Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS) when seeking a HUD Release of Funds for a project that requires Section 7 consultation. The FWS and NMFS may notify HUD if the State or local government has not fulfilled its Section 7 requirements, and HUD will not release the funds in those instances.

Please contact Regional Environmental Officer Therese Fretwell at 212-542-7445 if you have any questions regarding HUD's designation of New York City for Section 7 purposes under the CDBG-DR program, or HUD's general regulations concerning assumption of federal authority for Section 7 consultations.

Sincerely,



Therese Fretwell
Regional Environmental Officer
Department of Housing and Urban Development
26 Federal Plaza, Room 3513
New York, NY 10278

c. Mark Brown Murray, Section 7 Coordinator

CORRESPONDENCE TO SUPPORT DEIS PUBLICATION

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

The City of New York
Office of Management and Budget
255 Greenwich Street • New York, New York 10007-2146

March 27, 2019

Ms. Ursula Howson
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930-2276

Re: Response to Draft Essential Fish Habitat (EFH) Consultation for the East Side Coastal Resiliency Project
New York, New York

Dear Ms. Howson:

Thank you for your review of the draft EFH findings associated with the new Preferred Alternative for the East Side Coastal Resiliency (ESCR) project. The City of New York (the City) is pleased to inform NOAA NMFS that a revised consultation that is responsive to the concerns raised in an email correspondence on March 22, 2019 (letter dated March 14, 2019) will be provided to NOAA NMFS well in advance of the ESCR project's Final Environmental Impact Statement (FEIS). The City is committed to working with NOAA NMFS to identify any conservation measures that NOAA NMFS deems appropriate, and concluding the consultation process prior to the FEIS, so that all commitments will be acknowledged in the FEIS.

Consultation History to Date

As indicated in previous correspondence with NOAA NMFS, the City is receiving funds from the U.S. Department of Housing and Urban Development (HUD), a federal agency, to implement the ESCR project, and is therefore subject to Section 7 of the Endangered Species Act as well as the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended.

Requests for concurrence on findings regarding threatened and endangered species and EFH was previously submitted to NOAA NMFS on January 25, 2016. NMFS returned the results of the Section 7 consultation on March 18, 2016 and concurred with the findings that the in-water construction activities proposed at that time, including pile driving a 24-inch sheet pile coffer dam with an impact hammer for a 300-square foot area, may effect but would not likely adversely affect species listed as threatened or endangered. NOAA NMFS then returned the results of the EFH consultation on April 14, 2016 and concurred with the findings that adverse effects associated with the proposed in-water activities would be minimal and did not recommend conservation measures be implemented.

A project update was provided on May 26, 2016 (with a follow up email transmitting these materials on May 27, 2016) to request additional guidance on the addition of a new potential project alternative that would create a more robust line of projection and eliminate the need for closure structures across the FDR (Alternative 5 in the DEIS). A response was received from NOAA NMFS on June 2, 2016 that concurred with an unchanged determination for Section 7 threatened and endangered species and EFH.

Project Update

Subsequent to the initial and supplemental consultations identified above, design and planning for ESCR has progressed and a new Preferred Alternative has been identified. The Preferred Alternative would

involve additional in-water construction beyond what was described in the original and supplemental consultations as well as placement of additional permanent features within the East River. This alternative would further enhance the flood protection and open space enhancement goals of the proposed project by elevating East River Park and the existing esplanade to protect these valuable recreational amenities from extreme coastal storm events as well as increased inundation due to sea level rise.

New in-water components of the Preferred Alternative include: (1) the filling of two existing embayments that would be relocated within the project area to allow for active recreation fields to be reconstructed around the new flood protection alignment as well as allowing for ADA accessible pathways to the waterfront; (2) demolition of the existing esplanade at the sites of the proposed new embayments, and near one existing embayment; (3) reconstruction of ten sewer outfalls as part of a larger effort to reconstruct water and sewer infrastructure within East River Park to withstand additional fill; (4) utilization of construction barges; (5) construction of in-water footings and shafts to accommodate a pedestrian and bicyclist (shared use) flyover bridge between the northern portion of East River park and Captain Patrick J. Brown Walk to improve access along this stretch of the East River; and (6) demolition of the existing bulkhead along the East River to accommodate the installation of a new cut-off wall in the same footprint and alignment. Components (4) and (5) were previously mentioned in conjunction with the consultation update initiated on May 26, 2016.

Response to Comments

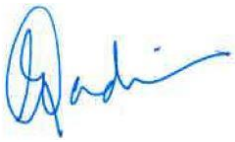
With the identification of the new Preferred Alternative and associated in-water components, a draft informal consultation was submitted to NOAA NMFS on February 7, 2019. The City appreciates the response and comments provided by your office on this draft EFH consultation. In response to these comments, the City has supplemented the analyses in our draft consultation in the Draft Environmental Impact Statement (DEIS). Specifically, we have completed the following in the DEIS:

- Supplemented the analysis of the 11 EFH species previously identified with analyses for the 5 additional EFH species in the March 14, 2019 letter;
- Provided an analysis of 10 Fish and Wildlife Coordination Act (FWCA) species identified in the March 14, 2019, letter from NOAA NMFS in the March 14, 2019 letter;
- Provided additional context for the permanent in-water components beyond the analysis included in our draft consultation, specifically regarding the relocation of the existing embayments, to preserve necessary park features and accessibility, and to provide improved wetland habitat and improved user experience;
- Provided a discussion of aforementioned improved habitat with the new embayments, including the elimination of bridges that shade aquatic habitat, which can reduce benthic organism productivity and biomass, and the provision of habitat enhancements designed for the recruitment of shellfish and other aquatic life along East River Park; and
- Provided discussion of wetland mitigation measures pursuant to NYSDEC and USACE permit requirements including restoration of wetland habitat both in the format of in-kind, on-site restoration and off-site restoration or purchase of wetland credits from the Saw Mill Creek Wetland Mitigation Bank located in Staten Island, New York, which would be provided at a 2:1 ratio per NYSDEC requirements.

In addition, the DEIS includes comprehensive analyses of the direct and indirect effects associated with the temporary and permanent placement of fill within the East River, including the potential for adverse effects to EFH species and prey species, and a discussion of measures taken to avoid and minimize these adverse effects. The DEIS discusses the measures that would be in place during construction of the proposed project to avoid and minimize affects to the aquatic environment, including minimizing or avoiding the potential for sediments and noise, as well as measures taken to avoid and minimize adverse effects associated with the permanent disturbance of aquatic habitat.

As noted above, the City anticipates submitting a revised consultation to NOAA NMFS well in advance of the FEIS, and concluding that consultation prior to the FEIS, such that all conservation measures will be reflected in that document. The City thanks you for your assistance during this process and looks forward to continued coordination with NOAA NMFS.

Sincerely,



Eram Qadri

cc:

NOAA:	E. Carson-Supino
DDC:	T.L. Dinh, E. Ilijevich, K. Leaman
Parks:	E. Humes, C. Alderson
OMB:	E. Qadri, J. Jacobs
Deputy Mayor's Office:	M. De Coo
HUD:	T. Fretwell; D. Mahon
JV:	A. Winter, C. Campbell, K. Mui, R. White

The City of New York
Office of Management and Budget
255 Greenwich Street • New York, New York 10007-2146

Ms. Edith Carson-Supino
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930-2276

Re: Informal Consultation for Endangered Species Act Section 7 Conclusion
East Side Coastal Resiliency Project
New York, New York

Dear Ms. Carson-Supino:

The City of New York (City) is requesting an informal consultation seeking concurrence on the conclusions of our initial analysis to support the publication of the Draft Environmental Impact Statement (DEIS). A follow up Section 7 consultation complete with acoustical analysis will be submitted to you for your review in April 2019. The City is requesting guidance from the National Oceanic and Atmospheric Association (NOAA) National Marine Fisheries Service (NMFS) regarding new design and construction information for the proposed East Side Coastal Resiliency (ESCR) project, located in New York City, New York. Specifically, the City is requesting confirmation that the design and construction of the Preferred Alternative **May Affect, but is Not Likely to Adversely Affect** the federally listed species identified as potentially occurring within the limits of disturbance for the proposed project: Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and the shortnose sturgeon (*Acipenser brevirostrum*).

Project Description

As you may recall, the proposed ESCR project extends along the east side of Manhattan between Montgomery Street and East 25th Street. The (EIS) study area for natural resources ("study area") extends 400 feet into the East River from the shoreline between Montgomery Street and East 25th Street. The proposed project is a series of integrated flood control measures designed to protect areas of Manhattan within the Federal Emergency Management Agency (FEMA)-designated 100-year flood hazard area accounting for sea level rise projections to the 2050s developed by the New York City Panel on Climate Change. The design and construction associated with the proposed project would occur primarily on land but will also include in-water work in the East River, a saline surface water component of the New York Harbor Estuary.

In-Water Components

Subsequent to the original and supplemental consultations for this project, design and planning for ESCR has progressed and a new Preferred Alternative has been identified. The new Preferred Alternative would involve additional in-water construction and placement of additional permanent features within the East River. The Preferred Alternative would further enhance the goals of the proposed project by elevating East River Park and the existing esplanade, to protect these valuable recreational amenities from extreme coastal storm events as well as increased inundation due to sea level rise. New in-water components of the Preferred Alternative include: (1) the filling and relocation of two existing embayments with improved habitat within the project area to allow for the accommodation of flood protection elements while maintaining valuable community recreation space, and allowing universal accessibility to the waterfront through the accommodation of ADA-accessible pathways; (2) demolition of the existing esplanade at the

sites of the proposed new embayments and near one existing embayment; (3) reconstruction of ten sewer outfalls as part of a larger effort to reconstruct water and sewer infrastructure within East River Park to withstand additional fill; (4) utilization of construction barges; (5) construction of in-water footings and shafts to accommodate a pedestrian and bicyclist (shared use) flyover bridge between the northern portion of East River park and Captain Patrick J. Brown Walk to improve access along this stretch of the East River; and (6) demolition of the existing bulkhead along the East River to accommodate the installation of a new cut-off wall in the same footprint and alignment. Components (4) and (5) were previously mentioned in conjunction with the consultation update initiated on May 26, 2016.

Design of the Preferred Alternative is ongoing and, as such, for the purposes of this informal consultation request, a reasonable worst-case scenario for potential in-water effects associated with the Preferred Alternative is presented and evaluated herein.

Summary of Findings

Based on prior communications with NOAA NMFS there are two species of endangered fish with the potential to occur in the East River adjacent to the study area: the Atlantic sturgeon and the shortnose sturgeon. Due to inhospitable habitat conditions within the East River, such as strong currents, heavy boat traffic, degraded water quality, the localized nature of the proposed in-water work adjacent to the project area, coupled with the proposed mitigation measures to lessen any potential effects**,** OMB has determined that the construction and operation of the Preferred Alternative **May Affect, but is Not Likely to Adversely Affect** the Atlantic sturgeon and shortnose sturgeon, and is seeking concurrence from NOAA NMFS on these findings.

The Preferred Alternative would result in a total of 24,085 square feet of permanent disturbance to tidal wetland habitat, which would require 48,170 square feet of tidal wetland mitigation. On-site, in-kind wetland mitigation would consist of constructing two new embayments within the project area which would restore approximately 26,000 square feet of the impacted tidal wetlands. The remaining 22,170 square feet of required mitigation would be accomplished through the purchase of tidal wetland mitigation bank credits or with off-site tidal wetland restoration or creation.

Construction of the Preferred Alternative would involve the following in-water elements: construction of shafts and footings for the shared use flyover bridge; construction barging; relocating and reconstructing sewer outfalls; demolition of the existing bulkhead to replace with a new cut-off wall; demolition of the existing embayments; and demolition of existing piles and formwork associated with the esplanade in the areas of existing and proposed embayments. There would be temporary adverse effects to New York State Department of Environmental Conservation (NYSDEC) and U.S. Army Corps of Engineers (USACE) regulated littoral zone tidal wetlands Waters of the United States resulting from the construction of these elements.

Construction barges may include unloading barges, transit barges, which may be employed to supplement truck deliveries, and storage barges. The anchoring of construction barges would be accomplished with spuds (vertical steel shafts) located on the barges. Monopile dolphins (a cluster of piles used as a fender for the bulkhead) could also be installed to control the transverse movements of unloading barges to ensure safe barging operations. The unloading barges, typically used to support excavators and small crawler cranes used for transferring materials from transit barges to the shoreline, would be sited along the bulkhead and moved as necessary between the Fireboat House and the north end of East River Park. Transit barges would be moored to the unloading barges from which materials would be transferred to the park for installation. Construction barges used for storage may be sited along the bulkhead in up to three other locations: between Pier 36 and Pier 42, at the northern end of East River Park, and/or along Captain Patrick J. Brown Walk. Upon completion of construction, any spuds and monopile dolphins would be removed and the affected area would be allowed to naturally restore to pre-construction conditions.

To install the shafts and footings associated with the flyover bridge, the current assumption includes use of land-based drill rigs positioned in East River Park, the East River Greenway path, and the Con Edison

pier to install these support structures south of East 15th Street. Drilling for footings to be installed along Captain Patrick J Brown walk would be performed using barge mounted drill rigs. Shaft construction activities for the flyover bridge would involve the installation of a turbidity curtain and sinking of the pipe with a rotating cutter head to push the pipe into the river bed. After sinking the pipe, a rebar cage is lowered prior to installing a tremie pipe. Concrete is then pumped into the tremie pipe. As the tremie pipe is filled with concrete, river water and sediment within that pipe is gradually displaced or may require pumping to remove the sediment and water. The support shafts and footings for the flyover bridge occurring within the East River would result in approximately 650 square feet of permanent disturbance within NYSDEC and USACE regulated tidal wetlands. Once the installation of these components is complete, the tremie pipe and any turbidity curtains would be removed, and the shafts and footings would remain.

To relocate and reconstruct the 10 sewer outfalls, a watertight cofferdam would be installed adjacent to the bulkhead at each of the 10 outfall locations and the work area would be dewatered. The top of the cofferdam would be above the mean higher-high water line to isolate the work area from tidal influence. The work area would not contain standing water and approved dewatering measures would be installed, as necessary, and would discharge below the mean higher-high water line. A portable sediment tank or approved equivalent would be used to treat dewatering effluent. Approximately 1,000 square feet of temporary disturbance to regulated tidal wetlands between the cofferdams and East River bulkhead is anticipated for each sewer outfall for a total temporary disturbance area of 10,000 square feet. Existing sewer infrastructure is anticipated to be filled with concrete and abandoned in place.

Demolition of the existing bulkhead would require turbidity curtains to be installed. Demolition of the esplanade would require debris nets to minimize the amount of debris falling into the waterway. Any large debris would be retrieved and disposed of in accordance with applicable regulations and best practices. Following demolition, a cut-off wall would be installed in the approximate alignment of the existing bulkhead. The cut-off wall sheet piles would be pile driven. The piles would initially be vibrated down and then pile driven to final tip elevation. Where obstructions are encountered, some pre-drilling may be needed prior to installing the cut-off wall sheet piles.

The filling of the existing embayments would occur following the installation of the cut-off wall, which would serve to limit any potential adverse effects to water resources during construction. Esplanade demolition and reconstruction activities in the areas of existing and proposed embayments would generally consist of the removal of the existing esplanade's concrete deck and support pilings at the mudline, and the installation of new girders and deck structure.

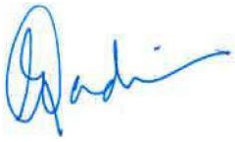
Upon completion of construction, the spuds, barges, turbidity curtains and debris nets would be removed, and the affected area would be allowed to naturally restore to pre-construction conditions.

Conclusions

Per your correspondence of March 22, 2019, no effects to Atlantic sturgeon eggs, larvae, or juveniles would occur as they are not tolerant of saline waters. To avoid and minimize any effects to adult and subadult Atlantic sturgeon as well as shortnose sturgeon associated with construction, including noise and turbidity within the East River, conservation measures would be implemented. To reduce noise or the likelihood that sturgeon would be exposed to the construction activities these conservation measures include, to the greatest extent practicable, the use of bubble curtains for pile driving activities, the use of a cushion block, and gradually ramping up pile driving. To avoid and minimize any effects due to turbidity, as turbidity curtains, water-tight cofferdams, and debris nets would be used as applicable. With these conservation measures in place, sturgeon may be discouraged from utilizing the near-shore environment in the East River.

The City would greatly appreciate an expeditious review of this informal consultation request. Should you have any questions or require additional information, please feel free to contact me at (212) 539-7063. Thank you in advance for your assistance with this matter.

Sincerely,



Eram Qadri

cc:

NOAA:	E. Carson-Supino
DDC:	T.L. Dinh, E. Ilijevich, K. Leaman
Parks:	E. Humes, C. Alderson
OMB:	E. Qadri, J. Jacobs
Deputy Mayor's Office:	M. De Coo
HUD:	T. Fretwell; D. Mahon
JV:	A. Winter, C. Campbell, K. Mui, R. White

Winter, Annie

From: Qadri, Eram (OMB) <QadriE@omb.nyc.gov>
Sent: Friday, March 22, 2019 9:28 AM
To: Winter, Annie; Stein, Haley (Law); Alderson, Colleen (Parks); Martin, Robert L (Law); Humes, Emily (Parks)
Cc: rwhite@akrf.com; Kenny Mui; Jacobs, Juliet (OMB); De Coo, Minelly
Subject: FW: FW: NMFS comment letter, East Side Coastal Resiliency project pDEIS and dEFH

Hi all – see below for email and comments on the ESA from Edith/NOAA.

From: Edith Carson-Supino - NOAA Federal [mailto:edith.carson-supino@noaa.gov]
Sent: Friday, March 22, 2019 9:22 AM
To: Qadri, Eram (OMB) <QadriE@omb.nyc.gov>
Cc: Ursula Howson - NOAA Federal <ursula.howson@noaa.gov>; Mahon, Donna M <Donna.M.Mahon@hud.gov>; Jacobs, Juliet (OMB) <JacobsJ@omb.nyc.gov>
Subject: Re: FW: NMFS comment letter, East Side Coastal Resiliency project pDEIS and dEFH

I apologize for the delay. Here are my comments:

Endangered Species Act

Atlantic Sturgeon

Atlantic sturgeon could be present in the waters of the East River and its adjacent bays and tributaries. The New York Bight, Chesapeake Bay, Carolina, and South Atlantic Distinct Population Segments (DPS) of Atlantic sturgeon are endangered; the Gulf of Maine DPS is threatened. Adult and subadult Atlantic sturgeon originating from any of these DPSs could occur in the proposed project area. As young remain in their natal river/estuary until approximately age 2, and early life stages are not tolerant of saline waters, no eggs, larvae, or juvenile Atlantic sturgeon will occur within the East River and its adjacent bays and tributaries.

Shortnose Sturgeon

Shortnose sturgeon could be present in the East River and could occur in its adjacent bays and tributaries. Shortnose sturgeon are listed as endangered throughout their range. As early life stages are not tolerant of saline water, no eggs, larvae, or juvenile shortnose sturgeon will occur within the saline waters of the East River and its adjacent bays and tributaries.

As project details develop, we recommend you consider the following effects of the project on Atlantic and shortnose sturgeon:

- For activities that increase levels of suspended sediment, consider the use of silt management and/or soil erosion best practices (i.e., silt curtains and/or cofferdams).
- For activities that may affect underwater noise levels, consider the use of cushion blocks and other noise attenuating tools to avoid reaching noise levels that will cause injury or behavioral disturbance to sturgeon - see the table below for more information regarding noise criteria for injury/behavioral disturbance in sturgeon.

Organism	Injury	Behavioral Modification

Sturgeon	206 dB re 1 µPaPeak and 187 dB cSEL	150 dB re 1 µPaRMS

Depending on the amount and duration of work that takes place in the water, listed species of sturgeon may occur within the vicinity of your proposed project. The federal action agency will be responsible for determining whether the proposed action may affect listed species. If they determine that the proposed action may affect a listed species, they should submit their determination of effects, along with justification and a request for concurrence to the attention of the Section 7 Coordinator, NOAA Fisheries, Greater Atlantic Regional Fisheries Office, Protected Resources Division, 55 Great Republic Drive, Gloucester, MA 01930 or nmfs.gar.esa.section7@noaa.gov. Please be aware that we have recently provided on our website guidance and tools to assist action agencies with their description of the action and analysis of effects to support their determination. See - http://www.greateratlantic.fisheries.noaa.gov/section7. After receiving a complete, accurate comprehensive request for consultation, in accordance to the guidance and instructions on our website, we would then be able to conduct a consultation under section 7 of the ESA. Should project plans change or new information become available that changes the basis for this determination, further coordination should be pursued. If you have any questions regarding these comments, please contact me (978-282-8490; Edith.Carson-Supino@noaa.gov).

Thank you,

Edith Carson-Supino, M.Sc.
Section 7 Fish Biologist
NOAA Fisheries
U.S. Department of Commerce
Greater Atlantic Regional Fisheries Office
Phone: 978-282-8490
edith.carson-supino@noaa.gov

For ESA Section 7 guidance please see:
https://www.greateratlantic.fisheries.noaa.gov/section7

On Fri, Mar 22, 2019 at 9:08 AM Qadri, Eram (OMB) <QadriE@omb.nyc.gov> wrote:

> Hello Edith,
>
> We have not received comments from you on the preliminary DEIS and ESA for the ESCR project yet. Please let me know if we should be expecting these anytime soon, and if you need any additional information from our office. Also, attached are comments received on the preliminary DEIS and the draft EFH assessment from Ursula.
>
> Thank you,
>
> Eram
>
> **Eram Qadri, AICP, LEED AP**

Unit Head - Environmental Review, CDBG Disaster Recovery

New York City Mayor's Office of Management & Budget

255 Greenwich Street, 5th Floor

New York, NY 10007

Tel: (212) 788-6241

* QadriE@omb.nyc.gov

From: Ursula Howson - NOAA Federal [mailto:ursula.howson@noaa.gov]
Sent: Wednesday, March 20, 2019 4:04 PM
To: Qadri, Eram (OMB) <QadriE@omb.nyc.gov>
Cc: stephan.a.ryba@usace.army.mil; Lamster, Stephanie <lamster.stephanie@epa.gov>; McReynolds, Dawn (DEC) <Dawn.McReynolds@dec.ny.gov>
Subject: NMFS comment letter, East Side Coastal Resiliency project pDEIS and dEFH

Hello all,
Attached please find our comment letter for the East Side Coastal Resiliency project pDEIS and dEFH assessment.

Let me know if you have any questions.
Ursula

--

Ursula Howson, PhD
NOAA/National Marine Fisheries Service
Greater Atlantic Regional Fisheries Office
Habitat Conservation Division
James J. Howard Marine Sciences Laboratory
74 Magruder Rd.
Highlands, NJ 07732
732 872-3116 (office)
ursula.howson@noaa.gov

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

MAR 14 2019

Eram Qadri
Unit Head - Environmental Review, CDBG Disaster Recovery
New York City Mayor's Office of Management & Budget
255 Greenwich Street, 5th Floor
New York, NY 10007

RE: Preliminary Draft Environmental Impact Statement and Draft Essential Fish Habitat Assessment, East Side Coastal Resiliency Project, East River, New York, New York.

Dear Ms. Qadri:

We have reviewed the February 2019 Preliminary Draft Environmental Impact Statement (PDEIS) and Draft Essential Fish Habitat Assessment for the East Side Coastal Resiliency project (ESCR), located along the East River in the Borough of Manhattan, New York, New York. We provided a comment letter on a previous version of the project on April 14, 2016. Subsequent to that correspondence, a different project alternative was selected, necessitating your request for a new EFH consultation with us.

The ESCR project is a coastal flood protection system designed to protect the east side of Manhattan from coastal storm events. The design includes a combination of floodwalls, raised landscapes, closure structures (floodgates) and other infrastructure improvements that together will reduce the risk of coastal flooding impacts in the project area. Approximately 0.49 acres of shallow open water habitat will be permanently impacted by the project. Construction of new shallow open water habitat and compensatory mitigation will be used to offset these adverse impacts.

The project area extends along the East River waterfront, including East River Park, from Montgomery Street to East 25th Street. The preferred alternative (PA) is designed to increase the elevation of the entire East River Park by approximately 8 ft. The Delancey Street, East 10th Street, and Corlears Hook bridges would be reconstructed to provide universal accessibility, and a new shared-use flyover bridge would be constructed. A portion of the park's underground water and drainage infrastructure, bulkhead, and esplanade will be repaired or reconstructed. Two existing embayments along the East River esplanade will be relocated to allow for siting of active recreation fields within the park and to facilitate direct connection of the public with the water.

The PA will result in impacts to shallow open water (unconsolidated bottom) habitat, including the filling of 0.47 acres to relocate two embayments in the park, and 0.02 acres for installation of support structures for the shared-use flyover bridge. Additional impacts to shallow open water habitat may result from the filling of the two embayments, including the removal and reconstruction of the East River Esplanade bulkhead, as well as construction of bridge support

shafts, installation of cofferdams to facilitate the reconstruction of several sewer outfalls, and the use of construction barges with temporary mooring spuds and dolphins.

The embayments would be reconstructed in approximately the same size along the shoreline within the project area. Permanent impacts to open water habitat will be mitigated through implementation of a compensatory mitigation plan consistent with state and federal regulations and in cooperation with the appropriate agencies.

