

Appendix F1
Natural Resources Survey

MEMORANDUM

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From: Annie Winter, Hazen and Sawyer
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Date: 3/22/2016

Re: SANDRESM1 East Side Coastal Resiliency Project:
Natural Resources Shoreline Survey

Superstorm Sandy caused widespread flooding in Lower Manhattan, resulting in extensive damages to residential and commercial property, medical and health care facilities, transportation operations, and critical energy, water and sewer infrastructure. In the wake of Superstorm Sandy, the U.S. Department of Housing and Urban Development (HUD) sponsored a design competition to solicit proposals that would increase the resiliency of the Hurricane Sandy-affected area. One of the six winning proposals focused on an integrated flood protection system that would extend along a portion of the East Side of Manhattan from Montgomery Street on the south to East 23rd Street on the north. This proposed project is referred to as the East Side Coastal Resiliency Project (ESCR). A Draft Environmental Impact Statement (DEIS) is currently being prepared to evaluate the potential for impacts associated with construction and operation of the ESCR project.

The Hazen and Sawyer/AKRF Joint Venture (JV) recently completed natural resources field surveys within the project area to support the natural resources assessment for the upcoming DEIS (Figure 1). This memorandum summarizes data collected during avian point counts and other passive observations made during those field surveys. High tide surveys were conducted on June 19, 2015 and low tide surveys were conducted on July 10, 2015. Surveys were performed along the East River shoreline within the ESCR project area.

A New York Natural Heritage Program response to a request for information on listed species and significant natural communities was received on June 12, 2015 and reported that the Williamsburg Bridge has been used as a nesting site by New York State Endangered Peregrine Falcons (*Falco peregrinus*). The Williamsburg Bridge is located in the southern portion of the project area. No information as to when falcons last nested on the bridge was provided. Therefore, the shoreline surveys incorporated targeted Peregrine Falcon surveys. Methodology employed during both site visits consisted of two components: (1) surveying the project area shoreline to characterize the physical shoreline and any habitat and note wildlife; and (2) dedicated bird surveys in the vicinity of the Williamsburg Bridge focusing on Peregrine Falcon. Notable findings from the shoreline survey in addition to a log of photographic data collected are included in Attachment 1.

Shoreline Survey Results

The high tide shoreline survey was conducted on Friday, June 19, 2015, between 10:00 AM and 2:00 PM; high tide occurred at 11:59 AM. The low tide shoreline survey was conducted on Friday, July 10, 2015, between 9:00 AM and 1:00 PM; low tide occurred at 10:42 AM. Weather conditions during both surveys were sunny, hot, and humid with temperatures in the high 80s. Surveys were initiated with Peregrine Falcon surveys and then the shoreline was surveyed generally from south to north before conducting the second falcon survey. The entire project area consists of hardened shoreline with bulkheading with the exception of Pier 42 at the southern end of Project Area 1, which is on concrete pilings. Several small areas of exposed riprap and sediment were identified at low tide and are discussed in more detail below. These areas all occurred at the toe of bulkheading. During both shoreline surveys, the project area included recreational users consisting of walkers, joggers, cyclists, school groups, and team sports.

Terrestrial

The vegetation documented throughout the surveys consisted primarily of landscaped planted beds in East River Park. These beds were lined with mulch and contained some native species, such as seaside goldenrod (*Solidago sempervirens*) and joe-pye-weed (*Eupatorium maculatum*), that provide habitat and foraging opportunities for pollinators. The majority of the vegetation in these beds consisted of ornamental plants (Photo 3). An invasive species, common reed (*Phragmites australis*), was also present in small, young stands in several beds. Most of these landscaped beds contained large areas of mulch, a sparse herbaceous layer and an evenly spaced shrub layer (Photo 4). Trees were present in most landscaped beds and included species such as swamp white oak (*Quercus bicolor*), London plan tree (*Platanus x acerifolia*), and red oak (*Quercus rubra*). The majority of the landscaped beds that lined the waterfront pathway are consistent with these attributes. The plants in these beds appeared healthy and well maintained. Other locations in the interior of the park such as south of the Williamsburg Bridge and adjacent to the basketball courts contained landscaped beds that were also composed of mostly ornamentals in excellent health and robust in size (Photo 2).

