

# Greenpoint-Williamsburg Rezoning EIS

## CHAPTER 10: NATURAL RESOURCES

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### A. INTRODUCTION

The area of the proposed action covers a long stretch of Brooklyn's East River waterfront, approximately two miles of shoreline between North 3<sup>rd</sup> Street on the south to McGuinness Boulevard on the north and including this segment of Newtown Creek. This waterfront is largely urbanized and contains stressed ecological communities and deteriorated built conditions. However, at certain locations (e.g., Bushwick Inlet) an ecological complex has emerged where natural systems are reappearing, albeit in an urban context. The proposed action would result in new development along this stretch of waterfront. This chapter analyzes the potential impacts of that development on natural resources, which are defined as terrestrial and aquatic flora and fauna. This chapter therefore presents:

- A methodology for the baseline data gathering and impact analysis;
- Describes the regulatory context of the study area including federal, state, and local laws and regulations that apply to water quality and natural resource protection;
- Provides a general description of the existing water quality and natural resources of the study area, including an overview of water and sediment quality, aquatic biota, terrestrial biota, Essential Fish Habitat (EFH), and the potential for rare, threatened, and endangered species and species of special concern to inhabit or use the area;
- Projects future water quality and natural resources conditions in the future without the proposed action;
- Assesses the potential impacts of the proposed action on water quality and natural resources; and
- Presents measures to mitigate any potential significant adverse impacts, as applicable.

The study area for this analysis is the uplands affected by the proposed action and the East River between the Williamsburg Bridge on the south and Newtown Creek on the north.

### Methodology

#### *New York City Environmental Quality Review (CEQR) Technical Manual Guidelines*

The *CEQR Technical Manual* describes the methods for undertaking an assessment of natural resources impacts. What follows is a brief description of that CEQR methodology, as well as a description of the approach for gathering data on existing conditions and the impact assessment.

The *CEQR Technical Manual* defines the various types of natural resources found in New York City (e.g., water resources, upland resources, built resources). To assess impacts, CEQR recommends that the assessment determine whether a significant adverse impact on natural resources could occur due to the presence of a natural resource on or near the site of the action (indirect impacts) or an action that involves disturbance of that resource (direct impacts).

According to the *CEQR Technical Manual*, an assessment of natural resource impacts is not required under the following conditions:

- The site is substantially devoid of natural resources;
- The site contains no “built resource” used as a habitat by a protected species;
- The site contains no subsurface conditions that might affect the function or value of a nearby resource;
- The site is near or contiguous to natural resources, but no activity associated with the proposed action would disturb them; and,
- The proposed action involves the disturbance of a natural resource, but that impact has been deemed insignificant by a government agency with jurisdiction over that resource and conditions have not changed significantly since the permit was issued.

Although the natural resources of the proposed action area are highly stressed, particularly the terrestrial resources, edge conditions along the East River are regulated tidal wetlands (e.g., littoral zone). Under the proposed action, there would be approximately 76 projected developments and 264 potential developments. Of these, there are 14 waterfront sites with shoreline along the East River, of which 4 are projected development sites and 10 are potential sites. Three of these projected development sites would be large residential housing projects and the fourth would be a park south of Bushwick Inlet (as described in Chapter 1, “Project Description” there are two scenarios for this proposed park). It would be expected that each of these sites would have waterfront improvements (e.g., improved bulkhead or shoreline protection) that would stabilize the shoreline and would provide waterfront access and a walkway in accordance with the proposed zoning. It is expected that these waterfront finishes would be landscaped. In addition, it is expected that the proposed park would be built as an urban waterfront park. It is also anticipated that there would be a pier at the end of Green Street to allow water taxi service. The other development that is anticipated to occur under the proposed action would occur on the 72 other inland projected development sites or the 250 inland potential development sites. While some of these sites are vacant land that may be overgrown, many are built sites. None of these upland sites possess significant natural resources.

The focus of this analysis is therefore the waterfront sites. At these sites, because they have substantial linear feet of shoreline along the East River, there is the potential for significant adverse impacts on natural resources and water quality that must be examined. Therefore, an assessment of potential natural resource impacts under the proposed action is appropriate.

According to the *CEQR Technical Manual*, an assessment of potential impacts on any natural resources contains three basic elements (although the level of detail may vary for site-specific, area-wide, or programmatic (generic) actions). Those elements are as follows:

- Evaluation of the resource;
- Assessment of environmental support systems; and
- Assessment of the probable impacts of the action (e.g., construction and operation activities).

This assessment, therefore, begins with the identification of a study area that includes the area of the proposed action and the resources that may be affected. The following steps are then taken:

- Conduct field reconnaissance;
- Assess existing conditions;
- Perform literature search and other research (e.g., letters to resource agencies, aerial photographs); and,
- Characterize the habitat, including wildlife characterization.

According to the *CEQR Technical Manual*, an assessment of the direct effects of an action includes the extent to which the action would disturb or alter a resource in the short- and long-term. Direct effects are relatively straightforward (e.g., clearing that eliminates a particular resource). However indirect effects

(e.g., changes in hydrology that impact wetlands) may require more analysis. Direct effects generally include, but are not limited to:

- Removal of vegetation;
- Changing one habitat to create another;
- Filling, draining, dewatering, dredging of water body or wetland;
- Development of roadways and other paved and unpaved surfaces;
- Construction of new marine structures (e.g., bulkheads, piers, piles);
- Stream channel changes;
- Noise;
- Landscaping and other physical alternations;
- Removal of soil;
- Construction of storm or sewer outfalls; and
- Introduction of contaminants.

Under the proposed action, each development site has the potential to: 1) remove vegetation; 2) change habitat or impact wetlands and water along the East River; 3) develop roadways and other paved surfaces; 4) construct new marine structures; and 5) introduce new landscaping. These potential impacts will therefore be the focus of this analysis. It is not expected that the proposed action would result in any stream channel changes, significant noise increases that could impact wildlife beyond what occurs with the current uses, or construct new storm or sewer outfalls, or introduce contaminants.<sup>1</sup>

Indirect effects occur when the changes on a site alter conditions on adjacent or nearby resources, or on other portions of the site itself, after construction has ended. Indirect effects generally include, but are not limited to:

- Domestic plantings, dewatering, soil compaction, site clearance, etc.;
- Alterations to tidal inundation;
- Exposure of contaminated sediments or soils;
- Decreases in quality of surface or groundwater;
- Increases in the number of people or noise; and
- Colonization by new plant or animal species or changes in vegetation.

None of these types of indirect impacts are expected to occur under the proposed action.

Other potential impacts on natural resources may include effects on the functioning of a natural resource. In this case, the context of the resource change (i.e., the severity of the impact) should be addressed in terms of the context of the resource change. Assessment issues for specific natural resources include evaluating the water resources (e.g., surface water bodies, groundwater, and wetlands). With the waterfront sites there is the potential for this impact. Thus, an examination of water quality conditions along the East River is appropriate.

As to defining significant adverse impacts, the *CEQR Technical Manual* considers an impact to be significant when:

- An action would likely render a water resource unfit for one or more uses for which it is classified and/or cause or exacerbate a water quality violation;
- An action would, directly or indirectly, adversely affect a significant, sensitive, or designated resource;
- An action would likely diminish habitat for or result in the loss of endangered, threatened, or rare animal species or species of special concern;

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<sup>1</sup> It is assumed that storm water generated under the proposed action would use existing outfalls.

- An action would, either directly or indirectly, be likely to cause a noticeable decrease in a resource's ability to serve one or more of the following functions: wildlife habitat, food change support, water supply, and other similar function; and
- An action would, either directly or indirectly, be likely to contribute to a cumulative loss of habitat or function which diminishes that resource's ability to perform its primary functions.

This impact assessment will examine the proposed action to determine if the development under the proposed action could result in impacts that meet or exceed these guidelines.

### ***Data Collection***

Data collection for existing water quality and natural resources conditions within the study area were summarized from the following sources:

- Current government sources including: the New York City Department of Environmental Protection (DEP) Harbor Water Quality Survey (DEP 2002); U.S. Environmental Protection Agency (EPA) National Sediment Quality Survey Database, 1980-1999 (EPA 2001); general New York/New Jersey Harbor Estuary Program (HEP) data;
- Information from the National Marine Fisheries Service (NMFS) including the "Summary of Essential Fish Habitat (EFH) Designation" posted on the internet at [www.nero.nmfs.gov/ro/STATES4/conn li ny/40407350.html](http://www.nero.nmfs.gov/ro/STATES4/conn_li_ny/40407350.html).
- Field observations and 2002 aerial photography;
- Information on rare, threatened or endangered species as obtained from the U.S. Fish and Wildlife Service (FWS), NMFS, and the New York Natural Heritage Program (NHP). NHP is a joint venture of the New York State Department of Environmental Conservation (DEC) and The Nature Conservancy that since 1985 has maintained an ongoing inventory of rare plants and animals native to New York State. The NHP database is updated continuously to incorporate new records and changes in the status of rare plants or animals. In addition to the state program, the FWS maintains information for federally-listed threatened or endangered freshwater and terrestrial plants and animals, and the NMFS maintains files for federally-listed threatened or endangered marine organisms.

The future without the proposed action was determined by projecting:

- Potential effects of No-Action development on water quality and natural resources; and
- Incorporating trend data on regional water quality and the natural resource conditions of the study area through the 2013 Analysis year.

### **Surface Water Quality**

An assessment of potential water quality impacts from an increase in treated effluent from the Newtown Creek Water Pollution Control Plant, and an increase in combined sewer overflow (CSO) events and volumes, as a result of the proposed action, was performed. A complete description of that assessment is attached as Appendix K. All future assessments were for the year 2013.

#### **WPCP Effluent**

The assessment of water quality impacts due to increased effluent from the Newtown Creek WPCP, which serves the entire area comprising the rezoning, applied the System-Wide Eutrophication Model (SWEM) to project the changes in water quality that would result from the proposed action. For the purposes of this assessment, the proposed action was presumed to increase daily influent dry weather sewage flow to the Newtown Creek WPCP by 2.42 million gallons/day (mgd) over future levels without the proposed action.

This is a very conservative assumption, because it overstates the increase in daily effluent due to the proposed action. In addition, the effluent concentrations were held constant with the exception of effluent Total Suspended Solids and CBOD-5, which were assumed to improve reflecting completion of the Track III construction at the WPCP. The effluent flow was held constant at 2.42 mgd. For every pollutant, the point of maximum impact was located and this value was used as the change in pollutant concentrations, as shown in Appendix K, Table 1.2. The changes in water quality associated with changes in Newtown Creek WPCP effluent presumed to result from the proposed action proved to be insignificant.

### CSOs

The assessment of CSO impacts from the proposed action determined both the frequency and volume by which CSO overflows would increase as a result of the proposed action, and the pollutant loadings associated with that increase. For the purposes of this assessment, it was presumed that the proposed action would increase dry weather sewage flows to the Newtown Creek WPCP by 2.42 mgd. This is a very conservative assumption, because it overstates the increase in daily dry weather flow resulting from the proposed action. Such an increase in dry weather sewage flows to the Newtown Creek WPCP could lead to a decrease in available wet weather capacity that could potentially increase CSO frequency and volume. A sewer system hydraulic model, InfoWorks, was used to predict the frequency and volume of CSOs within the entire Newtown Creek service area and to determine the pollutant loadings from those overflows. To capture a cumulative assessment of CSOs from the entire Newtown Creek drainage area, future developments anticipated with and without the proposed action were considered within the rezoning area, as well as additional developments anticipated throughout the Newtown Creek WPCP service area. No credit was taken for the decrease in CSO volumes that would result from the additional open space associated with the proposed action.

The assessment modeled every CSO outfall in the Newtown Creek WPCP service area on an hourly basis for the entire analysis year, 2013. As shown in Appendix K at page 28 to 29, the assessment superimposed onto the dry weather flow conditions that are projected to exist in the year 2013, a simulated rainfall pattern from a representative year. The rainfall year that was selected was 1988. The model assessed surface runoff and sewer infrastructure throughout the Newtown Creek WPCP service area during each rainfall event to determine the increased frequency and volume of CSO discharges.

Based on the annual increased volume of CSO discharges, and the average pollutant concentrations in those discharges, the amount by which pollutant loadings of certain pollutants would increase was determined. Those amounts are presented in Appendix K, Tables 3.2 and 3.6, as total increased loadings per year, per event, and per day. In each case, the increase that would result from the proposed action is insignificant.

## **Assessment of Impacts**

Potential impacts to water quality and natural resources were determined based on the following potential types of impacts that could occur under the proposed action:

- Changes in terrestrial habitat;
- Water quality and aquatic resources impacts due to resuspension or deposition of sediment;
- Alteration to fish breeding or nursery habitat;
- Impacts to EFH species identified by NMFS;
- Dredging or disturbance of habitats for benthic macro invertebrates;
- Shading effects on aquatic organisms caused by new or modified in-water structures; and
- Changes in terrestrial habitat.

Impacts during construction are assessed in Chapter 20, "Construction."

## B. REGULATORY CONTEXT

The following section briefly describes the federal and state laws and the implementing regulations that apply to the protection of water quality and aquatic resources along the study area. The regulations particularly apply to activities in coastal zone management areas (which includes the proposed action) including marine waters, floodplains, tidal wetlands, and protection of species of special concern.

### Federal

#### *The Clean Water Act of 1987 (PL 100-4)*

The Clean Water Act of 1987 amended the Federal Water Pollution Control Act of 1972 to address non-point source pollution such as runoff from streets, agricultural lands, construction and mining sites that enter waterbodies. Before these amendments, the Act addressed the control of point sources of water pollution such as discharges of municipal sewage and industrial wastewater. The amendments also allowed for tighter control of toxic pollutants. The sections of the Clean Water Act relevant to the proposed action are discussed below.

Section 401. Section 401 of the Clean Water Act of 1987 requires that any applicant for a federal permit or license for activities that may result in a discharge to navigable waters provide a certificate from the state in which the activities will occur, or from an interstate water pollution control agency with jurisdiction over navigable waters, that the discharge complies with Sections 301 (effluent limitations for point source discharges), 302 (effluent limitations for a point source or group of point sources), 303 (setting of water quality standards and implementation plans), 306 (standards for the control of pollutants), and 307 (effluent standards for certain toxic contaminants) of the Clean Water Act. Furthermore, such regulations apply to dredging or disposal of dredged material. In such cases, it must be demonstrated that the activity does not cause a violation of State water quality standards. To meet these requirements, discharges to navigable waters in New York must obtain a Water Quality Certificate from the DEC.

Section 404. Section 404 of the Clean Water Act requires authorization from the Secretary of the Army, acting through the U.S. Army Corps of Engineers (ACOE), for the discharge of dredged or fill material into navigable waters of the United States. Waters of the United States are defined in 33 CFR 328.3 and include, but are not limited to, rivers (e.g., the East River) and wetlands that meet this definition. Section 404 applies to both permanent and temporary fill that may be discharged into waters classified as navigable by the ACOE, or wetlands under the jurisdiction of the ACOE. Issuance of a Section 404 permit by the ACOE also requires a Water Quality Certificate from the state where the discharge occurs (see 401 above).