Magnuson Stevens Fishery Conservation and Management Act (MSA)
The project area has been designated as EFH for a number of federally managed species including Atlantic butterfish (*Peprilus triacanthus*), Atlantic mackerel (*Scomber scombrus*), Atlantic sea herring (*Clupea harengus*), bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), clearnose skate (*Raja eglanteria*), cobia (*Rachycentron canadum*), king mackerel (*Scomberomorus cavalla*), little skate (*Leucoraja erinacea*), red hake (*Urophycis chuss*), scup (*Stenotomus chrysops*), Spanish mackerel (*Scomberomorus maculates*), summer flounder (*Paralichthys dentatus*), windowpane flounder (*Scophthalmus aquosus*), winter flounder (*Pseudopleuronectes americanus*), and winter skate (*Leucoraja ocellata*).

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to consult with us on any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect EFH identified under the MSA. The EFH regulations, 50 CFR Section 600.920, outline that consultation procedure and require the preparation of an EFH assessment by the action agency, or its designated non-federal representative. While our regulations also allow a federal agency such as the US Department of Housing and Urban Development (HUD) to designate a non-federal representative to conduct the EFH consultation, it is important to note that the federal action agency remains ultimately responsible for compliance with sections 305(b)(2) and 305(b)(4)(B) of the MSA.

We have reviewed the draft EFH assessment for this project. The assessment adequately assesses some of the impacts of the project on EFH associated with this coastal flood control project on the East River. According to the information in the PDEIS, 0.49 acres of shallow water habitat will be filled to construct the PA. The direct and indirect effects of this fill on EFH are not evaluated in the draft EFH assessment. In addition, the assessment does not include a discussion of measures taken to avoid, and minimize this loss of aquatic habitat. In addition, some of the construction activities proposed for the project area, including removal of the bulkhead and installation of the cofferdam system, may adversely affect EFH for species such as bluefish, summer flounder, windowpane flounder and winter flounder. Some adverse effects are a result of the loss of EFH or from construction related impacts to water quality and sediments. However, some adverse effects are due, in part, to impacts to prey species. Impacts to prey species are not evaluated fully in the draft assessment.

Because the draft assessment provided for this project does not assess fully the adverse effects to EFH that will result from the construction of this project, we cannot consider the assessment complete. In order to initiate the EFH consultation, a revised EFH assessment that includes a full and complete evaluation of the direct, indirect, individual and cumulative effects of the construction and operation of all of the project components on EFH should be provided to us.

The required components of the EFH assessment include a description of the action; an analysis of the potential adverse effects of the action on EFH and the managed species; the federal agency's conclusions regarding the effects of the action on EFH; and proposed mitigation, if applicable. The assessment should also include an analysis of alternatives to the action. Such analysis should include alternatives that could avoid or minimize adverse effects on EFH.

The EFH final rule published in the Federal Register on January 17, 2002 defines an adverse effect as "any impact which reduces the quality and/or quantity of EFH" and further states that:

> An adverse effect may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystems components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from action occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

The EFH final rule states that the loss of prey may be an adverse effect on EFH and managed species because the presence of prey makes waters and substrate function as feeding habitat; the definition of EFH includes waters and substrate necessary to fish for feeding. Therefore, actions that reduce the availability of prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat may also be considered adverse effects on EFH. Prey for these managed species include alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*), collectively referred to as river herring. The final EFH assessment this project should include an analysis of the impacts of the project on these species.

Additionally, the Clean Water Act (CWA) Section 404 (b)(1) Guidelines outline a sequence to be followed when evaluating actions such as this that propose the placement of fill material into aquatic habitats. The Guidelines specify that it must first be demonstrated that potential impacts have been avoided and minimized to the maximum extent practicable before considering compensatory mitigation. Also, the Guidelines allow permit issuance for only the least environmentally damaging practicable alternative. Because the construction of recreation fields is not a water-dependent activity, it is presumed that practicable upland alternatives exist and that these alternatives would be less environmentally damaging. An analysis of alternatives that avoid and minimize the placement of fill in aquatic habitats is needed to rebut this presumption. This analysis should be included in the final EFH assessment to demonstrate that impacts to EFH have been minimized.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA), as amended in 1964, requires that all federal agencies consult with us when proposed actions might result in modifications to a natural stream or body of water. It also requires that they consider effects that these projects would have on fish and wildlife, and must also provide for improvement of these resources. Under this authority, we work to protect, conserve and enhance species and habitats for a wide range of aquatic resources such as diadromous species, shellfish, and other commercially and recreationally important species that are not managed by the federal fishery management councils and therefore do not have designated EFH. The New York Harbor estuary and the East River are highly productive

habitat for a wide variety of NOAA trust resources covered by the FWCA, including important forage species such as river herring, silversides (*Menidia* spp.), killifish (*Fundulus* spp.), menhaden (*Brevoortia tyrannus*), anchovies (*Anchoa* spp.), and shellfish. The abundance of forage species makes these waterways important feeding and nursery areas for a number of estuarine-dependent commercially and recreationally important species, including summer flounder, winter flounder, bluefish, American eel (*Anguilla rostrata*), striped bass (*Morone saxatilis*), tautog (*Tautoga onitis*) and weakfish (*Cynoscion regalis*). The New York Harbor estuary provides habitat for one of the largest populations of striped bass on the East Coast, including an overwintering population in the upper New York Harbor and associated tributaries.

We are particularly concerned about potential impacts to river herring and striped bass. River herring and striped bass undergo spring spawning migrations and use the East River as a migratory route. An evaluation of impacts of the ESCR project to NOAA trust resources should also be provided. Seasonal work restrictions or other best management practices may be needed to minimize adverse effects to these species. Additional information on the effects of the project on river herring and striped bass, such as the construction methods, construction schedule, and materials to be used should be provided to assist us in determining the appropriation recommended protections for these species.

Endangered Species Act

Our Protected Resources Division will provide separate comments on this project. Further questions should be directed to Edith Carson-Supino at (978) 282-8490 or edith.carson-supino@noaa.gov .

Conclusion

As stated above, the draft EFH assessment provided for this project does not evaluate all of the potential direct, indirect, individual and cumulative effects to EFH that could result from the implementation of the proposed project. To initiate the EFH consultation with us, a revised assessment should be provided to us that addresses the impacts of the proposed fill, impacts to prey species, and discussed alternatives considered to avoid and minimize the adverse effects. This will enable us to develop site-specific EFH conservation recommendations. We look forward to our continued coordination with your office on this project as it moves forward. If you have any questions or need additional information, please do not hesitate to contact Ursula Howson in our Highlands, NJ field office at (732) 872-3116 or ursula.howson@noaa.gov.

Sincerely,

Karen Greene
Mid-Atlantic Field Office Supervisor

cc: NYD ACOE – S. Ryba
PRD – D. Marrone, E. Carson
NYDEC – D. McReynolds
EPA – S. Lamster
NOAA NEPA

CONSULTATION

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

Hazen | AKRF
AKRF Engineering, P.C.
a joint venture

Hazen and Sawyer / AKRF, JV
440 Park Avenue South
New York, NY 10016
tel: 212 696-0670
fax: 212 213-3191

February 7, 2019

Mr. Daniel Marrone
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930-2276

Re: Section 7 and Essential Fish Habitat Findings for the
East Side Coastal Resiliency Project, Alternative 4
New York, New York
New York City Department of Design and Construction Capital Contract: SANDRESM1

Dear Mr. Marrone:

On behalf of the New York City (City) Department of Design and Construction (DDC), the Hazen and Sawyer/AKRF Joint Venture (JV) is requesting additional guidance from the National Oceanic and Atmospheric Association (NOAA) National Marine Fisheries Service (NMFS) regarding new design and construction information for the proposed East Side Coastal Resiliency (ESCR) project, located in New York City, New York. Specifically, the JV is requesting confirmation that (1) the federally listed species identified as potentially occurring within the limits of disturbance for the proposed project include only Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and the shortnose sturgeon (*Acipenser brevirostrum*); (2) confirmation of the Essential Fish Habitat (EFH) species identified herein; and (3) that the changes to design and construction of the proposed project May Affect but is Not Likely to Adversely Affect these two listed species and would result in Minimal Adverse Effects to EFH.

Consultation History to Date

To implement the proposed project, the City is receiving funds from the U.S. Department of Housing and Urban Development (HUD), a federal agency, and is therefore subject to Section 7 of the Endangered Species Act as well as the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended. Requests for concurrence on findings regarding threatened and endangered species and EFH was previously submitted to NMFS on January 25, 2016. A project update was provided on May 26, 2016 (with a follow up email transmitting these materials on May 27, 2016) to request additional guidance on the addition of a new potential project alternative that would create a more robust line of projection and eliminate the need for closure structures across the FDR (Alternative 5). The original consultation requests, all correspondence associated with those requests, and NMFS's responses are provided in **Attachment 1**.

NMFS returned the results of the Section 7 consultation on March 18, 2016 and concurred with the findings that the proposed limited in-water construction activities, including pile driving a 24-inch sheet pile coffer am with an impact hammer for a 300-square foot area, is not likely to adversely affect species listed as threatened or endangered.

NMFS returned the results of the EFH consultation on April 14, 2016 and concurred with the findings that adverse effects associated with the proposed in-water activities would be minimal and did not recommend conservation measures be implemented.

As noted above, a project update was provided on May 26, 2016, to request additional guidance on the addition of a new potential project alternative and a response was received from NMFS on June 2, 2016 that concurred with an unchanged determination for Section 7 threatened and endangered species and EFH.

New Consultation Request

As you may recall, the proposed ESCR project extends along the east side of Manhattan between Montgomery Street and East 25th Street. The Environmental Impact Statement (EIS) study area for natural resources ("study area") extends 400 feet into the East River from the shoreline between Montgomery Street and East 25th Street (**Figure 1**). The proposed project is a series of integrated flood control measures designed to protect areas of Manhattan within the Federal Emergency Management Agency (FEMA)-designated 100-year flood hazard area accounting for sea level rise projections to the 2050s developed by the New York City Panel on Climate Change. The proposed project design and construction associated with the proposed project would occur primarily on land but will also include in-water work in the East River, a saline surface water component of the New York Harbor Estuary. A more in-depth description of the in-water components of proposed project is provided in **Attachment 2**. The Draft EIS for ESCR is anticipated to be published in spring 2019, and a preliminary DEIS will be made available for your review in advance of that publication.

Subsequent to the original and supplemental consultations identified above, design and planning for ESCR has progressed and a new preferred alternative has been identified. This alternative, Alternative 4 in the DEIS, would involve additional in-water construction and placement of additional permanent features within the East River. Alternative 4 would further enhance the goals of the proposed project by elevating East River Park and the existing esplanade to protect these valuable recreational amenities from extreme coastal storm events as well as increased inundation due to sea level rise. A schematic of Alternative 4 is provided in **Figure 2**. New in-water components of Alternative 4 include: (1) the filling of two existing embayments that would be relocated within the project area to allow for active recreation fields to be reconstructed around the new flood protection alignment; (2) reconstruction of ten sewer outfalls (**see Figure 3**) as part of a larger effort to reconstruct water and sewer infrastructure within East River Park to withstand additional fill; (3) the use of construction barges; and (4) construction of in-water footings and shafts to accommodate a pedestrian and bicyclist (shared use) flyover bridge between the northern portion of East River park and Captain Patrick J. Brown Walk to improve access along this stretch of the East River. Components (3) and (4) were previously mentioned in conjunction with the consultation update initiated on May 26, 2016. Information on the current construction assumptions is provided in **Attachment 2**.

Design of this new alternative is ongoing and, as such, for the purposes of this consultation request, a reasonable worst-case scenario for potential in-water effects associated with Alternative 4 is presented and evaluated herein. A Species Conclusion Table documenting the natural history of threatened and endangered species potentially occurring within the study area along with discussions of potential project related effects is provided in **Attachment 3**. A "NOAA Fisheries Northeast Regional Office EFH Assessment Worksheet for Federal Agencies" and an EFH impact assessment is provided in **Attachment 4**. Documentation from HUD and the New York City Office of Management and Budget (OMB) designating the JV as the non-federal representative for this project is provided in **Attachment 5**.

Summary of Findings

Threatened and Endangered Species

Based on prior communications with NMFS (**Attachment 1**) there are two species of endangered fish with the potential to occur in the East River adjacent to the study area: the Atlantic sturgeon and the shortnose sturgeon. We are requesting an informal Section 7 consultation with NMFS for these species, in addition to confirmation that no additional federal or endangered species would be anticipated to occur within the project area.

Due to inhospitable habitat conditions within the East River, such as strong currents, heavy boat traffic, degraded water quality, the localized nature of the proposed in-water work adjacent to the project area, and mitigation proposed by DDC to lessen any potential effects as described in **Attachment 2,** DDC has determined that the construction and operation of Alternative 4 May Affect, but is Not Likely to Adversely Affect the Atlantic sturgeon and shortnose sturgeon. DDC is seeking concurrence from NMFS on these findings. A Species Conclusion Table with additional details on sturgeon life history and rationale for this finding is provided in **Attachment 3**.

Essential Fish Habitat (EFH)

An EFH assessment and accompanying NOAA Fisheries Northeast Regional Office EFH Assessment Worksheet for Federal Agencies are provided in **Attachment 4**. As a result of construction activities associated with the proposed project, there would be minor effects to EFH for one or more lifestages of winter flounder, windowpane flounder, summer flounder, Atlantic herring, scup, and black sea bass. Several species listed as potentially occurring in the study area are either at the extreme limit of their known range or are highly migratory and are therefore anticipated to occur in the East River only as uncommon or transient individuals. The remainder of the species evaluated would not be anticipated to be found in the East River due to unsuitable environmental conditions, unsuitable depths, and unsuitable substrates or other habitat features. DDC is requesting an Abbreviated EFH Consultation for Alternative 4 and concurrence with their findings of Minimal Adverse Effects to EFH in the study area. DDC also requests guidance on any Conservation Recommendations that NMFS may have for the proposed project.

Results of these consultation requests will be used to inform the DEIS currently being prepared for the ESCR project in order to comply with applicable National Environmental Protection Act (NEPA), New York State Environmental Quality Review Act (SEQRA), and New York City Environmental Quality Review (CEQR) standards. In the event that new design elements are developed that result in additional in-water construction activities not described above or in **Attachment 2**, DDC would notify NMFS of these changes as addenda to this submission.

The City would greatly appreciate an expeditious review of the enclosed documents within the 30-day review period. Please send the results of the requested consultations to JEinhorn@hazenandsawyer.com. Should you have any questions or require additional information, please feel free to contact me at (212) 539-7063. Thank you in advance for your assistance with this matter.

Sincerely,

Jessica Einhorn
Principal Scientist
Hazen and Sawyer

Enclosures:

Figure 1 – Site Location Map
Figure 2 – Map Location of Existing Embayments
Figure 3 – Water and Sewer Schematic Showing Location of Proposed Reconstructed Outfalls
Attachment 1 – Previous Correspondence with NMFS
Attachment 2 – Construction Description
Attachment 3 – Section 7 Species Conclusion Table
Attachment 4 – EFH Assessment Worksheet and EFH Assessment
Attachment 5 – Designation of Non-Federal Representative Letter

cc:	NOAA:	K. Greene
	DDC:	T.L. Dinh, E. Ilijevich, K. Leaman
	Parks:	E. Humes, C. Alderson
	OMB:	E. Qadri, J. Jacobs
	Deputy Mayor's Office:	M. De Coo
	HUD:	T. Fretwell
	JV:	A. Winter, C. Campbell, K. Mui, R. White

1/9/2019

Source: USFWS

Project Area One

Project Area Two

Natural Resources Study Area (400-Foot Study Area Radius)

Estuarine and Marine Deepwater (Estuarine Subtidal Wetlands with an Unconsolidated Bottom- E1UBL)

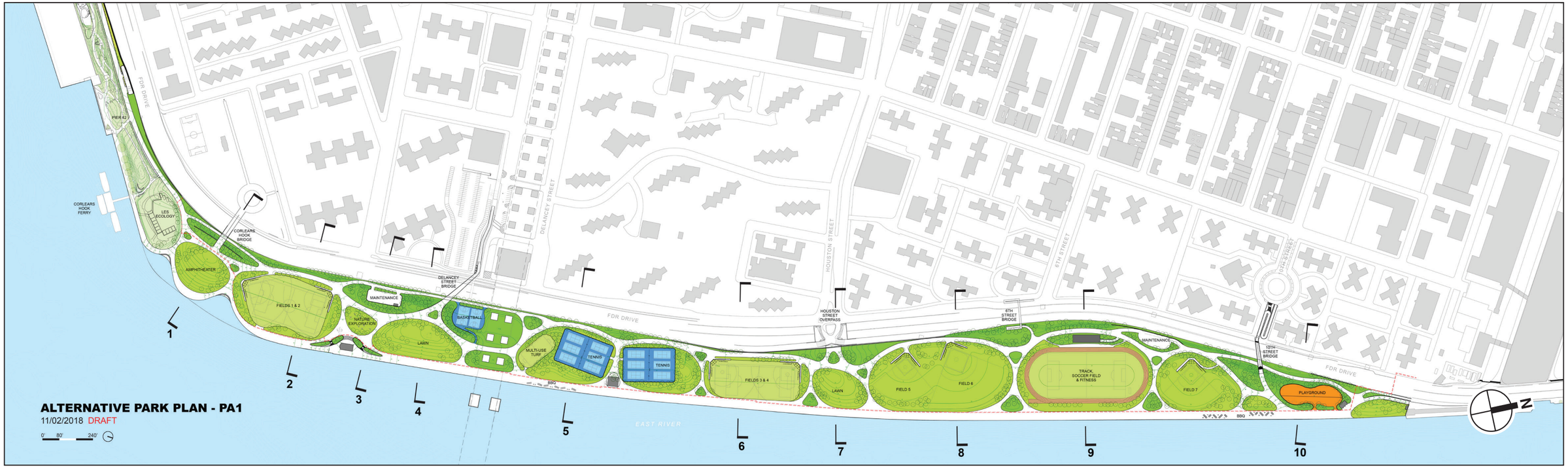
0 1,000 FEET

Capital Project SANDRESM1

EAST SIDE COASTAL RESILIENCY PROJECT

Natural Wetlands Inventory Map

Figure 1

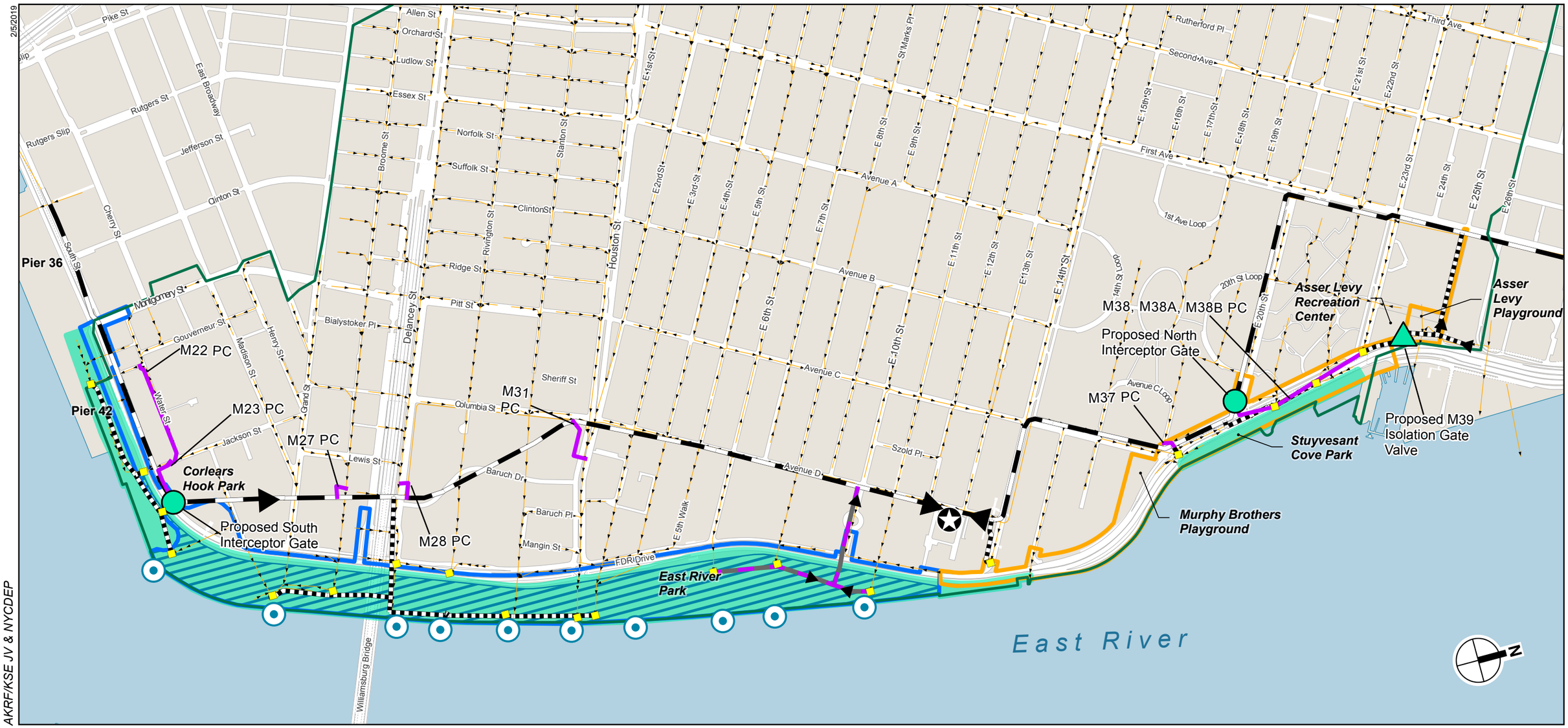


Project Elements

Proposed Floodwall

Redesigned Open Spaces

NOTE: Based on Preliminary Draft Design Concept.



Drainage Isolation

- *Proposed Isolation Gate Valve at Regulator M-39*
- *Proposed Interceptor Gate*
- *Proposed Floodproofing of Unprotected Sewer Infrastructure*

Drainage Management

- *Proposed Parallel Conveyance (PC)*
- *Proposed Upsized Branch Interceptor*

Infrastructure Reconstruction

- *Proposed Infrastructure Reconstruction*
- *Proposed Reconstructed Outfall Location*

- *Existing Regulators*
- *Existing Lateral Sewers in Drainage Protected Area*
- *Existing Branch Interceptors*
- *Existing Interceptor*
- *Manhattan Pump Station*

- *Drainage Protected Area*
- *Project Area One*
- *Project Area Two*

0 1,000 FEET

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY PROJECT

Infrastructure Reconstruction, Drainage Isolation, and Drainage Management Components
Figure 3

ATTACHMENT 1
PREVIOUS CORRESPONDENCE WITH NMFS

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

Diamond, Ross

From: Daniel Marrone - NOAA Federal <daniel.marrone@noaa.gov>
Sent: Tuesday, August 11, 2015 8:55 AM
To: Diamond, Ross
Cc: Karen Greene - NOAA Federal; pauh@ddc.nyc.gov; dinhl@ddc.nyc.gov; rogersel@ddc.nyc.gov; PichardoJimenezC@ddc.nyc.gov; DaviesMi@ddc.nyc.gov; cgrassi@cityhall.nyc.gov; Alda.chan@parks.nyc.gov; qadrie@omb.nyc.gov; JonesM@omb.nyc.gov; Wells, Owen (Parks); EBrunner; rwhite@akrf.com; mlee@akrf.com; Mehrotra, Sandeep; Young, Valerie; Winter, Annie; Wells, Ruby
Subject: Re: Request for Information/Informal Section 7 Review of Federally Listed Marine Species - East Side Coastal Resiliency, New York, NY

Hi Ross,
Atlantic and shortnose sturgeon are the only ESA-listed species under our jurisdiction that may occur in the East River. Sea turtles do not occur in the East River.
Dan

On Mon, Aug 10, 2015 at 4:54 PM, Diamond, Ross <RDiamond@hazenandsawyer.com> wrote:

> Hi Daniel, thank you for distributing the technical guidance letter. For our own records, can you confirm that the species in question for our project area are:
>
> Atlantic Sturgeon
>
> Shortnose Sturgeon
>
> Green Turtle
>
> Atlantic Hawksbill
>
> Loggerhead
>
> Kemp's Ridley
>
> Leatherback
>
> The design of the ESCR project is currently progressing and when additional information is available on the extent of the in-water construction, we will resume coordination with NMFS. Thank you.
>
> **Ross Diamond**
>
> **Principal Scientist | Hazen and Sawyer**
> 498 Seventh Avenue, 11th Floor, New York, NY 10018

212.539.7082 (direct) | 973.820.5398 (cell)
rdiamond@hazenandsawyer.com | hazenandsawyer.com

From: Daniel Marrone - NOAA Federal [mailto:daniel.marrone@noaa.gov]
Sent: Thursday, July 30, 2015 1:58 PM
To: Diamond, Ross <RDiamond@hazenandsawyer.com>
Cc: Karen Greene - NOAA Federal <karen.greene@noaa.gov>; pauh@ddc.nyc.gov; dinhl@ddc.nyc.gov; rogersel@ddc.nyc.gov; PichardoJimenezC@ddc.nyc.gov; DaviesMi@ddc.nyc.gov; cgrassi@cityhall.nyc.gov; Alda.chan@parks.nyc.gov; qadrie@omb.nyc.gov; JonesM@omb.nyc.gov; Wells, Owen (Parks) <Owen.Wells@parks.nyc.gov>; EBrunner <EBrunner@cityhall.nyc.gov>; rwhite@akrf.com; mlee@akrf.com; Mehrotra, Sandeep <SMehrotra@hazenandsawyer.com>; Young, Valerie <vyoung@hazenandsawyer.com>; Winter, Annie <awinter@hazenandsawyer.com>; Wells, Ruby <RWells@hazenandsawyer.com>
Subject: Re: Request for Information/Informal Section 7 Review of Federally Listed Marine Species - East Side Coastal Resiliency, New York, NY

Hi Ross,

Sorry for the delay. Attached is a copy of the technical guidance letter we sent out in July for Sandy resiliency projects. I believe your project fits in with this group. Please let me know if you have any questions.