Stuyvesant Cove Park, in Project Area 2 in the northern portion of the project area, contained landscaped beds of native plants intended to serve as habitat for pollinators (e.g., certain bees, moths, butterflies, flies) and other native species. The planting beds in this area contained bee balm (*Monarda fistulosa*), purple coneflower (*Echinacea purpurea*), switchgrass (*Panicum virgatum*), butterfly weed (*Asclepias tuberosa*), milkweed (*Asclepias syriaca*), seaside goldenrod (*Solidago sempervirens*), joe-pye-weed (*Eupatorium maculatum*), eastern bluestar (*Amsonia tabernaemontana*), upland sea oats (*Chasmanthium latifolium*), black-eyed Susan (*Rudbeckia hirta*), and others (Photo 12). One non-native species, Asiatic day flower (*Commelina communis*), was observed in low densities in the planting beds. These plant beds were located primarily at the waterfront edge. Additional planting beds located in the park interior between the waterfront path and FDR East River Drive contained mature swamp white oak (*Quercus bicolor*) trees and an understory of shade-tolerant native herbaceous plants.

Aquatic

During the high tide survey, the entire shoreline was inundated. No aquatic vegetation or wildlife was observed during the high tide survey. During the low tide survey, any areas adjacent to the largely bulkheaded East River Park were inspected to identify any observable intertidal habitat characteristics. During low tide, the majority of the project area was inundated with the exception of the following areas: a portion of the southern shoreline by Pier 42, two riprap coves in East River Park north of the Williamsburg Bridge, a portion of the shoreline at Stuyvesant Cove Park, and the derelict dock at Stuyvesant Cover Park. These areas are described in greater detail below.

Pier 42

Starting at Pier 42 and extending several hundred feet north (Photo 5), the edge of the riprap shoreline was evident during low tide. During wave ebbs, small areas of gravel and sand substrate were temporarily exposed. Wave energy at this location was high (Photo 6). Some of the riprap in this area contained green algae (*Ulva* spp.) and rockweed (*Ascophyllum* spp.). Barnacles (insert scientific name) were also observed on the exposed bulkhead surface below the water line. No other invertebrates or plants, and no fish were observed in this area. (Said already)

East River Park Riprap Coves

Two constructed coves are present in East River Park north of the Williamsburg Bridge. These coves are hardened and have a large riprap embankment (Photo 8). At low tide, no substrate type other than riprap was observed (Photo 10). On the lowest riprap, green algae and rockweed were observed (Photo 10). On the highest elevation where high tides do not reach, some upland vegetation was observed including sunflower (*Helianthus* spp.), mugwort (*Artemisia vulgaris*), rye-grass (*Lolium* spp.), narrow-leaved plantain (*Plantago lanceolata*), morning glory (*Ipomoea* spp.), and a honey-locust seeding (*Gleditsia triacanthos*). No other invertebrates or plants, and no fish were observed in this area.

Stuyvesant Cove Park – Shoreline

At Stuyvesant Cove Park, a strip of sand, gravel, and rock intertidal substrate was observed (Photo 13). The strip was approximately 50 feet long and 3 feet wide. Green algae and rockweed were also observed on the rocks. Wave energy at this site was high. Additional sandy substrate could be seen through the shallow water, indicating that at a lower low tide there would be more substrate exposed. No shellfish, invertebrates, or fish were observed in this area.

Stuyvesant Cove Park – Derelict Dock

At Stuyvesant Cove Park, the remains of a dock or small pier structure were observed at both high and low tide. At high tide, mostly concrete and wood pilings were visible, with some substrate exposed closest to the bulkhead and under shallow water extending out from the bulkhead (Photo 17). At low tide, an intertidal flat was exposed (Photo 16). This flat consisted of a sandy area at its northern half and concrete, pilings, and debris in the southern half. A pipe structure extending from the bulkhead had associated signage indicating it to be a combined sewer outfall (Outfall #NCM-048). Wave energy at the edges of the flat was high; however, the intertidal area is large enough to potentially provide refuge from tidal influence during periods of low tide. The pilings were being used as perching habitat for Double-crested Cormorants (*Phalacrocorax auritus*) and Ring-billed Gulls (*Larus delawarensis*) (Photo 15). Green algae and rockweed were observed on the large rocks and concrete slabs. Numerous birds were observed foraging on the benthic substrate and among the seaweed, indicating aquatic invertebrates likely present. No shellfish or fish were observed in this area.

