Chapter 6.8: Natural Resources

A. INTRODUCTION

This chapter describes natural resources within the regional and local study areas for the Cross Harbor Freight Program (CHFP) and assesses the potential effects from operation of the project alternatives on those resources. Potential impacts from construction of the alternatives, including the direct loss or modification of natural resources to construct project elements, are also addressed. Natural resources assessed within the local study areas include aquatic biota, wetlands, vegetation, wildlife, and threatened and endangered species.

B. REGULATORY CONTEXT

This section provides a description of the federal and state legislation and implementing regulations that may apply to the project alternatives with respect to aquatic and terrestrial wildlife, threatened or endangered species, species of special concern and wetlands.

FEDERAL

CLEAN WATER ACT (33 USC §§ 1251 TO 1387)

The objective of the Clean Water Act, also known as the Federal Water Pollution Control Act, is to restore and maintain the chemical, physical, and biological integrity of the waters of the United States. It regulates point sources of water pollution, such as discharges of municipal sewage, industrial wastewater, and stormwater, the discharge of dredged or fill material into navigable waters and other waters including wetlands, and non-point source pollution such as atmospheric deposition and runoff.

Under Section 401 of the Act, any applicant for a federal permit or license for an activity that may result in a discharge to navigable waters must provide to the federal agency issuing a permit a certificate, either from the state where the discharge would occur or from an interstate water pollution control agency, that the discharge would comply with Sections 301, 302, 303, 306, 307, and 316 (b) of the Clean Water Act. Applicants for discharges to navigable waters in New York and New Jersey must obtain a Water Quality Certification from New York State Department of Environmental Conservation (NYSDEC) and New Jersey Department of Environmental Protection (NJDEP), respectively.

Section 404 of the Act requires authorization from the Secretary of the Army, acting through U.S. Army Corps of Engineers (USACE), for the permanent or temporary discharge of dredged or fill material into navigable waters and other waters of the United States, including wetlands.

MAGNUSON-STEVENS ACT (16 USC §§ 1801 TO 1883)

Section 305(b)(2)-(4) of the Magnuson-Stevens Act outlines the process for the National Marine Fisheries Service (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 those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 USC §1802(10)).

ENDANGERED SPECIES ACT OF 1973 (16 USC §§ 1531 TO 1544)

The Endangered Species Act of 1973 recognizes that endangered species of wildlife and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value to the nation and its people. The Act prohibits the importation, exportation, taking, possession, and other activities involving illegally taken species covered under the Act, and interstate or foreign commercial activities. The Act also provides for the protection of critical habitats on which endangered or threatened species depend for survival.

FISH AND WILDLIFE COORDINATION ACT (PL 85-624; 16 USC 661-667D)

The Fish and Wildlife Coordination Act entrusts the Secretary of the Interior with providing assistance to, and cooperation with, federal, state, and public or private agencies and organizations to ensure that wildlife conservation receives equal consideration and coordination with other water-resource development programs. These programs can include the control (such as a diversion), modification (such as channel deepening), or impoundment (dam) of a body of water.

NEW JERSEY

Most of the New Jersey laws and regulatory programs that would apply to potential project activities located in New Jersey would fall under the regulatory responsibility of the NJDEP Land Use Management and Compliance Division, Land Use Regulation Program (LUR). Through the LUR program, NJDEP reviews applications for permits to build or develop on environmentally sensitive lands such as freshwater wetlands, coastal areas, and floodplains. LUR is authorized to act by the State Public Laws (New Jersey Statutes Annotated [NJSA]). LUR implements the laws through regulations or rules found in the New Jersey Administrative Code (NJAC). The following sections describe the laws and regulations that may apply to the project with respect to aquatic and terrestrial wildlife and wetlands.

FRESHWATER WETLANDS PROTECTION ACT, NJSA 13:9B, AND RULES AT NJAC 7:7A.

The Freshwater Wetlands Protection Act and regulatory program protects freshwater wetlands, the buffers around these wetlands, and other surface waters such as lakes, ponds, rivers, and streams. Most activities that disturb soil or vegetation in freshwater wetlands or in buffers adjacent to freshwater wetlands, and the discharge of dredged or fill material to surface waterbodies are regulated under this program.

WETLANDS ACT OF 1970, NJSA 13:9A, AND RULES AT NJAC 7:7 AND 7:7E

The Wetlands Act of 1970 protects wetlands shown in the NJDEP Coastal Wetland Maps dated 1971/1972. Activities regulated under this program include placement of structures, fill, excavation, pesticide application, or similar activity within coastal wetlands.

WATERFRONT DEVELOPMENT ACT, NJSA 12:5-3, AND RULES AT NJAC 7:7 AND 7:7E

The Waterfront Development Act regulates activities on lands in or near tidally flowed waters (see Chapter 6.13, “Coastal Zone Management”). Activities regulated under this program include placement of structures, fill, or dredging within or over a tidally flowed waterway, and development adjacent to a tidally flowed waterway. A Waterfront Development Permit is needed for projects that develop waterfront near or upon any tidal or navigable waterway. Waterfront

development can include docks, wharfs, piers, bulkheads, bridges, pipelines, cables, pilings, filling, dredging or removing of sand or other materials from lands under all tidal waters, and limited upland construction within 500 feet of tidally flowed waters.

TIDELANDS ACT, NJSA 12:3-1

The Tidelands Act protects all lands owned by the State of New Jersey that are now tidally flowed, or were formerly tidally flowed. Projects that include building in or near tidal waters may need a grant, lease, or license from the State for portions of the project occurring on State-owned lands. The NJDEP Bureau of Tidelands Management manages this program.

ENDANGERED AND NONGAME SPECIES ACT, NJSA 23:2A-2 ET SEQ AND RULES NJAC 7:25-4

The New Jersey State Endangered Nongame Species Act provides special protection to species or subspecies of wildlife indigenous to the state found to be endangered to maintain and possibly enhance their numbers. NJAC 7:25-4 Endangered, Nongame and Exotic Wildlife- Endangered Species List lists the species classified as endangered or threatened in the State.

NEW YORK

PROTECTION OF WATERS, ARTICLE 15, TITLE 5, ECL, IMPLEMENTING REGULATIONS 6 NYCRR PART 608

NYSDEC is responsible for administering the Protection of Waters Act and regulations to govern activities on surface waters (rivers, streams, lakes, and ponds). The Protection of Waters Permit Program regulates five different categories of activities: disturbance of stream beds 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 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.

TIDAL WETLANDS ACT, ARTICLE 25, ECL, IMPLEMENTING REGULATIONS 6 NYCRR PART 661

Tidal wetlands regulations apply anywhere tidal inundation occurs on a daily, monthly, or intermittent basis. In New York, tidal wetlands occur along the tidal waters of the Hudson River up to the salt line and along the saltwater shore, bays, inlets, canals, and estuaries of Long Island, New York City, and Westchester County. NYSDEC administers the tidal wetlands regulatory program and the mapping of the state's tidal wetlands. A permit is required for almost any activity that would alter wetlands or the adjacent areas (up to 300 feet inland from wetland boundary or up to 150 feet inland within New York City).