#### *Rivers and Harbors Act of 1899*

Section 10 of the Rivers and Harbor Act of 1899 requires authorization from the Secretary of the Army, acting through the ACOE, for the construction of any structure in or over any navigable waters of the United States; the excavation from, or deposition of, material in these waters; or any obstruction or alteration in navigable waters. The intent of this Act is to protect navigation and navigable channels. Any structures such as pilings, piers, or bridge abutments up to the mean high water line would be regulated pursuant to this Act (e.g., a water taxi landing).

***Coastal Zone Management Act of 1972***

The Federal Coastal Zone Management Act of 1972 established a nationwide program to encourage coastal states to develop management programs in designated coastal areas. The intent of the Act is to provide a management framework for the use of coastal lands for the purposes of reducing conflicts between coastal development and protection of resources within the coastal zone. New York has a federally-approved coastal zone management program that is described in Chapter 12 of this EIS. Federal permits issued in states with approved coastal management programs must be accompanied by a Coastal Zone Consistency Determination that evaluates consistency with that management plan. In New York, the New York State Department of State (NYSDOS) conducts this consistency review. Because the City of New York has a Waterfront Revitalization Program (WRP), any federal, state, and city actions must be evaluated for consistency with those policies. Chapter 12, “Waterfront Revitalization Program,” provides a consistency analysis for the proposed action.

***Magnuson-Stevens Act***

Section 305(b)(2)-(4) of the Magnuson-Stevens Act outlines the process for NMFS and the Regional Fishery Management Councils (in this case the Mid-Atlantic Fishery Management Council) to comment on activities proposed by federal agencies (issuing permits or funding projects) that may adversely impact areas designated as essential fish habitat (EFH). EFH is defined as the waters and substrate necessary for fish to spawn, breed, feed, or grow to maturity (16 USC 1802(10)). The ACOE, through their permitting process, must either incorporate NMFS recommendations for minimizing effects to EFH (measures to avoid, minimize, or mitigate), or provide basis for not adopting them. Under the Magnuson-Stevens Act, NMFS and the eight regional Fishery Management Councils were directed to describe and identify EFH in the fishery management plans for the purposes of reducing the adverse effects of fishing on EFH and encouraging the conservation and enhancement of EFH. The East River is a designated EFH.

***Endangered Species Act of 1973 (PL 93-205; 16 USC 1531 et seq.)***

The Endangered Species Act of 1973 recognizes that endangered wildlife and plant species provide aesthetic, ecological, educational, historical, recreational, and scientific value. The Act prohibits the importation, exportation, taking, possession, and other activities, involving species covered under the Act. The Act also provides for the protection of critical habitats that endangered or threatened species depend on for survival. FWS (non-marine plants and animals) and NMFS (marine plants and animals) are responsible for administering the Act. Section 7(a) of the Act requires federal agencies to consult with the Secretary of the Interior (through FWS and/or NMFS) before project implementation to ensure that the proposed action will not jeopardize a species, or destroy, or adversely modify the designated critical habitat of such species.

***New York State******Protection of Waters, Article 15, Title 5, ECL, Implementing Regulations 6NYCRR Part 608.***

In adopting this act, the State of New York found that its surface waters (rivers, streams, lakes, and ponds) are valuable resources for multiple purposes (e.g., potable water, fish and wildlife habitat, educational and recreational opportunities). It is therefore the State’s policy, as set forth in Title 5 of Article 15 of the Environmental Conservation Laws (ECL) to preserve and protect these waters. DEC administers the Protection of Waters regulations. Under this program, all waters of the state are provided a use classification such as A or AA for drinking water, B for swimming and other contact recreation, C for

waters supporting fisheries and non-contact recreation, for fresh and marine waters). The East River along the study area is designated I– saline surface waters– best uses are secondary contact recreation and fishing; water quality suitable for fish propagation and survival. The Protection of Waters Program regulates five categories of activities: disturbance of the stream bed or banks of a protected stream or other watercourse; construction, reconstruction or repair of dams and other impoundment structures; construction, reconstruction or expansion of docking and mooring facilities; excavation or placement of fill in navigable waters and their adjacent and contiguous wetlands; and Water Quality Certification for dredging or placing fill or other activities that result in a discharge to waters of the United States in accordance with Section 401 of the Clean Water Act (see above).

***State Pollutant Discharge Elimination System (SPDES), Article 17 Title 8, ECL, Implementing Regulations 6NYCRR Parts, 750, 751, 752, 753, 754, 755, 756 757.***

Title 8 of Article 17, ECL, *Water Pollution Control*, was enacted to protect and maintain surface and ground water resources and authorized the creation of the State Pollutant Discharge Elimination System (SPDES) to regulate discharges to the state’s waters. The following activities require SPDES permits: constructing or using an outlet or discharge pipe (point source) that discharges wastewater into surface or ground waters of the State; constructing or operating a disposal system (sewage treatment plant); or discharge of stormwater. Under the current Phase II regulations, construction activities that disturb one acre or more must obtain an SPDES permit.

***Waterfront Revitalization of Coastal Areas and Inland Waterways Act (Executive Law Sections 910-921).***

This state act implements the Federal Coastal Zone Management Act. The New York State Department of State (DOS) is responsible for conducting Coastal Zone Consistency review and administering the Coastal Management Program (CMP) which contains 44 coastal policies that need to be addressed when actions are located within the coastal zone. This Act also authorizes the state to encourage local governments to adopt Waterfront Revitalization Programs (WRP) that incorporate the state’s policies. New York City has a Waterfront Revitalization Program (WRP) administered by the City Planning Commission. The City’s WRP consists of 10 policies. Any activity in the City’s coastal zone must be assessed with respect to these City policies. A number of the policies deal with protection of water quality and natural resources. Chapter 12, “Waterfront Revitalization Program,” addresses the general consistency of the proposed action with the 10 City policies.

***Tidal Wetlands Act, Article 25, ECL, Implementing Regulations 6NYCRR Part 661.***

Tidal wetlands regulations apply to lands where tidal inundation occurs on a daily, monthly, or intermittent basis and also includes a regulated adjacent area. Tidal wetlands are found along marine shores, bays, inlets, canals, and estuaries of New York City and include the East River. Tidal wetlands provide valuable support for biological activity, wildlife habitat, flood control, recreation, pollutant filtration, education and research opportunities, and scenic values. Thus, the state’s policy is that tidal wetlands should be preserved and protected. DEC is responsible for administering the tidal wetlands regulatory program (6 NYCRRR Part 661) and mapping the tidal wetlands. Tidal wetlands are identified by category based on the types of vegetation and the presence of tide. For example, the shallow water areas of the East River (at locations less than 1.8 meters [6 feet] deep) are defined as littoral zone. A permit is required for activities in the wetlands or adjacent areas. In New York City, those adjacent areas extend up to 45.7 meters (150 feet) inland of the wetlands, or to an elevation of 10 feet to National Geodetic Vertical Datum (NGVD).



***Endangered and Threatened Species of Fish and Wildlife; Species of Special Concern, ECL, Sections 11-0535[1]-[2], 11-0536[2], [4], Implementing Regulations 6 NYCRR Part 182.***

Under the New York State ECL and its implementing regulations (6 NYCRR, Part 193 and Part 182), DEC maintains a list of plant and animal species that are considered rare, endangered, threatened, or of special concern. The classifications are slightly different for plants and animals—e.g., plants can be considered endangered, threatened, rare, or vulnerable, while animals can be endangered, threatened, or of special concern. These State designations have legal status, providing protection for plants and animals that are endangered, threatened, or rare, although species considered to be vulnerable or of special concern have no legal protection. Species determined to be of special concern are those that are candidates for listing as rare or endangered, but for which insufficient data exist for a final determination. It is a violation to pick, damage, or destroy any protected plants, or to apply defoliant or herbicides or to carry these plants away without the owner's consent. Animal species designated as endangered or threatened are protected from hunting, importing, exporting, or possession.

## **New York City**

### ***New York City Environmental Quality Review (CEQR)***

As discussed above, CEQR defines the impact assessment for a natural resources analysis. The approach most often used for CEQR in this type of analysis is to consider plant and animal species in the context of the surrounding environment, or habitat. The methodology for the assessment, as previously described, evaluates an action's potential to affect the environment through direct and indirect impacts.

## **C. EXISTING CONDITIONS**

This section provides a description of the natural resources setting for this study and includes a description of the coastal floodplains and wetlands, terrestrial resources, water resources and aquatic biota.

### **Wetlands**

There are no freshwater wetlands in the study area. All wetlands are tidal along the East River (see Figure 10-1).

The shoreline along the proposed action area consists primarily of urban bulkhead and/or riprap. This type of urban structural shoreline significantly limits the potential for higher quality tidal wetlands such as tidal marsh or submerged aquatic vegetation. As shown in Figure 10-1, the FWS National Wetlands Inventory (NWI) classifies the majority of the waters along the proposed action area as estuarine subtidal with unconsolidated bottom (at least 25 percent of particles are smaller than 6-7 cm (2.4-2.8 in.) stones)<sup>2</sup>.

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<sup>2</sup> Estuarine subtidal waters include substrates in estuarine waters (from the mouth of the river, bay, or sound to where ocean-derived salts measure less than 0.5 parts per thousand during the period of average annual low flow) that are continuously submerged. Unconsolidated bottom areas have at least 25 percent cover of particles smaller than stones and less than 30 percent of the area is covered by vegetation. These areas are characterized by the lack of stable surfaces that could be used as attachment areas for plants and animals.



Subtidal estuarine habitats are continuously submerged areas with low energy and variable salinity, influenced and often enclosed by land. Unconsolidated bottoms have at least 25 percent cover of particles smaller than 6 or 7 cm (2.4-2.8 in), and less than 30 percent vegetative cover.

The East River is designated as littoral zone (shallow waters 1.8 meters [6 feet] or less in depth) by DEC. However, regulations state that *actual* water depths determine whether or not an area is a littoral zone (generally defined as depth of less than 1.8 meters [6 feet] to mean low water). For example, with respect to state regulated wetlands, a bathymetric survey of Bushwick Inlet indicates that it is a shallow littoral habitat with water depths less than 1.5 meters (5 feet) at mean low tide (see also the discussion below under “Bushwick Inlet”). Bushwick Inlet and intermittent shoreline areas of the adjacent East River are therefore regulated as littoral zones. The littoral zone is defined under 6NYCRR 661.4(hh) as any “land under tidal waters” that is not part of other tidal wetland resource areas with specific ecological function (such as intertidal marsh, etc.) and is less than 1.8 meters (6 feet) deep at mean low water.

The TransGas Energy (TGE) Facility Article X Application (December 2002, revised March 2003) describes two types of tidal communities present at Bushwick Inlet and along the study area. Those habitats are marine riprap/artificial shore and tidal river community. Each of these communities is described below. These communities also represent the ecological communities along much of the shoreline of the proposed action area.

Edinger (2002) defines this community as “the community of a constructed marine shore in which the substrate is composed of broken rocks, stones, wooden bulkheads, or concrete placed so as to reduce erosion. Characteristic organisms are attached algae, mussels, and barnacles; percent cover and species diversity are low compared to a marine rocky intertidal community. This community is demonstrably secure throughout its range.”

The TGE Application reported the observation of a dark band of macroalgae present along the base of riprapped slope and dominated by rockweed (*Fucus vesiculosus*). Barnacles (*Balanus balanoides*) formed an occasional component of this intertidal community. The distinct vertical zonation of the macroalgae and sessile invertebrates reflects tidal amplitude.

Edinger (2002) describes this community as “the aquatic community of continuously flooded substrates that support no emergent vegetation.” Within the East River there are two zones; the deepwater zone (>1.8 meters [6 feet] in depth) and the shallows zone (<1.8 meters [6 feet] in depth).” The latter zone is regulated by the DEC.

### ***Submerged Aquatic Vegetation and Benthic Algae***

Submerged aquatic vegetation (SAV) are 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 algae that are 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 factors in determining SAV and benthic algae productivity and biomass.

None of the studies reviewed as part of this assessment reported the presence of SAVs in the East River or along the study area. The extensively developed shoreline and swift currents severely limit inhabitation of this area by SAVs. One study in the upper East River reported common algal species including *Fucus*, *Ulva*, and *Enteromorpha* (Perlmutter 1971).

## Bushwick Inlet

Bushwick Inlet is an important water body in the study area because it is a unique protected cove along the East River. As described above, the TGE Application defined Bushwick Inlet as littoral zone. The estimated depth of Bushwick Inlet is 0.6 to 1.5 meters (2 to 5) feet at the innermost (easterly) shoreline and 5.2 meters (17 feet) deep at the outlet, based on the NOAA Nautical Chart for the Hudson and East Rivers. No soundings were taken within the inlet; NOAA soundings are only shown at the mouth.

Fish with the potential to occur in Bushwick Inlet include winter flounder, scup, white perch (i.e., juveniles inhabit creeks and inshore areas until they are about one year old). A more detailed description of potential fish habitats is provided in the section “Essential Fish Habitat.”

## Floodplains

All of the water area and the majority of land area along the immediate shoreline (up to Wythe Avenue and Franklin Street) is within the 100-year floodplain (see Figure 10-2). The 100-year flood elevation is 3 meters (10 feet) above National Geodetic Vertical Datum (NGVD). The immediate shoreline is within the velocity zone, which means it is subject to wave action in storms. The area of the proposed action does not contain any regulated floodways.

## Water Resources

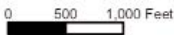
### *Overview*

The proposed action area is located along the eastern shore of the East River from the North 3<sup>rd</sup> Street on the south to McGuinness Boulevard on the north and including this segment of Newtown Creek. The East River is a tidal strait that connects New York Harbor with the western end of Long Island Sound. Its circulation and salinity are therefore largely determined by conditions in the Upper Harbor and the Sound. The river is approximately 25.7 kilometers (16 miles) long and generally ranges from 182.9 to 1,219.2 meters (600 to 4,000 feet) wide. Water depth in the channel is generally 12.2 meters (40 feet) below mean low water (MLW) at the Battery to the former Brooklyn Navy Yard, and 10.7 meters (35 feet) at MLW from that point north to the Throgs Neck Bridge. However, sections of the channel are much deeper, reaching depths up to 30.5 meters (100 feet) deep in areas just north of Hell Gate.

Maximum currents in the East River are approximately 9.3 to 11.1 km/hr (5 to 6 knots) and the shorelines are virtually entirely bulkheaded or riprapped. During the early flood cycle of the East River, Hudson River water flows in via the Battery, and during the entire flood cycle, Hudson River water enters through the Harlem River and the East River also floods from Long Island Sound. The mean tidal range is approximately 1.3 meters (4.3 ft) at the Battery, increasing to 2.2 meters (7.2 ft) at Willets Point. The phase of the tide at Willets Point lags from the Battery by about 3 hours. This differential and the disparity in water elevations between the Battery and Willets Point, is chiefly responsible for the rapid tidal currents in this water body.

Sources of freshwater inputs to the East River are the Bronx River, Westchester Creek, the Upper Hudson River, and combined sewer overflows (CSOs) and water pollutant control plant (WPCP) point sources (e.g., Newtown Creek, Red Hook, Hunts Point, Wards Island WPCPs). The Newtown Creek WPCP discharges to the East River in the proposed action area. There are over 100 CSOs discharging to the East





River. Solutions to CSO pollutant loadings are being evaluated and prioritized by the DEP (Interstate Environmental Commission (IEC) 2002).