Thanks,

Dan

On Tue, Jul 14, 2015 at 1:25 PM, Diamond, Ross <RDiamond@hazenandsawyer.com> wrote:

> Dear Mr. Marrone,
>
> A request for information for federally-listed threatened and endangered marine species with regards to the East Side Coastal Resiliency Project located in New York County, New York was placed in the mail to you today, July 14th 2015. This is a supplementary digital submission of the same package. Attached to this email please find a copy of the cover letter that contains a project description, two figures representing the project location, and the GIS shapefiles of the study area and respective buffer area. Thank you for your review and please do not hesitate to contact me for any reason.
>
> **Ross Diamond**
>
> **Principal Scientist | Hazen and Sawyer**
> 498 Seventh Avenue, 11th Floor, New York, NY 10018
> 212.539.7082 (direct) | 973.820.5398 (cell)
> rdiamond@hazenandsawyer.com | hazenandsawyer.com

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

July 8, 2015

Andrew Raddant, Office of Environmental Policy and Compliance, Department of the Interior
Nancy Danzig, Federal Transit Administration, Region 2, Department of Transportation
Timothy Timmermann, Region 1, EPA
Grace Musumeci, Region 2, EPA
Katherine Zeringue, Region 2, FEMA
Irene Chang-Cimino, Sandy Recovery Office, FEMA
Therese Fretwell, Regions I and II, HUD
COL David Caldwell, New York District, USACE
LTC Michael Bliss, Philadelphia District USACE
COL Christopher Barron, New England District, USACE

Re: Sandy Regional Infrastructure Resilience Coordination - Federal Review and Permitting

Dear Mr. Raddant, Ms. Danzig, Mr. Timmerman, Ms. Musumeci, Ms. Zeringue, Ms. Chang-Cimino, Ms. Fretwell, Col. Caldwell, Lt Col. Bliss, and Col. Barron:

You have requested guidance on consulting with NMFS Protected Resources Division, Greater Atlantic Region, under Section 7 of the Endangered Species Act (ESA), as amended, for species listed under our jurisdiction, and with NMFS Habitat Conservation Division, Greater Atlantic Region under the essential fish habitat (EFH) provisions of the Magnuson Stevens Fishery Conservation and Management Act (MSA), regarding the projects in the Sandy-affected region funded under the following federal grant/loan programs, some of which are supported by the Disaster Relief Appropriations Act of 2013 (Sandy Supplemental), and/or other federal programs or authority including the following:

- **DOI's** Hurricane Sandy Coastal Resiliency Competitive Grant Program
- **DOT's** FHWA Emergency Relief Program and FTA Emergency Relief Program
- **EPA**'s Clean Water State Revolving Fund (annual + Sandy Supplemental) and Drinking Water State Revolving Fund (annual + Sandy Supplemental)
- **FEMA**'s Public Assistance and Hazard Mitigation Grant Program
- **HUD**'s Community Development Block Grant - Disaster Recovery
- **NOAA**'s Coastal Resilience Networks (CRest) and Cooperative Institute of North American Research (CINAR)
- **USACE's** Civil Works Program, Sandy Supplemental appropriations to USACE, and the USACE Regulatory Program
- **USDA**'s Natural Resources Conservation Service (NRCS) Emergency Watershed Protection Program

You have requested technical guidance to help you determine which activities funded by the program may require additional coordination with NOAA's National Marine Fisheries Service, including potential future consultation pursuant to Section 7 of the ESA and the MSA. We propose that it would be more efficient to consider ESA Section 7 and MSA EFH consultation needs as they apply to the entire group of above-funded projects rather than having you submit a separate request for each project. The guidelines provided below are intended to be incorporated into your environmental review process so that you can determine which projects require additional coordination with us. This letter is provided as technical assistance, and Section 7 and EFH consultations have not been initiated. In fact, as indicated below, we expect the majority of activities being considered for funding will not need additional coordination with us.

We understand that this guidance applies to (but is not limited to) the following proposed land-based activity:

1. Rehabilitation and repair of 1-4 unit homes, 5-9 unit buildings, and commercial properties, including appropriate elevations of properties within a floodplain.
2. Repair and replacement of bulkheads in accordance with the USACE Nationwide General Permit Program, for which EFH consultation is complete on a regional basis.
3. Buy-out of certain storm-damaged properties for conversion to green space or other public facility in perpetuity.
4. Acquisition of certain damaged properties for future redevelopment.
5. Coastal infrastructure, both green and gray.

Endangered Species Act Guidance

Several species of listed sea turtles and Atlantic and shortnose sturgeon occur in the coastal waters of New York and New Jersey. Distribution maps are currently available on our website (http://www.greateratlantic.fisheries.noaa.gov/protected/section7/guidance/maps/index.html). Because these species only occur in the water in New York and New Jersey, they would not be exposed to any effects of activities that occur solely on land or above the high tide line and do not involve work in waterways. We also understand that appropriate best management practices will be required by other permits and employed to avoid any discharge into waterways and wetlands during any work. While there are ESA listed species under our jurisdiction in the coastal waters adjacent to where these land projects maybe based, these species are aquatic and limited to oceans and rivers (e.g., there are no nesting beaches for sea turtles in New York or New Jersey). Activities that have no effect on waterways or wetlands do not have the potential to impact our listed species and their habitats. ESA Section 7 consultation is required when a proposed Federal action may affect a listed species. Because no listed species under our jurisdiction will be exposed to effects from proposed activities on land, no section 7 consultation is necessary.

For activities such as bulkhead repair and replacement that occur along the shoreline, typical bulkhead repair and replacement methodologies include sheet pile installation, individual piles used to support an aboveground structure, or, gravity construction resting on the shore bottom supported by its own weight. The presence of sea turtles and sturgeon in shallow waters adjacent to the shoreline where bulkheads are typically installed would be rare. Impacts to these species are more likely to occur as a result of increased turbidity (due to sediment disturbance) and noise

resulting from the installation of piles. Measures that can be implemented to minimize the potential exposure of these species to these stressors include the use of turbidity or silt curtains, construction at low tide when water is absent from the area, use of vinyl piles, use of the smallest diameter piles practicable, and use of vibratory pile drivers. Avoidance of the May-October time period would also reduce the likelihood of impacts to listed species of sea turtles. We also encourage you to follow the guidance of the relevant permit conditions of the USACE Nationwide Permit Program (e.g. #3 (maintenance), 13 (Bank Stabilization), 23 (NEPA CE exclusions)), as well as general and regional specific conditions for New York and New Jersey.

The lead action agency, or their designated non-Federal representative, is responsible for determining if a proposed action may affect a listed species. If you determine that listed species will not be exposed to any effects of a proposed activity, no additional coordination with us is necessary. For any activities that may affect a listed species, section 7 consultation is required. We expect the projects that will require additional coordination would be any that result in negative impacts to submerged aquatic vegetation (SAV), shellfish resources, or involve pile installation, or dredging and disposal.

Essential Fish Habitat Guidance

EFH has been designated within the proposed project area by the New England and Mid-Atlantic Fishery Management Councils. The MSA requires federal agencies to consult with us on any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect EFH identified under the MSA. Additional information on EFH designations and the EFH consultation process can be found at http://www.greateratlantic.fisheries.noaa.gov/habitat. Programs occurring along the shoreline and adjacent to nearshore coastal waters will likely require federal authorizations by USACE pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, potentially through the Nationwide General Permit Program. One aspect of the conditions for these authorizations is to identify and implement measures which would avoid and minimize adverse effects to EFH and other trust resources; therefore, avoiding the need for additional consultation with us.

In order to avoid and minimize impacts to EFH, we encourage you to design any shoreline structures in accordance with the regional and general conditions for the Nationwide Permits. The regional conditions for New Jersey can be found on the USACE Philadelphia District website (http://www.nap.usace.army.mil/Missions/Regulatory/Permits/NWP.aspx). The regional conditions for New York can be found on the USACE New York District website (http://www.nan.usace.army.mil/Portals/37/docs/regulatory/geninfo/natp/NWP_PN_30MAY12.pdf). Activities that do not meet these regional conditions will require additional EFH consultation with our office.

Conclusion

Under the ESA and MSA and our implementing regulations, it is up to the action agency to make the determination of whether to consult. This guidance applies to all present and potential projects under the above-listed grants and loan programs, including bulkhead repair activities, housing rehabilitation for homes of all sizes, reimbursement for costs incurred, demolition, redevelopment activities, economic development, and infrastructure activities, and will assist you in determining if consultation is necessary.

We look forward to continuing to work with you on projects funded by the above-listed programs. Should you have any questions regarding the ESA comments, please contact Jennifer Goebel in our Protected Resources Division (978-281-9373 or jennifer.goebel@noaa.gov). If you have any questions concerning the EFH comments, please contact Karen Greene in our Habitat Conservation Division (732-872-3023 or karen.greene@noaa.gov).

Sincerely,

Kimberly Damon-Randall
Assistant Regional Administrator
Protected Resources Division

EC: Goebel, Murray-Brown GARFO PRD
Chiarella, Greene – GARFO HCD

PREVIOUS CORRESPONDENCE WITH NMFS
JANUARY 2016 CONSULTATION

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

Hazen and Sawyer / AKRF, JV
440 Park Avenue South
New York, NY 10016
tel: 212 696-0670
fax: 212 213-3191

January 25, 2016

Mr. Daniel Marrone
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930-2276

Re:

Section 7 and Essential Fish Habitat Findings for the
East Side Coastal Resiliency Project
New York, New York
New York City Department of Design and Construction Capital Contract: SANDRESM1

Dear Mr. Marrone:

On behalf of the New York City (City) Department of Design and Construction (DDC), the Hazen and Sawyer/AKRF Joint Venture (JV) is requesting concurrence from the National Oceanic and Atmospheric Association (NOAA) National Marine Fisheries Service (NMFS) with DDC's findings regarding Section 7 threatened and endangered species and Essential Fish Habitat (EFH) for the East Side Costal Resiliency (ESCR) project, located in New York City, New York. The proposed ESCR project extends along the east side of Manhattan between Montgomery Street and East 23rd Street (with a potential alignment extending to East 25th Street). The Environmental Impact Statement (EIS) study area for the Natural Resources chapter ("study area") extends 400 feet into the East River from the shoreline between Montgomery Street and East 25th Street (**Figure 1**). The proposed project is a series of integrated flood control measures designed to protect areas of Manhattan within the Federal Emergency Management Agency (FEMA)-designated 100-year flood hazard area accounting for 2050 sea level rise projections developed by the New York City Panel on Climate Change. The construction associated with the proposed project would occur primarily on land, but may also include some in-water work in the East River, a saline surface water component of the New York Harbor Estuary.

To assist in your review, a Species Conclusion Table documenting the natural history of threatened and endangered species potentially occurring within the study area along with discussions of potential project related effects is found in **Attachment 1**. A "NOAA Fisheries Northeast Regional Office EFH Assessment Worksheet for Federal Agencies" and an EFH impact assessment are provided in **Attachment 2**. Previous correspondence with NMFS regarding the ESCR project is provided in **Attachment 3**. Please find below a project description and description of potential construction activities for the proposed project.

Project Description

Hurricane Sandy, which made landfall in October 2012, greatly impacted New York City and surrounding areas, including the east side of Manhattan, highlighting existing deficiencies in the City's ability to adequately protect vulnerable populations and critical infrastructure during major storm events. Hurricane Sandy caused extensive inland flooding in the study area, resulting in damage to residential and commercial property; transportation; and critical power, water, and sewer infrastructure. Addressing the vulnerability of the study area by protecting critical infrastructure and resources on Manhattan's lower east side is essential to the City's resiliency planning.

In June 2013, the U.S. Department of Housing and Urban Development (HUD) launched Rebuild by Design (RBD), a competition to respond to Hurricane Sandy's devastation in the northeast region of the United States. The winning proposals would be implemented using Community Development Block Grant – Disaster Recovery (CDBG-DR) funding as well as other public and private-sector funding sources. One of the winning proposals was an integrated flood protection system on the east side of southern Manhattan between Montgomery Street and East 23rd Street to reduce the risk of coastal flood hazards, which became the ESCR project. The proposed flood protection system would be comprised of a combination of elevated berms, floodwalls, and deployables (temporary flood protection walls/gates deployed only during flood conditions). The study area was defined based on floodplain and topography mapping.

In addition to providing a reliable flood protection system for this flood hazard area, the proposed project aims to improve and enhance access to the waterfront, including East River Park and Stuyvesant Cove Park, which are located within the study area. As such, the City is proposing to construct and operate a flood protection system with integrated urban design features that will reduce flood hazards to a diverse and vulnerable residential population and safeguard critical energy, infrastructure, commercial, and transportation assets while enhancing access to the waterfront and parkland. Project construction is anticipated to commence in summer 2017.

Potential In-water Construction Activities Associated with ESCR

As stated above, the majority of construction associated with ESCR would occur on land within East River Park. Design of ESCR is ongoing and subject to change. However, the following in-water construction activities have been identified as potential components of the project:

- Construction barging;
- Installation of temporary mooring structures; and
- Construction of a combined sewer outfall.

Utilizing barges for construction activities may be necessary due to the site constraints of East River Park, including those associated with limited vehicular access and ongoing construction activities within a highly-utilized public park. Barges would have extended gangways to allow for offloading of construction materials and vehicles and would not require anchoring to the bulkhead. Therefore no dredging to accommodate barges would be necessary. Temporary appurtenances (i.e., mooring spuds) on the East River floor would be installed at barging locations to allow for mooring. A combined sewer outfall is currently planned to be constructed to provide drainage to the inland area protected by the proposed flood protection system. This outfall would only discharge during emergency storm surge conditions in which the flood protection system is operational. During non-storm conditions there would be no flow of any kind discharging form this outfall. Construction of the outfall would occur within the existing bulkhead and only temporary construction-related impacts such as installation of a coffer dam and dewatering in the affected area are anticipated.

Section 7 Findings

ESCR is receiving funds from HUD, a federal agency, and is therefore subject to Section 7 of the Endangered Species Act. Based on prior communications with NMFS for a request for information dated 8/11/2015 (**Attachment 3**), there are two species of endangered fish with the potential to occur in the East River adjacent to the study area. These species are the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and the shortnose sturgeon (*Acipenser brevirostrum*). DDC is requesting an informal Section 7 consultation with NMFS for these species. Due to inhospitable habitat conditions in the East River such as strong currents, heavy boat traffic, and degraded water quality; the localized nature of the proposed in-water work within the study area; and the minimal effects future operation of the flood protection system would have on the East River, DDC has determined that the construction and operation of the proposed ESCR project May Affect, but is Not Likely to Adversely Affect both the Atlantic sturgeon and shortnose sturgeon. DDC is seeking

concurrence from NMFS on these findings. A Species Conclusion Table with additional details on sturgeon life history and rationale for this finding is provided in **Attachment 1**.

Essential Fish Habitat Findings

An Essential Fish Habitat (EFH) assessment and accompanying NOAA Fisheries Northeast Regional Office EFH Assessment Worksheet for Federal Agencies are provided in **Attachment 2**. As a result of construction activities associated with the proposed project, there would be minor effects to EFH for one or more lifestages of winter flounder, windowpane flounder, summer flounder, Atlantic herring, scup, and black sea bass. Several species listed as potentially occurring in the study area are either at the extreme limit of their known range or are highly migratory and are therefore anticipated to occur in the East River only as uncommon or transient individuals. The remainder of the species evaluated would not be anticipated to be found in the East River due to unsuitable environmental conditions, unsuitable depths, and unsuitable substrates or other habitat features. DDC is requesting an Abbreviated EFH Consultation and concurrence with their findings of Minimal Adverse Effects to EFH in the study area. DDC also requests guidance on any Conservation Recommendations that NMFS may have for the proposed project.

Results of these consultation requests will be used to inform the EIS currently being prepared for the ESCR project in order to comply with applicable National Environmental Protection Act (NEPA), State Environmental Quality Review Act (SEQRA), and City Environmental Quality Review (CEQR) standards. Design of the ESCR project and reasonable alternatives are currently being developed. In the event that new design elements are developed that result in additional in-water construction activities not described above, DDC would notify NMFS of these changes as addenda to this submission.

The City would greatly appreciate an expeditious review of the enclosed documents. Please send the results of the requested consultations to me at rdiamond@hazenandsawyer.com. Should you have any questions or require additional information, please feel free to contact me at (212) 539-7082. Thank you in advance for your assistance with this matter.

Sincerely,

Ross Diamond
Principal Scientist
Hazen and Sawyer, P.C.

Enclosures:

Figure 1 – Site Location Map
Attachment 1 - Section 7 Conclusions Table
Attachment 2 - EFH Assessment and EFH Assessment Worksheet for Federal Agencies
Attachment 3 - Previous NMFS Correspondence

cc:

DDC: T. Foley, H.S. Pau, L. Murray, E. Ilijevich, E. Rogers, M. Davies, C. Pichardo-Jimenez
DPR: O. Wells, A. Chan
OMB: E. Qadri, C. Johnson, M. Jones
ORR: C. Grassi
HUD: T. Fretwell, J. Levine

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

MAR 18 2016

Ross Diamond
Hazen and Sawyer / AKRF, JV
440 Park Avenue South
New York, New York 10016

Re: ESA Section 7 East Coast Resiliency Project: SANDRESM1

Dear Mr. Diamond:

We have completed an Endangered Species Act (ESA) section 7 consultation in response to your letter received on January 26, 2016, and additional information received on February 17, 2016. Based on correspondence you provided us from the U.S. Department of Housing and Urban Development, and the New York City Office of Management and Budget, we understand that you have been designated as the lead non-federal representative on this action. We concur with your determination that the proposed project is not likely to adversely affect any species listed by us as threatened or endangered under the ESA of 1973, as amended. Our supporting analysis is provided below.

Proposed Action
The proposed project is a series of integrated flood control measures on the east side of southern Manhattan between Montgomery Street and East 23rd Street designed to protect areas of Manhattan within the Federal Emergency Management Agency (FEMA) designated 100-year flood hazard area, accounting for 2050 sea level rise projection developed by the New York City Panel on Climate Change. The construction associated with the proposed project will occur on land, but will also include some in-water work in the East River. The proposed flood protection system will comprise a combination of elevated berms, floodwalls, and deployables (temporary flood protection walls/gates deployed only during flood conditions). Project construction is anticipated to commence in summer 2017.

The in-water work for the project includes:

- Installation of a turbidity curtain prior to installing the coffer dam.
- Installation of 24-inch steel sheet piles to be used as a coffer dam. The sheet piles will be installed via a vibratory or impact hammer, depending on subsurface conditions. The area enclosed by the sheet piles is anticipated to measure approximately 300 square feet. The duration of pile driving will be two, 8-hour construction days.
- Removal of the piles after the completion of the project.
- The construction of an outfall that will occur in a dewatered coffer dam and will not have any effects on ESA-listed species.

Description of the Action Area

The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR§402.02). For this project, the action area is confined to the area affected by the installation of sheet piles and the route traveled by the barge. This includes underwater areas where effects of pile driving and pile removal (i.e., elevated levels of underwater noise; increase in suspended sediment) will be experienced. Analyses of similar pile driving activities indicate that effects of increased underwater noise are likely to be experienced up to a maximum of 295 feet from the piles to be driven (depending on the pile installation method) (ICF Jones & Stokes and Illingworth and Rodkin Inc. 2009, 2012). Therefore, the action area is the footprint of the pile installation and removal area and areas within a 295-foot radius of piles being driven, as well as the surrounding area where any increase in vessel traffic may occur. This area is expected to encompass all of the effects of the proposed project, including the ensonified area (295-foot radius around the piles).

The project will occur in the East River. The river is a highly developed waterway with substantial vessel traffic. The maximum depth of the action area is approximately 40 feet. The substrate consists of coarse sands and gravels in high-energy areas with fine-grained silts and clay in low-energy areas. There is no known submerged aquatic vegetation (SAV) and limited benthic invertebrates in the action area.

NMFS Listed Species in the Action Area

Atlantic Sturgeon

There are five distinct population segments (DPSs) of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) listed as threatened or endangered. Atlantic sturgeon originating from the New York Bight, Chesapeake Bay, South Atlantic and Carolina DPSs are listed as endangered; the Gulf of Maine DPS is listed as threatened. The marine range of all five DPSs extends along the Atlantic coast from Canada to Cape Canaveral, Florida and includes the action area.

At around three years of age, subadults exceeding 70 centimeters (cm) in total length begin to migrate to marine waters (Bain *et al.* 2000). After emigration from the natal river/estuary, subadults and adult Atlantic sturgeon travel within the marine environment, typically in waters less than 164 feet in depth, using coastal bays, sounds, and ocean waters (ASSRT 2007). In rivers and estuaries, Atlantic sturgeon typically use the deepest waters available; however, Atlantic sturgeon also occur over shallow (8 feet), tidally influenced flats and mud, sand, and mixed cobble substrates (Savoy and Pacileo 2003). Occurrence in these shallow waters is thought to be tied to the presence of benthic resources for foraging. Atlantic sturgeon spawn in freshwater portions of their natal river, and early life stages are not tolerant of salinity (ASSRT 2007); therefore, no eggs or larvae will occur in any part of the action area, and thus, will not be exposed to the direct and indirect effects of the proposed action.

Research conducted by Savoy and Pacileo (2003) suggests the East River is used by subadult Atlantic sturgeon to move between the Hudson River to western Long Island Sound. Use of the East River by Atlantic sturgeon has been confirmed by the detection of 15 tagged subadults and/or adults (total length 50-150 cm) at a receiver array placed near the east end of Roosevelt Island from May 2011 to August 2013 (Tomichek *et al.* 2014). Atlantic sturgeon were detected in March through July and October. Tagged sturgeon records show that 7 of 15 sturgeon were in

the area for less than 10 minutes, with the others present 48 minutes to 6 hours. This indicates use of the East River is limited to transient individuals. Based on detections in the East River, we expect sturgeon presence to be limited to March through October.

New York Bight, Gulf of Maine, and Chesapeake Bay DPSs of Atlantic sturgeon occur in the Hudson River (Damon-Randall *et al.* 2013). In Long Island Sound, Atlantic sturgeon from all five DPSs are present. Therefore, adult and subadult Atlantic sturgeon from any of the five DPSs may be present in the action area. These sturgeon are likely to be migrating and may also use the action area for opportunistic foraging.

Shortnose Sturgeon

Shortnose sturgeon (*Acipenser brevirostrum*) occur in the Hudson and Connecticut Rivers. In some areas, including the Gulf of Maine, nearshore coastal migrations and movements between river systems have been documented. For example, approximately 70% of shortnose sturgeon tagged in the Penobscot River made regular seasonal movements out of the river, with some fish spending up to a year outside of the river (Zydlewski *et al.* 2011). Movements of these fish have been limited to the Gulf of Maine with the furthest extent of movements documented between the Merrimack River (MA) and Penobscot River (ME).

Only a few of these types of nearshore coastal movements have been documented in the New York Bight. Three shortnose sturgeon adults tagged in the Hudson River have been recaptured in the Connecticut River (Savoy 2004 in SSSRT 2010) and one Hudson River origin shortnose sturgeon was captured in both the Connecticut and Housatonic rivers (Savoy 2004 in SSSRT 2010). In fall 2014, a shortnose sturgeon was caught in the Merrimack River (MA) carrying a tag implanted in the Connecticut River in 2001. Genetic information is not yet available so we do not know the river of origin of this fish. At this time, the available tagging and tracking information is too limited to determine if Hudson River and Connecticut River shortnose sturgeon are making regular movements outside of their natal rivers. Very few movements of Hudson River fish have been documented outside of the river since the mid-1990s which is thought to be a reflection of the rarity of these types of movements. However, the documented occurrence of Hudson River shortnose sturgeon in the Connecticut River, the capture of a shortnose sturgeon in the Housatonic River, and the movement of a shortnose sturgeon from the Connecticut River to the Merrimack River, indicate that occasional shortnose sturgeon may be present in nearshore coastal waters and rivers between the Hudson and Connecticut rivers.

Based on known movement patterns, we expect any shortnose sturgeon moving between the Hudson River and the Connecticut River to travel through the East River and in the nearshore coastal waters of northern Long Island Sound with occasional movements into small coastal rivers and estuaries. The range of shortnose sturgeon in this area is expected to include nearshore waters, accessible estuaries, and small rivers on the northern coast of Long Island Sound between the East River and the Connecticut River. Based on the best available information, rare transient shortnose sturgeon may occur in the action area which is located in the East River. Occurrence in these shallow waters is thought to be tied to the presence of suitable benthic resources for foraging. However, as noted above, the action area has no SAV and limited benthic resources. Because of the limited suitable forage, use of the area by shortnose sturgeon is likely to be limited to transient individuals that are passing through; opportunistic foraging may occur in areas if suitable benthic resources are available. As shortnose sturgeon spawn in freshwater

portions of large rivers and early life stages are not tolerant of salinity, juveniles, eggs, and larvae will not occur in any part of the action area.