FRESHWATER WETLANDS ACT, ARTICLE 24, ENVIRONMENTAL CONSERVATION LAW [ECL], IMPLEMENTING REGULATIONS 6 NYCRR PART 662

The Freshwater Wetlands Act requires NYSDEC to map freshwater wetlands protected by the Act (12.4 acres or greater in size containing wetland vegetation characteristic of freshwater wetlands as specified in the Act). Around each mapped wetland is a protected 100-foot adjacent area that serves as a buffer.

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)

The Endangered and Threatened Species of Fish and Wildlife, Species of Special Concern Regulations prohibit the taking, import, transport, possession, or selling of any endangered or threatened species of fish or wildlife, or any hide, or other part of these species as listed in 6 NYCRR §182.6.

C. METHODOLOGY

The following chapter begins by defining natural resources existing conditions for the 23-county regional study area, which for aquatic resources was defined as Upper New York Harbor, including the Kill van Kull, Newark Bay, and Newtown Creek/Maspeth Creek, and the East River. The regional study area for terrestrial resources included the New York City boroughs of Brooklyn, Queens, and the Bronx, Long Island Counties of Nassau and Suffolk, and northern New Jersey Counties of Bergen, Hudson, Newark, and Union.

Potential effects to natural resources from the project alternatives are assessed for the local study areas, which were generally defined as the area within 400 feet of existing and proposed freight facilities, and expanded as necessary to take into account sensitive habitats or wildlife occurring near a particular site. The study areas include segments of rail lines that would experience increased freight movement from the operation of the rail-based alternatives, or are otherwise pertinent to the project. For each of the local study areas, natural resources existing conditions were described as follows:

- Aquatic Resources—existing information on aquatic biota (e.g., fish, sea turtles, marine mammals) in the immediate vicinity of any in-water activities that would occur as a result of an alternative.
- Terrestrial resources—existing information on wetlands, vegetation, and wildlife within 400 feet of the project facilities, as discussed in Chapter 4, "Alternatives."
- Threatened or endangered species, species of special concern, and special habitat areas within 0.5 miles of the project facilities.

Descriptions of existing conditions from the 2004 *Cross Harbor Freight Movement Project DEIS* ("2004 DEIS") served as the basis for this section and were expanded and updated as needed to incorporate recent information from regulatory bodies, online databases, and peer-reviewed literature. Project sites that were not included in the 2004 DEIS and not visited for natural resources surveys were assessed by desktop surveys, drawing on existing information sources including:

- United States Fish and Wildlife Service (USFWS) Significant Habitats and Habitat Complexes of the New York Bight Watershed (USFWS 1997) and online County lists of threatened, endangered, candidate, and proposed species;
- New York Natural Heritage Program (NYNHP) and New Jersey Natural Heritage Program (NJNHP) online mapping tools for records of threatened, endangered, and special concern species;
- NYSDEC tidal and freshwater wetland maps, Breeding Bird Atlas, and Herp Atlas Project;
- NJDEP tidal and freshwater wetland maps;

- USFWS National Wetlands Inventory (NWI) maps.

Potential impacts from the operation of the Build Alternatives to aquatic biota, terrestrial resources (wetlands, vegetation, and wildlife), and threatened and endangered species were assessed for the local study areas by considering disturbances generated by increased activity from the project alternatives, and overall anthropogenic activity near tunnel alignments, waterborne alternative routes, and rail lines. These potential impacts are generally described in this chapter; a more detailed analysis would be completed in Tier II documentation or other subsequent environmental review. Potential temporary and permanent impacts on natural resources from construction of the project elements (i.e., roads, tracks, rail yards, tunnel sections) are also addressed.

D. EXISTING CONDITIONS

REGIONAL STUDY AREA

AQUATIC BIOTA

The Upper New York Harbor regional study area includes the Upper New York Harbor, Kill van Kull, Newark Bay, and the East River. These waters provide a variety of habitats that support a diverse and productive aquatic community. Aquatic organisms include phytoplankton, submerged aquatic vegetation (SAV), benthic macroalgae, zooplankton, benthic invertebrates (including shellfish), and fish, as well as occasional marine mammals and sea turtles, as described below.

Phytoplankton, SAV, and benthic macroalgae

These organisms are the primary producers of energy in marine food webs. Diatoms, dinoflagellates, green algae, and blue-green algae are the most dominant groups of phytoplankton species in the New York Harbor and East River (Hazen and Sawyer 1983, Brosnan and O'Shea 1995). SAV refers to vascular plants that grow in shallow areas around the harbor where light sufficient for photosynthesis can penetrate. SAV provide prey with cover from predators, act as host structures for epiphytes, buffer nutrients and trap sediment, and minimize erosion of the harbor floor. The extensively developed shoreline, swift currents, and steeply sloped engineered shorelines of the East River severely limit SAV occurrence. Benthic macroalgae occur in the shallower areas of the harbor and the East River; common species include brown algae (*Fucus* sp.) and sea lettuce (*Ulva lactua*) (Perlmutter 1971).

Zooplankton

Zooplankton are another integral component of the food web in the Upper New York Harbor. These organisms feed on phytoplankton and decomposed material, and are a primary food source for fish such as bay anchovy (*Anchoa mitchilli*), as well as early life stages of commercially and recreationally important fish such as striped bass (*Morone saxatilis*) and white perch (*Morone Americana*). Copepods, rotifers, barnacle larva, mysid shrimp, and amphipods are among the most common groups of zooplankton found within this region (Perlmutter 1971, Stepien et al. 1981, Hazen and Sawyer 1983, Lonsdale and Cosper 1994).

Benthic Invertebrates

Benthic invertebrates inhabit the sediments and surfaces of submerged objects such as rock pilings or debris, and are food source for fish and waterfowl in the Upper New York Harbor regional study area. Common groups include aquatic earthworms (oligochaetes), segmented worms (polychaetes), snails (gastropods), bivalves (e.g., soft shell clams, dwarf surf clam, and

blue mussel), barnacles, cumaceans, amphipods, isopods, crabs, and shrimp (LMS 1980,1984; NJDEP 1984; EA Engineering Science & Technology 1990). Most benthic invertebrates reported in the area are classified as pollution tolerant species (Adams et al. 1998). The benthic community in Newark Bay is particularly degraded, with approximately 65 percent of the species being pollution tolerant and less than 1 percent being pollution sensitive. Newark Bay also supports fewer species than other areas of the harbor (Adams et al. 1998). Benthic and epibenthic sampling in the East River documented nine benthic macroinvertebrate taxa, including annelids, arthropods, and mollusks (NYCDEP 2007). The annelid *Haploscoloplos robustus* and mollusks *Melampus bidentatus* and *Mulinia lateralis* were found in the highest densities. Blue crab (*Callinectes sapidus*) and American lobster (*Homarus americanus*) may also be present within the Upper New York Harbor regional study area (NMFS 2001).