Wildlife

Observations of birds were recorded during the shoreline surveys. A Red-tailed Hawk (*Buteo jamaicensis*) was observed flying between buildings approximately one city block inland from the shore, south of the Williamsburg Bridge. During both surveys, Mourning Doves (*Zenaidura macroura*) in groups of approximately four to eight birds occurred in the constructed riprap coves within East River Park (Photo 10). Six Barn Swallows (*Hirundo rustica*) were observed during the July 10, 2015 survey perched and foraging at Pier 42. A pair of Mallards (*Anas platyrhynchos*) was observed foraging towards the northern end of the shoreline project area within Stuyvesant Cove Park (Photo 18). No birds or other wildlife was observed at the Pier 42

intertidal area. Unidentified dragonflies were observed at the Williamsburg Bridge landscaped beds and at Stuyvesant Cove Park during both shoreline surveys. Bumblebees (*Bombus* spp.) and honey bees (*Apis mellifera*) were observed in low densities at some of the landscaped beds in East River Park and in high densities in the Stuyvesant Cove Park planting beds. Butterflies observed included an eastern tiger swallowtail (*Papilio glaucus*) (Photo 7) and monarch butterflies (*Danaus plexippus*) (Photo 16). The only mammal observed during the site visits was eastern grey squirrel (*Sciurus carolinensis*).

Peregrine Falcon Survey Results

To conduct the Peregrine Falcon surveys, two biologists equipped with binoculars observed from both sides of the Williamsburg Bridge for two 30 minute periods for each of the low tide and high tide survey events. The bridge trusses, eaves, suspensions, high points, and other bridge features from where the bridge connects with Delancey Street to as far as could be seen over the East River were regularly scanned. In addition the airspace around the bridge, over water, over buildings, inland, and throughout the general project area was periodically scanned to look for Peregrine Falcons. Ambient noise levels at the site were very high; traffic on the FDR and Williamsburg Bridge, train travel over the Williamsburg Bridge, active construction underneath the Williamsburg Bridge (Photo 1), frequent helicopter flyovers, and boats maintained a nearly constant elevated noise level. No Peregrine Falcons were observed during these targeted surveys or during any of the other site visits. Incidental observations of other species, including counts and behaviors, were recorded and are shown on Table 1 below.

During the targeted surveys at the Williamsburg Bridge, most bird activity occurred in the eaves and trusses underneath the deck of the bridge and in the air over the East River. Rock Pigeons (*Columbia livia*) were the most commonly observed species and also the species most likely to have been flying to or from the bridge or resting within the bridge eaves and trusses. Other species observed utilizing the bridge included European Starling (*Sterna vulgaris*), Common Grackle (*Quiscalus quiscula*), and House Sparrow (*Passer domesticus*). Other birds observed flying over the East River included Ring-billed Gull, Laughing Gull (*Leucophaeus atricilla*), Double-crested Cormorant, and Canada Goose (*Branta canadensis*). A Black-crowned Night-Heron (*Nycticorax nycticorax*) and a Great Egret (*Ardea alba*) were observed in flight over the East River. Birds were also observed within East River Park. Bird activity within the park consisted mostly of foraging at trash cans by European Starlings, Rock Pigeons, and House Sparrows.