### ***Water Quality***

Title 6 of the New York Code of Rules and Regulations (NYCRR) Part 703 defines surface water standards for New York State's surface waters. As shown in Table 10-1 below, the East River is classified I.

**TABLE 10-1**  
**DEC Water Quality Standards for the East River**

<b>Class</b>	<b>Definition</b>	<b>Fecal Coliform</b>	<b>Total # of Colonies/100</b>	<b>DO (never less than mg/L)</b>	<b>pH</b>
I	Saline surface waters—best usages are secondary contact recreation and fishing. Water quality should be suitable for fish propagation and survival.	Monthly geometric mean less than or equal to 2,000 colonies/100mL from 5 or more samples.	The monthly geometric mean from a minimum of 5 examinations shall not exceed 10,000.	4.0	The normal range shall not be extended by more than 0.1 of a pH unit.
<b>Source:</b> 6NYCRR Part 703 ( <a href="http://www.dec.state.ny.us/website/regs/703.htm">http://www.dec.state.ny.us/website/regs/703.htm</a> )					

The City of New York has monitored New York Harbor water quality with an annual survey (Harbor Survey) for over 90 years. The DEP conducts the survey by collecting water samples at stations in four designated regions: Inner Harbor, Upper East River-Western Long Island Sound, Lower New York Bay-Raritan Bay, and Jamaica Bay (DEP 2002). The proposed action area is along the Inner Harbor, which includes the East River to the Battery.

As part of the Harbor Survey, DEP evaluates water quality, sediment characteristics, hydrology, phytoplankton, and macroinvertebrates two to four times in the summer months and once each in October, February, March and April (DEP 2000, 2001). DEP records water quality parameters such as temperature, salinity, density, dissolved oxygen (DO), water clarity, pH, total suspended solids (TSS), nutrients, chlorophyll *a*, plankton and coliforms. The results of the survey are used to determine use attainment and classifications for waterbodies and have been used to create a chemical and water quality characterization of the harbor, including the East River. What follows is a description of the harbor and East River based on these data as well as other sources. This includes a description of temperature and salinity conditions, as well as a general overview of harbor-wide and East River water quality trends.

Temperature and salinity influence several physical and biological processes within the East River. Temperature has an effect on the spatial and seasonal distribution of aquatic species and affects oxygen solubility, respiration, and other temperature-dependent water column and sediment biological and chemical processes. Salinity fluctuates in response to tides and freshwater discharges. Salinity and temperature combined largely determine water density and can affect vertical stratification of the water column. Salinity is also an important habitat variable as a number of aquatic species have a limited salinity tolerance.

Average temperatures in the Upper Bay range from about 3.7 °C in winter to 23.8 °C in summer (38.7 to 74.8 °F) (USACOE 1999). Temperatures in the East River measured near the proposed action area during the 1995–2002 Harbor Survey ranged from approximately 2.28 to 25.5 °C (36 to 78 °F).

Salinity values vary depending on the volume of freshwater flow. As a result, salinity values are highest in the Lower Harbor and Raritan Bay (nearer the ocean), and decrease up the estuary into the Lower Hudson River and the East River. In addition, the Upper Harbor is partially stratified—higher salinity water originating from the Atlantic Ocean at the mouth of the estuary tends to be at the bottom, while freshwater from the rivers is found at the top. Average salinity differences throughout the water column in the Harbor are generally between 1,000 and 3,000 mg/L (1 and 3 parts per thousand [ppt]) (USACOE 1999). However, swift tidal currents and limited freshwater inflow are responsible for thorough vertical mixing and can cause the absence of large salinity gradients in the East River.

Salinity measurements taken in the East River near the proposed action area between 1995 and 2002 generally ranged from about 6,000 to 28,000 mg/L (6 to 28 ppt), with bottom water salinity generally only slightly greater than surface water salinity. Periodic high freshwater flows in extremely wet years can occasionally create oligohaline conditions (salinity <5,000 mg/L [5 ppt]) for relatively short periods.

The most recent Harbor Survey data available are from 2002. These data show that the water quality of New York Harbor has continued to improve since the 1970s due in part to measures implemented by the City. 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 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).

Recent data from the survey station closest to the proposed action area, E2 just south of Newtown Creek, indicate that the water quality in this part of the East River is generally good. Table 10-2 below presents a summary of water quality measurements at station E2 in 2002. As shown in the table, the station is generally meeting the standards for fecal coliform and D.O.

**TABLE 10-2**  
**2002 DEP Water Quality Data for the E2 (East River) Sampling Station**

Parameter	Top Waters			Bottom Waters		
	Low	High	Avg	Low	High	Avg
Total Fecal Coliforms (per 100 mL) <sup>1</sup>	7.0	830	112.8	NM	NM	NM
Dissolved Oxygen (D.O.) (mg/L) <sup>2</sup>	3.4	13.6	7.2	4.2	13.5	6.9
Secchi Transparency (ft)	3.0	7.0	4.9	-	-	-
Chlorophyll <i>a</i> (µg/L)	0.8	8.5	3.0	-	-	-
<b>Standards:</b> <sup>1</sup> Total Fecal Coliform – monthly geometric mean, from a minimum of five examinations, shall not exceed 10,000 (per 100 mL) <sup>2</sup> DEC standard for D.O. shall not be less than 4.0 mg/L at any time There are no standards for sechhi transparency and chlorophyll <i>a</i> <b>Source:</b> DEP Harbor Water Quality Survey Summary, 2002						

The presence of coliform bacteria in surface waters indicates potential health impacts from human or animal waste, and elevated levels of coliform can result in the closing of bathing beaches and shellfish beds. According to the 1999, 2000, and 2001 Harbor Surveys, the waters of the Inner Harbor Area, which includes the East River, meet the fecal coliform standard at most sampling locations. While there are temporary increases in fecal coliform concentrations during and after wet weather events, overall, fecal coliform concentrations have declined, thus improving water quality from the early 1970s, when levels were well above 2,000 colonies/100 mL (2,000 colonies/6.1 in<sup>3</sup>) (DEP 2001). In 2002, fecal coliform

concentrations near the proposed action area were below 8 colonies/100mL (8 colonies/6.1 in<sup>3</sup>) in bottom waters. Fecal coliform bacteria concentrations in top waters peaked as high as 830 colonies/100 mL (830 colonies/6.1 in<sup>3</sup>), but generally remained well below 200 colonies/100 ML (200 colonies/6.1 in<sup>3</sup>) (DEP 2002) in this zone.

Dissolved oxygen (DO) 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 DO to low levels and persistently low DO can degrade habitat and cause a variety of sublethal or, in extreme cases, lethal effects. Consequently, DO is one of the most universal indicators of overall water quality in aquatic systems. DO concentrations in the Inner Harbor Area have increased over the past 30 years from an average that was below 3 mg/L (3ppm) in 1970 to above 5 mg/L (5 ppm) in 2001, a value fully supportive of ecological productivity (DEP 2002). In 2002, DO concentrations at Station E2 were above the 4 mg/L (4 ppm) standard for Class I waters in more than half of the samples surveyed (DEP 2002). The reappearance of marine borers in the river is another indication of improving water quality conditions.

High levels of nutrients can lead to excessive plant growth and depletion of dissolved oxygen. Concentrations of the plant pigment chlorophyll-*a* in water can be used to estimate productivity and the abundance of phytoplankton. Concentrations greater than 20 µg/L (0.02 ppm) are considered suggestive of eutrophic conditions. DEP is currently implementing a program to reduce nitrogen loadings from wastewater treatment plants to the East River. Upgrades implemented at four upper East River treatment plants have decreased nitrogen discharges from these plants by over 13,607.8 kilograms (30,000) pounds per day since 1993. Upgrades to the Newtown Creek treatment plant, which discharges to the East River in the vicinity of the proposed action area, have been underway since 1998 and are expected to be completed in 2007. In 2002, concentrations at station E2 averaged 3.0 µg/L (0.003 ppm) and never exceeded 9 µg/L (0.009 ppm) (DEP 2002).

Secchi transparency is a measure of the clarity of surface waters. Transparency greater than 1.5 meters (5 feet) is indicative of clear water. Decreased clarity can be caused by high suspended solid concentrations or blooms of plankton. Secchi transparencies less than 0.9 meters (3 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 1.1 and 1.7 meters (3.5 and 5.5 feet). Average Secchi transparency near the proposed action area in 2002 was 1.5 meters (4.9 feet), with the lowest measurement of 0.9 meters (3 feet) taken only once.

The DEC is attempting to reduce toxic chemicals in New York Harbor. This work is being done under the Contamination Assessment and Reduction Project (CARP). Under this program, DEC developed a comprehensive, multi-media contaminant identification and trackdown program simultaneously with New Jersey and the CARP Work Group (a group of government, academic, and consultant experts). The states, together with the Work Group, are undertaking a variety of projects including studies to track down contaminant sources in the surface water, groundwater, and wastewater inputs to the Harbor. The overall goal of the initiative is to reduce the inflow of contaminants. The principle chemicals of concern are:

- dioxin/furans
- polychlorinated biphenyls (PCBs)
- polyaromatic hydrocarbons (PAHs)
- metals (mercury, cadmium, and lead)
- pesticides (dieldrin and chlordane).

The two CARP sampling areas nearest to the proposed action area are the Lower East River (LER) near the Brooklyn Navy Yard, and at the outfall of the Red Hook Sewage Treatment Plant (RHSTP). Samples



from the LER sampling area exceeded the NYS standards for benzo(b,k)fluoranthene and benzo(a)pyrene in 1998, but not in 1999 (Litten et al. 1999). Total polychlorinated byphenyls (PCBs) were the only other trace contaminant reported in samples from the LER site (Litten and Fowler 1999). Samples from the RHSTP contained measurable concentrations of three pesticides (DDT, chlordane, and mirex), methyl mercury, and dissolved mercury (Litten and Fowler 1999, Litten et al. 1999).

### ***Sediment Quality***

Complex flow patterns lead to widely variable sediment characteristics throughout the Harbor and East River. The Upper Harbor has the most complex distribution of sediments in the area because of variable currents and a high degree of sediment input due to natural and human actions. The ACOE (1999) reports that sediments in the Upper Harbor vary from coarse sands and gravels in high-energy areas to fine-grained silts and clays in low-energy areas. The East River primarily has a hard, rock bottom consisting of gravel, cobble, rocks, and boulders covered with a shallow layer of sediment. The shallow sediment cover is caused by strong tidal currents in the river.

Typical of any urban watershed, New York Harbor sediments are often contaminated due to the history of waterfront industrial uses. Contaminants found throughout the harbor include pesticides such as chlordane and DDT, metals such as mercury and copper, and various polycyclic aromatic hydrocarbons. Adams et al. (1998) found the mean sediment contaminant concentration for 50 of 59 chemicals measured to be statistically higher in the Harbor than other coastal areas on the East Coast. Biological effects, identified based upon the benthic invertebrate community, were found to be associated with the chemical contamination. While the sediments of the harbor are contaminated, the levels of most sediment contaminants (e.g., dioxin, DDT, and mercury) have decreased on average by an order of magnitude over the past 30 years (Steinberg et al. 2002).

## **Upland Resources**

### ***Flora***

The proposed action area is a mix of residential, commercial, industrial uses and urban vacant lots where vegetation is both opportunistic and sparse. The 14.6-hectare (36-acre) McCarren Park is the largest open space resource in the area. The park provides a variety of recreational facilities and mowed lawns with ornamental and/or native trees and shrubs.

From a natural resources perspective, the proposed action area is located within a disturbed, urban setting where little or no indigenous vegetation exists and a preponderance of common invasive species are present. The ecological communities in the study area primarily consist of urban vacant lot communities. Trees would include tree-of-heaven, black cherry, eastern cottonwood, and locust. Herbaceous vegetation would include ragweed, goldenrods, asters, sweet clover, common mullein, and grasses such as Japanese brome grass, orchard grass, and fescue grass. Terrestrial and avian wildlife in the study area are generally limited to species tolerant of urban conditions and low-quality habitat.

### ***Fauna***

#### **Mammals**

Because the proposed action area is highly developed, wildlife species likely to occur are limited to pockets of vacant areas that may provide suitable habitat, and developed areas that may provide habitat

to a limited number of species. These areas include residential, parks and other land uses with some open space. Common urban animals are those adapted to human disturbance. Mammals with the potential to occur in the proposed action area include brown bat (*Myotis lucifugus*), big brown bat (*Eptesicus fuscus*), house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), gray squirrel (*Sciurus carolinensis*), and raccoon (*Procyon lotor*).

## Avifauna

### Coastal and Upland Birds

As a tidal strait linking New York Harbor with Long Island Sound, the East River is an important flyway, particularly for shorebirds that feed and forage in water environments. In addition, there are migratory and overwintering birds that would be attracted to the river as well as raptors that have re-appeared, some of them nesting in the East River bridges and structures along the river. A comprehensive list of avifauna found along the East River is provided in Table 10-8 at the end of this chapter.

In addition, as stated above, Bushwick Inlet is a unique feature on the East River. As a protected cove it provides the opportunity for overwintering and feeding in a quiescent environment. An inventory of species observed at Bushwick Inlet and the Greenpoint waterfront is provided in Table 10-3 below. This list was compiled between 1995 and 2003 by Emily Bradshaw, a local resident, and reviewed by the New York City Audubon Society. In addition to the bird sighting, surveyors noted whether the species was observed during migration, is a resident, a visitor, or was nesting. These observations are provided under the column “Activity Notes.”