Finfish

The finfish community in New York Harbor and adjacent waterbodies is typical of large coastal estuaries and inshore waterways along the Mid-Atlantic Bight, supporting a variety of estuarine, marine, and anadromous fish species that use this area for spawning habitat, a migratory pathway, and as a nursery/foraging area. Hogchoker (*Tinectes maculates*), tomcod (*Microgadus tomcod*), winter flounder (*Pseadopeuronectes americanus*), white perch (*Morone americana*), bay anchovy (*Anchoa mitchilli*), Atlantic menhaden (*Brevoortia tyrannus*) and striped bass (*Morone saxatilis*) are examples of fish found within the Upper New York Harbor study area (NOAA 2001). Atlantic silverside (*Menidia menidia*), mummichog (*Fundulus heteroclitus*), striped killifish (*Fundulus majalis*), and three-spined stickleback (*Gasterosteus aculeatus*) are common estuarine species that occur year round. Blueback herring (*Alosa aestivalis*), alewife (*Alosa pseudoharengus*), American shad (*Alosa sapidissima*), hickory shad (*Alosa mediocris*), striped bass, tomcod, Atlantic sturgeon (*Acipenser oxyrhynchus*), and rainbow smelt (*Osmerus mordax*) are anadromous fish that pass through the harbor during migration to and from spawning areas in the upper Hudson River. Examples of marine species found from spring through fall include bluefish (*Pomatomus saltatrix*), scup (*Stenotomus chrysops*), black sea bass (*Centropristis striata*), tautog (*Tautoga onitis*), and weakfish (*Cynoscion regalis*) (NOAA 2001). Overall, the harbor's fish community is very spatially and seasonally dynamic. Transient shortnose sturgeon (*Acipenser brevirostrum*) and Atlantic sturgeon (*Acipenser oxyrinchus*) may occasionally be present in New York Harbor (Bain 1997, NMFS 2001).

WETLANDS

Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. If the soils in the area are saturated or inundated for a two-week time period, and certain vegetation and soil conditions exist, the area is generally described as a wetland. While there are many types of wetlands distinguished by specific characteristics, wetlands may be described as being one of two fundamental types: tidal and freshwater. Most of the wetlands found within the project study areas are tidal wetlands.

The NY/NJ Harbor Estuary Program (NY/NJHEP) estimates that approximately 75 percent of the New York-New Jersey Harbor shoreline consists of man-made structures such as bulkheads, riprap, and piers. Some of the remaining shoreline areas that have not been stabilized contain coastal wetlands (approximately 105,000 acres) that provide habitat for terrestrial and aquatic animals. Much of the shoreline within the study areas has been stabilized with bulkheads or

riprap. Areas of tidal marsh and/or mudflats do occur along sections of New Jersey and Staten Island coast line within the project region where shoreline stabilization is absent or degraded.

Few inland wetlands are left throughout the project region. New York City currently has only one percent of its historic freshwater wetlands; most remaining wetlands are tidal and concentrated in Brooklyn, Queens, and Staten Island (City of New York 2009). Nassau and Suffolk Counties are also largely developed, and much of their historic wetlands have been filled. State regulations enacted to stem the continued loss of wetlands on Long Island have had success, and in some areas wetlands have increased.

VEGETATION

The majority of the terrestrial landscape within the New York City boroughs of Brooklyn, Queens, and the Bronx, and the northern New Jersey Counties of Bergen, Hudson, Newark and Union is heavily urbanized and dominated by impervious surfaces. Remaining natural areas are primarily fragments of eastern deciduous forest types such as oak-tulip tree forest and successional southern hardwoods (Edinger et al. 2002). Mowed lawn with trees, characteristic of many municipal parks, is also an abundant ecological community in the study area (Edinger et al. 2002). Other terrestrial habitat types remaining in the regional study area include salt and freshwater marsh, maritime grassland, and successional shrubland. Pine barrens and similar xeric habitats occur in the sandy regions of eastern Long Island, but in many areas these habitats are transitioning to oak-hardwood forests due to suppression of natural fire regimes (Kurczewski and Boyle 2000). Eastern Long Island also contains the largest, most contiguous tracts of natural habitat in the regional study area and the largest pine barrens in New York State.

WILDLIFE

Birds

The Atlantic Flyway, a major migratory pathway for waterfowl and other groups of birds, passes through New York Harbor and much of the Upper New York Harbor regional study area. Habitats along the flyway provide important resting and feeding sites during the spring and fall migration periods. Major groups of birds that are typically found within and around the New York metropolitan area and Long Island include the following:

- Waterfowl. Waterfowl use the waters off NYC and Long Island during fall migration and during the winter. Common migratory species of waterfowl found in the area during autumn include brant (*Branta bernicla*), American black duck (*Anas rubripes*), and mallard (*Anas platyrhynchos*) (USFWS 1997). Common overwintering waterfowl include horned grebe (*Podiceps auritus*), brant, red-breasted merganser (*Mergus serrator*), American widgeon (*Anas Americana*), greater scaup (*Aythya marila*), and bufflehead (*Bucephala albeola*) (NRG 1990). Common waterfowl breeding in the New York-New Jersey Harbor Estuary include mallard, wood duck (*Aix sponsa*), American black duck, and Canada goose (*Branta canadensis*). Within the regional study area, waterfowl are particularly concentrated along the Staten Island shoreline of Upper and Lower New York Harbor, the Kill Van Kull, and Jamaica Bay (USFWS 1997).
- Shorebirds. Nearly 30 species of shorebirds regularly stop in the harbor area and along Long Island during spring (March to June) and fall (July to November) migration, feeding on beaches and in marshes, mud flats, and shallow water areas before continuing onwards. Shorebirds that commonly stop over in the area during migration include semi-palmated sandpiper (*Calidris pusilla*), sanderling (*Calidris alba*), ruddy turnstone (*Arenaria*

interpres), and least sandpiper (*Calidris minutilla*). Spotted sandpiper (*Actitis macularius*), willet (*Tringa semipalmata*), killdeer (*Charadrius vociferous*), piping plover (*Charadrius melodus*), American oystercatcher (*Haematopus palliates*), least tern (*Sternula antillarum*), and clapper rail (*Rallus longirostris*) breed in the harbor area (USFWS 1997, Fowle and Kerlinger 2001).