Table 1 – Peregrine Falcon Survey Results

| Date and Time | Species Observed | Count | Behaviors |
|-------------------------------|--|--------------|----------------------------|
| June 19, 2015; 8:15-8:30 AM | Common Grackle (<i>Quiscalus quiscula</i>) | 8 | Flying, Resting |
| | Double-crested Cormorant (<i>Phalacrocorax auritus</i>) | 1 | Flying |
| | European Starling (<i>Sturnus vulgaris</i>) | 5 | Flying, Foraging |
| | Great Egret (<i>Ardea alba</i>) | 1 | Flying |
| | House Sparrow (<i>Passer domesticus</i>) | 1 | Foraging |
| | Ring-billed Gull (<i>Larus delawarensis</i>) | 5 | Flying |
| | Rock Pigeon (<i>Columba livia</i>) | 44 | Flying, Resting, Courtship |
| June 19, 2015; 9:35-10:05 AM | American Robin (<i>Turdus migratorius</i>) | 1 | Foraging |
| | Black-crowned Night-Heron (<i>Nycticorax nycticorax</i>) | 1 | Flying |
| | Canada Goose (<i>Branta canadensis</i>) | 3 | Flying |
| | Double-crested Cormorant (<i>Phalacrocorax auritus</i>) | 4 | Flying |
| | European Starling (<i>Sturnus vulgaris</i>) | 3 | Flying, Foraging, Calling |
| | House Sparrow (<i>Passer domesticus</i>) | 3 | Flying, Foraging |
| | Laughing Gull (<i>Leucophaeus atricilla</i>) | 1 | Flying |
| | Ring-billed Gull (<i>Larus delawarensis</i>) | 4 | Flying |
| | Rock Pigeon (<i>Columba livia</i>) | 26 | Flying, Foraging, Resting |
| July 10, 2015; 8:10-8:40 AM | Double-crested Cormorant (<i>Phalacrocorax auritus</i>) | 12 | Flying, Swimming |
| | European Starling (<i>Sturnus vulgaris</i>) | 4 | Foraging |
| | House Sparrow (<i>Passer domesticus</i>) | 6 | Flying, Foraging |
| | Laughing Gull (<i>Leucophaeus atricilla</i>) | 5 | Flying, Foraging |
| | Ring-billed Gull (<i>Larus delawarensis</i>) | 11 | Flying |
| | Rock Pigeon (<i>Columba livia</i>) | 26 | Flying, Foraging, Resting |
| July 10, 2015; 11:10-11:40 AM | Canada Goose (<i>Branta canadensis</i>) | 5 | Flying |
| | Double-crested Cormorant (<i>Phalacrocorax auritus</i>) | 2 | Flying |
| | Gray Catbird (<i>Dumetella carolinensis</i>) | 1 | Calling |
| | House Sparrow (<i>Passer domesticus</i>) | 3 | Flying, Foraging |
| | Laughing Gull (<i>Leucophaeus atricilla</i>) | 1 | Flying |
| | Ring-billed Gull (<i>Larus delawarensis</i>) | 3 | Flying |
| | Rock Pigeon (<i>Columba livia</i>) | 12 | Flying, Resting |

Discussion and Recommendations

Overall, the ESCR shoreline surveys resulted in a species richness typical of heavily urbanized areas. Although the observed biodiversity was low compared to more natural communities outside of metropolitan areas, the shoreline surveys revealed more wildlife than is typical of many urban park areas due to the park's shoreline location. The bird species observed included many species that are extremely common to urban areas. During spring or fall migration, more species could potentially be recorded flying or stopping over within the project area. One supporting indicator of this can be seen through eBird data where 43 species (including Peregrine Falcon) were recorded at Stuyvesant Cove Park (eBird, 2012)¹. Mammal and invertebrate species richness was low, as anticipated for a heavily-disturbed, urban system.

Although density was not quantified during the surveys, Stuyvesant Cove Park had a much higher abundance of birds than East River Park. This was evident from the numerous birds observed resting and calling in the inland wooded area and the volume of calls was qualitatively almost as loud as the traffic on the adjacent FDR Drive. Stuyvesant Cove Park planting beds supported abundant pollinators including monarch butterflies and bees. Also of biological significance at this park was the sandy beach area associated with the derelict pier/dock, which provided foraging habitat for some birds. Several Mallards, House Sparrows, European Starlings, Rock Pigeons, Double-crested Cormorants, and Ring-billed Gulls were utilizing this space simultaneously. This small intertidal may be used by migrating shorebirds, and there is the potential for overwintering waterfowl to use this area during periods of low tide. During high tide, there is no exposed shoreline area to be used by waterbirds. The intertidal conditions at the other low-tide sites described above all had wave energy that was too high to allow birds to forage or find refuge at those sites. No birds were observed at any intertidal site other than the Stuyvesant Cove Park derelict dock.