Effects of the Action

Noise Associated with Pile Installation

Pile driving produces underwater sound pressure waves that can affect aquatic species, including sturgeon. Effects to fish can range from temporary avoidance of an area to death due to injury of internal organs, such as swim bladders. The type and size of pile, installation method (i.e., vibratory vs. impact hammer), size of the organism (smaller individuals are more susceptible to effects) and particular species, and distance from the sound source (i.e., sound dissipates over distance so noise levels are greater closer to the source) all contribute to the likelihood of effects to an individual. Generally, the larger the pile and the closer an individual is to the pile, the greater the likelihood of effects.

The existing piles will be removed via extraction. For the purpose of this consultation, we assume any underwater noise levels produced by extracting the piles will be below noise levels produced by the driving of piles via an impact hammer. Based on the best available information, vibratory hammers produce underwater noise levels that are approximately 10-20 dB re: 1μPa lower than those produced by an impact hammer (Laughlin 2005). For the purpose of this consultation, we assume any underwater noise levels produced by vibratory hammer will be below noise levels produced by the driving of piles via an impact hammer. Given the available information, we will analyze the underwater noise levels generated by the driving of the sheet piles with an impact hammer as the factor that will produce the greatest stressor. Because any noise generated during pile removal will be less than that produced during pile installation, an analysis considering effects of noise of pile installation will provide a conservative analysis of potential effects of exposure to noise during pile removal.

The applicant plans to install 24 inch steel sheet piles. To estimate underwater noise levels for the installation of sheet piles via an impact hammer, underwater noise estimates were taken from a project that installed 24-inch steel sheet piles driven by an impact (ICF Jones & Stokes and Illingworth and Rodkin, Inc. 2012). Given the type and size of the pile, and the installation method, this is a reasonable estimator of noise produced during the proposed project. Therefore, following the noise measurements from ICF Jones & Stokes and Illingworth and Rodkin, Inc. (2012), we expect the noise produced by an un-attenuated impact hammer at the proposed project site to be: 205 dB re 1μPa peak, 190 dB re 1μPa RMS, and 180 dB re 1μPa^{2}s sSEL at 33 feet from the pile (ICF Jones & Stokes and Illingworth and Rodkin, Inc. 2009).

Table 1. Estimated average underwater noise levels produced by the driving of piles at a distance of 33 feet.

Type Pile	Hammer Type	Estimated Peak Noise Level (dB_{Peak}[1])	Estimated Pressure Level (dB_{RMS}[2])	Estimated Single Strike Sound Exposure Level (sSEL)
24 " Sheet Pile	Impact hammer	205	190	180

The sound levels in Table 1 are an estimate, and will likely vary depending on the geometry and boundaries of the surrounding underwater and benthic environment (*i.e.* shallow/deep water, shoaled portions of channels, obstacles in the waterway). As the distance from the source increases, underwater sound levels produced by pile driving dissipate rapidly. Underwater noise levels will attenuate approximately 5 dB every 33 feet for sheet piles (ICF Jones & Stokes and Illingworth and Rodkin Inc. 2009, 2012). If significant obstacles or variable bathymetry are present in an area, attenuation may occur more rapidly, dampening the sound pressure by an even greater factor.

Background Information on Noise and Sturgeon

Sturgeon rely primarily on particle motion to detect sounds (Lovell *et al.* 2005). While there are no data either in terms of hearing sensitivity or structure of the auditory system for Atlantic and shortnose sturgeon, there are data for the closely related lake sturgeon (Lovell *et al.* 2005, Meyer *et al.* 2010), which because of the biological similarities, for the purpose of considering acoustic impacts, are a good surrogate for Atlantic and shortnose sturgeon. The available data suggest that lake sturgeon can hear sounds from below 100 Hz to 800 Hz (Lovell *et al.* 2005, Meyer *et al.* 2010). However, since these two studies examined responses of the ear and did not examine whether fish would behaviorally respond to sounds, it is hard to determine thresholds for hearing (that is, the lowest sound levels that an animal can hear at a particular frequency) using information from these studies. The best available information indicates that Atlantic and shortnose sturgeon are not capable of hearing noise in frequencies above 1000 Hz (1 kHz) (Popper 2005). Sturgeon are categorized as hearing "generalists" or "non-specialists" (Popper 2005). Sturgeon do not have any specializations, such as a coupling between the swim bladder and inner ear, to enhance their hearing capabilities, which makes these fish less sensitive to sound than hearing specialists. Low-frequency impulsive energies, including pile driving, cause swim bladders to vibrate, which can cause damage to tissues and organs as well as to the swim

[1] Peak sound pressure level is the largest absolute value of the instantaneous sound pressure and is expressed as dB re: 1 µPa.

[2] Root Mean Square (RMS): the square root of the average squared pressures over the duration of a pulse; most pile-driving impulses occur over a 50 to 100 millisecond (msec) period, with most of the energy contained in the first 30 to 50 msec (Illingworth and Rodkin, Inc. 2001, 2009). Therefore, RMS pressure levels are generally "produced" within seconds of pile driving operations and represent the effective pressure and its resultant intensity (in dB re: 1 µPa;) produced by a sound source.

bladder (Halvorsen *et al.* 2012a). Sturgeon have a physostomous (open) swim bladder, meaning there is a connection between the swim bladder and the gut (Halvorsen *et al.* 2012a). Fish with physostomous swim bladders, including Atlantic and shortnose sturgeon, are able to expel air, which can diminish tension on the swim bladder and reduce damaging effects during exposure to impulsive sounds. Fish with physostomous swim bladders are expected to be less susceptible to injury from exposure to impulsive sounds, such as pile driving, than fish with physoclistous (no connection to the gut) swim bladders (Halvorsen *et al.* 2012a).

If a noise is within a fish's hearing range and is loud enough to be detected, effects can range from mortality to a minor change in behavior (e.g., startle), with the severity of effects increasing with the loudness and duration of the noise (Hastings and Popper 2005). The actual nature of effects and the distance from the source at which they could be experienced will vary and depend on a large number of factors, such as fish hearing sensitivity, source level, how the sounds propagate away from the source and the resultant sound level at the fish, whether the fish stays in the vicinity of the source, the motivation level of the fish, etc.

Criteria for Assessing the Potential for Physiological Effects to Sturgeon

The Fisheries Hydroacoustic Working Group (FHWG) was formed in 2004 and consists of biologists from NMFS, USFWS, FHWA, and the California, Washington, and Oregon DOTs, supported by national experts on sound propagation activities that affect fish and wildlife species of concern. In June 2008, the agencies signed a Memorandum of Agreement documenting criteria for assessing physiological effects of pile driving on fish. The criteria were developed for the acoustic levels at which physiological effects to fish could be expected. It should be noted that these are onset of physiological effects (Stadler and Woodbury 2009), and not levels at which fish are necessarily mortally damaged. These criteria were developed to apply to all species, including listed green sturgeon, which are biologically similar to Atlantic and shortnose sturgeon and, for these purposes, is considered a surrogate. The interim criteria are:

- Peak Sound Pressure Level (SPL): 206 decibels relative to 1 micro-Pascal (dB re 1 μPa) (206 dB_{Peak}).
- Cumulative Sound Exposure Level (cSEL): 187 decibels relative to 1 micro-Pascal-squared second (dB re 1μPa^2-s) for fishes above 2 grams (0.07 ounces) (187 dBcSEL).
- cSEL: 183 dB re 1μPa^2-s for fishes below 2 grams (0.07 ounces) (183 dBcSEL).

At this time, these criteria represent the best available information on the thresholds at which physiological effects to sturgeon from exposure to impulsive noise, such as pile driving, are likely to occur. It is important to note that physiological effects may range from minor injuries from which individuals are anticipated to completely recover with no impact to fitness to significant injuries that will lead to death. The severity of injury is related to the distance from the pile being installed and the duration of exposure. The closer the fish is to the source and the greater the duration of the exposure, the higher likelihood of significant injury.

Since the FHWG criteria were published, two papers relevant to assessing the effects of pile driving noise on fish have been published. Halvorsen *et al.* (2011) documented effects of pile driving sounds (recorded by actual pile driving operations) under simulated free-field acoustic conditions where fish could be exposed to signals that were precisely controlled in terms of

number of strikes, strike intensity, and other parameters. The study used Chinook salmon and determined that onset of physiological effects that have the potential of reduced fitness, and thus a potential effect on survival, started at above 210 dB re 1μPa^2-s cSEL. Smaller injuries, such as ruptured capillaries near the fins, which the authors noted were not expected to impact fitness, occurred at lower noise levels. Chinook salmon are hearing generalists with physostomous swim bladders. Results from Halvorsen *et al.* (2012a) suggest that the overall response to noise between chinook salmon and lake sturgeon is similar.

Halvorsen *et al.* (2012b) exposed lake sturgeon to pile driving noise in a laboratory setting. Lake sturgeon were exposed to a series of trials beginning with a cSEL of 216 dB re 1uPa^2-s (derived from 960 pile strikes and 186 dB re 1uPa^2-s sSEL). Following testing, fish were euthanized and examined for external and internal signs of barotrauma. None of the lake sturgeon died as a result of noise exposure. Lake sturgeon exhibited no external injuries in any of the treatments but internal examination revealed injuries consisting of hematomas on the swim bladder, kidney, and intestines (characterized by the authors as "moderate" injuries) and partially deflated swim bladders (characterized by the authors as "minor" injuries). The author concludes that an appropriate cSEL criteria for injury is 207 dB re 1uPa^2-s.

It is important to note that both Halvorsen papers (2012a, 2012b) used a response weighted index (RWI) to categorize injuries as mild, moderate, or mortal. Mild injuries (RWI 1) were determined by the authors to be non-life threatening. The authors made their recommendations for noise exposure thresholds at the RWI 2 level and used the mean RWI level for different exposures. Because we consider even mild injuries to be physiological effects and we are concerned about the potential starting point for physiological effects and not the mean, for the purposes of this consultation we will use the FHWG criteria to assess the potential physiological effects of noise on Atlantic and shortnose sturgeon and not the criteria recommended by Halvorson *et al.* (2012a, 2012b). Therefore, we will consider the potential for physiological effects upon exposure to impulsive noise of 206 dB$_{Peak}$ and 187 dBcSEL. Use of the 183 dBcSEL threshold is not appropriate for this consultation because all sturgeon in the action area will be larger than 2 grams. As explained here, physiological effects from noise exposure can range from minor injuries that a fish is expected to completely recover from with no impairment to survival to major injuries that increase the potential for mortality or result in death.

Available Information for Assessing Behavioral Effects on Sturgeon

To date, neither we nor the FHWG have published criteria for underwater noise levels resulting in behavioral responses. However, in practice, we rely on a level of 150 dB re 1uPa RMS as a conservative indicator as to when a behavioral response can be expected in fish exposed to impulsive noise such as pile driving. This level is based on the available literature where fish behavior has been observed (see Fewtrell 2003 and Mueller-Blenkle *et al.* 2010). Because there are no published studies establishing the noise levels at which sturgeon respond behaviorally to noise, these studies of fish—which are likely more sensitive to noise than Atlantic or shortnose sturgeon—are a reasonable conservative indicator of when sturgeon can be expected to respond behaviorally to noise.

Fewtrell (2003) exposed caged fish to air gun arrays. Fewtrell reported altered behavioral responses (alarm responses, faster swimming speeds) for fish exposed to noise of 158-163 dB re

1uPa. Consistent startle responses were observed at noise levels of 167-181 dB re 1uPa (in striped trumpeters). Alarm responses became more frequent at noise levels above 170 dB re 1uPa. Fewtrell reports that avoidance behavior is expected at noise levels lower than that required to produce a startle response.

Mueller-Blenkle *et al.* (2010) played back pile-driving noise to cod and sole held in two large net pens. Movements of fish were tracked and received sound pressure levels were measured. The authors noted a significant movement response to the pile-driving stimulus in both species at received SPL of 144-156 dB re 1uPa peak (cod) and 140-161 dB re 1uPa peak (sole). Indications of directional movements away from the sound source were noted in both species.

We are aware of only one study that has attempted to assess the behavioral responses of sturgeon to underwater noise. A monitoring plan is currently being implemented at the Tappan Zee Bridge replacement project (Hudson River, New York) using acoustic telemetry receivers to examine the behavior of acoustically tagged sturgeon. During the installation of test piles, the movements of tagged Atlantic sturgeon were monitored with a series of acoustic receivers. Tagged Atlantic sturgeon spent significantly less time in the detection area (an area that encompassed the 206 dB re 1uPa peak, 187 dB re 1uPa 2s cSEL and 150 dB re 1uPa RMS SPL isopleths), during active impact pile driving compared to that time period just prior to the work window. Results of this study indicate that sturgeon are likely to avoid areas with potentially injurious levels of noise (AKRF and Popper (2012a, 2012b)). However, due to limitations of the study design, it is not possible to establish the threshold noise level that results in behavioral modification or avoidance of Atlantic sturgeon. Monitoring is ongoing as the bridge project progresses. To date, hundreds of tagged sturgeon have been documented in the project area; however, no sturgeon have been injured or killed as a result of exposure to pile-driving noise.

For the purposes of this analysis, we will use 150 dB re 1 µPa RMS as a conservative indicator of the noise level at which there is the potential for behavioral effects, provided the operational frequency of the source falls within the hearing range of the species of concern. That is not to say that exposure to noise levels of 150 dB re 1 µPa RMS will always result in behavioral modifications or that any behavioral modifications will rise to the level of "take" (i.e., harm or harassment) but that there is a potential, upon exposure to noise at this level, to experience some behavioral response. We expect that behavioral responses could range from a temporary startle to avoidance of the area with disturbing levels of sound. The effect of any anticipated response on individuals will be considered in the effects analysis below.

Physiological Effects of Pile Driving to Sturgeon

As described above, exposure to underwater noise levels of 206 dB_{Peak} and 187 dB_{cSEL} can result in injury to sturgeon. Because peak noise levels will be below 206 dBpeak, no sturgeon will be exposed to peak pressure levels that may result in injury (i.e., 206 dB_{Peak}) (see Table 2).

Table 2: Estimated Distances to Injury and Behavioral Thresholds

Type Pile	Hammer Type	Distance (feet) to 206dB$_{Peak}$ (injury)	Distance (feet) to Behavioral Disturbance Threshold (150 dB$_{RMS}$)	Distance (feet) to sSEL of 150 dB (surrogate for 187 dB$_{cSEL}$-injury)
24" Sheet Pile	Impact hammer	Not Reached	295 feet	230 feet

In addition to the "peak" exposure criteria which relates to the energy received from a single pile strike, the potential for injury exists for multiple exposures to noise over a period of time; this is accounted for by the cSEL threshold. The cSEL is not an instantaneous maximum noise level, but is a measure of the accumulated energy over a specific period of time (e.g., the period of time it takes to install a pile). The Practical Spreading Loss Model is used to determine underwater noise attenuation rates and can be used to calculate the distance at which a specific noise value (e.g., cSEL) is attained. This model is not a reliable predictor of attenuation in shallow, relatively confined waters such as the action area and typically results in overestimates of distances to thresholds of concern. For that reason, we are not using that model to estimate the distance to the 187 dB re 1uPa^{2}s criteria.

When it is not possible to accurately calculate the distance to the 187 dB re 1uPa cSEL re: 1μPa^2•s isopleth, we calculate the distance to the 150 dB re 1uPa sSEL isopleth. The further a fish is away from the pile being driven, the more strikes it must be exposed to accumulate enough energy to result in injury. At some distance from the pile, a fish is far enough away that, regardless of the number of strikes it is exposed to, the energy accumulated is low enough that there is no potential for injury. This distance is where the 150 dB re 1uPa sSEL isopleth occurs (Stadler and Woodbury 2009). A fish located outside of this isopleth has no potential for injury, regardless of the number of pile strikes it is exposed to (i.e., sound levels will not accumulate to injurious levels). The distance to the 150 dB sSEL isopleth is no greater than 230 feet, depending on the installation method. In order to be exposed to potentially injurious levels of noise during installation of the piles, a sturgeon would need to be within 230 feet of the pile being driven. This is extremely unlikely to occur because we expect sturgeon to modify their behavior (i.e., avoid an ensonified area) upon exposure to underwater noise levels of 150 dB re 1 μPa$_{RMS}$. Given that a sturgeon would be exposed to levels of noise that cause behavioral modification (at 295 feet) before being exposed to injurious levels of noise (at 230 feet), we expect sturgeon would swim away from the sound source and never be exposed to potentially injurious levels of underwater noise. If any sturgeon are within 295 feet of the pile at the time pile driving commences, we still expect the sturgeon to leave the area before injurious levels of noise are reached. This is because pile driving hammers have a ramp up period, so the first several blows produce less noise than estimated in Table 1. As we expect sturgeon to modify their behavior and leave the area in a matter of seconds, sturgeon will swim away from the pile well before the cSEL threshold (a cumulative effect of multiple exposures) is reached. Therefore, no injury is anticipated.

Behavioral Effects of Pile Installation to Sturgeon

Behavioral effects, such as avoidance or disruption of foraging activities, may occur in sturgeon exposed to noise above 150 dB re 1 μPa_{RMS}. We expect underwater noise levels to be below 150 dB_{RMS} at distances beyond approximately 295 feet from the piles being installed. Should sturgeon move into the action area where the 150 dB_{RMS} isopleth extends, as described above, it is reasonable to assume that a sturgeon, upon detecting underwater noise levels of 150 dB_{RMS}, will modify its behavior such that it redirects its course of movement away from the ensonified area and therefore, away from the project site. No spawning or overwintering occurs in the action area; therefore, these behaviors will not be impacted. While sturgeon may opportunistically forage in the action area, the temporary displacement from the noisy area is extremely unlikely to affect any sturgeon. This is because the noisy area is only a small fraction of the available foraging habitat in East River and the action will not prevent sturgeon from accessing other suitable foraging areas. Given the width of the East River (approximately 2,000 feet) and the short distance any sturgeon would have to swim to avoid the noisy area (no more than 295 feet), it is extremely unlikely that a sturgeon would experience any effects from making the small behavioral changes necessary to avoid exposure to disturbing or injurious levels of noise. Given the very small distance a sturgeon would need to move to avoid the disturbing levels of noise, any effects will not be able to be meaningfully measured or detected. Therefore, effects are insignificant.

Water Quality Effects

The installation and removal of the sheet piles will disturb bottom sediments and may cause a temporary increase in suspended sediment in the action area. The turbidity curtain will prevent sturgeon from accessing the area. Thus, there is no risk of sturgeon being exposed to any increase in suspended sediment resulting from pile installation and removal.

While the barriers are up, sturgeon will not have access to the area. However, given the small size of the project area as compared to the width of the East River (approximately 2,000 feet), the reduction in space available for migratory passage and opportunistic foraging for sturgeon will be extremely small (<1%) and any effects to Atlantic and shortnose sturgeon are extremely unlikely. Thus, effects of the placement of the turbidity curtain on Atlantic and shortnose sturgeon are discountable.

Habitat Modification

This action involves a total of 300 square feet of displaced river bottom. The cofferdam will prevent sturgeon from entering the 300 square foot area. The habitat in the action area has no SAV or shellfish beds, and is otherwise marginally suitable for sturgeon foraging. Given the extremely small size of the displaced area that would fall under the coffer dam, relative to the available foraging area in the East River, the effects of habitat modification on sturgeon foraging will be too small to be meaningfully measured or detected. Therefore, effects of habitat modification on sturgeon are insignificant.

Vessel Interactions

The construction operations will result in a temporary increase in vessel traffic in the area, consisting of one barge assisting with construction. We have considered whether this temporary

increase in vessel traffic in the action area will increase the risk of interactions between vessels and sturgeon.

Sturgeon are known to be vulnerable to vessels strikes in rivers and channels. The vessel movements associated with this project will be localized to the area where pile driving will occur. We have considered the likelihood that an increase in vessel traffic associated with the project increases the risk of interactions between sturgeon and vessels in the project area, compared to baseline conditions. Given the large volume of traffic in the project area, the increase in traffic associated with the project (one vessel) is extremely small. Based on this information, we believe the effects of vessel traffic on sturgeon from this project would not be able to be detected and are, therefore, insignificant.

Conclusions

Based on the analysis that any effects to listed species of sturgeon will be insignificant or discountable, we concur with your determination that the proposed project is not likely to adversely affect any listed species under our jurisdiction. Therefore, no further consultation pursuant to section 7 of the ESA is required.

Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If new information reveals effects of the actions that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) If the identified actions are subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the consultation; or (c) If a new species is listed or critical habitat designated that may be affected by the identified actions. No take is anticipated or exempted. If there is any incidental take of a listed species, reinitiation would be required. Should you have any questions about this correspondence please contact Dan Marrone at (978) 282-8465 or by email (Daniel.Marrone@Noaa.gov).

Essential Fish Habitat Comments

NMFS Habitat Conservation Division (HCD) is responsible for overseeing programs related to Essential Fish Habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act and other NOAA trust resources under the Fish and Wildlife Coordination Act. HCD will provide comments separately on this project. If you wish to discuss this further, please contact Karen Greene (732-872-3023 or Karen.Greene@noaa.gov).

Sincerely,

Kimberly B. Damon-Randall
Assistant Regional Administrator
for Protected Resources

EC: NMFS, Marrone
File Code: \Non-Fisheries\HUD\2016\NYC DDC East Coast Resiliency Project
PCTS: NER-2016-13164

References:

AKRF and A.N. Popper. 2012a. Presence of acoustic-tagged Atlantic sturgeon and potential avoidance of pile-driving activities during the Pile Installation Demonstration Project (PIDP) for the Tappan Zee Hudson River Crossing Project. September 2012. 9pp.

AKRF and A.N. Popper. 2012b. Response to DEC memo reviewing AKRF sturgeon noise-analysis for the Tappan Zee Hudson River Crossing Project. November 2012. 7pp.

Borodin, N. 1925. Biological observations on the Atlantic Sturgeon, *Acipenser sturio.* Transactions of the American Fisheries Society 55: 184-190.

Breece, M., P. Simpson, and D. Fox. Shifting environments, shifting habitats, Atlantic sturgeon spawning characteristics in the Delaware River. Abstract: North American Chapter of the World Sturgeon Conservation Society, 4th Annual Meeting, Vancouver Island University, International Center for Sturgeon Studies, Nanaimo, British Columbia. July 11-14, 2011.

California Department of Transportation (Caltrans). 2012. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. 215 pp.

Calvo, L., H.M. Brundage, III, D. Haidvogel, D. Kreeger, R. Thomas, J.C. O'Herron, II, and E.N. Powell. 2010. Effects of flow dynamics, salinity, and water quality on Atlantic sturgeon, the shortnose sturgeon, and the Eastern oyster in the oligohaline zone of the Delaware Estuary. Final Report for Project No. 151265. Project Year 2008-2009. Submitted to the U.S. Army Corps of Engineers, Philadelphia District. 106 pp.

Cobb, J.N. 1899. The sturgeon fishery of Delaware River and Bay. Commissioner's Report of the United States Commission of Fish and Fisheries. Pages 277-392.

Damon-Randall K, Bohl R, Bolden S, Fox D, Hager C, Hickson B, Hilton E, Mohler J, Robbins E, Savoy T, Spells A. 2010. Atlantic Sturgeon Research Techniques. NOAA Technical Memorandum NMFS NE 215; 19 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://www.nefsc.noaa.gov/nefsc/publications/

EPA (Environmental Protection Agency). 1986. Quality Criteria for Water. EPA 440/5-86-001.

ERC, Inc. (Environmental Research and Consulting, Inc.). 2007. Preliminary acoustic tracking study of juvenile shortnose sturgeon and Atlantic sturgeon in the Delaware River. May 2006 through March 2007. Prepared for NOAA Fisheries. 9 pp.

Fewtrell, Jane Leah. 2003. The response of marine finfish and invertebrates to seismic survey noise. PhD. Curtin University of Technology, Muresk Institute of Agriculture. Available at: http://espace.library.curtin.edu.au/cgi-bin/espace.pdf?file=/2008/05/14/file_67/15126

FHWA 2012. Biological Assessment for the Tappan Zee Pile Installation Demonstration Project. January 2012. 105 pp.

Fisher, M. 2009. Atlantic Sturgeon Progress Report. State Wildlife Grant Project T-4-1. Delaware Division of Fish and Wildlife Department of Natural Resources and Environmental Control. Smyrna, Delaware. 24 pp.

Fisher, M. 2011. Atlantic Sturgeon Final Report. State Wildlife Grant Project T-4-1. Delaware Division of Fish and Wildlife Department of Natural Resources and Environmental Control. Smyrna, Delaware. 44 pp.

Fisheries Habitat Working Group (FHWG). 2008. Agreement in Principal for Interim Criteria for Injury to Fishfrom Pile Driving Activities. Memorandum of Agreement between NOAA Fisheries' Northwest and Southwest Regions; USFWS Regions 1 and 8; California, Washington, and Oregon Departments of Transportation; California Department of Fish and Game; and Federal Highways Administration. June 12, 2008.

Fox, D.A. and M.W. Breece. 2010. Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) in the New York Bight DPS: Identification of critical habitat and rates of interbasin exchange; Final Report Submitted to NOAA (Award NA08NMF4050611). 62 p.

Halvorsen, M. B., Casper, B. M, Woodley, C. M., Carlson, T. J., and Popper, A. N. 2012a. Threshold for onset of injury in Chinook salmon from exposure to impulsive pile driving sounds. PLoS ONE, 7(6) e38968. Available at: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0038968

Halvorsen, M.B., B.M. Casper, F. Matthews, T.J. Carlson, and A.N. Popper. 2012b. Effects of exposure to pile-driving sounds on the lake sturgeon, Nile tilapia and hogchoker. Proc. R. Soc. B. 279:4705-4714.