- Wading Birds/Colonial Waterbirds. Great blue heron (*Ardea herodias*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), snowy egret (*Egretta thula*), glossy ibis (*Plegadis falcinellus*), great egret (*Ardea alba*), and double-crested cormorants (*Phalacrocorax auritus*) are waterbirds that breed in the New York harbor area and on parts of Long Island (USFWS 1997, Fowle and Kerlinger 2001, Craig 2010). NY/NJ HEP (1996) estimates that the heron populations in New York Harbor represent up to 25 percent of all nesting wading birds along the Atlantic Coast from Cape May, NJ to Rhode Island. Regionally significant breeding colonies of these birds are found in the Arthur Kill Complex and Harbor Herons Complex along the Arthur Kill and Kill van Kull.
- Raptors. Many species of raptors occur in the New York metropolitan area and on Long Island, particularly during autumn when nearly all migratory species native to eastern North America are apt to pass through the region. Red-tailed hawks (*Buteo jamaicensis*) and American kestrels (*Falco sparverius*) commonly nest in the study area. Less common breeders include peregrine falcon (*Falco peregrines*), northern harrier (*Circus cyaneus*), screech owl (*Otus asio*), great-horned owl (*Bubo virginianus*), and osprey (*Pandion haliaetus*). Species that commonly overwinter in the area include red-tailed hawk, northern harrier, American kestrel, and peregrine falcon. The species most commonly occurring during migration include sharp-shinned hawk (*Accipeter striatus*) and Cooper's hawk (*Accipeter cooperii*), with transient merlins (*Falco columbarius*), American kestrels, turkey vultures (*Cathartes aura*), and red-tailed hawks also frequently observed (Fowle and Kerlinger 2001).
- Songbirds. All species of migratory songbirds that are native to eastern North America are known to pass through the study region during spring and/or autumn. Species that commonly stop over in terrestrial habitats in the area to rest and refuel during their migration include American redstart (*Setophaga ruticilla*), black and white warbler (*Mniotilta varia*), black-throated blue warbler (*Dendroica caerulescens*), common yellowthroat (*Geothlypis trichas*), magnolia warbler (*Dendroica magnolia*), northern parula (*Parula Americana*), ruby-crowned kinglet (*Regulus calendula*), golden-crowned kinglet (*Regulus satrapa*), Swainson's thrush (*Catharus ustulatus*), white-throated sparrow (*Zonotrichia albicollis*), wood thrush (*Hylocichla mustelina*), and yellow-rumped warbler (*Dendroica coronate*). Far fewer songbird species nest or overwinter in the area. Common breeding species include American robin (*Turdus migratorius*), Baltimore oriole (*Icterus galbula*), blue jay (*Cyanocitta cristata*), gray catbird (*Dumetella carolinensis*), northern cardinal (*Cardinalis cardinalis*), red-eyed vireo (*Vireo olivaceus*), northern mockingbird (*Mimus polyglottos*), song sparrow (*Melospiza melodia*), yellow warbler (*Dendroica petechia*), red-winged blackbird (*Agelaius phoeniceus*), American goldfinch (*Carduelis tristis*), and tufted titmouse (*Baeolophus bicolor*) (USFWS 1997, Fowle and Kerlinger 2001). American goldfinch, black-capped chickadee (*Poecile atricapillus*), blue jay, house finch (*Carpodacus mexicanus*), northern cardinal, and tufted titmouse are among the common overwintering songbird species.
- Other. Many species belonging to other groups of birds commonly occur in the project area, such as woodpeckers (e.g., red-bellied woodpecker [*Melanerpes carolinus*], game birds

(e.g., wild turkey [*Meleagris gallopavo*], ring-necked pheasant [*Phasianus colchicus*]), and gulls and other seabirds (e.g., ring-billed gull [Larus delawarensis], common tern [*Sterna hirundo*]).

Amphibians and Reptiles

Most amphibians and reptiles occurring within the New York/New Jersey metropolitan area and on Long Island are disturbance-tolerant, generalist species that are able to inhabit isolated fragments of remaining terrestrial and freshwater habitats such as red-backed salamander (*Plethodon cinereus*), bullfrog (*Rana catesbeiana*), red-eared slider (*Trachemys scripta*), and brown snake (*Storeria dekayi*). Some relatively sensitive salamander species such as marbled salamander (*Ambystoma opacum*) persist in Staten Island and Suffolk County (Gibbs et al. 2007, Pehek 2007). Pine barren regions of Suffolk County also support some regionally uncommon reptile and amphibian species such as eastern hognose snake (*Heterodon platirhinos*) and eastern tiger salamander (*Ambystoma tigrinum*) (Gibbs et al. 2007).

Mammals

Because the study area is highly developed, its terrestrial mammal communities are limited to primarily disturbance-tolerant and urban-adapted generalists such as gray squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and Norway rat (*Rattus norvegicus*). Eastern cottontail (*Sylvilagus floridanus*) and white-tailed deer (*Odocoileus virginianus*) would also be expected to occur in the Long Island portion of the study area. Multiple species of bats may pass through the New York/New Jersey metropolitan area during migration, and some species breed in the area. Eastern coyote (*Canis latrans*), black bear (*Ursus americanus*), and red fox (*Vulpes vulpes*) occasionally occur in lesser-developed, suburban parts of the region. Marine mammals such as harbor seals (*Phoca vitulina*) and gray seals (*Halichoerus grypus*) occur in New York Harbor and off of Long Island. Six species of whale, all of which are federally endangered, occasionally occur as transients in these waters.

THREATENED, ENDANGERED, AND SPECIAL CONCERN SPECIES, AND SPECIAL HABITAT AREAS

Multiple federal and/or state listed species occur in the project region and in the vicinity of project sites. Federally listed species in the region include piping plover, Atlantic sturgeon, shortnose sturgeon, five species of sea turtles, and six species of whales that occur as transients in New York Harbor and off of Long Island. Bald eagles (*Haliaeetus leucocephalus*) also occur as transients in the project region, and although recently de-listed by USFWS, the species remains federally protected under the Eagle Act. Two species of federally listed plants occur within the region (Nassau County), sandplain gerardia (*Agalinis acuta*) and seabeach amaranth (*Amaranthus pumilus*).

The northern long-eared bat (Myotis septentrionalis) has been proposed by USFWS for listing as endangered under the federal Endangered Species Act of 1973, and appears on the USFWS Information, Planning, and Conservation System (IPaC) list of species in each county within the regional study area. However, the northern long-eared bat is a forest interior species that generally inhabits upland and riparian forest within heavily forested landscapes, and is sensitive to fragmentation and urbanization (Ford et al. 2005, Broders et al. 2006, Henderson et al. 2008). The urbanized regional study area does not contain any habitat that would be suitable for northern long-eared bats for either breeding or winter hibernation. The NYNHP and NYSDEC have no records of the northern long-eared bat occurring in any of the five boroughs of New

York City, and no nuisance bats ever collected from the city and submitted to the New York State Department of Health for rabies testing have included a northern long-eared bat. The northern long-eared bat is not considered to have the potential to occur in the regional study area, with the exception of possible rail yards on eastern Long Island, where northern long-eared bats have been documented.