No horseshoe crabs or horseshoe crab shells were present at any of the intertidal areas. The large intertidal flat at Stuyvesant Cove Park may be suitable to support horseshoe crab (*Limulus polyphemus*) breeding based on its slope, substrate, and tidal conditions. However, the area is so small that tidal currents would likely wash any eggs that were not consumed by birds into the deeper water of the East River where dissolved oxygen is not high enough to support hatching.

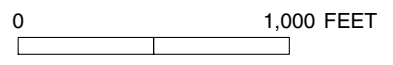
¹ eBird. 2012. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: <http://www.ebird.org>. (Accessed: July 17, 2015).

7/31/2015



Source: Aerial Image - USGS

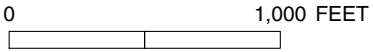
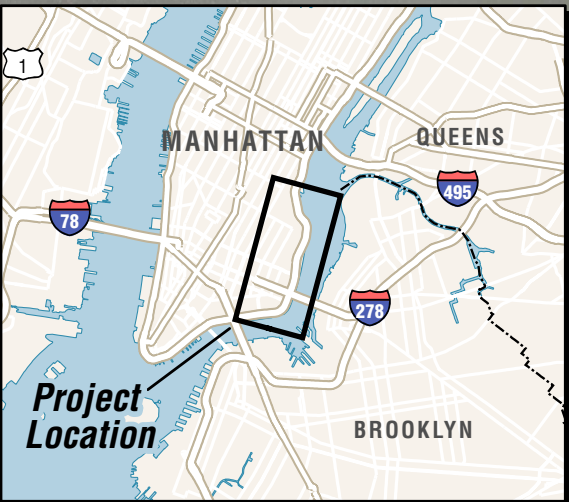
-  Project Area One
-  Project Area Two



7/31/2015



Source: Aerial Image - USGS



- Project Area One
- Project Area Two

Shoreline Survey Results Memorandum

Attachment 1

Photo Location Map and Photo Log

7/31/2015



Source: Aerial Image - USGS

-  Project Area One
-  Project Area Two
-  Photo Location and Direction

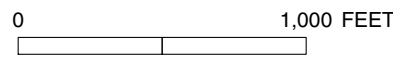




Photo 1 – Active construction underneath the Williamsburg Bridge. Photo taken facing southeast.



Photo 2 – Healthy landscaped bed of mostly ornamentals in East River Park. Several dragonflies observed at this location. Photo taken facing west.

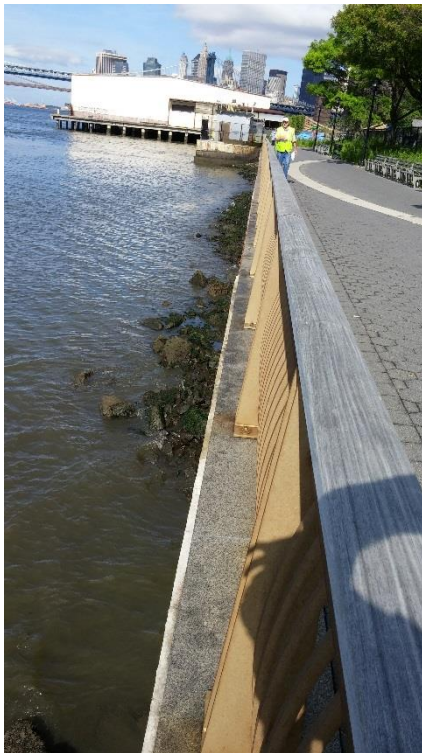


Photo 3 – East River Park typical landscaping bed with mix of ornamentals and natives. Photo taken facing north.



Photo 4 – East River Park landscaping bed with sparse herbaceous vegetation. Photo taken facing northwest.