**TABLE 10-3**  
**Avian Species List for Bushwick Inlet and the**  
**Greenpoint/Williamsburg Waterfront**

Common Name	Scientific Name	Activity Notes
Alder Flycatcher	<i>Empidonax alnorum</i>	Occasional migrant
American Black Duck	<i>Anas rubripes</i>	Possible nesting species
American Coot	<i>Fulica americana</i>	Winter resident
American Crow	<i>Corvus brachyrhynchos</i>	Common resident
American Goldfinch	<i>Carduelis tristis</i>	Migrant
American Kestrel	<i>Falco sparverius</i>	Frequent visitor during migration
American Redstart	<i>Sexophaga ruticilla</i>	Uncommon migrant
American Robin	<i>Turdus migratorius</i>	Formerly nested around Greenpoint Park and aspen grove
Baltimore Oriole	<i>Icterus galbula</i>	Observed for one week around West Street two seasons ago
Barn Swallow	<i>Hirundo rustica</i>	Nesting species
Belted Kingfisher	<i>Megasceryle alcyon</i>	Migrant seen a few times
Black-capped Chickadee	<i>Parus atricapillus</i>	Occasional visitor
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	Nests along Greenpoint waterfront
Blue Jay	<i>Cyanocitta cristata</i>	More common in Greenpoint, possible nester in aspen grove
Brant	<i>Branta bernicla</i>	Migrant, except occasional regular individual in Inlet
Bufflehead	<i>Bucephala albeola</i>	Winter resident
Canada Goose	<i>Branta canadensis</i>	Nesting species
Canvasback	<i>Aythya valisineria</i>	Winter resident
Chestnut-sided Warbler	<i>Dendroica pensilvanica</i>	Seen in American Playground
Common Grackle	<i>Quiscalus quiscula</i>	Spring migrant
Common Yellowthroat	<i>Geothlypis trichas</i>	Common migrant, suspected it nested along river, but not proven
Dark-eyed Junco	<i>Junco hyemalis</i>	Common migrant, sometimes abundant
Double Crested Cormorant	<i>Phalacrocorax auritus</i>	Resident, nesting species

**TABLE 10-3**  
**Avian Species List for Bushwick Inlet and the**  
**Greenpoint/Williamsburg Waterfront**

Common Name	Scientific Name	Activity Notes
Downy Woodpecker	<i>Picoides pubescens</i>	Common migrant
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Common migrant
Eastern Phoebe	<i>Sayornis phoebe</i>	Frequently seen migrant
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	Common migrant, sometimes abundant
European Starling	<i>Sturnus vulgaris</i>	Resident, numbers have declined
Field Sparrow	<i>Spizella pusilla</i>	Migrant, possible winter resident
Fish Crow	<i>Corvus ossifragus</i>	Seen often along waterfront
Gadwall	<i>Anas strepera</i>	Winter resident
Golden-crowned Kinglet	<i>Regulus satrapa</i>	Frequent migrant
Gray Catbird	<i>Dumetella carolinensis</i>	Nested several years in the aspen grove
Greater black-backed gull	<i>Larus marinus</i>	Resident, pair nests along river
Great Blue Heron	<i>Ardea herodias</i>	Occasional visitor, probably nests in NY Harbor
Great Egret	<i>Casmerodius albus</i>	Visitor
Greater Scaup	<i>Aythya marila</i>	Winter resident
Green Heron	<i>Butorides striatus</i>	Migrant
Herring gull	<i>Larus argentatus</i>	Resident, pair has nested along river
Horned Grebe	<i>Podiceps auritus</i>	Two sightings in winter
House Finch	<i>Carpodacus mexicanus</i>	Common visitor
House Sparrow	<i>Passer domesticus</i>	Resident
Killdeer	<i>Charadrius vociferus</i>	One pair nested along riverfront until 2001
Laughing Gull	<i>Larus atricilla</i>	Common summer visitor
Mallard	<i>Anas platyrhynchos</i>	Nesting species
Marsh Wren	<i>Cistothorus platensis</i>	Heard one spring
Mourning Dove	<i>Zenaida macroura</i>	Dozens nest along river
Northern Cardinal	<i>Cardinalis cardinalis</i>	Frequent visitor to American Manufacturing grounds, perhaps nested there
Northern Flicker	<i>Colaptes auratus</i>	Migrant seen in abundance
Northern Harrier	<i>Circus cyaneus</i>	Sighted two different autumns
Northern Mockingbird	<i>Mimus polyglottos</i>	Two nesting pairs divided up the area from North 11th St. between Ken and Berry Sts.
Northern Shoveler	<i>Anas clypeata</i>	One sighting
Northern Waterthrush	<i>Seiurus noveboracensis</i>	Migrant seen during two springs
Palm Warbler	<i>Dendroica palmarum</i>	Spring and autumn migrant, in good numbers
Peregrine Falcon	<i>Falco peregrinus</i>	Occasional but regular visitor to waterfront
Pied-billed Grebe	<i>Podilymbus podiceps</i>	Winter resident
Red-bellied Woodpecker	<i>Centurus carolinus</i>	Seen around American Playground
Red-breasted Merganser	<i>Mergus serrator</i>	common visitor
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Two autumn sightings
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Migrant, at least one nesting male each season
Ring-billed gull	<i>Larus delawarensis</i>	Common winter resident
Rock Dove	<i>Columba livia</i>	No data
Ruby-crowned Kinglet	<i>Regulus calendula</i>	Frequent migrant
Ruddy Duck	<i>Oxyura jamaicensis</i>	Winter resident
Scarlet Tanager	<i>Piranga olivacea</i>	Sighting one spring in Greenpoint Park
Snowy Egret	<i>Egretta thula</i>	Visitor from NY Harbor
Song Sparrow	<i>Melospiza melodia</i>	Resident
Spotted Sandpiper	<i>Actitis macularia</i>	May have nested at Inlet one season
Swainson's Thrush	<i>Catharus ustulatus</i>	One sighting in Greenpoint Park
Swamp Sparrow	<i>Melospiza georgiana</i>	Spring migrant, attempted to nest but area cleared
Tundra Swan	<i>Olor columbianus</i>	Around the inlet off and on in January one year
White-throated Sparrow	<i>Zonotrichia albicollis</i>	Common migrant, sometimes abundant
Willow Flycatcher	<i>Empidonax traillii</i>	Occasional migrant
Yellow Warbler	<i>Dendroica petechia</i>	Common migrant
Yellow-rumped Warbler	<i>Dendroica coronata</i>	Abundant autumn migrant

**Source:** New York City Audubon Society (2004).

Waterfowl use the New York City area during fall migration, which peaks in November, and, secondarily, as overwintering areas. Common migratory species include Atlantic brant, greater scaup, American black duck, canvasback, mallard, bufflehead, oldsquaw, mergansers, common goldeneye, and American wigeon (FWS 1997). Overwintering waterfowl can include horned grebe, brant, red-breasted merganser, American widgeon, greater scaup, and bufflehead (NRG 1990a). Common breeding waterfowl include mallard, American black duck and Canada goose. In New York City, waterfowl concentration areas are found in Jamaica Bay, Staten Island shoreline of Raritan Bay and New York Bay, the lower Hudson River, and the Kill Van Kull, but with its densely developed shoreline, do not include the East River (FWS 1997).

Nearly 30 species of shorebirds regularly use and migrate through the New York Harbor area during the spring (March to June) and summer/fall (July to November), feeding in the marshes, flats, and shallow water areas before continuing their migration. Abundant shorebirds include herring gull, black-backed gull, laughing gull, semipalmated sandpiper, semipalmated plover, sanderling, ruddy turnstone, black-bellied plover, red knot, dunlin, short-billed dowitcher, greater and lesser yellowlegs, and least sandpiper. Spotted sandpiper, willet, killdeer, piping plover, and American oystercatcher, and clapper rail breed in the New York Harbor area (NRG 1990a, and 1995a, FWS 1997). Sandy or mudflat shorelines such as Jamaica Bay Wildlife Refuge and the tidal flats along Staten Island are commonly used foraging and staging areas for these species. They are not typically found along the East River because of the absence of this type of habitat. Breezy Point, located on Rockaway Point at the entrance to Rockaway Inlet supports large nesting populations of the endangered piping plover, least tern, common tern, and black skimmer. Other terns that nest in the New York Harbor include Forster's tern, gull-billed tern, and the Federally listed roseate tern (FWS 1997). Likewise, terns may occasionally occur along the East River, but this is not their principal habitat.

Long-legged wading birds (herons, egrets, and ibises) form regionally significant colonies in the Arthur Kill and Kill van Kull (the Harbor Herons Complex), and on Hoffman Island in lower New York Bay, North and South Brother Islands in the Upper East River, some of the small marsh islands in Jamaica Bay, and on Huckleberry Island in the Long Island Sound Narrows. Abundant wading birds include great blue heron, little blue heron, tricolored heron, black-crowned night-heron, green heron, American bittern, snowy egret, glossy ibis, cattle egret and great egret (New York City Department of Parks and Recreation (NYCDPR) 1994, 1995, FWS 1997). These birds may flyover the study area, but do not find the habitat suitable for their use. However, it is noted that black-crowned night heron, great blue heron and green heron have been observed on the Greenpoint waterfront in Bushwick Cove (see Table 10-3 above).

Raptors, such as northern harrier, osprey, common barn owl, and peregrine falcon, breed in the New York City area. Overwintering species include northern harrier, rough-legged hawk, American kestrel, common barn owl, short-eared owl, long-eared owl, and peregrine falcon. Floyd Bennett Field in the Gateway National Recreational Area, and Jamaica Bay are important raptor wintering grounds. Commonly observed raptors migrating through the area include American kestrel and sharp-shinned hawk, as well as merlin, northern harrier, and osprey (NRG 1990a, FWS 1997). Other raptors observed in New York City parks include red-tailed hawks and great horned owls (NYCDPR 1994, NRG 1995b). These species are also known to nest in City bridges along the East River, as well as the taller buildings of the Manhattan waterfront.

Many songbirds migrate through the New York City area, and about 172 species are believed to breed in the City. The large number of breeding songbirds can be attributed to the diversity of habitats as well as a mixing of northern and southern species in the New York City area. Song birds known to breed in New York City include: song sparrow, American robin, gray catbird, yellow warbler, red-winged blackbird, marsh wren, sharp-tailed sparrow and seaside sparrow, and brown-headed cowbird black-capped chickadee, tufted titmouse, yellow-shafted flicker, American redstart, and blue winged warbler (NRG

1991b, FWS 1997). Other birds known to occur in New York City parks include American goldfinch, ring-necked pheasant, eastern meadowlark, bobolink, northern oriole, white-breasted nuthatch, yellow-bellied flycatcher, great crested flycatcher, hermit thrush, wood thrush, rufous-sided towhee; warblers such as chestnut-sided, hooded, bay-breasted, Wilson's, and Cape May; brown thrasher, ovenbird, American woodcock, northern cardinal, red-bellied woodpecker, downy woodpecker, wood peewee, red-eyed vireo, and scarlet tanager (NRG 1991b, 1995b, NYCDPR 1994).

## Aquatic Resources

The strong hydrodynamic features of the East River, coupled with the numerous municipal and industrial discharges that have occurred in the river over many years, make this river a physically harsh environment. Therefore, many of the species using the area are tolerant of highly variable conditions. The following provides a brief description of the aquatic biota found in the East River.

### *Primary Organisms*

#### Phytoplankton

Phytoplankton are microscopic plants whose movements within the system are largely governed by prevailing tides and currents. Several species can obtain larger sizes as chains or in colonial forms. Light penetration, turbidity, and nutrient concentrations are important factors in determining phytoplankton productivity and biomass. While nutrient concentrations in most areas of New York Harbor are very high, low light penetration has often precluded the occurrence of phytoplankton blooms.

In several studies focusing on the East River, investigators have collected 77 phytoplankton genera, several of which were represented by a number of different species. Diatoms are generally the most widely represented class of phytoplankton, accounting for over 90 percent of the different taxa. The green algae, *Nannochloris*, was the most abundant single taxa identified in this area. In a 1993 survey of New York Harbor, 29 taxa of phytoplankton were identified, with the diatom *Skeletonema costatum* and the green algae *Nannochlorus atomus* found to be the most abundant species at the monitored sites (Brosnan and O'Shea 1995). Resident times of phytoplankton species within New York Harbor are short and species move quickly through the system. The average summer cell counts in the 1993 survey year ranged from 6,300 to 97,000 cells/mL (6,300 to 97,000 cells/.1in<sup>3</sup>).

#### Zooplankton

Zooplankton is an integral component of aquatic food webs—they are primary grazers on phytoplankton and detritus material, and are themselves consumed by organisms of higher trophic levels as food. 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 and white perch during their early life stages. Predacious zooplankton species can consume eggs and larvae, and can have a detrimental effect on certain fish species.

Studies conducted in New York Harbor found crustacean taxa to be the most prevalent form of zooplankton. The most dominant species include the copepods *Acartia tonsa*, *Acartia hudsonica*, *Eurytemora affinis*, and *Temora longicornis*, with each species being prevalent in certain seasons (Stepien et al. 1981, Lonsdale and Cosper 1994, Perlmutter 1971, Lauer 1971, Hazen and Sawyer 1983). The data suggest that the copepods collected in the East River are extensions of populations established in Long Island Sound and New York Harbor.

### ***Benthic Invertebrates***

Invertebrate organisms that inhabit river bottom sediments as well as surfaces of submerged objects (such as rocks, pilings, or debris) are commonly referred to as benthic invertebrates. These organisms are important to an ecosystem's energy flow because they convert detrital and suspended organic material into carbon (or living material). Moreover, they are also integral components of the diets of ecologically and commercially important fish and waterfowl species. In addition, benthic invertebrates are also essential in promoting the exchange of nutrients between the sediment and water column. Benthic invertebrates include those that can be retained on a 0.5 mm (0.02 in) screen (macroinvertebrates) as well as smaller forms, such as nematodes (a class of roundworm) and harpacticoid copepods (order of copepods that are primarily benthic) called meiofauna. Some of these animals live on top of the substratum (epifauna) and some within the substratum (infauna). Substrate type (rocks, pilings, sediment grain size, etc.), salinity, and dissolved oxygen levels are the primary factors influencing benthic invertebrate communities; secondary factors include currents, wave action, predation, succession, and disturbance.

A number of studies regarding the distribution and abundance of benthic invertebrates have been conducted in New York Harbor. A compilation of these studies (Coastal Environmental Services, 1987) indicated that over 100 taxa had been identified in the East River, most of which were either crustaceans or polychaete worms. A more recent literature review identified over 180 benthic taxa in the Hudson River, East River, and upper New York Harbor (PBS&J, 1998). Common infaunal macroinvertebrates collected within the Harbor include aquatic earthworms, segmented worms, snails, bivalves and soft shell clam, barnacles, cumaceans, amphipods, isopods, crabs and shrimp. Epifauna include hydrozoans, sea anemones, flatworms, oligochaete worms, polychaetes, bivalve, barnacles, gammaridean and caprellid amphipods, isopods, sea squirts, hermit crabs, rock crabs, grass shrimp, sand shrimp, blue crabs, mud dog whelks, mud crabs, horseshoe crabs, blue mussels, softshell clams, and sea slug (EEA Engineering, Science, and Technology 1990, Able et al. 1995, NYCDPR 1994, AKRF Inc., 2001).

Two separate, but related benthic invertebrate subcommunities have also been identified based on sediment hardness in the East River (Hazen and Sawyer 1983). The hard substrate community was characterized by organisms that were either firmly attached to rocks and other hard objects (e.g., mussels or barnacles), or that built or lived in tubes. Other species of polychaetes and amphipods also occur on the hard bottom surfaces, and several species have adapted to the East River's hard bottoms and rapid currents by living within the abandoned tubes of other species (Hazen and Sawyer 1985). The soft substrate community, which is characteristic of the more protected areas within the upper East River (e.g., Bushwick Inlet, see discussion below), has permitted detritus, clay, silt, and sand to accumulate in shallow, low velocity zone, such as under piers and within basins and inlets. Common soft substrate organisms observed included oligochaete worms, the soft shelled clam *Mya arenaria*, and a variety of flatworms, nemerteans, polychaetes, and crustaceans.

Benthic macroinvertebrate sampling conducted between Brooklyn Piers 1 and 2 in the East River (which are located south of the proposed action area near the Brooklyn Bridge) in 1986-1987 identified a total of 22 taxa (EEA 1989). Abundance was highest in late summer (27,907 individuals per square meter [1.2 square yard]) and lowest in the spring (847 individuals per square meter) when water dissolved oxygen levels were relatively low. The high summer abundance can be attributed almost entirely to a single species, *Streblospio benedicti*, a pollution-tolerant oligochaete. In the EPA R-EMAP study, *Streblospio benedicti* was abundant in benthic samples taken from degraded areas but not in samples from reference sites.