In addition to the federally listed species above which are also state listed, other state threatened, endangered, and special concern species in the project region include birds such as black-crowned night heron (*Nycticorax nycticorax*), common tern, least tern (*Sterna antillarum*), saltmarsh sharp-tailed sparrow (*Ammodramus caudacutus*), northern harrier, peregrine falcon, and least tern, and reptiles and amphibians such as eastern tiger salamander (*Ambystoma tigrinum*) and eastern hognose snake (*Heterodon platirhinos*). Within the regional study area, colonial waterbirds associated with the Harbor Herons Complex on Staten Island and certain species of waterfowl are considered sensitive species. Birds in this group occurring on Staten Island or on the islands surrounding Staten Island include great egret, cattle egret (*Bubulcus ibis*), snowy egret, tricolored heron, little blue heron, glossy ibis, black-crowned night-heron (NJ threatened), yellow-crowned night-heron (*Nyctanassa violacea*; NJ threatened), least bittern (NY threatened, NJ special concern), and pied-billed grebe (*Podilymbus podiceps*; NY threatened, NJ endangered). NMFS Essential Fish Habitat (EFH) is present in the Upper New York Harbor regional study area for: red hake (*Urophycis tenuis*), winter flounder, windowpane flounder (*Scopthalmus aqosus*), Atlantic sea herring (*Clupea harengus*), bluefish, butterfish (*Peprilus triacanthus*), Atlantic mackerel (*Scomber scombrus*), summer flounder (*Paralichthys dentatus*), scup, black sea bass, spiny dogfish (*Squalus acanthias*), king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorus maculates*), sandbar shark (*Charcharinus plumbeus*), sand tiger shark (*Odontaspis taurus*), and dusky shark (*Charcharinus obscurus*).

Pitch pine-oak forests and pitch pine-scrub oak barrens that occur throughout much of Suffolk County are considered significant natural communities by NYNHP.

Detailed discussions of threatened or endangered species or species of concern are presented below as appropriate for each of the local study areas.

WEST-OF-HUDSON LOCAL STUDY AREAS

OAK ISLAND YARD, GREENVILLE YARD, PORT NEWARK/PORT ELIZABETH

Aquatic Biota

Oak Island Yard and Greenville Yard are connected by the Greenville Branch, which crosses Newark Bay on the Lehigh Valley Railroad Bridge. The Port Newark/Port Elizabeth site is located on Elizabeth Channel which is also part of Newark Bay. Aquatic biota in the bay are generally characteristic of the Upper New York Harbor regional study area described above.

Wetlands

No wetlands are located within the upland area of Greenville Yard. The shoreline bordering the eastern boundary of the Greenville Yard with Upper New York Bay is mapped by NJDEP as herbaceous wetlands and saline marshes, and by the NWI as subtidal wetlands (i.e., bottom is continuously covered by water). Along the Greenville Branch, a small area south of the rail right-of-way and east of NJ Route 440 is mapped as freshwater palustrine emergent marsh by NJDEP and as estuarine intertidal emergent on NWI maps (see **Figure 6.8-1 and Figure 6.8-2**, respectively). North of the Greenville Branch, next to the Tropicana facility, the NJDEP wetland maps indicate a freshwater wetland classified as palustrine emergent, but this wetland was not

Source: NJDEP, 2007 Land Use/Land Cover Update, 2010

FIGURE 6.8-1

New Jersey DEP Wetlands

CROSS HARBOR FREIGHT PROGRAM

Source: NJDEP, 2007 Land Use/Land Cover Update, 2010

FIGURE 6.8-1

New Jersey DEP Wetlands

CROSS HARBOR FREIGHT PROGRAM

Source: National Wetlands Inventory, USFWS

FIGURE 6.8-2

National Wetland Inventory Mapped Wetlands

CROSS HARBOR FREIGHT PROGRAM

Source: National Wetlands Inventory, USFWS

FIGURE 6.8-2

National Wetland Inventory Mapped Wetlands

CROSS HARBOR FREIGHT PROGRAM

observed during site visits. Numerous wetlands surround the Oak Island Yard located on the western shoreline of Newark Bay. Along Newark Bay at the southern border of the yard, there are NJDEP-classified herbaceous wetlands and modified wetlands that are also designated as estuarine intertidal emergent wetlands on NWI maps. One area of emergent wetland was located at the northeast corner of the mapped wetland, in the area bounded by the western side of Doremus Avenue and the southern border of the yard. The NWI map classifies this wetland as tidal. The central portion of the NJDEP freshwater wetland has been developed and now contains a large building and parking area. The remaining portion is between the road leading to the yard and the western border of the new building's parking area. Another smaller wetland is located across the access road to the yard, bounded by the southern border of the yard and the northern border of the parking area. The NWI map identifies these wetlands as freshwater.

Vegetation

Vegetation within Greenville Yard is sparse; most of the area around the tracks is gravel with some mugwort (*Artemisia vulgaris*), goldenrod (*Solidago* sp.), and black cherry (*Prunus serotina*). A narrow tree line consisting of tree-of-heaven (*Ailanthus altissima*) and eastern cottonwood trees (*Populus deltoids*) are present along the fence line of the yard's northern border. Similarly, at the head of Elizabeth Channel is a full paved, heavily developed industrial area. Vegetation in this area is primarily limited to grass and ornamental trees located amongst buildings and parking lots. Herbaceous vegetation (e.g., mugwort, goldenrod, evening primrose (*Oenothera macrocarpa*), common mullein (*Verbascum Thapsus*), dandelion (*Taraxacum* sp.), and bull thistle (*Cirsium vulgare*)) grows along the right-of-way in some areas, along with narrow bands of cottonwood. Vegetation within the Oak Island Yard is limited to mugwort and some scattered cottonwood trees around the periphery. The yard is surrounded by industrial land uses, but some densely vegetated areas remain adjacent to the yard's boundaries. Most of these areas are wetlands dominated by *Phragmites*, as described above. Beyond the northern border of the yard, there is a channelized creek bordered by a mixture of tree-of-heaven, mulberry (*Morus sp.*), and cottonwood, with mugwort undergrowth.

Wildlife

Greenville Yard is built on fill material and bulkheaded. It contains limited areas that are suitable for native wildlife. Brant and herring gulls have been observed along the shoreline, south of Greenville Yard. Other birds such as such as American black duck, common merganser (*Mergus merganser*), common tern, and various gull species would also be expected to occur along the shoreline off Greenville Yard. Migrating shorebirds can occur in the wetlands near the northeast corner of the Global Marine Terminal during stopovers, and least terns (NJ endangered) nest in this area.