Low Tide



High Tide

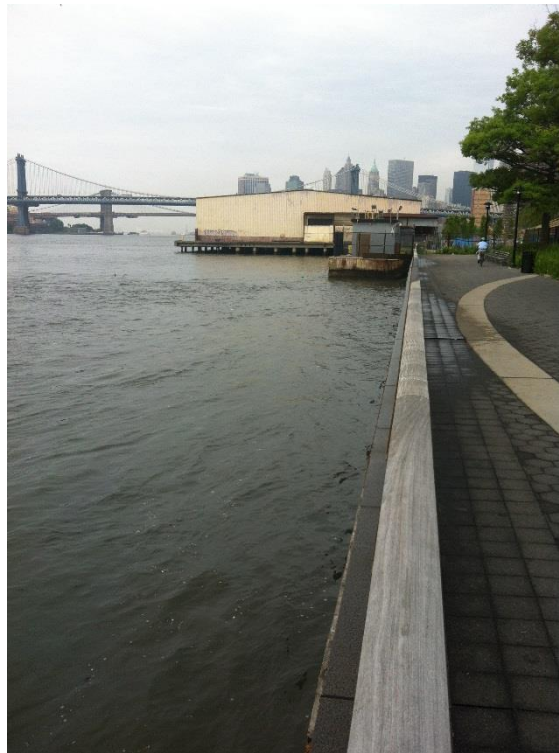


Photo 5 –Exposed intertidal rock with small areas of sand and gravel along bulkhead north of Pier 42 at low tide. Flooded at high tide. Photo taken facing west.

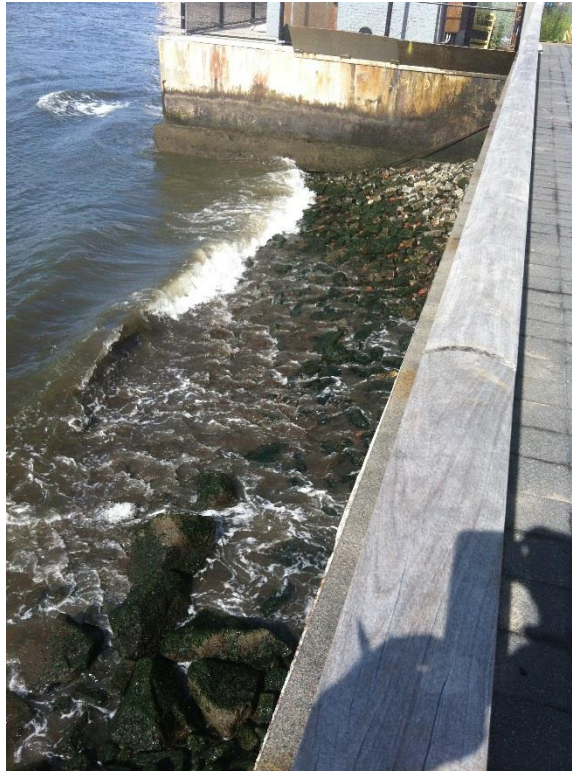


Photo 6 – High wave energy and intertidal substrate of rock and sand located north of Pier 42 at low tide. Rocks contained some submerged aquatic vegetation consisting of rockweed and green algae. Photo taken facing southwest.



Photo 7 – Eastern tiger swallowtail butterfly in East River Park. Photo taken facing west.



Photo 8 – Riprap cove feature in East River Park, between East 4th Street and East 5th Street. High tide. Upland vegetation located at highest point. Photo taken facing north.



Photo 9 – Group of Mourning Dove at riprap cove in East River Park. Photo taken of facing northeast.



Photo 10 – Riprap cove feature in East River Park, between Rivington Street and Stanton Street. Low tide. Photo taken of Plot 2, facing north.