Benthic macroinvertebrate sampling was also conducted in 1993-1994 between Piers 8 and 9A (which are located near Red Hook terminal) as part of the USEPA Regional Environmental Monitoring and

Assessment Program (R-EMAP) (Adams et al. 1998). These data suggested that the benthic community was highly impacted, consisting primarily of pollution-tolerant organisms. A benthic macroinvertebrate sampling program conducted in July 2002 between Piers 6 and 9 on the Manhattan shore of the East River also found large numbers of pollution-tolerant benthic invertebrate (primarily polychaetes in the families Capitellidae and Spionidae) (AKRF 2002). However, pollution-sensitive benthic invertebrate species (e.g., *Ampelisca* sp.) were also collected at this location including snail, amphipod, polychaetes, and clam. Other collected invertebrates were mussels, crabs, shrimp, isopods, nematodes, and several species of polychaete.

### ***Fish***

New York City is located at the convergence of several major river systems, all of which connect to the New York Bight and the Atlantic Ocean. This convergence has resulted in a mix of habitats in the East River that supports marine fish, estuarine fish, anadromous fish (fish that migrate up rivers from the sea to breed in freshwater), and catadromous fish (fish that live in freshwater, but migrate to marine waters to breed).

Despite the relatively low value of the East River for fish propagation, the waterway does serve as a major migratory route between the Hudson River/New York Harbor and Long Island Sound. Harsh conditions in the East River, including its swift current, lack of shoal and protected habitat, and possibly a lack of prey, are possible explanations as to why the East River experiences only limited utilization by fish at various times of the year. The swift currents act to scour the river bottom and prevent accumulation of sediment. Consequently, the benthic community in deeper channel areas is characterized by attached rather than infaunal species. During the summer months, impaired water quality—particularly episodic low levels of dissolved oxygen—can also limit fish population (PAS 1985).

The Article X Application for the proposed TGE project reported the consistently numerically dominant species in the project area include hogchoker, tomcod, winter flounder, white perch, and striped bass. The community of year-round resident fishes that can be observed within the East River include Atlantic tomcod, American eel, grubby, sculpin, red hake, mummichog, cunner, northern pipefish, striped bass, white perch, windowpane, winter flounder, and hogchoker. During the warmer months, bay anchovy flourish. Based upon the review of the East River fisheries studies, it appears that the dominant fishes expected to occur within the vicinity of the proposed TGE project include winter flounder, Atlantic tomcod, grubby, striped bass, and bay anchovy and several species that occur at lower frequencies.

### Marine Species

Winter flounder, scup, and bluefish are marine species common to the East River. Winter flounder is an important commercial and recreational fish species that prefers cold water. Adults have a short migration pattern, moving offshore a short distance in spring and returning to shallow inshore or estuarine waters in late fall (Bigelow and Schroeder 1953). Winter flounder spawn in the lower estuary during winter and early spring and prefer sandy bottoms in shallow water where freshwater from the estuary reduces salinities to slightly below full strength (Pereira et al. 1999). Capture of adult-size winter flounder during the winter months in the East River indicates possible spawning activity (NJMSC 1984 in PAS 1985). Winter flounder have a varied diet of small invertebrates and fish fry (Grimes et al. 1989).

Scup, or porgy, is a marine species that migrates inshore during late spring. It tends to stay close to the coast during the summer months before moving offshore during the fall to deeper waters. The scup is a bottom feeder that spawns from May through August (Bigelow and Schroeder 1953).

Bluefish are also reported as an abundant species in the East River. Bluefish is a pelagic fish whose young migrate into estuaries and harbors along the coast during late spring or early summer. The major spawning grounds of the bluefish are located in the outer half of the continental shelf, and the resulting young move inshore in the late summer to feed (Bigelow and Schroeder 1953). Incidence of young bluefish in the East River is assumed to be related to this migration pattern (PAS 1985).

#### Estuarine Species

Species found in the East River are the resident fish Atlantic silverside, striped killifish, and common killifish. These species are important prey for larger predator fish and are commonly used as bait by fishermen. They are primarily resident estuarine fish although considered euryhaline (PAS 1985).

Atlantic silversides are small fish that school in shallow water and are permanent residents of the estuary. They spawn in May through early July and mature in one year. Atlantic silversides are omnivorous and feed chiefly on copepods, mysids, shrimp, amphipods, cladocerans, fish eggs, young squid, annelid worms, and mollusk larvae (Bigelow and Schroeder 1953).

Common killifish spawn primarily in fresh or brackish water, usually from spring to late summer or early autumn. Adults generally mature during their second year. Striped killifish spawn in shallow water close to shore from June through August, and again mature in their second year. Both species feed primarily on crustaceans and polychaetes (Abraham 1985).

White perch is an additional estuarine species that has been found in the East River. Adult white perch migrate to shallow fresh and slightly brackish water in the spring and early summer to spawn, after which they return to the lower estuary. The demersal eggs hatch in 3 to 5 days, and after approximately 1 month they begin to look like small adults. The juveniles inhabit creeks and inshore areas until they are about a year old (Heimbuch et al. 1994). Small white perch primarily eat invertebrates. Larger white perch in salt and brackish water eat small fish fry, crabs, shrimp, and other invertebrates. White perch of more than 200 mm in length eat mostly fish (Stanley and Danie 1983).

#### Anadromous Species

Anadromous species that use the East River include striped bass and tomcod, and members of the herring family. Striped bass use the East River for migration from fall through spring (PAS 1985). Mature striped bass return from marine waters to fresh water to spawn before migrating back to salt waters. The young then use the brackish waters as nursery and wintering area. Juvenile striped bass migrate to marine waters when nearing maturity. The majority of adults then spend much of their time in coastal, bay, and river mouth waters before returning to spawn in the spring each year (Bigelow and Schroeder 1953). Juvenile striped bass eat a variety of invertebrates, and adults eat a variety of fish and may also eat shrimp. Young-of-the-year and older striped bass have been shown to overwinter in large numbers in the lower Hudson River estuary. They feed primarily on invertebrates; as they grow striped bass feed primarily on fish (Fay et al. 1983).

Tomcod is an inshore species of cod that is distributed from southern Labrador to Virginia along the Atlantic Coast. Adults may spawn in marine waters but are typically anadromous and migrate into rivers and estuaries during late fall and winter to spawn. In New York water, the adult tomcod move out from shore to cooler waters in the spring. These fish feed mainly on small crustaceans (Bigelow and Schroeder 1953).



Two of the common anadromous species are members of the herring family-alewife and American shad. These species live in the sea as adults and move into estuaries in spring on their spawning migrations. Both spawn in freshwater. Juveniles migrate from the estuaries in their first year primarily in the fall. These species primarily eat crustaceans and other invertebrates (Bigelow and Schroeder 1953).

#### Catadromous Species

The single catadromous species common to the East River is American eel. Eels spawn at sea and the young move into the estuary as elvers in the spring, typically in February and March (Fahay 1978). American eels are opportunistic feeders and juveniles eat crustaceans, polychaetes, bivalves and fish. They grow slowly and at sexual maturity move down the estuary in the fall and out to sea (Bigelow and Schroeder 1953).

#### Essential Fish Habitat (EFH) Analysis

##### *Overview*

The study area is located on the East River, which is Essential Fish Habitat (EFH) as designated by the FWS. Table 10-4 lists those EFH species.

**TABLE 10-4**  
**Essential Fish Habitat Designated Species**

Species	Eggs	Larvae	Juveniles	Adults
Pollock ( <i>Pollachius virens</i> )			X	X
Red hake ( <i>Urophycis chuss</i> )		X	X	X
Winter flounder ( <i>Pleuronectes americanus</i> )	X	X	X	X
Windowpane flounder ( <i>Scophthalmus aquosus</i> )	X	X	X	X
Atlantic sea herring ( <i>Clupea harengus</i> )		X	X	X
Bluefish ( <i>Pomatomus saltrix</i> )			X	X
Atlantic butterfish ( <i>Peprilus triacanthus</i> )		X	X	X
Atlantic mackerel ( <i>Scomber scombrus</i> )			X	X
Summer flounder ( <i>Paralichthys dentatus</i> )		X	X	X
Scup ( <i>Stenotomus chrysops</i> )	X	X	X	X
Black sea bass ( <i>Centropristus striata</i> )	N/A		X	X
King mackerel ( <i>Scomberomorus cavalla</i> )	X	X	X	X
Spanish mackerel ( <i>Scomberomorus maculatus</i> )	X	X	X	X
Cobia ( <i>Rachycentron canadum</i> )	X	X	X	X
Sand tiger shark ( <i>Odontaspis taurus</i> )		X		
Dusky shark ( <i>Charcharinus obscurus</i> )		X		
Sandbar shark ( <i>Charcharinus plumbeus</i> )		X		X
<b>Source:</b> National Marine Fisheries Service, "Summary of Essential Fish Habitat (EFH) Designation" posted on the internet at <a href="http://www.nero.nmfs.gov/ro/STATES4/conn_li_ny/40407350.html">www.nero.nmfs.gov/ro/STATES4/conn_li_ny/40407350.html</a> .				

Swift currents scour the bottom and prevent accumulation of sediment, thus limiting the bottom community on which fish feed to attached rather than free-moving species. As a result, the FWS has indicated that the extant bottom community on the East River is not sufficient for the feeding requirements of higher fish levels. In addition, the few soft bottom communities present along the channel edges and main stem of the river are not highly productive. The meager benthic food sources, the lack of shallow water habitat and swift currents also limit the population of principal forage fish, such as mummichog (*Fundulus sp.*) and Atlantic silverside (*Menidia menidia*).

However, as a tidal strait with swift currents, the East River provides an important migratory route between New York Harbor/Atlantic Ocean and Long Island Sound. This is recognized as a FWS “Urban Core Area” for EFH. According to FWS’s *New York-New Jersey Harbor Urban Core Review* (2001), the nearshore fishery—within 5 kilometers (3 miles) of the shoreline—includes winter and summer flounder and bluefish as well as more EFH designated as within the study area.

#### *Species Likely to Occur in the Study Area*

The EFH species and life stages with the greater potential to occur within the study area are listed in Table 10-5. A more detailed description of each of the EFH species follows.

#### Pollock

The East River is designated as EFH for juvenile and adult pollock. The typical habitat for juveniles is bottom habitats with aquatic vegetation or a substrate of sand, mud, or rocks with water temperatures below 18 °C (65 °F), depths from 0 to 250 meters (0 to 820 feet), and salinities between 29,000 and 30,000 mg/L (29 and 30 ppt). This is a greater salinity than is typical for the proposed action area. In addition, there is currently little, if any, in-water vegetation in the proposed action area to provide nursery areas for juvenile pollock.

Adults are found on hard bottom habitats, including artificial reefs, with water temperatures below 14 °C (57 °F), depths from 15 to 365 meters (50 to 1,200 feet), and salinities between 31,000 and 34,000 mg/L (31 and 34 ppt). This is a greater depth and greater salinity than is typical for this part of the East River.

**TABLE 10-5**  
**EFH-Designated Species with the Potential to Occur in the Proposed Action Area**

Species	Eggs	Larvae	Juveniles	Adults
Pollock ( <i>Pollachius virens</i> )				X
Red hake ( <i>Urophycis chuss</i> )				X
Winter flounder ( <i>Pleuronectes americanus</i> )	X	X	X	X
Windowpane flounder ( <i>Scopthalmus aquosus</i> )	X	X	X	X
Atlantic sea herring ( <i>Clupea harengus</i> )		X		X
Bluefish ( <i>Pomatomus saltrix</i> )			X	X
Atlantic butterfish ( <i>Peprilus triacanthus</i> )		X	X	X
Summer flounder ( <i>Paralichthys dentatus</i> )		X	X	X
Scup ( <i>Stenotomus chrysops</i> )	X	X	X	X
Black sea bass ( <i>Centropristus striata</i> )			X	X
<b>Source:</b> AKRF, Inc., March 2004.				

NOAA (1994) indicates that (in this instance) no life stages of this species are known to occur in the mixing zone portion of the Hudson River/Raritan Bay Estuary. However, adult pollock were collected during impingement studies at the nearby Ravenswood plant conducted during 1993-1994, nearly one mile from the proposed action area. If present in the proposed action area, adults of this species are expected to be transient.

#### Red Hake

The East River is designated as EFH for larvae, juvenile, and adult red hake. The typical habitat for red hake larvae is sea surface temperatures below 19 °C (66 °F), depths of less than 200 meters (660 feet), and salinities greater than 500 mg/L (0.5 ppt). The larvae are most often observed from May through December, with peaks in September and October. Juveniles are found on shelly substrates, and prefer water temperatures below 16 °C (61 °F), depths of less than 100 meters (33 feet), and a salinity range of

31,000 to 33,000 mg/L (31 to 33 ppt). This is a slightly lower temperature and greater salinity than is typical in the vicinity of the proposed action area.

Adults, however, are found in bottom habitats of sand and mud, although they prefer water temperatures below 14 °C (57 °F), depths from 15 to 365 meters (50 to 1,200 feet), and salinities between 31,000 and 34,000 mg/L (31 and 34 ppt); a more open water environment than the proposed action area. Red hake are very sensitive to low dissolved oxygen (DO). In particular, juveniles are sensitive to DO levels less than 4.2 mg/L (4.2 ppm), and would likely not tolerate summer minima conditions in the East River.

Adults of the species were collected during impingement studies at the nearby Ravenswood plant. If present in the proposed action area, adults of this species are expected to be transient, likely during the cooler months of the year, when DO is above 4.2 mg/L (4.2 ppm).

#### Winter Flounder

The East River is designated as EFH for eggs, larvae, juvenile, and adult winter flounder. Habitat and environmental conditions in the East River are typical for all life stages of winter flounder. Spawning adults and eggs are often observed from February to June, and larvae are observed from March to July. Eggs, juveniles, and adults prefer bottom habitats of mud or fine-grained sand, and larvae are found in both bottom habitats and in the water column. NOAA (1994) indicates that all life stages of winter flounder are known to be abundant within the mixing zone portion of the Hudson River/Raritan Bay Estuary. In addition, all life stages were collected during impingement and entrainment studies at the nearby Ravenswood plant conducted in 1993-1994. If present in the study area, winter flounder could use certain bottom habitats for overwintering, spawning, and maturing.

#### Windowpane Flounder

The East River is designated as EFH for eggs, larvae, juvenile, and adult windowpane flounder. Habitat and environmental conditions in the East River are typical for all life stages of windowpane flounder. Spawning adults, eggs, and larvae are often observed from February to November or December, with peaks in May and October. Eggs and larvae are concentrated in the mid to upper water column, and juveniles and adults prefer bottom habitats of mud or fine-grained sand. NOAA (1994), indicates that eggs and spawning adults are known to be rare, and larvae, juveniles, and adults are known to be common within the mixing zone portion of the Hudson River/Raritan Bay Estuary. Windowpane flounder eggs, larvae, juveniles, and adults were collected in the vicinity of the study area during impingement and entrainment studies at the Ravenswood plant conducted in 1993-1994. The bottom habitats of the study area are more likely to be used by this species.

#### Atlantic Sea Herring

The East River is designated as EFH for larvae, juvenile, and adult Atlantic sea herring. Larvae are generally found in pelagic waters with temperatures below 16 °C (60 °F), water depths from 50 to 90 meters (154 to 300 feet), and salinities of about 32,000 mg/L (32 ppt). Juveniles and adults prefer pelagic waters and bottom habitats with water temperatures below 10 °C (50 °F), at water depths of 15 to 135 meters (50 to 450 feet) and 10 to 130 meters (33 to 430 feet), respectively, and salinity ranges of over 26,000 mg/L (26 ppt). The preferred water temperatures are lower than the study area, and the depths and salinities are greater.