From Greenville Yard to Oak Island Yard, most of the Greenville Branch runs through a mixture of commercial, industrial, and residential land uses that provide limited wildlife habitat, before crossing Newark Bay (see **Figure 6.8-1)**. A 20 to 30-foot zone of invasive trees, shrubs, and herbaceous plants borders both sides of the tracks through Jersey City. Wildlife observed within this area included red-winged blackbird, European starling (*Sturnus vulgaris*), and pigeon (*Columba livia domestica*). The remainder of the study area outside the rail right-of-way and east of NJ Route 440 is emergent marsh dominated by *Phragmites* with a perimeter of shrub/scrub/wooded wetland. Native wildlife species expected to occur in this area are limited to species that are tolerant of highly disturbed marsh habitats such as red-winged blackbird, song sparrow, and mourning dove (*Zenaida macroura*).

The areas within Oak Island Yard and at the Port Newark/Port Elizabeth site are devoid of any vegetation or suitable habitat for native wildlife. The surrounding area is heavily developed with mostly commercial and industrial land uses. Narrow strips and fragments of vegetation exist beyond some sections of the yard's boundaries. These areas contain a mixture of invasive trees and shrubs that likely support primarily non-native wildlife species such as house sparrows (*Passer domesticus*), European starlings, and Norway rats, and possibly some native species that are urban-adapted and highly tolerant of disturbed areas such as American robin, mourning dove, northern cardinal, and gray squirrel. Adjacent wetlands (described above) may provide habitat for some wading birds common to the area such as great blue heron, snowy egret, and green heron (*Butorides virescens*), waterfowl such as mallards and black ducks, and songbirds such as red-winged blackbird, common yellowthroat, and song sparrow. Muskrats (*Ondatra zibethicus*) also have the potential to occur. Great egret and red-winged blackbird have been observed in these wetlands.

Threatened or Endangered Species, Species of Special Concern, and Special Habitat Areas

The tip of the Global Marine Terminal pier located immediately south of Greenville Yard is a NJNHP Natural Heritage Priority Site and hosts a small breeding colony of the state-endangered least tern. The pied-billed grebe, a NJ state-endangered species, may occur in the offshore waters of this area during winter. The peregrine falcon, a state endangered species, has been recorded in the vicinity of the project sites. No federally listed species are known to occur in the area.

EAST-OF-HUDSON LOCAL STUDY AREAS

SBMT, 51ST YARD, 65TH STREET YARD, RED HOOK, EAST NEW YORK, BAY RIDGE BRANCH

Aquatic Biota

Aquatic biota expected to occur in this portion of the Upper New York Harbor are as described for the regional study area. No aquatic habitats are present along the Bay Ridge Branch, with the exception of a small, man-made pond that is adjacent to the Fresh Pond Yard site. This pond would be expected to provide limited habitat for aquatic biota other than mosquito larvae.

Wetlands

Portions of Upper New York Harbor within the study area are mapped by the NYSDEC as littoral zone tidal wetlands and by the NWI as estuarine subtidal unconsolidated bottom wetlands (see **Figure 6.8-3 and Figure 6.8-4**, respectively). There are no NWI or NYSDEC freshwater or tidal wetlands along the Bay Ridge Branch.

Vegetation

The Brooklyn waterfront facilities (South Brooklyn Marine Terminal, 51st Street Yard, 65th Street Yard, and Red Hook) are located in a heavily developed, industrial and commercial section of Brooklyn that is dominated by impervious surfaces. Vegetation at the Brooklyn waterfront facilities is composed of predominantly invasive, non-native species that exist in disturbed areas and are tolerant of urban conditions. The ecological communities on-site are early successional and consist of herbicide-sprayed roadside/pathway and urban vacant lot communities, as defined by Edinger et al. (2002). Plant species in these areas include Queen Anne's lace (*Daucus carota*), dandelions, thistles (*Sonchus* sp.), goldenrods, common ragweed (*Ambrosia artemisiifolia*), pokeweed (*Phytolacca americana*), evening primrose, bittersweet nightshade (*Solanum dulcamara*), and *Phragmites*. The trees present are mostly invasive,

FIGURE 6.8-3

NYSDEC Wetlands

CROSS HARBOR FREIGHT PROGRAM

FIGURE 6.8-4

National Wetlands Inventory Mapped Wetlands

CROSS HARBOR FREIGHT PROGRAM

pioneer species such as Norway maple (*Acer platanoides*), eastern cottonwood, black locust (*Robinia pseudoacacia*), and tree-of-heaven.

Owl's Head Park is located to the south of the Brooklyn study area, separated from the study area by Belt Parkway. The 27-acre park consists of mowed lawn with trees (Edinger et al. 2002). Trees include native and exotic species such as ginkgo (*Ginkgo biloba*), tulip poplar (*Lirodendron tulipifera*), black cherry, pin oak (*Quercus palustris*), Scotch pine (*Pinus sylvestris*), little fan linden (*Tilia cordata*), London plane (*Plantanus acerifolia*), European beech (*Fagus sylvatica*), honey locust (*Gleditsia tricanthos*), Norway maple, Japanese zelkona (*Zelcona serrata*), horsechestnut (*Aesculus hippocastanum*), Amur cork tree (*Phellodendron amurense*), and willows (*Salix* sp.). Willow oak (*Quercus phellos*), listed by NYNHP as an endangered species, is also present in the park.

The plant community along the Bay Ridge Branch right-of-way is best described as herbicide-sprayed roadside/pathway (Edinger et al. 2002) and consists of mostly non-native invasive species that are common to disturbed areas and tolerant of urban conditions, such as Norway maple. Substantial portions of the railroad embankments and elevated areas contain sparse, invasive vegetation or no vegetation at all. The Cemetery of the Evergreens and Trinity Cemetery are located at the Brooklyn-Queens border, east of the rail line, and contain a wide variety of native and non-native planted trees. The state-endangered willow oak is present in the Cemetery of the Evergreens.

Wildlife

At the Brooklyn waterfront dilapidated waterfront piers may provide resting/basking platforms for some disturbance-tolerant waterbirds such as double-crested cormorants. During visits to the Brooklyn waterfront, rafts of several species of waterfowl were observed offshore within 50 yards of the site, and a group of cormorants was observed on the dilapidated piers extending into the harbor. However, the limited areas in this portion of the study area offer limited habitat for wildlife. Wildlife species with the potential to occur within the local study area are limited to invasive birds such as house sparrows and European starlings, as well as Norway rats. Nearby Owl's Head Park likely provides habitat for some urban-adapted native species such as American robin, northern cardinal, red-bellied woodpecker, blue jay, gray squirrel, and raccoon. Gray squirrels and dark-eyed juncos (*Junco hyemalis*) were observed during a visit to this area.