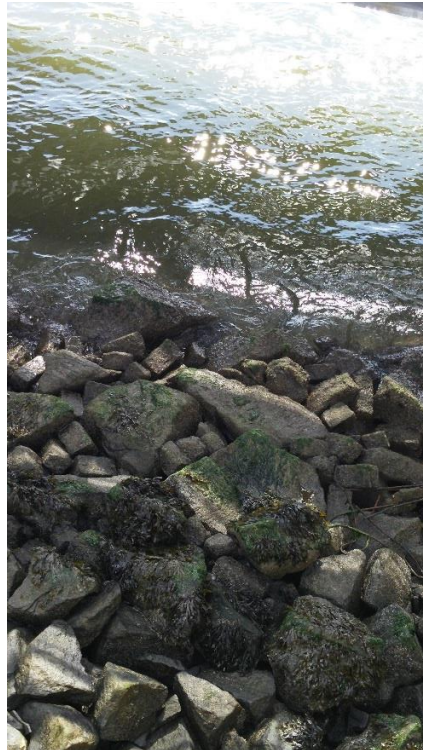
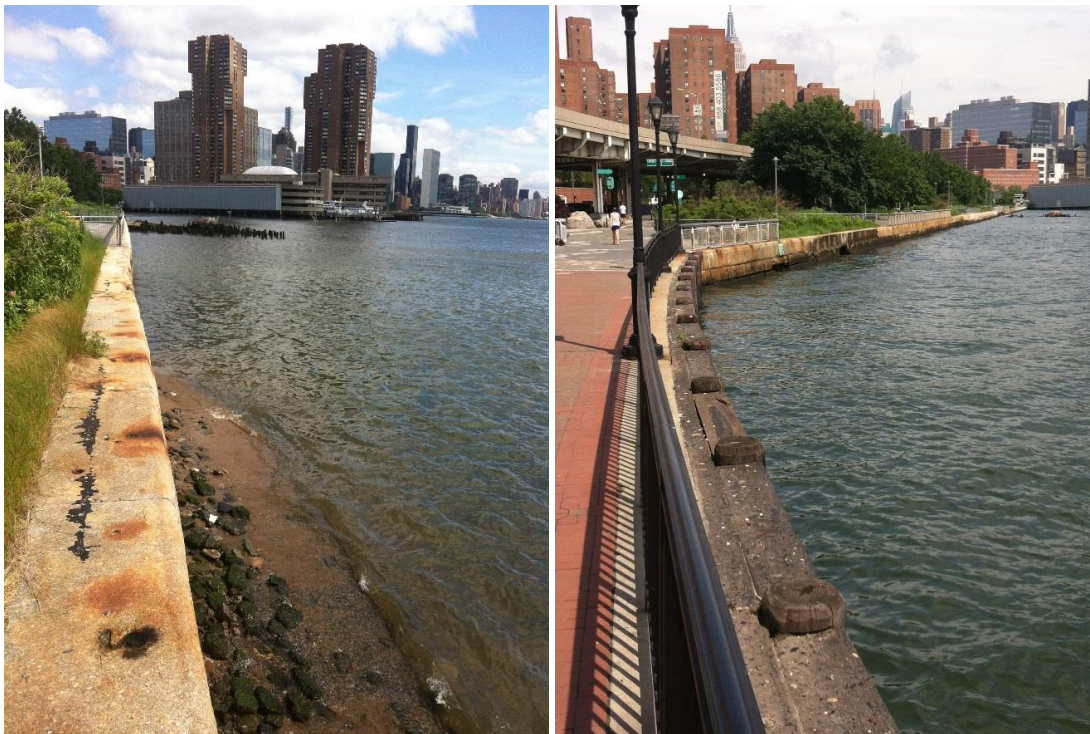


Photo 11 – Green algae and rockweed present on rocks exposed during low tide at riprap coves. Photo taken facing east.



Photo 12 – Stuyvesant Cove Park typical planting bed containing primarily native species. Photo taken facing east.



Low Tide

High Tide

Photo 13 – Rock, gravel, and sand intertidal substrate at Stuyvesant Cove Park at low tide. No exposed substrate at high tide. Photo taken facing north.



Photo 14 – Monarch butterfly at Stuyvesant Cove Park. Photo taken facing east.