Halvorsen, M.B., B.M. Casper, C.M. Woodley, T.J. Carlson, and A.N. Popper. 2011. Predicting and mitigating hydroacoustic effects on fish from pile installations. NCHRP Research Results Digest 363, Project 25-28, National Cooperative Highway Research Program, Transportation Research Board, National Academy of Sciences, Washington, D.C. http://www.trb.org/Publications/Blurbs/166159.aspx

Hastings, M., & Popper, A. (2005). Effects of sound on fish. White Paper. January.

ICF Jones & Stokes and Illingworth and Rodkin, Inc. 2009. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Prepared for California Department of Transportation.

ICF Jones & Stokes and Illingworth and Rodkin, Inc. 2012. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Prepared for California Department of Transportation.

Lovell, J.M, M.M. Findlay, R.M. Moatem J.R. Nedwell, and M.A. Pegg. 2005. The inner ear morphology and hearing abilities of the Paddlefish (Polyodon spathula) and the lake sturgeon (Acipenser fulvescens). Comparative Biochemistry and Physiology 142(3):286-296.

Meyer, M., R.R. Fay, and A.N. Popper. 2010. Frequency tuning and intensity coding of sound in the auditory periphery of lake sturgeon, *Acipenser fulvens*. Journal of Experimental Biology 213:1567-1578.

Mueller-Blenkle, C., P.K. McGregor, A.B. Gill, M.H. Andersson, J. Metcalfe, V. Bendall, P. Sigray, D.T. Wood, and F. Thomsen. 2010. Effects of Pile-driving Noise on the Behaviour of Marine Fish. COWRIE Ref: Fish 06-08, Technical Report. March 31, 2010.

National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS). 1998. Status review of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service and United States Fish and Wildlife Service. 126 pp.

National Marine Fisheries Service (NMFS). 2014. Biological Opinion on Tappan Zee Bridge Replacement NER-2014-11317. 9-23-2014.

O'Herron, J.C., K.W. Able, and R.W. Hastings. 1993. Movements of shortnose sturgeon (Acipenser brevirostrum) in the Delaware River. Estuaries 16:235-240.

Pennsylvania Commission of Fisheries. 1897. Annual report of the state commissioners of fisheries for the year 1897. Commonwealth of Pennsylvania, Harrisburg, PA.

Popper, A. 2005. A Review of Hearing by Sturgeon and Lamprey. Report submitted to the US Army Corps of Engineers, Portland District. 23 pp. Available at: http://nwpapps.usace.army.mil/environment/docs/afep/system/mscoe_Sturgeon_Lamprey.pdf

Simpson, P.C. 2008. Movements and habitat use of Delaware River Atlantic Sturgeon. Masters Thesis. Delaware State University, Dover, Delaware. 137pp.

Stadler, H. and D.P., Woodbury. 2009. Assessing the effects to fishes from pile driving: Application of new hydroacoustic criteria. Inter-noise 2009, innovations in piratical noise control. Ottawa, Canada.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

APR 14 2016

Ross Diamond
Hazen and Sawyer *I* AKRF, JV
440 Park Avenue South
New York, New York 10016

RE: Essential Fish Habitat Findings for the East Side Coastal Resiliency Project
New York, New York
New York City Department of Design and Construction Capital Contract: SANDRESM1

Dear Mr. Diamond:

We have reviewed the essential fish habitat (EFH) assessment for the East Side Coastal Resiliency (ESCR) Project provided to us as part of your January 25, 2016, letter to Mr. Daniel Marrone of our Protected Resources Division. The ESCR is a series of integrated flood control measures on the east side of southern Manhattan between Montgomery Street and East 23rd Street designed to protect areas within the Federal Emergency Management Agency (FEMA) designated 100-year flood hazard area, accounting for 2050 sea level rise projection developed by the New York City Panel on Climate Change. The construction associated with the proposed project will occur primarily on land, but will also include some in-water work in the East River. The proposed flood protection system includes a combination of elevated berms, floodwalls, and deployables (temporary flood protection walls/gates deployed only during flood conditions). The in-water work for the project comprises construction of a combined sewer outfall (CSO) and the installation of temporary mooring structures. As part of the construction of the CSO, a sheet pile cofferdam and turbidity barriers will be installed to enclose approximately 300 square feet of the river. The sheet piles will be installed via a vibratory or impact hammer, depending on subsurface conditions. The duration of pile driving will be two, 8-hour construction days. The sheet pile will be removed after the completion of the project. The construction is anticipated to commence in summer 2017.

Magnuson Stevens Fishery Conservation and Management Act (MSA)
The project area has been designated as (EFH) for a number of federally managed species including Atlantic butterfish (*Peprilus triacanthus*), Atlantic sea herring (*Clupea harengus*), bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), red hake (*Urophycis chuss*), scup (*Stenotomus chrysops*), summer flounder (*Paralichthys dentatus*), winter flounder (*Pseudopleuronectes americanus*), windowpane flounder (*Scophthalmus aquosus*) and others.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies, or their designee, to consult with us on projects such as this that may adversely affect EFH. This process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in the consultation process. Based on correspondence you provided us from the U.S.

Department of Housing and Urban Development and the New York City Office of Management and Budget, we understand that you have been designated as the lead non-federal representative on this action.

The EFH assessment provided adequately evaluates the effects of the proposed project on EFH and federally managed species, and we agree with your determination that the adverse effects will be minimal. As a result, no conservation recommendations are needed. Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CRF 600.920 (j) if new information becomes available, or if the project is revised in such a manner that affects the basis for the above determination. Should you have any questions regarding EFH, please contact me at 732-872-3023 or at karen.greene@noaa.gov.

Sincerely,

Karen M. Greene
Mid-Atlantic Field Offices
Supervisor

cc: PRD – D. Marrone

PREVIOUS CORRESPONDENCE WITH NMFS
MAY 2016 CONSULTATION

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

Hazen and Sawyer / AKRF, JV
440 Park Avenue South
New York, NY 10016
tel: 212 696-0670
fax: 212 213-3191

May 26, 2016

Mr. Daniel Marrone
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930-2276

Re: Section 7 and Essential Fish Habitat Findings for the
East Side Coastal Resiliency Project, Alternative 5
New York, New York
New York City Department of Design and Construction Capital Contract: SANDRESM1

Dear Mr. Marrone:

On behalf of the New York City (City) Department of Design and Construction (DDC), the Hazen and Sawyer/AKRF Joint Venture (JV) is requesting additional guidance from the National Oceanic and Atmospheric Association (NOAA) National Marine Fisheries Service (NMFS) for new design and construction information for the East Side Coastal Resiliency (ESCR) project, located in New York City, New York. ESCR is receiving funds from HUD, a federal agency, and is therefore subject to Section 7 of the Endangered Species Act. DDC originally submitted a request for concurrence on their findings regarding Section 7 threatened and endangered species and Essential Fish Habitat (EFH) on January 25, 2016, with additional information provided on February 17, 2016. NMFS returned the results of the Section 7 consultation on March 18, 2016, and concurred with DDC's findings that the proposed limited in-water construction activities, including pile driving a 24-inch sheet pile coffer dam with an impact hammer for a 300-square foot area, would result in insignificant or discountable effects to Atlantic sturgeon and that the proposed project was unlikely to result in adverse effects to Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) or the shortnose sturgeon (*Acipenser brevirostrum*). NMFS returned the results of the EFH consultation on April 14, 2016 and concurred with DDC's findings that adverse effects associated with the proposed in-water activities would be minimal and did not recommend any conservation measures. DDC's original consultation request, all correspondence associated with that request, and NMFS's response are provided in **Attachment 1**.

As you may recall, the proposed ESCR project extends along the east side of Manhattan between Montgomery Street and East 23rd Street (with an alternate alignment extending to East 25th Street). The Environmental Impact Statement (EIS) study area for natural resources ("study area") extends 400 feet into the East River from the shoreline between Montgomery Street and East 25th Street (**Figure 1**). The proposed project is a series of integrated flood control measures designed to protect areas of Manhattan within the Federal Emergency Management Agency (FEMA)-designated 100-year flood hazard area accounting for sea level rise projections developed by the New York City Panel on Climate Change. The construction associated with the proposed project would occur primarily on land, but may also include in-water work in the East River, a saline surface water component of the New York Harbor Estuary. A more in depth Project Description for ESCR is provided in **Attachment 2**. The draft EIS (DEIS) for ESCR is anticipated to be published in Fall 2016.

New Consultation Request

The original consultation described one of the possible ESCR project alternatives, identified as Alternative 3 in the DEIS. Since that consultation request was initiated, design and planning for ESCR has progressed and an additional project alternative, referred to as Alternative 5 in the DEIS, has been developed that would involve additional in-water construction, including pile driving, in addition to the permanent installation of support shafts in the East River. To eliminate the need for closure structures across the FDR Drive and create a more robust line of flood protection, this alternative instead includes raising the elevation of the northbound lanes of the FDR Drive between East 13th and East 18th Streets by approximately six feet and installing a wall along the raised portion of the roadway, effectively turning the FDR Drive itself into an integrated component of the flood protection system. This change would allow the FDR Drive to remain open for emergency traffic during a storm event.

In addition, Alternative 5 proposes to construct and install a bicycle and pedestrian flyover bridge that would connect the East River Park esplanade south of Con Edison with the Captain Patrick J. Brown Walk north of Con Edison (**Figure 2**). The flyover bridge would improve access along this stretch of the East River where currently pedestrian and bicyclist access is constrained near Con Edison facilities.

Construction activities for the elevated FDR Drive and the flyover bridge would be adjacent to each other and construction may occur concurrently, though each of the piles for these structures would be installed during one continuous period. While construction of Alternative 5 will be analyzed in the DEIS to the greatest extent practicable, design and construction information is ongoing. Therefore, for the purposes of this consultation request, a worst-case scenario for construction of Alternative 5 is presented (**Attachment 2**).

A Species Conclusion Table documenting the natural history of threatened and endangered species potentially occurring within the study area along with discussions of potential project related effects is provided in **Attachment 3**. A "NOAA Fisheries Northeast Regional Office EFH Assessment Worksheet for Federal Agencies" and an EFH impact assessment is provided in **Attachment 4**. Documentation from the U.S. Department of Housing and Urban Development (HUD) and the New York City Office of Management and Budget (OMB) designating the Hazen and Sawyer / AKRF Joint Venture the non-federal representative for this project is provided in **Attachment 5**.

Summary of Findings

Threatened and Endangered Species

Based on prior communications with NMFS (**Attachment 1**) there are two species of endangered fish with the potential to occur in the East River adjacent to the study area: the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and the shortnose sturgeon (*Acipenser brevirostrum*). DDC is requesting an informal Section 7 consultation with NMFS for these species. The noise generated by pile driving that would be associated with construction of Alternative 5 is known to cause behavioral and physiological impacts to fish, including these species of sturgeon. Due to the extent of proposed pile driving activities for Alternative 5, noise from pile driving activities has the potential to affect sturgeon in the East River. **Due to the potential for adverse effects to sturgeon, DDC has committed to implementing conservation measures for in-water pile driving associated with Alternative 5 including gradually ramping-up pile driving, using a cushion block for impact hammers, and installation of bubble curtains around all in-water piles**. Design and construction phasing for Alternative 5 are ongoing. As those develop, consideration will be given to the November to February window when Atlantic sturgeon are least likely to be migrating through the East River. With these conservation measures in place, DDC has determined that construction of Alternative 5 **May Affect, but is Not Likely to Adversely Affect** both the Atlantic sturgeon and the shortnose sturgeon. DDC is seeking concurrence from NMFS on these findings. A Species Conclusion Table with additional details on sturgeon life history and rationale for this finding is provided in **Attachment 3**.

Essential Fish Habitat (EFH)

An EFH assessment and accompanying NOAA Fisheries Northeast Regional Office EFH Assessment Worksheet for Federal Agencies are provided in **Attachment 4**. As a result of construction activities associated with the proposed project, there would be minor effects to EFH for one or more lifestages of winter flounder, windowpane flounder, summer flounder, Atlantic herring, scup, and black sea bass. Several species listed as potentially occurring in the study area are either at the extreme limit of their known range or are highly migratory and are therefore anticipated to occur in the East River only as uncommon or transient individuals. The remainder of the species evaluated would not be anticipated to be found in the East River due to unsuitable environmental conditions, unsuitable depths, and unsuitable substrates or other habitat features. DDC is requesting an Abbreviated EFH Consultation for Alternative 5 and concurrence with their findings **of Minimal Adverse Effects to EFH** in the study area. DDC also requests guidance on any Conservation Recommendations that NMFS may have for the proposed project.

Results of these consultation requests will be used to inform the DEIS currently being prepared for the ESCR project in order to comply with applicable National Environmental Protection Act (NEPA), State Environmental Quality Review Act (SEQRA), and City Environmental Quality Review (CEQR) standards. In the event that new design elements are developed that result in additional in-water construction activities not described above or in Attachment 2, DDC would notify NMFS of these changes as addenda to this submission.

The City would greatly appreciate an expeditious review of the enclosed documents. Please send the results of the requested consultations to me at rdiamond@hazenandsawyer.com. Should you have any questions or require additional information, please feel free to contact me at (212) 539-7082. Thank you in advance for your assistance with this matter.

Sincerely,

Ross Diamond
Principal Scientist
Hazen and Sawyer

Enclosures:

Figure 1 – Site Location Map
Figure 2 – Schematic of Alternative 5
Attachment 1 – ESCR Section 7 and EFH Consultation Received 3/18/2016
Attachment 2 – Alternative 5 Project and Construction Description
Attachment 3 – Section 7 Species Conclusion Table
Attachment 4 – EFH Assessment Worksheet and EFH Assessment
Attachment 5 – Designation of Non-Federal Representative Letter

cc: NOAA: K. Greene
DDC: T. Foley, H.S. Pau, E. Ilijevich, E. Rogers, M. Davies, C. Pichardo-Jimenez
DPR: O. Wells, A. Chan
OMB: E. Qadri, C. Johnson, M. Jones, D. Herrera
ORR: C. Grassi
HUD: G. Amabile, T. Fretwell, J. Levine

Diamond, Ross

From: Edith Carson - NOAA Federal <edith.carson@noaa.gov>
Sent: Thursday, June 02, 2016 1:05 PM
To: Diamond, Ross
Cc: Daniel Marrone - NOAA Federal; Karen Greene - NOAA Federal; William Barnhill - NOAA Federal; Winter, Annie; Leung, Nicolette
Subject: Re: Section 7 and Essential Fish Habitat Consultation for East Side Coastal Resiliency Project, Alternative 5, New York, NY

Hi Ross,

After reviewing the information you sent us, it appears the concrete piles for the support shafts will produce noise levels lower than what was analyzed in the original consultation for the installation of the cofferdam. The proposed modification will not increase effects to ESA-listed species beyond what was considered in the March 18, 2016, consultation. No reinitiation for consultation is necessary. Should project plans change, further coordination should be pursued.

If you have any questions regarding these comments, please contact me at edith.carson@noaa.gov or 978-282-8490.

Thank you,

Edith

Edith Carson, M.Sc.
Section 7/Shortnose Sturgeon Fish Biologist
NOAA Fisheries
U.S. Department of Commerce
Greater Atlantic Regional Fisheries Office
Phone: 978-282-8490
edith.carson@noaa.gov
www.greateratlantic.fisheries.noaa.gov/protected

NOAA FISHERIES

On Fri, May 27, 2016 at 2:56 PM, Diamond, Ross <RDiamond@hazenandsawyer.com> wrote:

> Hi Dan, Bill, and Edith,
>
> The design is conceptual and at this point no method can be committed to. However, it is my understanding that concrete is the more likely choice over steel for the shafts. Thanks.
>
> **Ross Diamond**

Principal Scientist | Hazen and Sawyer
498 Seventh Avenue, 11th Floor, New York, NY 10018
212.539.7082 (direct) | 973.820.5398 (cell)
rdiamond@hazenandsawyer.com | hazenandsawyer.com

From: Daniel Marrone - NOAA Federal [mailto:daniel.marrone@noaa.gov]
Sent: Friday, May 27, 2016 1:57 PM
To: Diamond, Ross <RDiamond@hazenandsawyer.com>
Cc: Karen Greene - NOAA Federal <karen.greene@noaa.gov>; Wells, Owen (Parks <Owen.Wells@parks.nyc.gov>; Chan, Alda (Parks <Alda.Chan@parks.nyc.gov>; Qadri, Eram (OMB <QadriE@omb.nyc.gov>; Pau, How Sheen (DDC <PAUH@ddc.nyc.gov>; Ilijevich, Eric (DDC <IlijevichE@ddc.nyc.gov>; Davies, Michael (DDC <DaviesMi@ddc.nyc.gov>; Murray, Loan (DDC <DinhL@ddc.nyc.gov>; Rogers, Eleanor (DDC <RogersEl@ddc.nyc.gov>; Pichardo Jimenez, Carlos (DDC <Pichardca@ddc.nyc.gov>; Mahmood, Tahsina (DDC <MahmoodTa@ddc.nyc.gov>; Robert White <rwhite@akrf.com>; Nathan Riddle <nriddle@akrf.com>; Winter, Annie <awinter@hazenandsawyer.com>; Leung, Nicolette <nleung@hazenandsawyer.com>; Campbell, Christopher <ccampbell@hazenandsawyer.com>; Mehrotra, Sandeep <SMehrotra@hazenandsawyer.com>; William Barnhill - NOAA Federal <william.barnhill@noaa.gov>; Edith Carson - NOAA Federal <edith.carson@noaa.gov>
Subject: Re: Section 7 and Essential Fish Habitat Consultation for East Side Coastal Resiliency Project, Alternative 5, New York, NY

Hi Ross,

Can you let me know what type of piles will be used for the support shafts (e.g., steel, concrete)? Once we have this information we can see if the noise levels will be higher or lower than what was analyzed in the original consultation for the installation of the cofferdam. If the noise levels that will be produced are lower, there will be no need to reinitiate consultation.

Can you please copy Bill Barnhill and Edith Carson (cc'd here) on your reply? I will be out of the office for a couple weeks and they will be handling the response for this project.

Thanks,

Dan

On Fri, May 27, 2016 at 11:35 AM, Diamond, Ross <RDiamond@hazenandsawyer.com> wrote:

> Dear Mr. Marrone,
>
> On behalf of the New York City Department of Design and Construction (DDC), we have placed in the mail to you today, May 27, 2016, a request for review of DDC's findings regarding (1) threatened and endangered species pursuant to Section 7 of the Endangered Species Act, and (2) Essential Fish Habitat pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, for DDC's East Side Coastal Resiliency

(ESCR) Project in New York, NY. NMFS has previously reviewed a similar consultation for this project. This request for consultation includes new design and construction information for a new project alternative to ESCR. This email is a supplementary digital submission of the same package that was mailed today. Attached to this email please find a single PDF that contains the following:

- Cover letter with project history and summary;
- Figures of the project location;
- Initial ESCR project NMFS consultation results;
- Description of the new construction activities proposed under the new project alternative;
- Summary table containing findings for federally threatened and endangered marine species with the potential to occur in the project area;
- NOAA Fisheries Northeast Regional Office EFH Assessment Worksheet for Federal Agencies;
- Essential Fish Habitat Assessment; and
- Federal Representative Designation documentation..

Thank you for your review and assistance to date coordinating with us on this project. Please do not hesitate to contact me for any reason.

Ross Diamond

Principal Scientist | Hazen and Sawyer
498 Seventh Avenue, 11th Floor, New York, NY 10018
212.539.7082 (direct) | 973.820.5398 (cell)
rdiamond@hazenandsawyer.com | hazenandsawyer.com

ATTACHMENT 2
CONSTRUCTION DESCRIPTION

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

Hazen and Sawyer / AKRF, JV
440 Park Avenue South
New York, NY 10016
tel: 212 696-0670
fax: 212 213-3191

Attachment 2

East Side Coastal Resiliency Project: Construction Description of Alternative 4

Project Background

Hurricane Sandy, which made landfall in October 2012, greatly impacted New York City and surrounding areas, including the east side of Manhattan, highlighting existing deficiencies in the City's ability to adequately protect vulnerable populations and critical infrastructure during major storm events. Hurricane Sandy caused extensive inland flooding in the study area, resulting in damage to residential and commercial property; transportation; and critical power, water, and sewer infrastructure. Addressing the vulnerability of the study area by protecting critical infrastructure and resources on Manhattan's lower east side is essential to the City's resiliency planning.

In June 2013, the U.S. Department of Housing and Urban Development (HUD) launched Rebuild by Design (RBD), a competition to respond to Hurricane Sandy's devastation in the northeast region of the United States. The winning proposals would be implemented using Community Development Block Grant – Disaster Recovery (CDBG-DR) funding as well as other public and private-sector funding sources. One of the winning proposals was an integrated flood protection system on the east side of southern Manhattan to reduce the risk of coastal flood hazards, which became the ESCR project. The proposed flood protection system would be comprised of a combination of elevated berms, floodwalls, and closure structures (temporary flood protection walls/gates deployed only during flood conditions). The study area for the proposed project is between Montgomery Street on the south and East 25th Street on the north, as shown in **Figure 1**.

The study area was defined based on floodplain and topography mapping. In addition to providing a reliable flood protection system for this flood hazard area, the proposed project aims to improve and enhance access to the waterfront, including East River Park and Stuyvesant Cove Park, which are located within the study area. As such, the City is proposing to construct and operate a flood protection system with integrated urban design features that will reduce flood hazards to a diverse and vulnerable residential population and safeguard critical energy, infrastructure, commercial, and transportation assets while enhancing access to the waterfront and parkland. Project construction is anticipated to commence in spring 2020 with an estimated 3.5-year construction schedule allowing the flood protection system to be in place in 2023.

Alternative 4 – Flood Protection System with a Raised East River Park

Alternative 4 of the East Side Coastal Resiliency (ESCR) project proposes to provide flood protection by raising East River Park by approximately eight feet and installing below-grade floodwalls within the park to meet the design flood protection criteria, providing flood protection for both the park and the inland community. This alternative would further enhance neighborhood connectivity to the East River Park by reconstructing the Delancey Street, East 10th Street, and Corlears Hook Bridges to provide universal accessibility. This alternative would require reconstructing the park's underground water supply and drainage infrastructure and the existing park structures and recreational features, including the park amphitheater, as well as relocating two embayments within East River Park. This alternative also includes construction of footings to accommodate a shared-use flyover bridge connecting the north end of East River Park to Captain Patrick J. Brown Walk to alleviate congestion in the East River Bikeway. Under this alternative, Murphy Brothers and Asser Levy Playgrounds would be reconstructed and protected by a

floodwall that would connect the northern point of East River park to the existing VA Hospital flood protection system at East 25th Street.

Description of In-Water Components

The in-water construction activities detailed in the original consultations (**Attachment 1**) included:

- Use of one construction barge and the installation of a temporary mooring structure
- Construction of a combined sewer outfall (approximately 300 square feet of temporary disturbance)
- Construction of support shafts for both the raised FDR Drive and the flyover bridge (15 shafts to be installed within the East River)

Some of the in-water components from the previous consultations are incorporated into Alternative 4, though with modified assumptions. The design of this alternative is currently underway and in the conceptual stage at present; therefore, this consultation assumes a reasonable worst-case scenario, specifically with respect to the in-water disturbances associated with the implementation of Alternative 4. The primary in-water activities associated with Alternative 4 are described below:

- Pile drilling for the installation of ten 8-foot diameter shafts and installation of five footings to be placed atop of the shafts for the shared use flyover bridge (resulting in approximately 652 square feet of permanent disturbance)
- Filling approximately 20,600 square feet of two existing embayments (permanent disturbance)
- Reconstruction of ten combined sewer outfalls (resulting in approximately 10,000 square feet of temporary disturbance)
- Use of construction barges and the installation of temporary mooring spuds and monopile dolphins for stabilization (resulting in approximately 160 square feet of temporary disturbance)

To install the shafts and footings associated with the flyover bridge, the current assumption includes use of land-based drill rigs positioned in East River Park, the East River Greenway path and, the Con Edison pier to install these support structures south of East 15th Street. Drilling for footings to be installed along Captain Patrick J Brown walk would be performed using barge mounted drill rigs. Pile drilling activities for the flyover bridge would involve the installation of a turbidity curtain and sinking of the pipe with a rotating cutter head to push the pipe into the river bed. After sinking the pipe, a rebar cage is lowered prior to installing a tremie pipe. Concrete is then pumped into the tremie pipe. As the tremie pipe is filled with concrete, river water and sediment within that pipe is gradually displaced or may require pumping to remove the sediment and water. In either case, the discharge material would be tested for quality before being discharged either to the river or the existing sewer system. Once the installation of these components is complete, the rebar cage, tremie pipe and any turbidity curtains would be removed.

The filling of existing embayments would be completed following the installation of a sheet pile cut-off wall just inland of the existing East River Esplanade bulkhead. Esplanade elevation activities would generally consist of the removal of the existing esplanade's concrete deck and support pilings at the mudline, the installation of floodwalls and the cut-off wall, backfill, and the installation of new girders and deck structure. Demolition of the existing embayments would require turbidity curtains to be installed as well as debris nets to minimize the amount of debris falling into the waterway. Any large debris would be retrieved and disposed of in accordance with applicable regulations and best practices. The area inland of the cutoff wall would be backfilled, which would involve the loss of approximately 20,600 square feet of tidal wetlands. However, two new embayments would be constructed that are larger in size (approximately 26,000 square feet) and would be similarly located along the East River Park waterfront. The need to relocate the embayments stems from the need to maintain large active recreation fields within the Parks that can only be sited where the existing embayments are located once the flood protection features are installed.