Beyond the Brooklyn waterfront facilities, the area within and around the Bay Ridge Branch lacks habitat for all but a few native wildlife species, such as gray squirrel and northern mockingbird. Wildlife occurring along the segments of the Bay Ridge Branch that pass the Cemetery of the Evergreens and Trinity Cemetery likely includes species commonly associated with urban parks such as gray squirrel, American robin, blue jay, mourning dove, red-bellied woodpecker, and similar backyard bird species. Eastern phoebes (*Sayornis phoebe*), pigeons, song sparrows, mourning doves, and gray squirrels were observed in trees along the Queens segment of the Bay Ridge Branch. Red admiral butterflies (*Vanessa atalanta*) were also observed in this area.

Threatened or Endangered Species, Species of Special Concern, and Special Habitat Areas

Willow oaks (NY endangered) in Owl's Head Park and Cemetery of the Evergreens are the only state or federally listed species known to occur in vicinity of the Brooklyn waterfront facilities and the Bay Ridge Branch. Federally threatened and endangered sea turtle species occur as transients in New York Harbor.

FRESH POND YARD TO MASPETH YARD, MONTAUK BRANCH

Aquatic Biota

No aquatic habitats exist at Fresh Pond Yard or along the Montauk Branch West to Maspeth Yard**.** At Maspeth Yard, aquatic habitat is present in nearby Maspeth Creek, a tributary to Newtown Creek. Newtown Creek has a long legacy of contamination and remains highly polluted from historical and current sources (see Chapter 6.9, "Water Resources"). The creek was designated a Superfund Site by the USEPA in 2010. Dissolved oxygen levels are so low that conditions are likely inhospitable for many aquatic animals. Fish that enter Newtown Creek from the East River are believed to remain for only short amounts of time before returning (UDEC 2011).

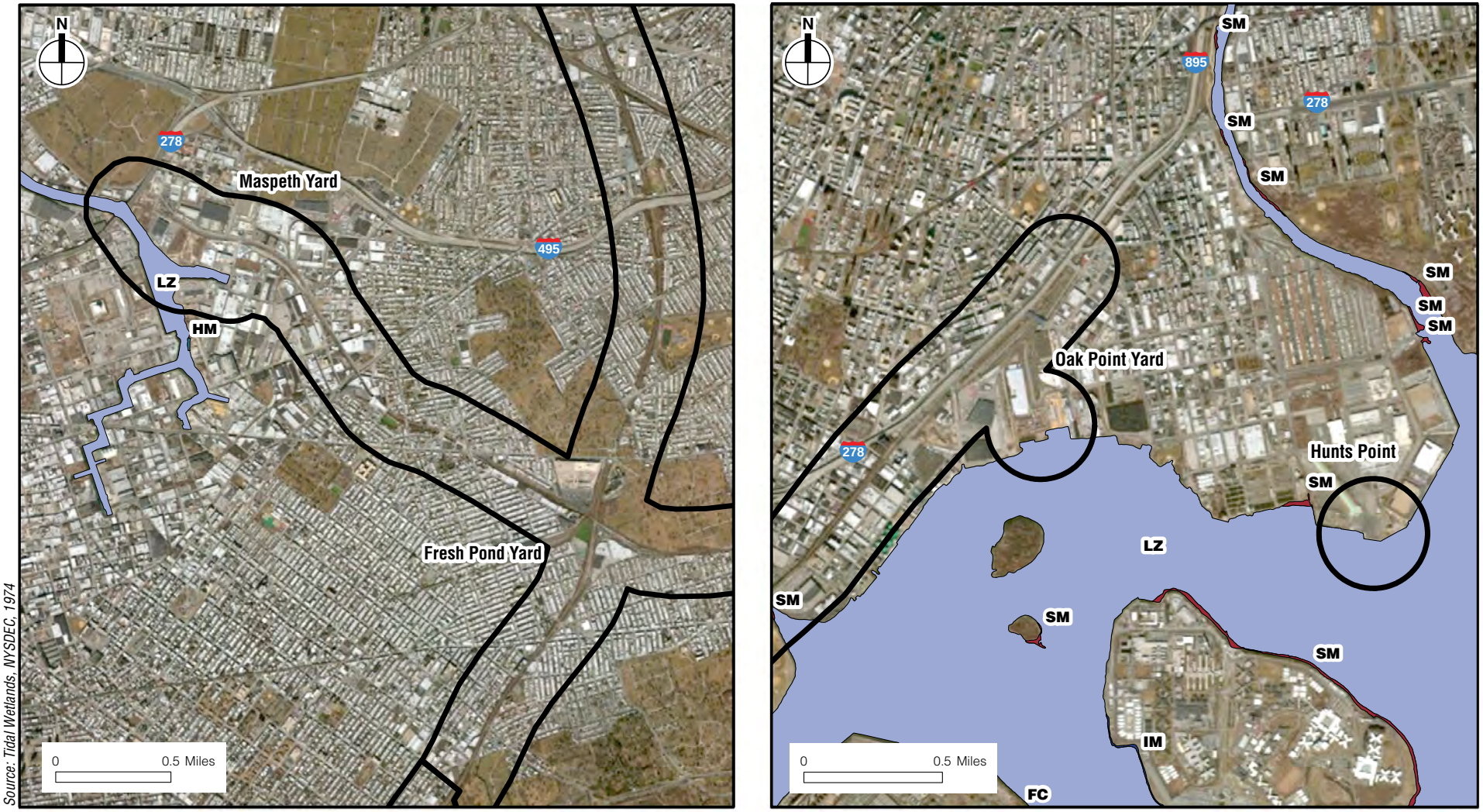
Newtown Creek's aquatic life has not been thoroughly documented, but because it is a direct tributary of the East River, its aquatic life would be expected to include species found in the East River. The phytoplankton community of the East River is highly dynamic, both temporally and spatially, but is generally dominated by diatoms (Hazen and Sawyer 1983, Brosnan and O'Shea 1995). Common macro-algae known to occur within the East River include the Phaeophyte species *Fucus vesiculosus*, the Chlorophyte species *Ulva lactuca*, and *Enteromorpha* species (Perlmutter 1971). The most dominant zooplankton species in the river include the copepods *Acartia tonsa, Acartia hudsonica, Eurytemora affinis,* and *Temora longicornis* (Stepien et al. 1981, Lonsdale and Cosper 1994, Perlmutter 1971, Hazen and Sawyer 1983). More than 100 benthic invertebrate taxa (mostly crustaceans or polychaete worms) have been identified in the East River; most are considered highly tolerant of degraded conditions (Coastal Environmental Services 1987). *Streblospio benedicti* (oligochaete), *Corophium insidiosum* (amphipod), *Molgula manhattensis* (sea grape), and *Polydora* species (polychaete worms) are the most abundant macroinvertebrates found in the bottom sediment of Newtown Creek (DSNY 2005). In 2003, the New York Department of Sanitation sampled the fish community in Newtown Creek from January through December (DSNY 2005). Ninety-eight adult finfish, representing 16 species, were collected. The most abundant species were striped bass, menhaden, tomcod, and Atlantic silverside. Bay anchovy was the fish species with the most eggs and larvae present in samples.