NOAA (1994) indicates that larvae, juvenile, and adult Atlantic sea herring are known to be common within the mixing zone portion of the Hudson River/Raritan Bay Estuary. In addition, larvae and adult life stages of this species were collected during impingement studies at the nearby Ravenswood plant conducted in 1993-1994. However, it is unlikely for this species to occur in the shallows of the East River (e.g., Bushwick Inlet), as this species prefers deeper waters.

### Bluefish

The East River is designated as EFH for juvenile and adult bluefish. Bluefish often migrate to estuaries in the summer months, between April (adults) or May (juveniles), and October. Juveniles in the Mid-Atlantic Bight inhabit inshore estuaries from May to October, preferring temperatures between 15-30 °C (59-86 °F), and salinities between 23,000-33,000 mg/L (23-33 ppt). Although, juvenile (and adult) bluefish are moderately euryhaline, occasionally they will ascend well into estuaries where salinities may be less than 3,000 mg/L (3 ppt). Juveniles use estuaries as nursery areas, and can be found in sand, mud, silt, or clay substrates as well as *Spartina* or *Fucus* beds. Bluefish juveniles are sensitive to changes in temperature where thermal edges apparently serve as important cues to juvenile migration off shore in the winter season.

Adult bluefish are pelagic and highly migratory with a seasonal occurrence in Mid-Atlantic estuaries from April to October. They prefer temperatures from 14-16 °C (57-81 °F) but can tolerate temperatures from 11.8-30.4 °C (53.2-86.7 °F) and salinities greater than 25,000 mg/L (25 ppt). Adult bluefish are not uncommon in bays and larger estuaries, as well as coastal waters.

NOAA (1994) indicates that larvae are known to be rare, juveniles as abundant, and adults as common within the mixing zone portion of the Hudson River/Raritan Bay Estuary. Bluefish adults were collected during impingement studies conducted in 1993-1994 at the Ravenswood plant. This species is likely to be in the East River as a migratory species and foraging.

### Atlantic Butterfish

The East River is designated as EFH for larvae, juvenile, and adult Atlantic butterfish. Butterfish spawning takes place chiefly from May through October in Mid-Atlantic Bight. The times and duration of spawning are closely associated with changes in surface temperatures.

Larvae are found at the surface or in the shelter of the tentacles of large jellyfish, and remain are more nektonic than planktonic from 10-15 mm (0.4-0.6 in.). Larvae are found at temperatures ranging from 7-26 °C (45-79 °F) (although most abundant at 9-19 °C [48-66 °F]), and at depths less than 120 m (393.7 ft).

Both juveniles and adults have similar habitat characteristics. Both are eurythermal and euryhaline and are common often near the surface in sheltered bays and estuaries during the spring to fall months. In the Hudson-Raritan trawl survey, juveniles and adults were found at depths from 3-23 m (9.8-75.5 ft), salinities from 19,000-32,000 mg/L (19-32 ppt), and DO from 3-10 mg/L (3-10 ppm). Juvenile and adult butterfish also often prefer sandy and muddy substrates, and temperatures from 3-28 °C (37-82 °F). Larvae and adult butterfish were collected during impingement and entrainment studies conducted in 1993-1994 at the Ravenswood plant. If present at all in the study area, butterfish are expected to be transient.

### Atlantic Mackerel

The East River is designated as EFH for juvenile and adult Atlantic mackerel. Juveniles in the Hudson River estuary prefer salinities of 26,100 to 28,900 mg/L (26.1 to 28.9 ppt), and DO from 7.3 to 8.0 mg/L (7.3 to 8.0 ppm). These values are higher than the study area, and, thus, juveniles are not expected in the study area. Adults prefer water temperatures of 6 to 16 °C (43 to 60 °F) and depths of 9 to 320 meters (30 to 1050 feet). Spawning adults would be found in deeper open waters. NOAA (1994) indicates that juveniles are known to be rare and all other life stages of this species are known to be not present in the mixing zone portion of the Hudson River/Raritan Bay Estuary. This species was not collected during the 1991-1992 and 1993-1994 impingement and entrainment studies at the Ravenswood plant, nearly one mile from the proposed action area. This species is not likely to occur within the study area due to depth and salinity preferences.

### Summer Flounder

The East River is designated as EFH for larvae, juvenile, and adult summer flounder. In the inshore waters of the New York Bight, summer flounder usually inhabit inshore regions during the warmer months and move off shore for the winter season. In the Mid-Atlantic, spawning begins inshore in September, continues through to December out over the continental shelf, sometimes to February/March (with peaks in the month of November).

Larvae of summer flounder are transported to estuarine nursery areas by currents where metamorphosis is completed from October to May. Summer flounder larvae are planktonic, and have been found in temperatures ranging from 0-23 °C (32-73.4 °F). Salinity preference within the Hudson River Estuary for larvae of this species was found between 20,000-30,000 mg/L (20-30 ppt). In the Mid -Atlantic Bight, larvae were found at depths from 10-70 m (32.8-229.7 ft).

Young summer flounder move into shallow (found usually at 0.5-5.0 m [1.6-16.4 ft] in depth) estuaries using them as nursery habitat in the fall, summer, and spring months. Juvenile summer flounder are able to withstand a wide range of temperatures (greater than 11 °C) and salinities from 10,000-30,000 mg/L (10-30 ppt). Juveniles can be found on mud and sand substrates.

Adult summer flounder often feed in estuaries and shelf waters in the warmer months and are more active during daylight hours since summer flounder are primarily visual feeders. Adults inhabit sand substrates usually at depths up to 25 m (82 ft), at temperatures ranging from 9-26 °C (48.2-78.8 °F) in the fall, 4-13 °C (39.2-55.4 °F) in the winter, 2-20 °C (35.6-68 °F) in the spring, and 9-27 °C (48.2-80.6 °F) in the summer. Salinity is known to have minimal effect on distribution in comparison to substrate preference.

The habitat characteristics within the study area are within the range of those preferred by this species. Therefore, summer flounder larvae, juveniles, and adults are likely to occur within the study area from April through late October. Summer flounder larvae and adults were also found present near the study area during impingement and entrainment studies conducted at the Ravenswood plant in 1993-1994.

### Scup

The East River is designated as EFH for eggs, larvae, juvenile, and adult scup. Scup of all life stages are found in estuaries during the spring and summer. All life stages prefer salinities greater than 15,000 mg/L (15 ppt). Eggs and larvae are found in water temperatures of 12.8 to 22.8 °C (55 to 73 °F), and juveniles and adults are found in water temperatures of greater than 7.22 °C (45 °F). Eggs and larvae are pelagic, with a gradual transition to the demersal adult stage. Adults will also use structured areas for feeding and shelter. Adults of the species were collected during impingement studies at the nearby Ravenswood plant. In addition, the habitat characteristics of the study area suggest that adults may be present here.

### Black Sea Bass

The East River is designated as EFH for juvenile and adult black sea bass. Juveniles and adults are found in estuaries during the spring and summer, in water temperatures above 6.1 °C (43 °F) and salinities greater than 18,000 mg/L (18 ppt). They generally prefer rough, shelly substrates, and can be found in natural and man-made structured habitats, such as piers. NOAA (1994) indicates that adults and juveniles are known to be rare in the mixing zone portion of the Hudson River/Raritan Bay Estuary. Adults were collected during the 1993-1994 impingement studies at the Ravenswood plant. The habitat characteristics of the East River suggest that juvenile and adult black sea bass may be found in the study area.

### King Mackerel

The East River is designated as EFH for eggs, larvae, juvenile and adult king mackerel. King mackerel inhabit Atlantic coastal waters from the Gulf of Maine to Rio de Janeiro, Brazil, and spawn in the coastal

waters of the northern Gulf of Mexico, and off the southern Atlantic coast. Because of a protracted spawning season, larvae have been collected from May through October, with the highest catches occurring in September. In the Gulf of Mexico, mackerel larvae have been taken at surface salinities ranging from 27,000-36,000 mg/L (27-36 ppt) and temperatures ranging from 26-31 °C (79-88 °F) and in the south Atlantic between (30,000-37,000 mg/L (30-37 ppt) and 22-28 °C (72-82 °F).

Temperature and salinity are believed to be the most important factors governing the distribution of king mackerel. Their northern range extends only to the 20 °C (68 °F) isotherm within the 18-m contour. Their northern range limit is in the vicinity of Block Island, Rhode Island. King mackerel usually inhabit waters with salinities of 32,000-36,000 mg/L (32-36 ppt). These salinity concentrations are not normally encountered within the study area.

Because of the salinity and temperature preferences of this species, it is unlikely that king mackerel is present within the study area.

#### Spanish Mackerel

The East River is designated as EFH for eggs, larvae, juvenile and adult Spanish mackerel. Spanish mackerel inhabit coastal waters of the western Atlantic Ocean from the Gulf of Maine to the Yucatan Peninsula. This species is migratory, generally moving northward each spring, spending summer in the northern part of their range, and migrating south in fall. In spring, summer, and fall, they are most abundant in the northern Gulf of Mexico and along the east coast of the United States up to Virginia.

Spawning in the vicinity of the study area begins in April from late August to late September off Sandy Hook, New Jersey, and Long Island, New York. Few Spanish mackerel spawn at water temperatures below 26 °C (79 °F). Studies indicate that Spanish mackerel spawn over the Inner Continental Shelf in water 12-34 m (39.4-111.5 ft) deep.

Spanish mackerel eggs are pelagic and about 1 mm (0.04 in) in diameter. Hatching takes place after about 25 hours at a temperature of 26 °C (79 °F). Most larvae have been collected in coastal waters of the Gulf of Mexico and the east coast of the United States.

Juvenile Spanish mackerel have been collected from low salinity estuaries (approximately 12,800 to 19,700 mg/L [12.8 to 19.7 ppt]) and high salinity beach waters (approximately 33,800 mg/L [33.8 ppt]). Some juvenile Spanish mackerel use estuaries as nursery grounds, although most stay nearshore in open beach waters.

As is the case with king mackerel, temperature and salinity are believed to be the most important factors governing the distribution of Spanish mackerel. Their northern range limit is also in the vicinity of Block Island, Rhode Island. Water temperatures of 21-27 °C (70-81 °F) are preferred by this species, and they have rarely been observed in waters cooler than 18 °C (64 °F). Notwithstanding the exceptions noted above, all life stages of Spanish mackerel usually inhabit waters within salinities of 32,000-36,000 mg/L (32-36 ppt). Spanish mackerel usually avoid freshwater or low salinities near the mouth of rivers.

Because of the salinity and temperature preferences of this species, it is unlikely that Spanish mackerel is regularly present in the study area.

#### Cobia

The East River is designated as EFH for eggs, larvae, juvenile and adult Cobia. Cobia are large, migratory, coastal pelagic fish of the monotypic family *Racycentridae*. In the western Atlantic Ocean, cobia occur from Massachusetts to Argentina, but are most common along the south Atlantic coast of the United States

and in the northern Gulf of Mexico. In the eastern Gulf, cobia typically migrates from its wintering grounds off south Florida into northeastern Gulf waters during early spring. They occur off northwest Florida, Alabama, Mississippi, and southeast Louisiana wintering grounds in the fall. Some cobia overwinter in the northern Gulf at depths of 100 to 125 m (328.1 to 410.1 ft). Information on the life history of cobia from the Gulf and the Atlantic Coast of the United States is limited.

The occurrence of the cobia species within the study area is highly unlikely due to its coastal migrations and pelagic nature.

#### Dusky Shark

The East River is designated as EFH for dusky shark larvae (neonates). The dusky is a large, coastal species found in tropical and temperate waters throughout the world, and ranges from Nova Scotia to Cuba. It is most often found along continental coastlines where it ranges from shallow inshore waters to the outer continental shelf and adjacent oceanic waters. This species is highly migratory, moving north during the summer and south in the winter.

In the western Atlantic, mating occurs in the spring. Due to the presence of two size classes of young found in pregnant females off the coast of Florida, it is believed that females of this species only mate every second year. These different size classes suggest alternating birth seasons every two years with a gestation period of 8 months or a single season with a longer gestation period of about 16 months. In the western Atlantic, the number of young per litter ranges from 6 to 8.

Adults tend to avoid areas of low salinity, and rarely enter estuaries. However, dusky sharks are viviparous, and females enter bays and estuaries to drop their pups. After pupping, adult sharks move to deeper waters. The essential fish habitat for dusky shark neonate and early juvenile life stages are the shallow coastal waters, inlets, and estuaries from the eastern end of Long Island, NY south to West Palm Beach, FL to the 100 m (328.1 ft) isobath. The prime nursery areas are estuaries and bays from Cape Hatteras, North Carolina to New Jersey (FMNH).

It is highly unlikely that neonates would be present within the study area at any time of the year due to their preference for shallow coastal waters and their southerly preference.

#### Sand Tiger Shark

The East River is designated as EFH for sand tiger shark larvae (neonates). The sand tiger is a large, coastal species found in tropical and warm temperate waters throughout the world. It is often found in very shallow water (< 4 m [13 ft]).

Males mature between 190-195 cm (74.8-76.8 in) or four to five years, and females at more than 220 cm (86.6 in) or six years. The sand tiger has an extremely limited reproductive potential, producing only two young per litter. In North America, the sand tiger gives birth in March and April to two young that measure about 100 cm (39.4 in). Parturition is believed to occur in winter in the southern portions of its range, and the neonates migrate northward to summer nurseries. The nursery areas are the following Mid-Atlantic Bight estuaries: Chesapeake, Delaware, Sandy Hook, and Narragansett Bays, as well as coastal sounds.

The species congregates in coastal areas in large numbers during the mating season, and the species is limited in its fecundity with only two pups per litter often contributing to overfishing vulnerability. Embryos, being cannibalistic, consume other embryos until only one from each oviduct survives where each pup grows to be quite large (up to 101.6 cm [40 inches]) before birth. Neonates, after birth, migrate northward in the summer to estuarine nursery areas (University of Delaware, 2001). The essential fish

habitat for sand tiger sharks for neonate and early juveniles are the shallow coastal waters from Barnegat Inlet, New Jersey, to Cape Canaveral, Florida to the 25-m (82-ft) isobath.

It is highly unlikely that neonates would be present within the study area at any time of the year due to their preference for shallow coastal waters and their principal distribution south of the study area.

#### *Sandbar Shark*

The East River is designated as EFH for sandbar shark larvae (neonates) and adults. The sandbar shark is cosmopolitan in subtropical and warm temperate waters. It is a common species found in many coastal habitats. It is a bottom-dwelling species most common in 20 to 55 m (65.6 to 180.4 ft) of water, but occasionally found at depths of about 200 m (656.2 ft).

The sandbar shark is a slow growing species. Both sexes reach maturity at about 180 cm. Estimates of age of maturity range from 15-16 years to 29-30 years, although 15-16 years is the commonly accepted age of maturity. Young are born at about 60 cm (2 ft) (smaller in the northern parts of the North American range) from March to July. Litters consist of one to 14 pups, with nine being the average. The gestation period lasts about a year and reproduction is biennial. In the United States, the sandbar shark uses estuarine nurseries in shallow coastal waters from Cape Canaveral, Florida, to the northern extent of the range at Great Bay, New Jersey (Merson and Pratt, 1997). Bays from Delaware to North Carolina are important nursery areas (Knickle, 2001).