To relocate and reconstruct the 10 sewer outfalls, a watertight cofferdam would be installed adjacent to the bulkhead and the work area would be dewatered. The top of the cofferdam would be above the mean higher-high water line to isolate the work area from tidal influence. The work area would not contain standing water and approved dewatering measures would be installed, as necessary, and would discharge below the mean higher-high water line. A portable sediment tank or approved equivalent would be used to treat dewatering effluent. Approximately 1,000 square feet of temporary disturbance to regulated tidal wetlands between the cofferdams and East River bulkhead is anticipated for each sewer outfall for a total temporary disturbance area of 10,000 square feet. Existing sewer infrastructure is anticipated to be filled with concrete and abandoned in place.

Utilizing barges for construction activities is likely due to the site constraints of East River Park that include limited vehicular access and ongoing construction activities within a highly-utilized public park. Temporary construction barging operations would primarily require the installation of mooring spuds and monopile dolphins on the East River floor that would resulting in approximately 160 square feet of temporary disturbance. The construction would likely involve the use of equipment such as barge-mounted cranes and a vibratory pile driver or other drilling equipment to place the piles. At the completion of construction, all barge components would be removed.

Summary of Protective Measures

Design and construction phasing planning for Alternative 4 are ongoing. However, pile drilling associated with installation of the flood protection alignment adjacent to and, in some locations, within the East River as well as for the support structures of the proposed shared use flyover bridge are anticipated. The noise generated by pile driving and pile drilling that would be associated with construction of Alternative 4 is known to cause behavioral and physiological impacts to fish. Due to the potential for adverse effects to fish, DDC has committed to implementing conservation measures for in-water pile installation associated with Alternative 4 including:

- **Cushion blocks**. Cushion blocks are wooden blocks placed on the top of the pile and act as a buffer between the impact hammer and the pile, reducing total noise from each impact.
- **Pile driving ramp up**. Pile driving would begin with a series of low impact hits and gradually increase to normal impact levels. This method allows for some warning to aquatic fauna prior to attaining peak noise levels of the pile driving.
- **Bubble Curtains**. Bubble curtains are hoses or manifolds that are placed on the sea floor around the project impact area. Air compressors disburse air into the hoses and air bubbles then discharge up into the water column. Bubble curtains have been shown to be effective at reducing the sound level of pile driving to acceptable underwater levels. Where practicable, bubble curtains would be used during installation of support structures for the shared use flyover bridge.

In addition, as construction phasing develops, consideration will be given to the November to February window when Atlantic sturgeon are least likely to be migrating through the East River. Moreover, to reduce suspension of sediment into the water column to the greatest extent practicable, turbidity curtains would be installed prior to any construction, where practicable. Sediments in the East River are anticipated to be contaminated due to historic land uses. All sediments removed from the support shaft casings will be handled, stored, and disposed of in accordance with all applicable health, safety, and sediment and waste management plans including a site specific Remedial Action Plan (RAP), a Construction Health and Safety Plan (CHASP), a New York State Department of Environmental Conservation (NYSDEC) approved stormwater pollution prevention plan (SWPPP), and a U.S. Environmental Protection Agency (USEPA) approved spill prevention control and countermeasures plan (SPCCP).

ATTACHMENT 3
SECTION 7 SPECIES CONCLUSION TABLE

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

Hazen | AKRF
a joint venture

Species Conclusion Table

Project Name: East Side Coastal Resiliency (ESCR), Alternative 4, New York City Department of Design and Construction
Date: January 28, 2019

Species Name/Critical Habitat	Potential Habitat Present?	Species Present?	Critical Habitat Present?	ESA Determination	Notes / Documentation Summary
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)	Yes	No Survey Conducted	Undefined for New York Bight, South Atlantic, Carolina, Chesapeake, and Gulf of Maine Distinct Population Segments	May Affect, but Not Likely to Adversely Affect	Atlantic sturgeon egg and larval lifestages occur only in the Hudson River for the New York Bight Distinct Population Segment (DPS). The Hudson River is outside of the study area and therefore egg and larval Atlantic sturgeon lifestages would not be impacted by the proposed ESCR project. Late juvenile and adult Atlantic sturgeon utilize brackish waters of the New York Bight (Bain et. al., 1998) and therefore have the potential to occur in the East River adjacent to the study area. The Atlantic waters off of Rockaway Peninsula and Sandy Hook are a significant concentration areas of wintering Atlantic sturgeon (Dunton et al. 2010), and transients moving between Hudson River spawning grounds and these overwintering areas may pass through the lower East River. Atlantic sturgeon passing through the East River are migrating from all five DPS's (New York Bight, South Atlantic, Carolina, Chesapeake, and Gulf of Maine). Telemetry arrays in the lower East River, on the east side of Roosevelt Island, have recently detected radio-tagged Atlantic sturgeon moving through this area (Tomichek et al. 2014). Occurrences of Atlantic sturgeons in the East River are likely brief, as these individuals are strictly transients. More information is available for the adult lifestage than for the late juvenile lifestage of Atlantic sturgeon. Some documentation suggests the two lifestages follow the same natural history when in ocean waters (Bain et al. 2000; Eyler 2006). When not spawning in the Hudson River, Atlantic sturgeon in the New York Bight DPS are found throughout the coastal bays, sounds, and marine waters along the East Coast of the United States. Habitat within these waters typically consists of deeper waters approximately 20-50 meters (m) deep with silt or mud substrates (New NY Bridge FEIS, 2012, citing others). When not spawning, Atlantic sturgeon are known to migrate great distances, typically with the seasons (south in winter and north in summer). Atlantic sturgeon do not return to spawn annually, therefore, their migration range may be very large, spanning from as far south as Cape Hatteras, North Carolina, into Maine (Bain et al., 1998). Depth of habitat used by Atlantic sturgeon changes seasonally: in winter and spring, Atlantic sturgeon tend to favor waters greater than 50m deep in the southern portion of the Mid-Atlantic Bight (North Carolina to New York). In summer and fall, waters in the northern portion of the Mid-Atlantic Bight approximately 20m deep are used (New York to Massachusetts) (Erickson et al., 2011). Atlantic sturgeon are rarely caught or observed using shallow habitats when utilizing ocean waters. The East River contains depths that are within the range of those used by Atlantic sturgeon. Depths in the northern portion of the East River where it meets the Long Island Sound, also known as Hell Gate, can reach approximately 33m. Depths in the East River between Hell Gate and the Battery are generally within 10-20m, with the deepest portions occurring in the federal navigation channel (NOAA Chart 12335, 2015). The ESCR study area is contained between the Hell Gate and Battery stretch of East River and occurs in the portions of the federal navigation channel south of the Williamsburg bridge. The East River is a tidal straight that has very strong tidal currents, routinely reaching speeds of 2 meters per second. The strong current is a result of the East River's width, channelization, bottom

					topography, and the influence of tidal water from the Hudson River (through the Harlem River) and the Long Island Sound (Blumberg and Pritchard, 1997). The strong tidal currents in the East River prevent the Atlantic sturgeon's preferred silt and mud habitat substrates from accumulating. Therefore, while the depths in the East River may be suitable for Atlantic sturgeon, the preferred habitat substrates are typically not available due to the strong tidal currents. Construction of the proposed project under Alternative 4 would include in-water activities that would consist of: construction barging, which would include placement of temporary mooring structures; the reconstruction of a combined sewer outfalls, which would include installation of watertight cofferdams during construction; the relocating of two embayments, which would include the filling of existing tidal wetland habitat; and the installation of support shafts and footings for the flyover bridge, which would include vibratory or impact pile driving and drilling. Temporary effects to the East River as a result of in-water construction would consist primarily of elevated turbidity, noise from construction equipment and pile driving and pile drilling, and shading from construction barges. Permanent effects would occur from the filling of approximately 21,252 square feet of the existing embayments, and 650 square feet of the support shafts and footings for the flyover bridge (see Attachment 2). As noted above, the potential habitat in this area is of low quality and unlikely to attract or contain Atlantic sturgeon and is small relative to the overall habitat within the East River. The permanent loss, therefore, May Affect but is Not Likely to Adversely Affect Atlantic sturgeon. For construction of the outfalls and pile driving and drilling, Best Management Practices (BMPs) such as a turbidity curtain would be used to contain suspended sediment within the affected area and prevent sturgeon from coming in contact with any increased turbidity or mechanical activity at the outfall or within areas requiring mooring of the construction barge. In addition, a cofferdam would be used during construction of the outfalls. The following conservation measures would be implemented to mitigate noise from pile driving of the support shafts: gradually ramping up pile driving and use of a cushion block, where practicable. In summary, Atlantic sturgeon may be present in the East River and May be Affected as a result of the proposed project, however the proposed project is Not Likely to Adversely Affect Atlantic sturgeon due to: • Low quality habitat of the East River (currents, substrates, water quality); • Potential presence of Atlantic sturgeon in the East River would likely be transient between areas with more suitable habitat; • Turbidity curtains would be used to contain suspended sediment within the affected areas and prevent sturgeon from coming in contact with any increased turbidity or mechanical activity at the outfalls and support shaft sites or within areas requiring mooring of construction barges. A cofferdam would be used during reconstruction of the outfalls to minimize suspended sediment and turbidity. • Conservation measures to mitigate the noise created from pile driving and pile drilling would be used and consist of gradually ramping up pile driving, use of a cushion block, and bubble curtains, where practicable, during installation of the support shafts and footings for the shared used flyover bridge.
Shortnose sturgeon (*Acipenser*	Yes	No Survey Conducted	Undefined	May Affect, but Not Likely to Adversely Affect	In the New York Bight, the egg, larval, and juvenile lifestages of shortnose sturgeon occur only in the Hudson River (Bain et al., 1998). In addition, adult shortnose sturgeon mostly spend their lives within the Hudson River, utilizing freshwater extents in the northern portion of the Hudson near

brevirostrum)					Albany south to the mouth of the Hudson River in the New York Harbor. The East River is at the extreme southern limit of this population's overwintering range due to the intolerance of shortnose sturgeon to high salinity levels this close to the Atlantic Ocean (Dadswell et al. 1984, Jenkins et al. 1993). Waters anywhere below the Tappan Zee region of the Hudson River are suboptimal due to their high salinities (Bain 1997). Shortnose sturgeon migrations from the Hudson River and other rivers containing reproductive populations have been rarely documented. One study documented a transient adult emigrating from the Hudson River to more southerly populations (Kynard 1997). Other studies have documented isolated occurrences of shortnose sturgeon migrating between the Hudson River and Connecticut River (Attachment 1; New NY Bridge FEIS, 2012, citing others). Migrations of shortnose sturgeon in other tidal river populations including the Gulf of Maine and southeast United States river populations have been documented more frequently. Based on the current studies and behavioral patterns of shortnose sturgeon, any shortnose sturgeon that are documented in the East River would be expected to be transient and such occurrences would be rare. In summary, adult shortnose sturgeon may undergo coastal migrations in search of other tidal river habitat, however such behavior in the New York Bight and consequently the East River, are extremely rare. Based on this, the proposed project is Not Likely to Adversely Affect shortnose sturgeon. In the event that a shortnose sturgeon does enter the East River and the study area, the following conservation measures would be in place to mitigate for any construction related activities: • Turbidity curtains would be used to contain suspended sediment within the affected areas and prevent sturgeon from coming in contact with any increased turbidity or mechanical activity at the outfalls and support shaft sites or within areas requiring mooring of construction barges. A cofferdam would be used during reconstruction of the outfalls to minimize suspended sediment and turbidity. • Conservation measures to mitigate the noise created from pile driving and pile drilling would be used and consist of gradually ramping up pile driving, use of a cushion block, and bubble curtains, where practicable, during installation of the support shafts and footings for the shared used flyover bridge.

References

- Bain, M., Arend, K., Haley, N., Hayes, S., Knight, J., Nack, S., ... & Walsh, M. 1998. Sturgeon of the Hudson River. Final Report to the Hudson River Foundation, New York, New York.
- Bain, M.B. 1997. Atlantic and shortnose sturgeons of the Hudson River: common and divergent life history attributes. Environmental Biology of Fishes 48:347-358.
- Bain, M.B., N. Haley, D. Peterson, J. R. Waldman, and K. Arend. 2000. Harvest and habitats of Atlantic sturgeon Acipenser oxyrinchus Mitchill, 1815, in the Hudson River Estuary: Lessons for Sturgeon Conservation. Instituto Espanol de Oceanografia. Boletin 16: 43-53.
- Blumberg, A. F., & Pritchard, D. W. 1997. Estimates of the transport through the East River, New York. Journal of Geophysical Research: Oceans (1978–2012), 102(C3), 5685-5703.
- Dadswell, M.J., B.D. Taubert, T.S. Squiers, D. Marchette, and J. Buckley. 1984. Synopsis of biological data on shortnose sturgeon, Acipenser brevirostrum LeSueur 1818. National Oceanic and Atmospheric Administration Technical Report NMFS 14, Washington, DC.
- Erickson, D.L., A. Kahnle, M.J. Millard, E.A. Mora, M. Bryja, A. Higgs, J. Mohler, M. DuFour, G. Kenney, J. Sweka, and E.K. Pikitch. 2011. Use of pop-up satellite archival tags to identify oceanic migratory patterns for adult Atlantic sturgeon, Acipenser oxyrinchus oxyrinchus Mitchell, 1815. Journal of Applied Ichthyology 27: 356-365.
- Eyler, S.M. 2006. Atlantic sturgeon migratory movements and bycatch in commercial fisheries based on tagging data. Summary Report submitted to U.S. Fish and Wildlife Service, Maryland Fishery Resources Office, Annapolis, MD. 31 pp
- Federal Highway Administration. 2012. New NY Bridge Final Environmental Impact Statement Appendices F-8 and F-10. Accessed from http://www.newnybridge.com/environmental-doc/
- Kynard, B. 1997. Life history, latitudinal patterns, and status of the shortnose sturgeon, Acipenser brevirostrum. Environmental Biology of Fishes 48:319-334.
- National Oceanic and Atmospheric Association (NOAA). 2015. Chart 12335 Hudson and East Rivers: Governor's Island to 67th Street. Accessed from http://www.charts.noaa.gov/PDFs/12335.pdf
- Tomichek, C. et al. 2014. Tagged Species Detection: Approach to Monitoring Marine Species at Marine Hydrokinetic Projects. Proceedings of the 2nd Marine Energy Technology Symposium, Seattle, WA. April, 2014.

ATTACHMENT 4
EFH ASSESSMENT WORKSHEET AND EFH ASSESSMENT

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

Hazen and Sawyer / AKRF, JV
440 Park Avenue South
New York, NY 10016
tel: 212 696-0670
fax: 212 213-3191

East Side Coastal Resiliency Project: Alternative 4
New York City Department of Design and Construction
Attachment 4: Essential Fish Habitat Assessment

Essential Fish Habitat (EFH) in the study area was identified by utilizing the Greater Atlantic Regional Fisheries Office (GARFO) "Guide to Essential Fish Habitat Designations in the Northeastern United States." Per NOAA NMFS guidance, the EFH species to assess in this consultation were those species that occurred in the mixing zone of the Hudson/Raritan Estuary (**Table 1**). A NOAA Fisheries Northeast Regional Office EFH Assessment Worksheet for Federal Agencies is attached. A description of the EFH life stages for the species in **Table 1** are provided below, followed by the Principal Conclusions concerning project related effects associated with Alternative 4.

EFH Analysis

Each species with the potential to occur in the study area is listed in **Table 1** along with the applicable life stage. Project related impact assessments for each species are provided below. Resources utilized for this assessment include the Guide to Essential Fish Habitat Descriptions provided by GARFO, EFH Assessments and Environmental Impact Statements conducted by others within the East River[1], EFH Source Documents from the Northeast Fisheries Science Center, and other literature and studies.

Table 1 - Essential Fish Habitat within the ESCR Study Area

Species	Eggs	Larvae	Juveniles	Adults
Red hake (*Urophycis chuss*)		X	X	X
Winter flounder (*Pseudopleuronectes americanus*)	X	X	X	X
Windowpane flounder (*Scophthalmus aquosus*)	X	X	X	X
Atlantic herring (*Clupea harengus*)		X	X	X
Bluefish (*Pomatomus saltatrix*)			X	X
Atlantic butterfish (*Peprilus triacanthus*)		X	X	X
Summer flounder (*Paralichthys dentatus*)		X	X	X
Black sea bass (*Centropristis striata*)			X	X
King mackerel (*Scomberomorus cavalla*)	X	X	X	X
Spanish mackerel (*Scomberomorus maculatus*)	X	X	X	X
Cobia (*Rachycentron canadum*)	X	X	X	X

Notes:
X = Lifestage is present in study area.

Source: National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the internet at http://www.greateratlantic.fisheries.noaa.gov/hcd/ny3.html

Red hake (*Urophycis chuss*)

EFH for red hake larva consists of surface waters of the Gulf of Maine, Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras, North Carolina. Generally, the

[1] NOAA NMFS GARFO. Guide to Essential Fish Habitat Descriptions. Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/list.htm;
New York City Department of City Planning. 2005. Greenpoint-Williamsburg Rezoning Final Environmental Impact Statement. Accessed from http://www.nyc.gov/html/dcp/html/greenpointwill/eis.shtml;
Metropolitan Transit Authority. 2004. Second Avenue Subway Final Environmental Impact Statement. Accessed from http://web.mta.info/capital/sas_docs/feis.htm

following conditions exist where red hake larvae are found: sea surface temperatures below 19 °C, water depths less than 200 meters, and a salinity greater than 0.5 ppt (NMFS, 1998b). Red hake larvae have been reported from the Hudson-Raritan Estuary; however, they are most abundant at the middle and outer continental shelf throughout the Middle Atlantic Bight (Steimle et al., 1999).

EFH for red hake juveniles consists of bottom habitats with a substrate of shell fragments, including areas with an abundance of live scallops in the Gulf of Maine, on Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras. Generally, the following conditions exist where red hake juveniles are found: water temperatures below 16 °C, depths less than 100 meters, and a salinity range from 31 – 33 ppt (NMFS, 1998b). Shelter is considered crucial for juvenile red hake (Steimle et al., 1999).

EFH for red hake adults consists of bottom habitats in depressions with a substrate of sand and mud in the Gulf of Maine, on Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras. Generally, the following conditions exist where non-spawning red hake adults are found: water temperatures below 12 °C, depths from 10 – 130 meters, and a salinity range from 33 – 34 ppt (NMFS, 1998b). This salinity is above the range found in the East River. Additionally, non-spawning red hake are abundant in the Long Island Sound, but not in the Hudson-Raritan Estuary (Steimle et al., 1999). Spawning adult red hake are known to use the New York Bight primarily in May-June and will utilize waters with salinity less than 25 ppt. The East River meets this salinity range, however both non-spawning and spawning adults do not inhabit water with dissolved oxygen (DO) less than 3 parts per million (ppm). DO in the East River is at or below 3.0 ppm periodically during the summer (NYCDEP, 2015)

High-quality EFH for larval and juvenile red hake is not found in the East River, and red hake larvae and juveniles that occur in the East River are most likely transient. Therefore, no significant adverse effects to red hake larval or juvenile EFH are anticipated as a result of the proposed project. Adult red hake are known to occur in the East River from impingement and entrainment studies conducted at the Ravenswood Power Plant on the Queens side of the East River (Normandeau Associates, 1994). However, adult red hake are not abundant in the Hudson-Raritan Estuary during any season (Stiemle et al., 1999a). Therefore, spawning and non-spawning adult red hake have the potential to occur in the East River but would most likely be transient individuals. Adult red hake would not be anticipated to be found in the East River during the summer when DO is periodically low. Therefore, no significant adverse effects to adult red hake or spawning red hake EFH are anticipated as a result of the proposed project.

Winter flounder (*Pleuronectes americanus*)

EFH for winter flounder eggs consists of bottom waters with a substrate of sand, muddy sand, mud and gravel on Georges Bank, the inshore areas of the Gulf of Maine, southern New England, and the middle Atlantic south to the Delaware Bay. Generally, the following conditions exist where winter flounder eggs are found: water temperatures less than 10 °C, salinities between 10 to 30 ppt, and water depths less than 5 meters (NMFS, 1998c).

Winter flounder larvae EFH consists of pelagic and bottom waters of Georges Bank, the inshore areas of the Gulf of Maine, southern New England, and the middle Atlantic south to the Delaware Bay. Generally, the following conditions exist where winter flounder larvae are found: sea surface temperatures less than 15 °C, salinities between 4 – 30 ppt, and water depths less than 6 meters (NMFS, 1998c).

EFH for winter flounder juveniles consists of bottom waters with a substrate of mud or fine-grained sand on Georges Bank, the inshore areas of the Gulf of Maine, southern New England, and the middle Atlantic south to the Delaware Bay. Young-of-the-year juveniles generally persist where the following conditions are found: water temperatures below 28°C, depths from 0.1 – 10.0 meters, and salinities between 5 – 33 ppt. Juveniles

over one year old are generally found where the following conditions exist: water temperatures below 25°C, depths from 1 – 50 meters, and salinities between 10 – 30 ppt (NMFS, 1998c).

Adult winter flounder EFH consists of bottom waters with a substrate of mud, sand, and gravel on Georges Bank, the inshore areas of the Gulf of Maine, southern New England, and the middle Atlantic south to the Delaware Bay. Generally, the following conditions exist where winter flounder adults are found: water temperatures below 25° C, depths from 1 – 100 meters, and salinities between 15 – 33 ppt (NMFS, 1998c). Adults found in the Hudson-Raritan Estuary are known to utilize waters with salinities as low as 15 ppt, although most were found at salinities less than 22 ppt (Pereira et al. 1999). Spawning winter flounder are typically found in shallower, cooler bottom waters where the temperature is below 15° C, depth is less than 6 meters, and salinity is between 5.5 – 36 ppt (NMFS, 1998c). Winter flounder spawn between February and April in waters with temperatures lower than 15° C, salinities between 10 and 32 ppt, and on substrates sand, gravel, or mud in depths less than 6 meters. Spawning winter founder have the potential to be present in shallow areas of the East River.

Winter flounder were collected during impingement and entrainment studies at the Ravenswood power plant on the Queens side of the East River and found to be the most abundant fish at the site (Normandeau Associates, 1994). Noise from pile driving and pile drilling could potentially have minimal adverse effects to winter flounder in the immediate vicinity of the pile installation and could prevent winter flounder from utilizing that area for the duration of construction. Disturbance of substrate and the water column due to activities associated with barging, construction of the combined sewer outfalls, and construction of the shared use flyover bridge support structures could potentially cause a temporary increase in turbidity and result in temporary effects to winter flounder EFH. In addition, temporary shading from barges may adversely affect some habitat. Construction BMPs such as turbidity curtains would be utilized to limit turbidity and potential effects to winter flounder EFH. Conservation measures to limit the noise of the pile driving and drilling to the greatest extent practicable would be implemented. These include using a cushion block to dampen the impact of the pile hammer, ramping up pile driving gradually to give fish opportunities to vacate the construction area, and a bubble curtain would be implemented, as practicable, for installation of the flyover bridge support shafts. The study area constitutes a very small portion of the available EFH for this species, therefore, some temporary construction related effects to EFH could occur, however no significant adverse effects to EFH for any lifestage of winter flounder are anticipated as a result of the proposed project.

Windowpane flounder (*Scopthalmus aquosus*)

Windowpane flounder, also called sand flounder, is found from the Gulf of St. Lawrence to South Carolina and has its maximum abundance in the New York Bight. EFH for windowpane flounder eggs consists of surface waters around the perimeter of the Gulf of Maine, on Georges Bank, southern New England, and the middle Atlantic south to Cape Hatteras. Generally, windowpane flounder eggs are found where sea surface temperatures are less than 20 °C and water depths are less than 70 meters (NMFS, 1998d).

EFH for windowpane flounder larvae consists of pelagic waters around the perimeter of the Gulf of Maine, on Georges Bank, southern New England, and the middle Atlantic south to Cape Hatteras. Generally, windowpane flounder larvae are found where sea surface temperatures are less than 20 °C, and water depths are less than 70 meters (NMFS, 1998d). Based on collections from southern New Jersey, it appears that settlement of spring-spawned individuals occurs both in estuaries and on the continental shelf, while settlement of autumn-spawned individuals occurs primarily on the continental shelf (Chang et al., 1999).

EFH for juvenile windowpane flounder consists of bottom habitats with a substrate of mud or fine-grained sand around the perimeter of the Gulf of Maine, on Georges Bank, southern New England and the middle Atlantic south to Cape Hatteras (NMFS, 1998d). Generally, the following conditions exist where windowpane

flounder juveniles are found: water temperatures below 25 °C, depths between 1 – 100 meters, and salinities between 5.5 – 36 ppt (NMFS, 1998d). In the Hudson-Raritan Estuary, juveniles were fairly evenly distributed throughout the estuary, but were most abundant in the deeper channels in winter and summer (Wilk et al., 1996).

EFH for adult windowpane flounder consists of bottom habitats with a substrate of mud or fine-grained sand around the perimeter of the Gulf of Maine, on Georges Bank, southern New England and the middle Atlantic south to the Virginia-North Carolina border. Generally, the following conditions exist where windowpane flounder adults are found: water temperatures below 21 °C, depths between 1 – 75 meters, and salinities between 5.5 – 36 ppt. Adult windowpane flounder are sensitive to hypoxic conditions and have been found to avoid conditions where DO levels were less than 3 ppm (Howell and Simpson 1994). During the summer, DO in the water column and bottom waters of the East River can be reduced to less than 3 ppm, making this unsuitable habitat for windowpane flounder.