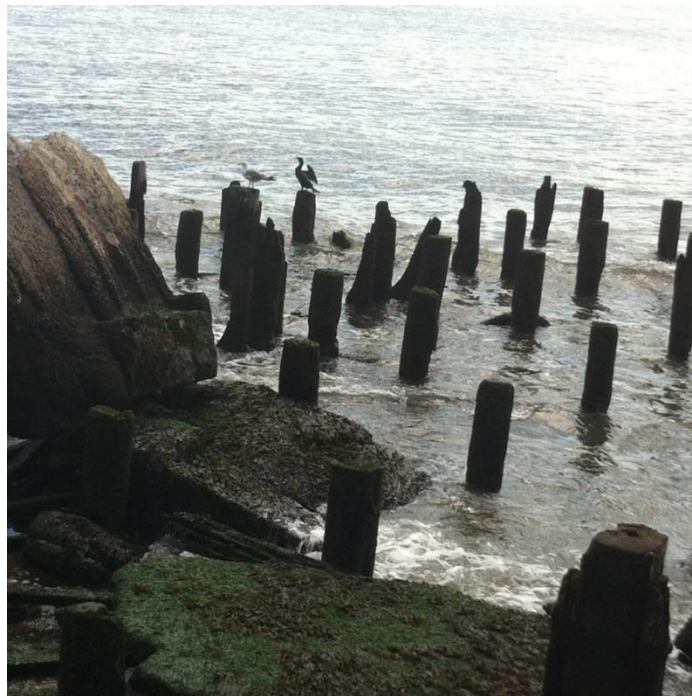


Photo 15 – Birds perching on pilings from derelict dock/pier. Photo taken facing east.



Photo 16 – Intertidal sand flat associated with remains of derelict dock/pier. Photo taken facing southeast.



Photo 17 – Intertidal sand flat and in Stuyvesant Cove Park at high tide. Photo taken facing north.

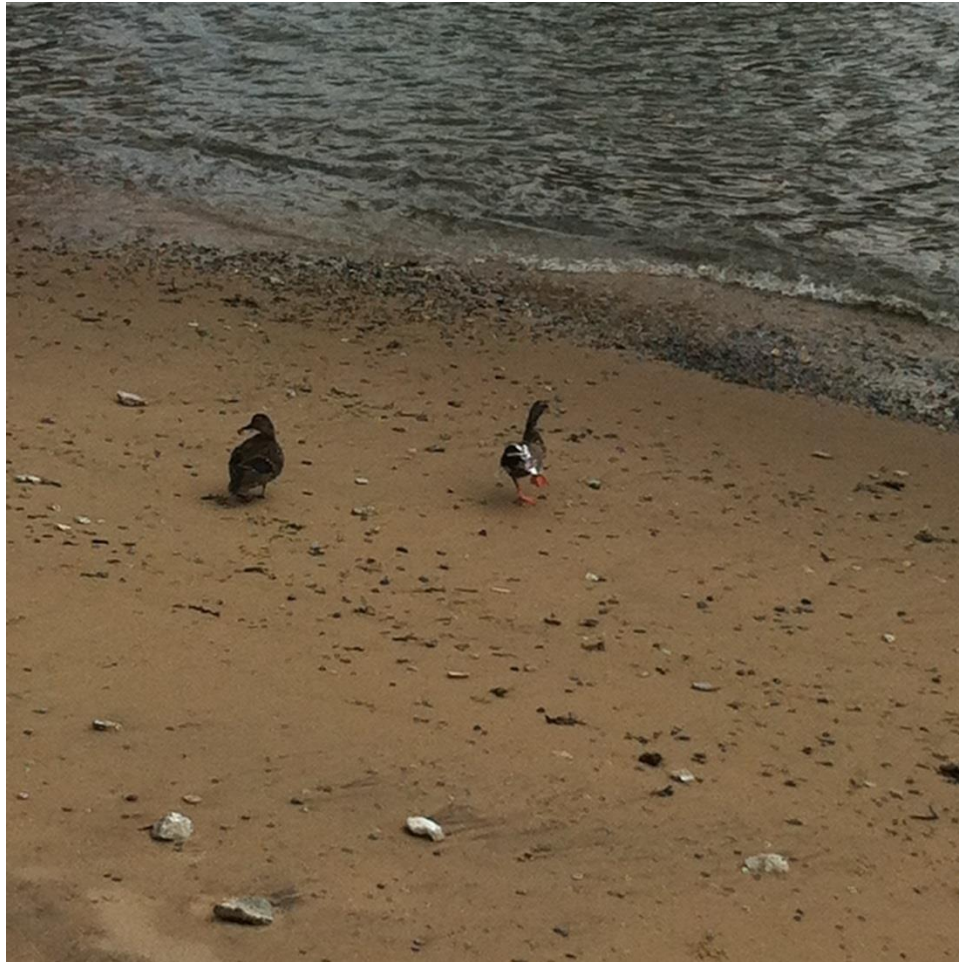


Photo 18 – Pair of Mallards at the Stuyvesant Cove Park sand flat. Photo taken facing north.