Neonates have been captured in Delaware Bay in late June. Young-of-the-year are present in Delaware Bay until early October when the temperature falls below 21 °C (70 °F). Sandbar sharks were captured in varying salinities but no specimens were caught at salinities below 22,000 mg/L (22 ppt).

The essential fish habitat for sandbar shark neonates and early juveniles are shallow coastal areas; nursery areas in shallow coastal waters from Great Bay, New Jersey to Cape Canaveral, Florida, especially Delaware and Chesapeake Bays (seasonal summer); also shallow coastal waters up to a depth of 50 m (164 ft) on the west coast of Florida and the Florida Keys. Neonates and early juveniles require salinity greater than 22,000 mg/L (22 ppt) and temperatures greater than 21 °C (70 °F).

It is unlikely that this species is present in the study area due to a preference for warmer and shallow coastal waters.

#### ***Endangered, Threatened, and Special Concern Species***

Requests for information on rare, threatened or endangered species for the study area were submitted to FWS (NY office), NMFS, and the DEC New York Natural Heritage Program (NHP). With the exception of occasional transient individuals, no records of federally listed or proposed threatened or endangered species or sensitive habitats were reported by the FWS (Stilwell 2003) for the study area. NHP reported no records of known occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of the study area (Krahling 2003). NMFS indicated that the following endangered or threatened species (i.e., sea turtles) may be present in the study area as seasonal transients: loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempii*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*) (Rusanowsky 2003).

Four species of marine turtles, all state and federally listed, can occur in New York Harbor. Juvenile Kemps ridley and large loggerhead turtles regularly enter the New York Harbor and bays in the summer and fall. The other two species, green sea turtle and leatherback sea turtle, are usually restricted to the higher salinity areas of the harbor (FWS 1997). In general, however, these four turtle species mostly



inhabit Long Island Sound and Peconic and Southern Bays. They neither nest in the New York Harbor Estuary, nor reside there year-round (Morreale and Standora 1995). Turtles leaving Long Island Sound for the winter usually do so by heading east to the Atlantic Ocean before turning south (Standora et al. 1990). It is unlikely that these turtle species would occur in the East River except as occasional transients. No significant adverse impacts would occur to sea turtles as a result of the proposed action.

#### **D. THE FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)**

In the future without the proposed action (through 2013), no major changes are expected in the natural resource conditions of the study area. However, based on the baseline data and trends discussed above, the following environmental changes would be expected through 2013:

- No major changes in wetlands would be expected. The swift currents of the East River should preclude any significant shoaling that could result in the development or migration of tidal wetlands.
- As the floodplains in the area are marine/tidal, no changes in floodplain delineations or flood elevations are expected.
- Water quality trends have shown an improvement over the last few decades and this should continue through 2013. City projects such as the upgrade of the Newtown Creek WPCP should support the trend in water quality improvement, particularly with respect to improved Dissolved Oxygen (DO) and reduced coliform.
- Continued decrease in toxics in bottom sediments due to diminishing pollutant loads.
- Improved habitat for aquatic resources including fish and benthic fauna, with improved water quality and ecological conditions. This should improve the habitat for the Essential Fish Habitat species; however, no major increases in population are anticipated.
- Additional growth of invasive plants on the upland sites. However, no significant change in the quality of these habitats would be expected.
- Continued use of the East River by avifauna, but no major change in populations or species diversity would be expected.
- The amount by which dry weather sanitary sewage flows are predicted to increase by 2013 without the proposed action was included in baseline condition for estimating the changes in CSO overflows associated with the proposed action.

A study undertaken by the Regional Plan Association (“Needs and Opportunities for Environmental Restoration in the Hudson-Raritan Estuary,” May 2003) identified Bushwick Inlet as a site for wetland restoration. While such a project could improve the ecology of the cove, at this time there is no known capital project that has been initiated to fund that restoration.

On the waterfront blocks in the area immediately south of Bushwick Inlet there could be the development of the proposed TGE power plant. In this event, the site would remain in industrial use, but converted from the proposed Bayside Fuel facility to a power plant. No major in-water activities are proposed as part of this effort that would adversely impact the natural resources of Bushwick Inlet (Source: TransGas Article X Application).

## E. THE FUTURE WITH THE PROPOSED ACTION (SCENARIO A)

### Upland Resources

Direct impacts as a result of a proposed action can include construction of new structures, landscaping, and removal of common invasive vegetation. These direct impacts would not be considered significant at the upland sites due to the minimal vegetative coverage and low habitat quality. As stated above, the study area is an urban context lacking significant terrestrial resource communities (i.e., the upland sites are vacant lots that are sparsely vegetated and contain rubble or other debris) with low species diversity and vegetative cover.

The proposed action also includes the creation of a 11.3-hectare (28-acre) park south of Bushwick Inlet, which would provide the potential for an expanded open space/ecological resource of the uplands immediately along the waterfront. This park would provide opportunity for an expanded and diverse habitat for wildlife, particularly birds. Therefore, the proposed action would enhance the potential for wildlife to inhabit the study area, thus providing a positive impact.

The proposed action also offers an opportunity to create urbanized upland landscaped spaces that can provide habitat areas for songbirds and butterflies particularly on the site of the proposed park. The park, if planted with a variety of native trees that can provide variable heights and canopy, offers the potential for providing restored natural resources habitat.

Potential indirect effects as a result of the proposed action may include an increased number of people or noise in the study area due to new construction and the conversion of underutilized industrial properties to residential dwellings and changes in the conditions that introduce the colonization of new plant or animal species or changes in vegetation coverage. Although these activities would occur, the species that would be affected would be urban mammals, the loss or displacement of which is not considered to be significant.

### Waterfront Development Sites

The projected developments would rehabilitate and improve approximately 3,410 linear feet of shoreline that is presently bulkhead/riprap (see Table 10-6).

**TABLE 10-6**  
**Projected Waterfront Development Sites**

<b>Projected Development Site</b>	<b>Linear Feet of Waterfront</b>
Site 3	660
Site 56	750
Site 199	400
Site 211	1,600
<b>Total</b>	<b>3,410</b>

In addition, there are another 10 potential development sites with about 3,230 linear feet of shoreline that could potentially be developed (see Table 10-7).

**TABLE 10-7**  
**Potential Development Sites**

Potential Development Site	Linear Feet of Waterfront
Site 1	300
Site 2	360
Site 3.1	360
Site 3.2	560
Site 24	50
Site 34	250
Site 41	250
Site 44	200
Site 62	500
Site 222	400
<b>Total</b>	<b>3,230</b>

These improvements would occur as part of the development of new residential and mixed use buildings along the waterfront. There are no site specific details for each waterfront site with respect to the installation of new shoreline improvements. However, it would be expected that at each site there would be:

- An engineering assessment of existing bulkhead/riprap conditions and a determination as to the need for such improvements;
- Installation of new shoreline structures, as necessary;
- Creation of a public access promenade and additional waterfront access and landscaping as part of the Greenpoint-Williamsburg Waterfront Access Plan.

Assuming a reasonable worst case, that each linear foot of waterfront would need to be improved at the development sites (see Table 10-6), it would not be expected that these potential shoreline improvements would result in significant natural resource impacts for the following reasons:

- The wetlands along the proposed action area are low-quality habitats. For example, there are no known SAV habitats along the water's edge of the study area. Therefore, no moderate to high-quality wetland environments would be impacted.
- Any impacts to water quality would be temporary and are likely to be confined. It is not expected that any of these projected developments would place fill in the river or build over the river (e.g., new piers or docks). Rather, there would be the repair and replacement of existing shoreline protection structures. The impacts of such activities are temporary and are typically not significant.
- Any impacts to aquatic resources that are present along the existing shoreline or benthos (e.g., algae, crustaceans) would not be significant due to the generally degraded quality of existing habitats. In addition, the types of species that would be impacted are likely to recolonize on the new structure once it is in place. Likewise, impacts on primary organisms should be short-term or minimal.
- EFH species that are expected in the study area would not be impacted. No primary or secondary habitats for these species would be affected. In addition, in-water activities are expected to be minimal, with little impact on bottom habitats or the ability of these species to migrate along the river, since no major in-water structures are proposed (the majority of the EFH species are identified as transients).

Shoreline improvements under the proposed action would include landscape zones (e.g., trees, shrubs and groundcover) that would provide habitat for migratory species and songbirds, as well as other wildlife. This is a positive impact of the proposed action.

While the East River is designated as EFH for a number of fish species, the proposed action does not pose a substantial threat to the existing populations or habitats. Primary and secondary habitats would not be affected by the project; nor would there be a significant adverse impact on individual EFH species. For example, Pollock, red hake, Atlantic sea herring, and Atlantic, Spanish, and King mackerel prefer salinity ranges outside the range found in the study area. The presence of cobia, Dusky, Sand Tiger, and Sandbar sharks is unlikely, due to a preference for shallow and warmer coastal waters. Species such as Atlantic butterfish are transient and are not expected to be impacted. Any temporary impacts from bulkhead reconstruction or limited impacts from new structures (e.g., water taxi landing) would not impact those species. Although winter, summer, and windowpane flounder, bluefish, scup, and black sea bass could use the water area of the East River for foraging, spawning, and migration, the proposed action would not significantly alter the depth, temperature, salinity, or substrate of the river. The proposed action area is not known to contain SAV, and is not considered a primary nursery area for any species. Thus, any impacts to the study area are temporary and confined and not significant.

Moreover, in examining these potential impacts it is important to note that it is likely that each waterfront development site would be subject to its own permitting requirements (e.g., ACOE Section 10 or DEC Tidal Wetlands and Protection of Waters Permits). As part of that permitting process, additional site design details would be prepared and more detailed site-specific environmental impacts would be addressed. However, based on the assumptions above (e.g., no major filling or dredging, no structures out over the water), it is concluded that the proposed action would not result in any significant adverse direct or indirect impacts. In addition, the permitting process for each waterfront site would involve coordination with natural resource and permit agencies in order to comply with regulations for obtaining the required permit approvals for construction or rehabilitation activities along the shoreline. It is expected that this review process would also minimize impacts to the extent practicable.

### **Water Quality Effects of Newtown Creek WPCP Effluent**

As shown in Appendix K, the changes in water quality associated with changes in Newtown Creek WPCP effluent resulting from the proposed action would be insignificant.

### **Increased Pollutant Loadings from CSOs**

As shown in Appendix K, the increased pollutant loadings from changes in CSO volumes associated with the proposed action would be insignificant.

### **Recreational Boating and Water Taxi Facilities**

The proposed action assumes a new park at Bushwick Inlet that could include some recreational boating facilities for small craft (e.g., kayaks, canoes), as well as the construction of a water taxi landing and the operation of a water taxi from the existing pier on the end of Green Street. These proposals are not mandated by the proposed action, but could occur as a secondary result of new development of the waterfront and increased demand for such services. Plans for Bushwick Inlet Park are conceptual at this time and it is not expected that the City would operate such a water taxi service. It is likely, however, that the City would need to issue a franchise for a water taxi operation and it is also likely that the infrastructure to support such an operation (e.g., new docks and pilings) would require Federal and State permits (see the discussion above under “Regulatory Context.”). In the event a water taxi service moves forward, the construction and operation of such a facility must consider a number of engineering,

financial, and operational issues prior to making any decisions regarding such services. Should those planning efforts result in a determination to make such services part of a waterfront development, given the need for a number of City, State, and Federal actions to allow that proposal to move forward, it is likely that a separate (site-specific) environmental review would need to be performed. However, in order to assess the potential impacts of such an operation, what follows are some examples of the types of impacts and issues that need to be considered.

For ferries and other motorized transportation boats, the potential for impacts vary by boat size, type, and level of service. Propeller wash, drafts, and wakes, are some of the potential impacts that can occur. Significant ferry wakes can erode shorelines, increase turbidity and sedimentation. Overall, however, smaller water taxis do not result in that kind of impact. In addition, since the shoreline along the water's edge at Green Street is largely stabilized with a bulkhead and riprap, the wake impacts from a water taxi should not result in any significant adverse impacts on the wetlands. Likewise, any impacts from propeller wash would depend on the depth of water at this location as well as the frequency of service. Again, however, impacts from a water taxi are less than that for a larger passenger ferry (which has a deeper draft and larger propellers) and it would be expected that through facility design and operations management, a water taxi service could be designed without any significant adverse impacts on turbidity, which can adversely affect water quality (clarity) and aquatic resources.

A water taxi or a landing dock for kayaks or canoes could need a floating dock or platform, which would increase the amount of shaded aquatic habitat. However, the extent of shaded area could be minimized in the design, thus minimizing impacts. Potential impacts associated with construction of a floating platform or ferry dock include: localized, temporary increases in suspended sediments and turbidity; potential releases of contaminants to the water column from disturbed sediments; localized, temporary disturbances to benthic invertebrates and fish; and possible decreases in dissolved oxygen. With these facilities, there would be a relatively small, permanent loss of benthic habitat at the locations of any anchor points installed for the floating platforms; however, it would not be expected that these impacts are significant.

A water taxi and public access to the waterfront have the potential to increase the volume of solid waste and debris in the proposed action area. However, enclosed trash containers are typically used to preclude or minimize this impact. Therefore, it would not be expected that these activities would result in significant adverse impacts due to floatables. There would be a concern for water quality impacts (e.g., petroleum spills) if fueling were provided. However, given the location of this site at what is proposed to be a redeveloped public waterfront, it is not expected that a water taxi facility at this location would include fueling. Moreover, if fueling were proposed, it would require additional DEC permits and possibly a City zoning action that would require additional environmental review and the implementation of water quality protection measures.

The degree to which any of these potential impacts could result in significant adverse impacts would depend on the amount of in-water structure and on operational maintenance practices. However, potential impacts would be minimized by:

- Avoiding or minimizing dredging;
- Limiting the footprint of piers or any other in-water construction;
- Design the project to avoid creating a net increase in platform coverage (if feasible);
- Minimizing activities that impact littoral zones;
- Providing opportunities for habitat enhancement;
- Minimizing uses of harmful pesticides, herbicides and fertilizers for management of vegetated areas; and
- Abiding by seasonal restrictions for in-water construction.

These impact-avoidance techniques would be examined during the permitting process for these facilities.

In sum, since the shoreline in the proposed action area is bulkheaded or rip-rapped and built for industrial use, potential impacts to resources is likely to be minimal. Estuarine organisms present in the study area are also generally tolerant of turbidity increases that can be generated by watercraft. Any temporary increases in turbidity associated with water taxi operations or shoreline improvements would be minor and insignificant compared to naturally occurring variations in water clarity and suspended sediment that occurs in the East River (e.g., post storm events). Moreover, such short term turbidity increases would have little impact on estuarine biota. In addition, any incremental increase in suspended sediment from wakes is within normally occurring and within the range of total suspended solids. As a result, no significant adverse impacts on water quality or aquatic resources would be expected.

### **Threatened and Endangered Species**

No significant adverse impacts would occur to threatened and endangered species or species of special concern. The species (e.g., sea turtles) identified as potentially occurring in the East River use the river on a transient basis and do not typically land on the built urbanized shoreline of the East River.