As with winter flounder, the windowpane flounder is a bottom-dwelling species that has the potential to be affected by Alternative 4 of the proposed project. Noise from pile driving and pile drilling could potentially have minimal adverse effects on winter flounder in the immediate vicinity of the pile installation and could prevent windowpane flounder from utilizing that area for the duration of construction. Disturbance of substrate and the water column due to activities associated with barging, construction of the combined sewer outfalls, and construction of the shared use flyover bridge support structures could potentially cause a temporary increase in turbidity and result in temporary effects to windowpane flounder EFH. In addition, temporary shading from barges may adversely affect some habitat. Construction BMPs such as turbidity curtains would be utilized to limit turbidity and potential effects to windowpane flounder EFH. Conservation measures to limit the noise of the pile driving and drilling to the greatest extent practicable would be implemented. These include using a cushion block to dampen the impact of the pile hammer, ramping up pile driving gradually to give fish opportunities to vacate the construction area, and a bubble curtain would be implemented, as practicable, for installation of the flyover bridge support shafts. The study area constitutes a very small portion of the available EFH for this species, therefore, some temporary construction related effects to EFH could occur, however no significant adverse effects to EFH for any lifestage of windowpane flounder are anticipated as a result of the proposed project.

Atlantic sea herring (*Clupea harengus*)

EFH for Atlantic herring larvae consists of pelagic waters in the Gulf of Maine, Georges Bank, and southern New England. Generally, the following conditions exist where Atlantic herring larvae are found: sea surface temperatures below 16 °C, water depths from 50 – 90 meters, and salinities around 32 ppt (NMFS, 1998e). The East River does not contain suitable depth or salinity for Atlantic herring larvae. Therefore, no significant adverse effects to Atlantic herring larvae EFH are anticipated as a result of the proposed project.

EFH for Atlantic herring juveniles and adults consists of pelagic waters and bottom habitats in the Gulf of Maine, Georges Bank, southern New England, and the middle Atlantic south to Cape Hatteras. Generally, the following conditions exist where Atlantic herring juveniles and adults are found: water temperatures below 10 °C, water depths from 15 – 135 meters, and a salinity range from 26 – 32 ppt. The East River is on the low end of the preferred salinity for juvenile and adult Atlantic herring (NMFS, 1998e).

Atlantic herring juveniles and adults are known to occur in the Hudson-Raritan estuary in winter and spring from bottom trawling surveys (Stevenson and Scott, 2005) and have been collected during entrainment studies at the Ravenswood power plant in Queens (Normandeau Associates, 1994). However, water temperatures in other seasons in the East River would likely be too high to support juvenile and adult Atlantic herring. Juvenile and adult Atlantic herring prefer DO in bottom habitats between 6 – 12 ppm. Water quality monitoring in the East River shows DO at the bottom of the East River is only suitable for

Atlantic herring in the winter and spring (NYCDEP, 2015). Atlantic herring could potentially utilize the East River during winter and spring when DO and water temperatures are suitable. Construction of at least part of the proposed project is anticipated to occur in the winter and therefore has the potential to effect Atlantic herring. Noise from pile driving and pile drilling could potentially have minimal adverse effects on Atlantic herring in the immediate vicinity of the pile installation and could prevent Atlantic herring from utilizing that area for the duration of construction. Disturbance of substrate and the water column due to activities associated with barging, construction of the combined sewer outfalls, and construction of the shared use flyover bridge support structures could potentially cause a temporary increase in turbidity and result in temporary effects to Atlantic herring EFH. In addition, temporary shading from barges may adversely affect some habitat. Construction BMPs such as turbidity curtains would be utilized to limit turbidity and potential effects to Atlantic herring EFH. Conservation measures to limit the noise of the pile driving and drilling to the greatest extent practicable would be implemented. These include using a cushion block to dampen the impact of the pile hammer, ramping up pile driving gradually to give fish opportunities to vacate the construction area, and a bubble curtain would be implemented, as practicable, for installation of the flyover bridge support shafts. The study area constitutes a very small portion of the available EFH for this species, therefore, some temporary construction related effects to EFH could occur, however no significant adverse effects to EFH for any lifestage or the fishery of Atlantic herring are anticipated as a result of the proposed project.

Bluefish (*Pomatomus saltatrix*)

EFH for juvenile bluefish consists of pelagic waters over the continental shelf from Nantucket Island south to Key West, and estuaries from Penobscot Bay south to coastal Florida. Generally, juvenile bluefish prefer water temperatures between 19 – 24 °C and salinities between 23 – 36 ppt (NMFS, 1998f). Trawl surveys in the Hudson-Raritan Estuary found juvenile bluefish throughout the area in all depths sampled during the summer and fall, and no occurrences of juvenile bluefish during the winter and spring (Fahay et al., 1999).

Adult bluefish EFH consists of pelagic waters over the continental shelf from Nantucket Island south through Key West, and estuaries from Penobscot Bay, Maine south to Key West, Florida. Generally, juvenile bluefish prefer water temperatures between 14 – 16 °C and salinities greater than 25 ppt (NMFS, 1998f). Adult bluefish are highly migratory and occur seasonally in Mid-Atlantic estuaries from April to October (Fahay et al., 1999). Due to their migratory tendencies, any adult bluefish that occur in the East River would be anticipated to be transient individuals. Since bluefish are not a bottom dwelling species, any temporary increases in turbidity or shading due to barging and outfall construction activities are not anticipated to have a significant adverse effect. Noise from pile driving and pile drilling could potentially have minimal adverse effects to bluefish in the immediate vicinity of the pile installation and could prevent bluefish from utilizing that area for the duration of construction. Conservation measures to limit the noise of the pile driving and drilling to the greatest extent practicable would be implemented. These include using a cushion block to dampen the impact of the pile hammer, ramping up pile driving gradually to give fish opportunities to vacate the construction area, and a bubble curtain would be implemented, as practicable, for installation of the flyover bridge support shafts. The study area constitutes a very small portion of the available EFH for this species, therefore, some temporary construction related effects to EFH could occur, however no significant adverse effects to EFH for any lifestage or the fishery of bluefish are anticipated as a result of the proposed project.

Atlantic butterfish (*Peprilus triacanthus*)

EFH for Atlantic butterfish larvae consists of pelagic waters over the continental shelf from the Gulf of Maine to Cape Hatteras, and estuaries from Boston Harbor south to the Chesapeake Bay. Generally, the following conditions exist where Atlantic butterfish larvae are found: water temperatures between 9 – 19 °C, salinities between 6.4 – 37 ppt, and water depths between than 10 meters – 1829 meters (NMFS, 1998f).

Juvenile Atlantic butterfish EFH consists of pelagic waters over the continental shelf from the Gulf of Maine through Cape Hatteras, and estuaries from Boston Harbor south to the James River in Virginia. Generally, the following conditions exist where Atlantic butterfish juveniles are found: water temperatures between 3 – 28 °C, salinities between 3 – 37 ppt, and water depths between 10 meters – 365 meters (though most are found at depths less than 120 meters) (NMFS, 1998f).

EFH for Atlantic butterfish adults consists of pelagic waters over the continental shelf from the Gulf of Maine through Cape Hatteras, and estuaries from Boston Harbor south to the James River in Virginia. Generally, the following conditions exist where Atlantic butterfish juveniles are found: water temperatures between 3 - 28 °C, salinities between 4 – 26 ppt, and water depths between 10 meters – 365 meters (though most are found at depths less than 120 meters) (NMFS, 1998f). Adults are most common in the New York Harbor in the summer and have been found over shallow flats, estuaries, and may congregate on the bottom during the day.

In Hudson-Raritan trawl surveys, juvenile and adult Atlantic butterfish were collected at water temperatures ranging from 8 – 26 ºC, depths ranging from 3 – 23 meters, salinities ranging from 19 – 32 ppt, and DO levels ranging from 3 –10 ppm (Cross et al, 1999). Atlantic butterfish is primarily a pelagic species (Woodhead, 1990), and although Atlantic butterfish may be present in the East River, it is primarily anticipated to use the East River as a migratory route and therefore their presence would be transient. As such, the temporary construction activities would be occurring on the shoreline and would not be anticipated to significantly adversely impact any lifestage of Atlantic butterfish.

Summer flounder (*Paralicthys dentatus*)

EFH for summer flounder larvae consists of pelagic waters over the continental shelf from the Gulf of Maine south to the east coast of Florida, and estuaries from the Waquoit Bay, Massachusetts south to the Indian River, Florida. Generally, the following conditions exist where summer flounder larvae are found: water temperatures between 9 – 12 °C, salinities between 23 – 33 ppt, and water depths between 10 – 70 meters (NMFS, 1998f).

EFH for summer flounder juveniles consists of bottom habitat with mud or sand substrates in continental shelf waters from Gulf of Maine south to the east coast of Florida, and estuaries from the Waquoit Bay south to the Indian River. Generally, the following conditions exist where summer flounder juveniles are found: water temperatures greater than 11 °C, salinities between 10 – 30 ppt, and water depths between 0.5 – 5 meters (NMFS, 1998f).

EFH for summer flounder adults consists of bottom habitat with mud or sand substrates in continental shelf waters from Gulf of Maine south to the east coast of Florida, and estuaries from the Buzzards Bay, Massachusetts south to the Indian River (NMFS, 1998f). Generally, adults are found at depths up to 25 meters and in temperatures ranging from 9 to 26°C in the autumn, 4 to 13°C in the winter, 2 to 20°C in the spring, and 9 to 27°C in the summer. Salinity is known to have minimal effect on distribution in comparison to substrate preference. Trawl surveys from 1992 to 1997 found adult summer flounder to be present in moderate numbers throughout the Hudson-Raritan Estuary in all seasons except winter (Packer et al., 1999; Zetlin et. al., 1999).

As with the winter flounder and windowpane flounder described above, the summer flounder is a bottom dwelling species that has potential to be affected by pile driving and the temporary increases in turbidity and shading due to barging, outfall construction, and the shared use flyover bridge support structures construction activities in the study area. However, the study area constitutes a small portion of the EFH for this species, and any temporary changes to summer flounder habitat in the study area would not significantly affect this

fishery. Conservation measures to limit the noise of the pile driving and drilling to the greatest extent practicable would be implemented. These include using a cushion block to dampen the impact of the pile hammer, ramping up pile driving gradually to give fish opportunities to vacate the construction area, and a bubble curtain would be implemented, as practicable, for installation of the flyover bridge support shafts. Therefore, no significant adverse effects to EFH for the larvae, juvenile and adult lifestages or the fishery of summer flounder are anticipated as a result of the proposed project.

Black sea bass (*Centropristus striata*)

EFH for black sea bass juveniles consists of demersal waters over the continental shelf from the Gulf of Maine to Cape Hatteras, and estuaries from Buzzards Bay south to the James River. Generally, juvenile black sea bass are found in waters warmer than 6 °C with salinities greater than 18 ppt, and depths between 1 – 28 meters. Juvenile black sea bass are found in the estuaries in the summer and spring, and overwinter offshore from New Jersey and south. Juvenile black sea bass require structural complexity in both offshore and inshore substrates including rough bottoms, shellfish and eelgrass beds, and man-made structures in sandy-shelly areas. Offshore clam beds and shell patches may also be used during the wintering (NMFS, 1998h; Drohan et al., 2007). Black sea bass were captured during impingement and entrainment studies at the Ravenswood power plant in Queens (Normandeau Associates, 1994).

EFH for black sea bass adults consists of demersal waters over the continental shelf from the Gulf of Maine to Cape Hatteras, and estuaries from Buzzards Bay south to the James River. Black sea bass adults are generally found in estuaries from May through October and overwinter offshore south of New York to North Carolina from November through April. Generally, adult sea bass are found in waters warmer than 6 °C with salinities greater than 20 ppt, and depths between 20 – 50 meters. Structured habitats (natural and man-made), sand and shell rocky reefs, cobble and rock fields, stone coral patches, exposed stiff clay, and mussel beds are usually the substrate preference (NMFS, 1998h; Drohan et al., 2007). Spawning occurs in the Mid-Atlantic Bight in April through October. Black sea bass are only present in the inshore areas of the New York Harbor in the winter months.

Due to the preference of black sea bass for structured habitats, they are not uncommonly found underneath man-made structures such as docks and piers. Therefore, it is likely that black sea bass juvenile and adults are present in the study area. Construction activities are therefore likely to temporarily effect some black sea bass and make the area of the construction activities unsuitable for black sea bass for the duration of construction. Construction BMP's such as turbidity curtains would be implemented to minimize re-suspension of particulates into the water column. Conservation measures to limit the noise of the pile driving and drilling to the greatest extent practicable would be implemented. These include using a cushion block to dampen the impact of the pile hammer, ramping up pile driving gradually to give fish opportunities to vacate the construction area, and a bubble curtain would be implemented, as practicable, for installation of the flyover bridge support shafts. Therefore, there is the potential for temporary construction related effects to black sea bass juveniles and adults, however the study area is small in size and would not be anticipated to significantly adversely impact black sea bass.

King mackerel (*Scomberomorus cavalla*)

King mackerel are marine species of fish that can occur as far north as Rhode Island and south to Brazil. They are most common in warmer waters around the Chesapeake Bay southward. EFH for King mackerel eggs, larvae, juveniles, and adults consists of sandy shoals of capes and offshore bars, high profile rocky bottom and barrier-island ocean-side waters from the surf to the shelf break zone, from the Gulf Stream shoreward, including *Sargassum*, coastal inlets, and all state-designated nursery habitats of particular importance to coastal migratory pelagic species (NMFS, 1998i). King mackerel generally favor deeper and warmer waters than are typically found in the East River. Any king mackerel in the East River would be

Virginia
Submerged Aquatic Vegetation mapping
http://web.vims.edu/bio/sav/maps.html

anticipated to be rare and transient individuals. Therefore, no significant adverse effects to EFH for any lifestage of king mackerel are anticipated as a result of the proposed project.

Spanish mackerel (*Scomberomorus maculatus*)

Spanish mackerel are marine species of fish that can occur as far north as Connecticut and south to the Yucatan Peninsula. They are most common between the Chesapeake Bay and the Gulf of Mexico. Spanish mackerel overwinter in waters off of south Florida. EFH for Spanish mackerel eggs, larvae, juveniles, and adults consists of sandy shoals of capes and offshore bars, high profile rocky bottom and barrier-island ocean-side waters from the surf to the shelf break zone, from the Gulf Stream shoreward, including *Sargassum*, coastal inlets, and all state-designated nursery habitats of particular importance to coastal migratory pelagic species (NMFS, 1998i). Spanish mackerel generally favor higher salinities (greater than 30 ppt) and warmer waters (18 °C or more). Any Spanish mackerel in the East River would be anticipated to be rare and transient individuals. Therefore, no significant adverse effects to EFH for any lifestage of Spanish mackerel are anticipated as a result of the proposed project.

Cobia (*Rachycentron canadum*)

Cobia is a large, highly migratory species that is known to occur from Cape Cod, Massachusetts to Argentina (ESS, 2013). EFH for cobia eggs, larvae, juveniles, and adults consists of sandy shoals of capes and offshore bars, high profile rocky bottom and barrier-island ocean-side waters from the surf to the shelf break zone, from the Gulf Stream shoreward, including *Sargassum*, coastal inlets, high-salinity bays, estuaries, and seagrass habitat. Information about the distribution of cobia lifestages on the East Coast is limited. However, cobia are most abundant in the Gulf of Mexico where they spawn and then leave the Gulf to commence extreme migrations. No cobia lifestages were documented in entrainment studies at the Ravenswood power plant (Normandeau Associates, 1994). Any cobia in the East River would be anticipated to be rare and transient individuals. Therefore, no significant adverse effects to EFH for any lifestage of cobia are anticipated as a result of the proposed project.

Principal Conclusions

There would be minimal adverse effects to the EFH for winter flounder, windowpane flounder, summer flounder, Atlantic herring, and black sea bass as a result of construction activities associated with the proposed project. As discussed above, one or more lifestages of these species are likely to occur in the East River and could potentially utilize areas of the East River that would be affected by temporary construction related activities for the proposed project. The remainder of the species identified in **Table 1** would not be anticipated to be found in the East River due to either unsuitable environmental conditions, such as salinity, temperature, or DO; unsuitable depths; unsuitable substrates or other habitat features. Additionally, several species listed as potentially occurring in the study area would occur at the extreme limit of their known ranges or are highly migratory. These species would only be anticipated to occur in the East River as uncommon and transient individuals.

The effects to the EFH for species listed above would result from the in-water construction activities associated with Alternative 4 of the proposed ESCR project and would primarily be temporary and limited to small localized areas where (1) barging would occur; (2) temporary mooring appurtenances are installed for barges; (3) combined sewer outfalls are reconstructed; (4) embayments are filled and reconstructed in new locations; and (5) pile driving and pile drilling and construction activities associated with in-water support shafts for the flyover pedestrian bridge and the East River Park esplanade. Temporary effects from these activities would include re-suspension of fine particulate matter into the water column, shading by barges, construction noise including noise from in-water pile driving and pile drilling, and disturbance to the benthic invertebrate community. The majority of the permanent effects to the study area would result from the filling of embayments with limited additional permanent effects resulting from construction of the support shafts.

However, the embayments would be reconstructed in kind along the East River Park waterfront. For additional information about these permanent effects, see **Attachment 2**.

The effects on EFH would be small in scale and are not anticipated to result in significant adverse effects to EFH for any of the lifestages of the species listed above. Best Management Practices (BMP) would be utilized to the greatest extent practicable during construction of ESCR. These BMPs would include turbidity curtains surrounding all operations that disturb East River sediments. Turbidity curtains would minimize the spread of re-suspended particles. Spill prevention techniques for construction equipment and barges would also be implemented. The swift currents in the East River would further alleviate any localized turbidity resulting from construction. Spill kits would be kept on all construction barges. The combined sewer outfalls to be reconstructed would drain inland areas similar to existing conditions. No discharge of any kind would occur from the outfall during non-storm conditions. To minimize adverse effects to aquatic life due to pile driving and pile drilling, a variety of conservation measures will be implemented. These include using a cushion block to dampen the impact hammer, gradually ramping up pile driving so as to warn aquatic life and give fish a chance to vacate the impact area, and the use of a bubble curtain, where practicable, for installation of the shared use flyover bridge support shafts to reduce in-water noise peaks. Due to these BMP's and conservation measures, and the limited duration and footprint of the project, there is no mitigation to EFH proposed. The New York City Department of Design and Construction (DDC) will coordinate with New York State Department of Environmental Conservation (NYSDEC) and U.S. Army Corps of Engineers to mitigate for any adverse effects to tidal wetland areas under NYCRR Article 25 and Section 404 of the Clean Water Act, respectively.

References Cited

Chang S, Berrien PL, Johnson DL, Morse WW. 1999. Essential fish habitat source document: Windowpane, Scophthalmus aquosus, life history and habitat characteristics. NOAA Tech Memo NMFS NE 137; 32 p.

Cross JN, Zetlin CA, Berrien PL, Johnson DL, McBridge C. 1999. Essential fish habitat source document: Butterfish, Peprilus triacanthus, life history and habitat characteristics. NOAA Tech Memo NMFS NE 145; 42 p.

Drohan AF, Manderson JP, and Packer DB. 2007. Essential fish habitat source document: Black sea bass, Centropristis striata, life history and habitat characteristics. Second Edition. NOAA Tech Memo NMFS NE 143; 42 p.

ESS Group, Inc. (ESS). 2013. ESSENTIAL FISH HABITAT ASSESSMENT West Point In-River Transmission Cable Project Hudson River, New York. Accessed from http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B9A8C2628-6A7F-4EB6-A620-BFA9ECF9C3CE%7D

Fahay MP, Berrien PL, Johnson DL, Morse WW. 1999. Essential fish habitat source document: Bluefish, Pomatomus saltatrix, life history and habitat characteristics. NOAA Tech Memo NMFS NE 144; 64 p.

Howell, P. and D. Simpson. 1994. Abundance of marine resources in relation to dissolved oxygen in Long Island Sound. Estuaries 17: 394-402.

National Marine Fisheries Service (NMFS). 1998b. Essential Fish Habitat Description Red hake (Urophycis chuss). Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/red-hake.pdf

National Marine Fisheries Service (NMFS). 1998c. Essential Fish Habitat Description Winter flounder (Pseudopleuronectes americanus). Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/winter.pdf

National Marine Fisheries Service (NMFS). 1998d. Essential Fish Habitat Description Windowpane flounder (Scophthalmus aquosus). Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/windowpane.pdf

National Marine Fisheries Service (NMFS). 1998e. Essential Fish Habitat Description Atlantic herring (Clupea harengus). Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/herring.pdf

National Marine Fisheries Service (NMFS). 1998f. Summary of Essential Fish Habitat (EFH) and General Habitat Parameters for Federally Managed Species. Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/efhtables.pdf

National Marine Fisheries Service (NMFS). 1998h. Essential Fish Habitat Description Black sea bass (Centropristis striata). Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/blackseabass.htm

National Marine Fisheries Service (NMFS). 1998i. Essential Fish Habitat Description Coastal Migratory Pelagics. Accessed from http://www.greateratlantic.fisheries.noaa.gov/hcd/mackcobia.htm

New York City Department of Environmental Protection (NYCDEP). 2015. Harbor Water Sampling Data. Accessed from http://www.nyc.gov/html/dep/html/harborwater/harbor_water_sampling_results.shtml

Normandeau Associates. 1994. Ravenswood Generating Station Impingement and Entrainment Report, February 1993 through January 1994.

Packer DB, Griesbach SJ, Berrien PL, Johnson DL, Zetlin CA, Morse WW. 1999. Essential fish habitat source document: Summer Flounder, Paralichthys denatus, life history and habitat characteristics. NOAA Tech Memo NMFS NE 151; 88 p.

Pereira JJ, Goldberg R, Ziskowski JJ, Berrien PL, Morse WW, Johnson DL. 1999. Essential fish habitat source document: Winter Flounder, Pseudopleuronectes americanus, life history and habitat characteristics. NOAA Tech Memo NMFS NE 138; 39 p.

Steimle FW, Morse WW, Berrien PL, Johson DL. 1999a. Essential fish habitat source document: Red Hake, Urophycis chuss, life history and habitat characteristics. NOAA Tech Memo NMFS NE 133; 34 p.

Stevenson DK and Scott ML.2005. Essential fish habitat source document: Atlantic herring, Clupea harengus, life history and habitat characteristics. Second Edition. NOAA Tech Memo NMFS NE 126; 48 p.

Wilk, S.J., E.M. MacHaffie, D.G. McMillan, A.L. Pacheco, R.A. Pikanowski, and L.L. Stehlik. 1996. Fish, megainvertebrates, and associated hydrographic observations collected in the Hudson-Raritan Estuary, January 1992-December 1993. U.S. Natl. Mar. Fish. Serv., Northeast Fish. Sci. Cent. Ref. Doc. 96-14. 95 p.

Woodhead, P.M.J. 1990. The Fish Community of New York Harbor: Spatial and temporal Distribution of major Species. Report to the New York - New Jersey Harbor Estuary Program, New York, NY.

Zetlin CA, Johnson DL, Morse WW. 1999. Essential fish habitat source document: Summer Flounder, Paralichthys dentatus, life history and habitat characteristics. NOAA Tech Memo NMFS NE 151; 88 p.

NOAA FISHERIES
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
Essential Fish Habitat (EFH) Consultation Guidance
EFH ASSESSMENT WORKSHEET

Introduction:

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) mandates that federal agencies conduct an essential fish habitat (EFH) consultation with NOAA Fisheries regarding any of their actions authorized, funded, or undertaken that may adversely affect EFH. An adverse effect means any impact that reduces the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

This worksheet has been designed to assist in determining whether a consultation is necessary and in preparing EFH assessments. This worksheet should be used as your EFH assessment or as a guideline for the development of your EFH assessment. At a minimum, all the information required to complete this worksheet should be included in your EFH assessment. If the answers in the worksheet do not fully evaluate the adverse effects to EFH, we may request additional information in order to complete the consultation.

An expanded EFH assessment may be required for more complex projects in order to fully characterize the effects of the project and the avoidance and minimization of impacts to EFH. While the EFH worksheet may be used for larger projects, the format may not be sufficient to incorporate the extent of detail required, and a separate EFH assessment may be developed. However, regardless of format, the analysis outlined in this worksheet should be included for an expanded EFH assessment, along with additional information that may be necessary. This additional information includes:

- the results of on-site inspections to evaluate the habitat and site-specific effects
- the views of recognized experts on the habitat or the species that may be affected
- a review of pertinent literature and related information
- an analysis of alternatives to the action that could avoid or minimize the adverse effects on EFH.

Your analysis of adverse effects to EFH under the MSA should focus on impacts to the habitat for all life stages of species with designated EFH, rather than individual responses of fish species. Fish habitat includes the substrate and benthic resources (e.g., submerged

aquatic vegetation, shellfish beds, salt marsh wetlands), as well as the water column and prey species.

Consultation with us may also be necessary if a proposed action results in adverse impacts to other NOAA-trust resources. Part 6 of the worksheet is designed to help assess the effects of the action on other NOAA-trust resources. This helps maintain efficiency in our interagency coordination process. In addition, further consultation may be required if a proposed action impacts marine mammals or threatened and endangered species for which we are responsible. Staff from our Greater Atlantic Regional Fisheries Office, Protected Resources Division should be contacted regarding potential impacts to marine mammals or threatened and endangered species.