### **Bushwick Inlet**

The proposed action includes the creation of a park approximately 28 acres in size on lands immediately south of and surrounding Bushwick Inlet. This proposed park would increase upland open space and improve habitat quality primarily for avian species and other wildlife (e.g., butterflies, squirrels). The magnitude of this benefit would depend on the final design of the park. Although it would be expected that the park would provide a combination of passive and active areas, the conversion of what are now industrial sites to landscaped habitat would provide an expanded opportunity for an improved ecological community along the waterfront, particularly with respect to the avian species that are known to be present in Bushwick Inlet (see Table 10-3).

## **F. THE FUTURE WITH THE PROPOSED ACTION (SCENARIO B)**

As described in Chapter 1, “Project Description,” there are two potential build scenarios in the future without the proposed action. Under Scenario B, the Bayside Fuel site, which fronts the south waterfront of Bushwick Inlet, would be developed with the proposed 1,100 Megawatt TransGas power plant. South of the plant would be the proposed park. In this scenario, the proposed park is approximately 16 acres in size.

With the exception of the positive impacts of the proposed park presented above in Scenario A, all other impacts of the proposed action in this scenario are similar to the impacts under Scenario A. Certainly, a smaller waterfront open space (about 12 acres smaller) reduces the opportunity for new ecological habitat on the waterfront. Moreover, unlike Scenario A, this scenario would not provide a new open space habitat on the waterfront of Bushwick Inlet, thereby reducing the opportunity for an open space of the adjacent upland that would support the ecology of the cove.

**TABLE 10-8**  
**Comprehensive List of Avian Species Potentially Along the East River Corridor**

Common Name	Scientific Name
<b>Loons</b>	
Red-throated loon	<i>Gavia stellata</i>
Common loon	<i>Gavia immer</i>
<b>Grebes</b>	
Pied-billed grebe	<i>Podilymbus podiceps</i>
Horned grebe	<i>Podiceps auritus</i>
Red-necked grebe	<i>Podiceps grisegena</i>
<b>Gannet</b>	
Northern gannet	<i>Morus bassanus</i>
<b>Cormorants</b>	
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Great cormorant	<i>Phalacrocorax carbo</i>
<b>Herons</b>	
American bittern	<i>Botaurus lentiginosus</i>
Least bittern	<i>Ixobrychus exilis</i>
Great blue heron	<i>Ardea herodias</i>
Great egret	<i>Casmerodius albus</i>
Snowy egret	<i>Egretta thula</i>
Little blue heron	<i>Egretta caerulea</i>
Tricolored heron	<i>Egretta tricolor</i>
Cattle egret	<i>Bubulcus ibis</i>
Green heron	<i>Butorides striatus</i>
Black-crowned night-heron	<i>Nycticorax nycticorax</i>
<b>Ibis</b>	
Glossy ibis	<i>Plegadis falcinellus</i>
<b>Waterfowl</b>	
Snow goose	<i>Chen caerulescens</i>
Brant	<i>Branta bernicla</i>
Canada goose	<i>Branta canadensis</i>
Mute swan	<i>Cygnus olor</i>
Tundra swan	<i>Olor columbianus</i>
Wood duck	<i>Aix sponsa</i>
Gadwall	<i>Anas strepera</i>
Eurasian wigeon	<i>Anas penelope</i>
American wigeon	<i>Anas americana</i>
American black duck	<i>Anas rubripes</i>
Mallard	<i>Anas platyrhynchos</i>
Blue-winged teal	<i>Anas discors</i>
Northern shoveler	<i>Anas clypeata</i>
Northern pintail	<i>Anas acuta</i>
Green-winged teal	<i>Anas crecca</i>
Canvasback	<i>Aythya valisineria</i>
Redhead	<i>Aythya americana</i>
Ring-necked duck	<i>Aythya collaris</i>
Greater scaup	<i>Aythya marila</i>
Lesser scaup	<i>Aythya affinis</i>
Common eider	<i>Somateria mollissima</i>

**TABLE 10-8 (continued)**  
**Birds Observed in New York City**

Common Name	Scientific Name
Surf scoter	<i>Melanitta perspicillata</i>
White-winged scoter	<i>Melanitta fusca</i>
Black scoter	<i>Melanitta nigra</i>
Oldsquaw	<i>Clangula hyemalis</i>
Bufflehead	<i>Bucephala al beola</i>
Common goldeneye	<i>Bucephala clangula</i>
Hooded merganser	<i>Lophodytes cucullatus</i>
Common merganser	<i>Mergus merganser</i>
Red-breasted merganser	<i>Mergus serrator</i>
Ruddy duck	<i>Oxyura jamaicensis</i>
<b>Vulture</b>	
American Black vulture	<i>Coragyps atratus</i>
<b>Hawks and Eagles</b>	
Osprey	<i>Pandion haliaetus</i>
Northern harrier	<i>Circus cyaneus</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Northern goshawk	<i>Accipiter gentilis</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Broad-winged hawk	<i>Buteo platyperus</i>
Red-tailed hawk	<i>Buteo jamaiceusis</i>
Rough-legged hawk	<i>Buteo lagopus</i>
Golden eagle	<i>Aquila chrysaetos</i>
<b>Falcons</b>	
American kestrel	<i>Falco sparverius</i>
Peregrine falcon	<i>Falco peregrinus</i>
<b>Plovers</b>	
Killdeer	<i>Charadrius vociferus</i>
<b>Oystercatcher, Stilt and Avocet</b>	
American oystercatcher	<i>Haematopus palliatus</i>
American avocet	<i>Recurvirostra americana</i>
<b>Gulls</b>	
Laughing gull	<i>Larus atricilla</i>
Little gull	<i>Larus minutus</i>
Black-headed gull	<i>Larus ridibundus</i>
Bonaparte's gull	<i>Larus philadelphia</i>
Ring-billed gull	<i>Larus delawarensis</i>
Herring gull	<i>Larus argentatus</i>
Iceland gull	<i>Larus glaucoides</i>
Lesser black-backed gull	<i>Larus fuscus</i>
Glaucous gull	<i>Larus hyperboreus</i>
Great black-backed gull	<i>Larus marinus</i>
Black-legged kittiwake	<i>Rissa tridactyla</i>



**TABLE 10-8 (continued)**  
**Birds Observed in New York City**

Common Name	Scientific Name
<b>Terns and Skimmer</b>	
Gull-billed tern	<i>Gelochelidon nilotica</i>
Caspian tern	<i>Sterna caspia</i>
Royal tern	<i>Sterna maxima</i>
Sandwich tern	<i>Sterna sandvicensis</i>
Roseate tern	<i>Sterna dougallii</i>
Common tern	<i>Sterna hirundo</i>
Forster's tern	<i>Sterna forstereri</i>
Least tern	<i>Sterna albifrons</i>
Black tern	<i>Chlidonias nigra</i>
Black skimmer	<i>Rynchopus nigra</i>
<b>Pigeons and Doves</b>	
Rock dove	<i>Columba livia</i>
Mourning dove	<i>Zenaida macroura</i>
<b>Owls</b>	
Barn-owl	<i>Tyto aiba</i>
Eastern screech-owl	<i>Otus asio</i>
Great horned owl	<i>Bubo virginianus</i>
Snowy owl	<i>Nyctea scandiaca</i>
Barred owl	<i>Strix varia</i>
Long-eared owl	<i>Asio otus</i>
Short-eared owl	<i>Asio flammeus</i>
Northern saw-whet owl	<i>Aegolius acadicus</i>
<b>Nightjars</b>	
Common nighthawk	<i>Chordeiles minor</i>
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
Whip-poor-will	<i>Caprimulgus vociferus</i>
<b>Swift</b>	
Chimney swift	<i>Chaetura pelagica</i>
<b>Hummingbirds</b>	
Ruby-throated hummingbird	<i>Archilochus colubris</i>
<b>Kingfisher</b>	
Belted kingfisher	<i>Megaceryle alcyon</i>
<b>Woodpeckers</b>	
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>
Red-bellied woodpecker	<i>Centurus carolinus</i>
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>
Downy woodpecker	<i>Picoides pubescens</i>
Hairy woodpecker	<i>Picoides villosus</i>
Northern flicker	<i>Colaptes auratus</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>
<b>Flycatchers</b>	
Olive-sided flycatcher	<i>Nuttallornis borealis</i>
Eastern wood-pewee	<i>Contopus virens</i>
Yellow-bellied flycatcher	<i>Empidonax flaviventris</i>
Acadian flycatcher	<i>Empidonax virens</i>
Alder flycatcher	<i>Empidonax alnorum</i>
Willow flycatcher	<i>Empidonax traillii</i>
Least flycatcher	<i>Empidonax minimus</i>

**TABLE 10-8 (continued)**  
**Birds Observed in New York City**

Common Name	Scientific Name
Eastern phoebe	<i>Sayornis phoebe</i>
Geat crested flycatcher	<i>Myiarchus cinerascens</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>
<b>Lark</b>	
Horned lark	<i>Eremophila alpestris</i>
<b>Jay and Crows</b>	
Blue jay	<i>Cyanocitta cristata</i>
American crow	<i>Corvus brachyrhynchos</i>
Fish crow	<i>Corvus ossifragus</i>
<b>Titmice</b>	
Black-capped chickadee	<i>Parus atricapillus</i>
Tufted titmouse	<i>Parus bicolor</i>
<b>Nuthatches</b>	
Red-breasted nuthatch	<i>Sitta canadensis</i>
White-breasted nuthatch	<i>Sitta carolinensis</i>
<b>Creeper</b>	
Brown creeper	<i>Certhia familiaris</i>
<b>Wrens</b>	
Carolina wren	<i>Thryothorus ludovicianus</i>
House wren	<i>Troglodytes aedon</i>
Winter wren	<i>Troglodytes troglodytes</i>
Marsh wren	<i>Cistothorus platensis</i>
<b>Kinglets</b>	
Golden-crowned kinglet	<i>Regulus satrapa</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>
<b>Gnatcatcher</b>	
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>
<b>Thrushes</b>	
Eastern bluebird	<i>Cialia sialis</i>
Veery	<i>Catharus fuscescens</i>
American robin	<i>Turdus migratorius</i>
<b>Mimids</b>	
Gray catbird	<i>Dumetella carolinensis</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Brown thrasher	<i>Toxostoma rufum</i>
<b>Starling</b>	
European starling	<i>Sturnus vulgaris</i>
<b>Wagtail and Pipit</b>	
American pipit	<i>Anthus spinolette</i>
<b>Waxwing</b>	
Cedar waxwing	<i>Bombycilla cedrorum</i>
<b>Warblers</b>	
Blue-winged warbler	<i>Vermivora pinus</i>
Golden-winged warbler	<i>Vermivora chrysaptera</i>
Tennessee warbler	<i>Vermivora peregrina</i>
Orange-crowned warbler	<i>Vermivora celata</i>
Nashville warbler	<i>Vermivora ruficapilla</i>
Northern parula	<i>Parula americana</i>
Yellow warbler	<i>Dendroica petechia</i>

**TABLE 10-8 (continued)**  
**Birds Observed in New York City**

<b>Common Name</b>	<b>Scientific Name</b>
Chestnut-sided warbler	<i>Dendroica pensilvanica</i>
Magnolia warbler	<i>Dendroica magnolia</i>
Cape May warbler	<i>Dendroica tigrina</i>
Black-throated blue warbler	<i>Dendroica caerulescens</i>
Yellow-rumped ('Myrtle') warbler	<i>Dendroica coronata</i>
Black-throated green warbler	<i>Dendroica virens</i>
Blackburnian warbler	<i>Dendroica fusca</i>
Yellow-throated warbler	<i>Dendroica dominica</i>
Pine warbler	<i>Dendroica pinus</i>
Prairie warbler	<i>Dendroica discolor</i>
Palm warbler	<i>Dendroica palmarum</i>
Bay-breasted warbler	<i>Dendroica castanea</i>
Blackpoll warbler	<i>Dendroica striata</i>
Cerulean warbler	<i>Dendroica cerulea</i>
Black-and-white warbler	<i>Mniotilta varia</i>
American redstart	<i>Sexophaga ruticilla</i>
Worm-eating warbler	<i>Helmitheros vermivorus</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Northern waterthrush	<i>Seiurus noveboracensis</i>
Louisiana waterthrush	<i>Seiurus motacilla</i>
Kentucky warbler	<i>Oporornis formosus</i>
Connecticut warbler	<i>Oporornis agilis</i>
Mourning warbler	<i>Oporornis philadelphia</i>
Common yellowthroat	<i>Geothlypis trichas</i>
Hooded warbler	<i>Wilsonia citrina</i>
Wilson's warbler	<i>Wilsonia pusilla</i>
Canada warbler	<i>Wilsonia canadensis</i>
Yellow-breasted chat	<i>Icteria virens</i>
<b>Tanager</b>	
Scarlet tanager	<i>Piranga olivacea</i>
<b>Sparrows</b>	
Eastern towhee	<i>Pipilo erythrophthalmus</i>
American tree sparrow	<i>Spizella arborea</i>
Chipping sparrow	<i>Spizella passerina</i>
Field sparrow	<i>Spizella pusilla</i>
Vesper sparrow	<i>Pooecetes gramineus</i>
Lark sparrow	<i>Chondestes grammacus</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Baird's sparrow	<i>Ammodraus bairdii</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>
Le Conte's sparrow	<i>Passerulus caudatus</i>
Nelson's sharp-tailed sparrow	<i>Ammodramus caudatus</i>
Saltmarsh sharp-tailed sparrow	
Seaside sparrow	<i>Ammodramus maritima</i>
Fox sparrow	<i>Passerella iliaca</i>
Song sparrow	<i>Melospiza melodia</i>
Lincoln's sparrow	<i>Melospiza lincolni</i>
Swamp sparrow	<i>Melospiza georgiana</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>

**TABLE 10-8 (continued)**  
**Birds Observed in New York City**

Common Name	Scientific Name
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Lapland longspur	<i>Calcarius lapponicus</i>
Snow bunting	<i>Plectrophenax nivalis</i>
<b>Grosbeaks and Finches</b>	
Northern cardinal	<i>Cardinalis cardinalis</i>
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>
Blue grosbeak	<i>Guiraca caerulea</i>
Indigo bunting	<i>Passerina cyanea</i>
Evening grosbeak	<i>Hesperiphona vespertina</i>
Purple finch	<i>Carpodacus purpureus</i>
House finch	<i>Carpodacus mexicanus</i>
Red crossbill	<i>Loxia curvirostra</i>
White-winged crossbill	<i>Loxia Leucoptera</i>
Common redpoll	<i>Carduelis flammea</i>
Pine siskin	<i>Carduelis pinus</i>
American goldfinch	<i>Carduelis tristis</i>
<b>Blackbirds</b>	
Bobolink	<i>Dolichonyx oryzivorus</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Eastern meadowlark	<i>Sturnella magna</i>
Rusty blackbird	<i>Euphagus carolinus</i>
Common grackle	<i>Quiscalus quiscula</i>
Boat-tailed grackle	<i>Quiscalus major</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Orchard oriole	<i>Icterus sparius</i>
Baltimore oriole	<i>Icterus galbula</i>
<b>Weaver</b>	
House sparrow	<i>Passer domesticus</i>
<b>Source:</b> Adult Mosquito Control Programs FEIS, New York City Department of Health (2001).	