Instructions for Use:

Federal agencies must submit an EFH assessment to NOAA Fisheries as part of the EFH consultation. Your EFH assessment must include:

1) A description of the proposed action.
2) An analysis of the potential adverse effects of the action on EFH, and the managed species.
3) The federal agency's conclusions regarding the effects of the action on EFH.
4) Proposed mitigation if applicable.

In order for this worksheet to be considered as your EFH assessment, you must answer the questions in this worksheet fully and with as much detail as available. Give brief explanations for each answer.

Federal action agencies or the non-federal designated lead agency should submit the completed worksheet to NOAA Fisheries Greater Atlantic Regional Fisheries Office, Habitat Conservation Division (HCD) with the public notice or project application. Include project plans showing existing and proposed conditions, all waters of the U.S. on the project site, with mean low water (MLW), mean high water (MHW), high tide line (HTL), and water depths clearly marked and sensitive habitats mapped, including special aquatic sites (submerged aquatic vegetation, saltmarsh, mudflats, riffles and pools, coral reefs, and sanctuaries and refuges), hard bottom habitat areas and shellfish beds, as well as any available site photographs.

For most consultations, NOAA Fisheries has 30 days to provide EFH conservation recommendations once we receive a complete EFH assessment. Submitting all necessary information at once minimizes delays in review and keeps review timelines consistent. Delays in providing a complete EFH assessment can result in our consultation review period extending beyond the public comment period for a particular project.

The information contained on the HCD website (http://www.greateratlantic.fisheries.noaa.gov/habitat/) will assist you in completing this worksheet. The HCD website contains information regarding: the EFH consultation process; Guide to EFH Designations which provides a geographic species list; Guide to EFH Species Descriptions which provides the legal description of EFH as well as important ecological information for each species and life stage; and other EFH reference documents including examples of EFH assessments and EFH consultations.

Our website also includes a link to the NOAA EFH Mapper (http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html). We would note that the EFH Mapper is currently being updated and revised. Should you use the EFH Mapper to identify federally managed species with designated EFH in your project area, we recommend checking this list against the Guide to Essential Fish Habitat Designations in the Northeast (http://www.greateratlantic.fisheries.noaa.gov/hcd/index2a.htm) to ensure a complete and accurate list is provided.

EFH ASSESSMENT WORKSHEET FOR FEDERAL AGENCIES (modified 3/2016)

PROJECT NAME: EAST SIDE COASTAL RESILIENCY

DATE: 2/7/2019

PROJECT NO.: SANDRESM1

LOCATION (Water body, county, physical address): EAST RIVER, NEW YORK COUNTY, NEW YORK CITY, NEW YORK

PREPARER: JESSICA EINHORN (HAZEN AND SAWYER)

Step 1: Use the Habitat Conservation Division EFH webpage's Guide to Essential Fish Habitat Designations in the Northeastern United States to generate the list of designated EFH for federally-managed species for the geographic area of interest (http://www.greateratlantic.fisheries.noaa.gov/hcd/index2a.htm). Use the species list as part of the initial screening process to determine if EFH for those species occurs in the vicinity of the proposed action. The list can be included as an attachment to the worksheet. Make a preliminary determination on the need to conduct an EFH consultation.

1. INITIAL CONSIDERATIONS		
EFH Designations	**Yes**	**No**
Is the action located in or adjacent to EFH designated for eggs? **List the species:** Winter flounder, windowpane flounder, summer flounder, king mackerel, Spanish mackerel, and cobia.	X	
Is the action located in or adjacent to EFH designated for larvae? **List the species:** Red hake, winter flounder, windowpane flounder, Atlantic herring, Atlantic butterfish, summer flounder, king mackerel, Spanish mackerel, and cobia.	X	
Is the action located in or adjacent to EFH designated for juveniles? **List the species:** Red hake, winter flounder, windowpane flounder, Atlantic herring, bluefish, Atlantic butterfish, summer flounder, black sea bass, king mackerel, Spanish mackerel, and cobia.	X	

Is the action located in or adjacent to EFH designated for adults or spawning adults? **List the species:** Red hake, winter flounder, windowpane flounder, Atlantic herring, bluefish, Atlantic butterfish, summer flounder, black sea bass, king mackerel, Spanish mackerel, and cobia.	X	

If you answered no to all questions above, then EFH consultation is not required - go to Section 5. If you answered yes to any of the above questions proceed to Section 2 and complete remainder of the worksheet.

<u>Step 2</u>: In order to assess impacts, it is critical to know the habitat characteristics of the site before the activity is undertaken. Use existing information, to the extent possible, in answering these questions. Identify the sources of the information provided and provide as much description as available. These should not be yes or no answers. Please note that there may be circumstances in which new information must be collected to appropriately characterize the site and assess impacts. Project plans that show the location and extent of sensitive habitats, as well as water depths, the HTL, MHW and MLW should be provided.

2. SITE CHARACTERISTICS

Site Characteristics	Description
Is the site intertidal, sub-tidal, or water column?	**The East River within the project area includes both sub-tidal and water column areas as well as a very small area (~6,200 square feet) of intertidal area.**
What are the sediment characteristics?	**Sediment in the East River within the shallower areas of the project area is primarily sand, gravel, and riprap. Sediments in the greater East River have been reported to be silty mud.**
Is there submerged aquatic vegetation (SAV) at or adjacent to project site? If so describe the SAV species and spatial extent.	**There is no SAV (e.g. eel grass) in the project area. However, green algae (*Ulva* spp.) and rockweed (*Ascophyllum* spp.) are present on riprap in small areas of intertidal zone abutting bulkhead.**
Are there wetlands present on or adjacent to the site? If so, describe the spatial extent and vegetation types.	**There are NYSDEC regulated Littoral Zone tidal wetlands adjacent to the project area. These Littoral Zone wetlands are adjacent to the shoreline over the extent of the project area. Shoreline surveys conducted during low tide found three locations within the study area where the substrate of the East River is either visible or exposed. These areas are classified by NYSDEC as**

	coastal shoals, bars, and mudflats. There is no SAV (e.g. eel grass) in these surveyed areas. However, green algae (*Ulva* spp.) and rockweed (*Ascophyllum* spp.) are present on riprap in small areas of intertidal zone abutting bulkhead.
Is there shellfish present at or adjacent to the project site? If so, please describe the spatial extent and species present.	**No shellfish was observed during site surveys and no literature documenting shellfish on the hardened western shore of the East River was found.**
Are there mudflats present at or adjacent to the project site? If so please describe the spatial extent.	**Shoreline surveys conducted during low tide found three locations within the study area where the substrate of the East River is either visible or exposed. These areas are classified by NYSDEC as coastal shoals, bars, and mudflats.**
Is there rocky or cobble bottom habitat present at or adjacent to the project site? If so, please describe the spatial extent.	**The substrate of the East River is primarily sand and gravel in shallow areas and silty-mud in deeper areas. There may be rocky areas within the channel of the East River, but none that are inside the study area.**
Is Habitat Area of Particular Concern (HAPC) designated at or near the site? If so for which species, what type habitat type, size, characteristics?	**No HAPC is designated at the project area.**
What is the typical salinity, depth and water temperature regime/range?	**Salinity generally ranges between 19-25 parts per thousand. According to NOAA National Centers for Environmental Information, annual temperatures at both the Battery (south of project site) and Willets Point (north of project site) range from 34-74 degrees Fahrenheit.**
What is the normal frequency of site disturbance, both natural and man-made?	**Heavy daily boat traffic of both large and small vessels. Development at waterfront is common. Ambient noise in the area is generally high, including boats, traffic from the nearby FDR Drive, helicopters, and train traffic on the Williamsburg Bridge. Site is a hardened shoreline of Manhattan.**
What is the area of proposed impact (work footprint & far afield)?	**The currently existing study area spans from Montgomery Street north to 25th street. See Attached Figure 1. Within this study area, barging would occur at a limited number of locations and a combined sewer outfall would be constructed at one location. New**

	permanently installed support shafts would be constructed in the middle of the study area at 14th street and existing shafts would be replaced in kind. The specific work footprint has yet to be determined. See Attachment 2 for additional construction information and footprints for temporary and permanent impacts.

<u>Step 3</u>: This section is used to describe the anticipated impacts from the proposed action on the physical/chemical/biological environment at the project site and areas adjacent to the site that may be affected.

3. DESCRIPTION OF IMPACTS

Impacts	Y	N	Description
Nature and duration of activity(s). Clearly describe the activities proposed and the duration of any disturbances.			**See EFH Impacts Discussion in Attachment 4 for Additional Information**
Will the benthic community be disturbed? If no, why not? If yes, describe in detail how the benthos will be impacted.	**x**		**See EFH Impacts Discussion in Attachment 4 for Additional Information**
Will SAV be impacted? If no, why not? If yes, describe in detail how the SAV will be impacted. Consider both direct and indirect impacts. Provide details of any SAV survey conducted at the site.		**x**	**There is no SAV present in the East River.**
Will salt marsh habitat be impacted? If no, why not? If yes, describe in detail how wetlands will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?		x	**There is no salt marsh habitat present in the study area.**

Will mudflat habitat be impacted? If no, why not? If yes, describe in detail how mudflats will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?		X	**There are no intertidal areas present in the study area.**
Will shellfish habitat be impacted? If so, provide in detail how the shellfish habitat will be impacted. What is the aerial extent of the impact? Provide details of any shellfish survey conducted at the site.		X	**There is no shellfish habitat in the study area.**
Will hard bottom (rocky, cobble, gravel) habitat be impacted at the site? If so, provide in detail how the hard bottom will be impacted. What is the aerial extent of the impact?		X	**The substrate in the study area is primarily sand and small gravel in the shallower areas and in deeper areas is primarily silty mud.**
Will sediments be altered and/or sedimentation rates change? If no, why not? If yes, describe how.		**x**	**Sedimentation would be temporarily elevated during construction due to disturbance to the benthic environment. Potential impacts will be minimized through the use of turbidity curtains.**
Will turbidity increase? If no, why not? If yes, describe the causes, the extent of the effects, and the duration.	**x**		**Turbidity would temporarily increase during construction due to disturbance to the benthic environment. Potential impacts will be minimized through the use of turbidity curtains. There would not be any operational conditions that generate turbidity.**
Will water depth change? What are the current and proposed depths?		**x**	**The topography of the East River would not be altered and water depths would remain the same as they currently are.**
Will contaminants be released into sediments or water column? If yes,	**x**		**Contamination is anticipated to be present in East River sediments due to historic land uses. Turbidity curtains would be installed**

describe the nature of the contaminants and the extent of the effects.			**surrounding all work areas where benthic disturbance would occur.**
Will tidal flow, currents, or wave patterns be altered? If no, why not? If yes, describe in detail how.		**x**	**No construction activity proposed would alter tidal flow or currents. New piles and shafts are proposed, however these would be placed in areas already containing numerous piles and hardened structures.**
Will ambient salinity or temperature regime change? If no, why not? If yes, describe in detail how and the effects of the change.		**x**	**No proposed construction activity would result in altered salinity or temperature regimes to the East River.**
Will water quality be altered? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration of the impact.	**x**		**Water quality has the potential to be temporarily affected due to increased turbidity associated with disturbance to the benthic environment. This would be temporary and mitigated through the use of turbidity curtains.**
Will ambient noise levels change? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration and degree of impact.	**x**		**Ambient noise levels will be changed during construction due to pile driving. See Attachment 2 Construction Description for duration and degree of impacts.**
Does the action have the potential to impact prey species of federally managed fish with EFH designations?		**x**	**Prey species are not anticipated to be significantly impacted by the proposed action.**

Step 4: This section is used to evaluate the consequences of the proposed action on the functions and values of EFH as well as the vulnerability of the EFH species and their life stages. Identify which species (from the list generated in Step 1) will be adversely impacted from the action. Assessment of EFH impacts should be based upon the site characteristics identified in Step 2 and the nature of the impacts described within Step 3. The Guide to EFH Descriptions webpage (http://www.greateratlantic.fisheries.noaa.gov/hcd/list.htm) should be used during this assessment to determine the ecological parameters/preferences associated with each species listed and the potential impact to those parameters.

4. EFH ASSESSMENT			
Functions and Values	**Y**	**N**	**Describe habitat type, species and life stages to be adversely impacted**
Will functions and values of EFH be impacted for:	**See EFH Discussion in Attachment 4**		
<u>Spawning</u> **If yes, describe in detail how, and for which species. Describe how adverse effects will be avoided and minimized.**	**x**		**Winter flounder, windowpane flounder** **(See EFH Assessment in Attachment 4)**
<u>Nursery</u> **If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.**	**x**		**Winter flounder - eggs, larval, juvenile** **Windowpane flounder - eggs, larval, juvenile** **Summer flounder - larval, juvenile** **Atlantic herring - larval, juvenile** **Black sea bass - juvenile** **(See EFH Assessment in Attachment 4)**
<u>Forage</u> **If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.**	**x**		**Winter flounder - larval, juvenile, adult** **Windowpane flounder - larval, juvenile, adult** **Summer flounder - larval, juvenile, adult** **Atlantic herring - larval, juvenile, adult** **Black sea bass - juvenile, adult** **(See EFH Assessment in Attachment 4)**
<u>Shelter</u> **If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.**	**x**		**Black sea bass - juvenile, adult** **(See EFH Assessment in Attachment 4)**
Will impacts be temporary or permanent? Describe the duration of the impacts.			**Temporary impacts will consist of noise and approximately 17,200 square feet of benthic disturbance. Permanent impacts will consist of the support shafts and filled embayments. See EFH Impacts Discussion in Attachment 4.**

Will compensatory mitigation be used? If no, why not? Describe plans for mitigation and how this will offset impacts to EFH. Include a conceptual compensatory mitigation plan, if applicable.		**x**	**Compensatory mitigation will be provided for the permanent impacts to tidal wetlands. There is no compensatory mitigation proposed to offset specific impacts to EFH.**

<u>Step 5</u>: This section provides the federal agency's determination on the degree of impact to EFH from the proposed action. The EFH determination also dictates the type of EFH consultation that will be required with NOAA Fisheries.

Please note: if information provided in the worksheet is insufficient to allow NOAA Fisheries to complete the EFH consultation additional information will be requested.

5. DETERMINATION OF IMPACT

	/	Federal Agency's EFH Determination
Overall degree of adverse effects on EFH (not including compensatory mitigation) will be: **(check the appropriate statement)**		**There is no adverse effect on EFH or no EFH is designated at the project site.** **EFH Consultation is not required**
		The adverse effect on EFH is not substantial. **This means that the adverse effects are either no more than minimal, temporary, or that they can be alleviated with minor project modifications or conservation recommendations.** **This is a request for an abbreviated EFH consultation.**
		The adverse effect on EFH is substantial. **This is a request for an expanded EFH consultation**

Step 6: Consultation with NOAA Fisheries may also be required if the proposed action results in adverse impacts to other NOAA-trust resources, such as anadromous fish, shellfish, crustaceans, or their habitats as part of the Fish and Wildlife Coordination Act Some examples of other NOAA-trust resources are listed below. Inquiries regarding potential impacts to marine mammals or threatened/endangered species should be directed to NOAA Fisheries' Protected Resources Division.

6. OTHER NOAA-TRUST RESOURCES IMPACT ASSESSMENT	
Species known to occur at site (list others that may apply)	**Describe habitat impact type (i.e., physical, chemical, or biological disruption of spawning and/or egg development habitat, juvenile nursery and/or adult feeding or migration habitat). Please note, impacts to federally listed species of fish, sea turtles, and marine mammals must be coordinated with the GARFO Protected Resources Division.**
alewife	NOAA Trust Resources other than those identified in the EFH Assessment occur in or around the East River. These include alewife, Atlantic sturgeon, shortnose sturgeon, American eel, marine sea turtles, and others. The proposed project would not result in significant adverse impacts to any of these species or their habitat. BMPs such as turbidity curtains would be used to contain suspended sediment within the affected areas and prevent NOAA resources from coming in contact with any increased turbidity or mechanical activity at the outfalls or within areas requiring mooring of construction barges. A cofferdam would be used during construction of the outfalls to minimize suspended sediment and turbidity. Construction is not anticipated to result in permanent impacts to any benthic environment.
American eel	
American shad	
Atlantic menhaden	
blue crab	
blue mussel	
blueback herring	
Eastern oyster	
horseshoe crab	
quahog	
soft-shell clams	
striped bass	
other species:	

Useful Links

National Wetland Inventory Maps
http://www.fws.gov/wetlands/

EPA's National Estuaries Program
http://www.epa.gov/nep/information-about-local-estuary-programs

Northeast Regional Ocean Council (NROC) Data Portal
http://www.northeastoceandata.org/

Mid-Atlantic Regional Council on the Ocean (MARCO) Data Portal
http://portal.midatlanticocean.org/

Resources by State:

Maine

Eelgrass maps
http://www.maine.gov/dmr/rm/eelgrass/
Maine Office of GIS Data Catalog
http://www.maine.gov/megis/catalog/
Casco Bay Estuary Partnership
http://www.cascobayestuary.org/
Maine GIS Stream Habitat Viewer
http://mapserver.maine.gov/streamviewer/index.html

New Hampshire

New Hampshire's Statewide GIS Clearinghouse, NH GRANIT
http://www.granit.unh.edu/
New Hampshire Coastal Viewer
http://www.granit.unh.edu/nhcoastalviewer/

Massachusetts

Eelgrass maps
http://maps.massgis.state.ma.us/images/dep/eelgrass/eelgrass_map.htm
MADMF Recommended Time of Year Restrictions Document
http://www.mass.gov/eea/docs/dfg/dmf/publications/tr-47.pdf
Massachusetts Bays National Estuary Program
http://www.mass.gov/eea/agencies/mass-bays-program/
Buzzards Bay National Estuary Program
http://buzzardsbay.org/
Massachusetts Division of Marine Fisheries
http://www.mass.gov/eea/agencies/dfg/dmf/
Massachusetts Office of Coastal Zone Management
http://www.mass.gov/eea/agencies/czm/

Rhode Island

Eelgrass maps
http://www.savebay.org/file/2012_Mapping_Submerged_Aquatic_Vegetation_final_report_4_2013.pdf
Narraganset Bay Estuary Program

http://www.dem.ri.gov/programs/benviron/water/wetlands/wetldocs.htm
Rhode Island Division of Marine Fisheries
http://www.dem.ri.gov/
Rhode Island Coastal Resources Management Council
http://www.crmc.ri.gov/

Connecticut
Eelgrass Maps
https://www.fws.gov/northeast/ecologicalservices/pdf/wetlands/2012_CT_Eelgrass_Final_Report_11_26_2013.pdf
Long Island Sound Study
http://longislandsoundstudy.net/
CT GIS Resources
http://www.ct.gov/deep/cwp/view.asp?a=2698&q=323342&deepNav_GID=1707
CT DEEP Office of Long Island Sound Programs and Fisheries
http://www.ct.gov/deep/
CT Bureau of Aquaculture Shellfish Maps
http://www.ct.gov/doag/cwp/view.asp?a=3768&q=451508&doagNav=
CT River Watershed Council
http://www.ctriver.org/

New York
Eelgrass report
http://www.dec.ny.gov/docs/fish_marine_pdf/finalseagrassreport.pdf
Peconic Estuary Program
http://www.peconicestuary.org/
NY/NJ Harbor Estuary
http://www.harborestuary.org/

New Jersey
Submerged Aquatic Vegetation mapping
http://crssa.rutgers.edu/projects/coastal/sav/
Barnegat Bay Partnership
http://bbp.ocean.edu/pages/1.asp

Delaware
Partnership for the Delaware Estuary
http://www.delawareestuary.org/
Center for Delaware Inland Bays
http://www.inlandbays.org/

Maryland
Submerged Aquatic Vegetation mapping
http://data.imap.maryland.gov/datasets/da64df6bd4124ce9989e6c186a7906a7_0
MERLIN
http://geodata.md.gov/imaptemplate/?appid=a8ec7e2ff4c34a31bc1e9411ed8e7a7e
Maryland Coastal Bays Program
http://www.mdcoastalbays.org/

ATTACHMENT 5
DESIGNATION OF NON-FEDERAL REPRESENTATIVE LETTER

Capital Project SANDRESM1
East Side Coastal Resiliency Project
Borough of Manhattan, NY

U.S. Department of Housing and Urban Development
New York State Office
Jacob K. Javits Federal Building
26 Federal Plaza, Suite 3541
New York, New York 10278-0068
Office (212) 264-8000, Fax (212) 264- 0993
TTY (212) 264-0927

28 October 2013

Ms. Patricia Cole
Deputy Field Supervisor
New York Field Office
U.S. Fish and Wildlife Service
3817 Luker Road
Cortland, New York 13045

Re: Responsible Entity Certification for Section 7 Review for U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant-Disaster Recovery (CDBG-DR) Programs, administered by New York City Office of Management & Budget (NYC OMB)

Dear Ms. Cole:

The Department of Housing and Urban Development (HUD) has authorized New York State Homes and Community Renewal (NYSHCR) to implement the HUD Community Development Block Grant – Disaster Recovery (CDBG-DR) Programs (Program) in accordance with the *City of New York Action Plan for Community Development Block Grant Program Disaster Recovery*, dated August 2013 (Federal Register Docket # 78 FR 14329). In accordance with prior coordination agreements between HUD and the FWS, HUD certifies that NYC OMB shall assume federal responsibilities for all National Environmental Policy Act and all related environmental laws and authorities as identified in HUD regulation 24 CFR 58.5. Consultations arising from activities funded under this Program will be conducted directly by NYC OMB in accordance with the assumption authority of 24 CFR 58.4

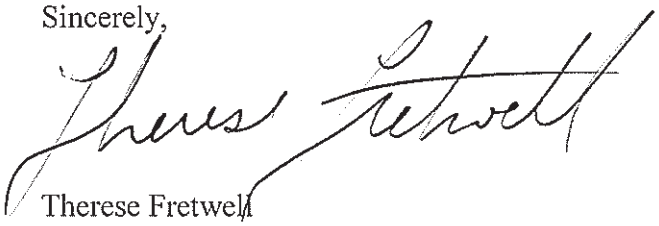
According to HUD regulations at 24 CFR §58.4, state and local governments that receive HUD funds assume the status of 'responsible entity,' and act as the federal action agency for all necessary consultations and other compliance measures. The assumption of federal status for environmental review purposes extends to substantive and procedural compliance with Section 7 of the Endangered Species Act, per 24 CFR §58.5.

For all Section 7 consultations arising from HUD-funded activities under any of the programs listed at 24 CFR §58.1(b), the State of New York and all local governments therein have been

granted authority to act as the federal action agency. These governments should alert the FWS when seeking a HUD Release of Funds for a project that requires Section 7 consultation. The FWS may notify HUD if the State or local government has not fulfilled its Section 7 requirements, and HUD will not release the funds in those instances.

Please contact Regional Environmental Officer Therese Fretwell at 212-542-7445 if you have any questions regarding HUD's designation of the City of New York for Section 7 purposes under the CDBG-DR program, or HUD's general regulations concerning assumption of federal authority for Section 7 consultations.

Sincerely,



Therese Fretwell
Regional Environmental Officer
Department of Housing and Urban Development
26 Federal Plaza, Room 3513
New York, NY 10278

cc: Steven Sinkevich, Long Island Field Office

The City of New York
Office of Management and Budget
255 Greenwich Street, 8th Floor • New York, New York 10007

February 8, 2016

Mr. Daniel Marrone
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930-2276

Re: Project ID. SANDRESM1
Designation of non-federal representative regarding Section 7 and Essential Fish Habitat Findings for the East Side Coastal Resiliency Project

Dear Mr. Marrone:

The New York City Office of Management and Budget ("OMB") acting under the authority of the U.S. Department of Housing and Urban Development (HUD) is assuming the role of Lead Agency under the National Environmental Policy Act ("NEPA"), and related laws, for the environmental review of the proposed East Side Coastal Resiliency Project (the "Proposed Project"). OMB is leading this NEPA environmental review on behalf of the City of New York as the Responsible Entity (RE) and recipient of Community Development Block Grant - Disaster Recovery ("CDBG-DR") funds from HUD under 42 U.S.C. § 5304(g) and 79 Fed. Reg. 62,182 (Oct. 16, 2014).

The Proposed Project would receive funds from HUD, a federal agency, and is therefore subject to Section 7 of the Endangered Species Act (ESA). Pursuant to the ESA, the federal agency may designate a non-federal representative to prepare the Section 7 consultation. The Hazen and Sawyer / AKRF JV is our designated non-federal representative for the purposes of this consultation. A Section 7 consultation was sent to you on January 25, 2016, by the Hazen and Sawyer / AKRF Joint Venture (JV).

If you have any questions, please feel free to contact me at 212-788-6241 and/or QadriE@omb.nyc.gov. Thank you for your consideration and cooperation, and we look forward to working with your agency on this critical capital project.

Sincerely,

Eram Qadri, AICP, LEED AP
Unit Head, Environmental Review
CDBG Disaster Recovery
New York City Office of Management and Budget

cc: G. Amabile, HUD
Therese Fretwell, HUD
O. Wells, A. Chan, NYCDPR
H.S. Pau, E. Ilijevich, C. Pichardo, M. Davies, E. Rogers, NYCDDC
R. Diamond, A. Winter, N. Leung, R. White, Hazen and Sawyer / AKRF JV