Wetlands

No NWI or NYSDEC freshwater or tidal wetlands are mapped along the Montauk Branch West right-of-way from Fresh Pond Yard to Maspeth Yard. Adjacent to Maspeth Yard, the shorelines of Maspeth Creek are mapped by the NYSDEC as littoral zone tidal wetlands and by the NWI as estuarine subtidal unconsolidated bottom subtidal wetlands (see **Figure 6.8-5 and Figure 6.8-6**, respectively).

Vegetation

From Fresh Pond Yard to Maspeth Yard, most of the Montauk Branch West line passes through commercial and industrial areas representative of "urban structure exteriors" (Edinger et al. 2002). Several urban vacant lots are adjacent to the corridor. Plants observed along the railroad right-of-way were predominantly invasive species that exist in disturbed areas and are tolerant of urban conditions such as tree-of-heaven, eastern cottonwood, black cherry, black locust, Japanese knotweed, ragweed, goldenrod, Queen Anne's lace, foxtail and other grasses. Minimal vegetation (e.g., ragweed and invasive grasses) exists on the streets around the potential Maspeth Yard site. The species present include London plane, black locust, mockernut hickory (*Carya tomentosa*), tree-of-heaven, and invasive herbaceous vegetation such as Japanese knotweed and



Source: Tidal Wetlands, NYSDEC, 1974

1000-Foot Study Area

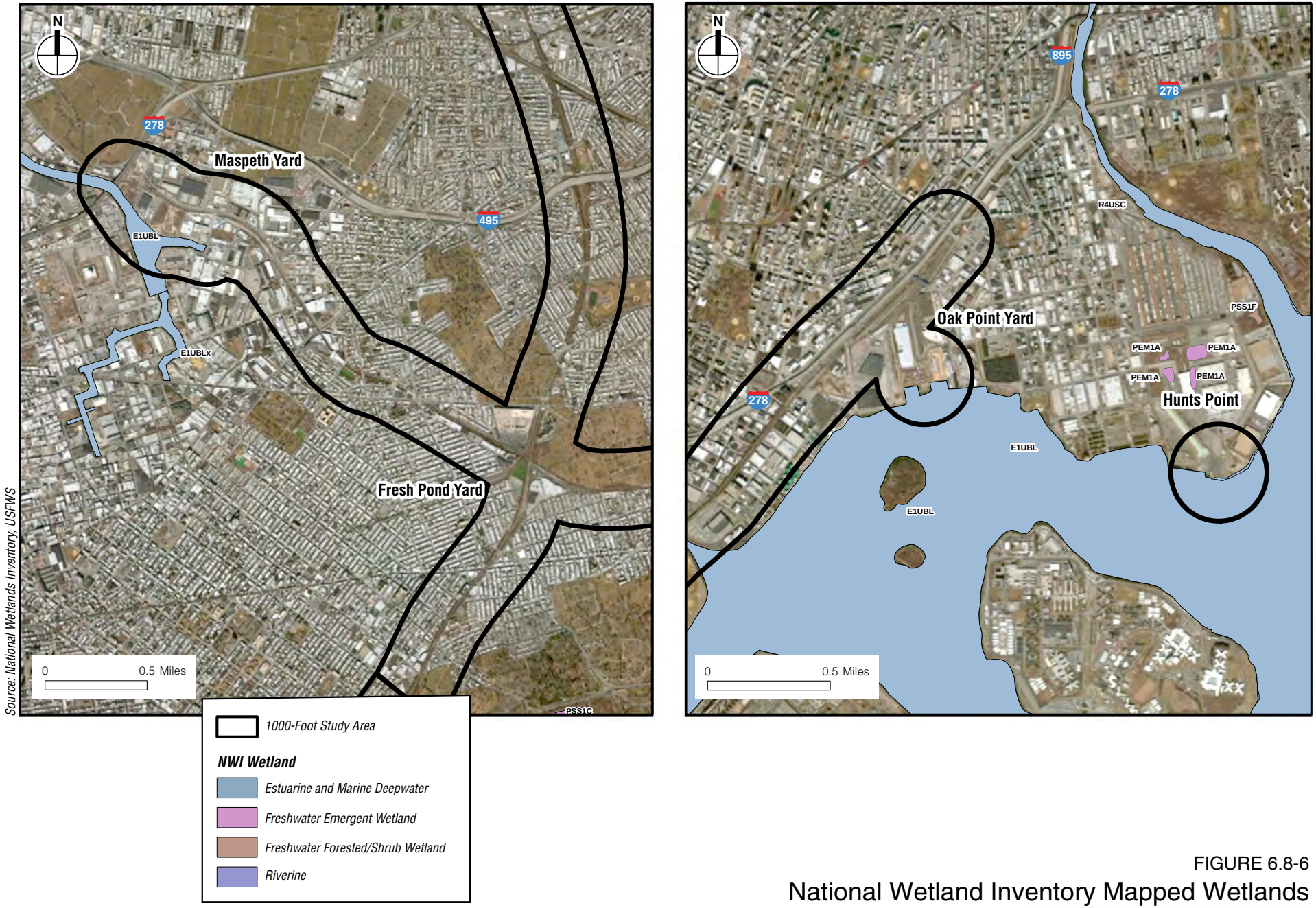
NYS DEC Wetlands

- Littoral Zone (LZ)
- Coastal Shoals, Bars and Mud Flats (SM)
- Intertidal Marsh (IM)
- High Marsh or Salt Meadow (HM)

FIGURE 6.8-5

NYSDEC Wetlands

CROSS HARBOR FREIGHT PROGRAM



Source: National Wetlands Inventory, USFWS

FIGURE 6.8-6

National Wetland Inventory Mapped Wetlands

CROSS HARBOR FREIGHT PROGRAM

ragweed. Small patches of *Phragmites* exist on-site, indicating the potential presence of unmapped wetlands. The edge of Maspeth Creek is riprapped, with ragweed and tree-of-heaven growing through the riprap.

Wildlife

As discussed above, the limited vegetation along the Montauk Branch West line provides limited habitat for wildlife. Only highly urban-adapted species such as house sparrow, European starling, rock dove (*Columba livia*), Norway rat, and gray squirrel are expected to occur in the vicinity of the right-of-way. Similarly, Maspeth Yard offers minimal wildlife habitat. Species inhabiting the area are likely native and non-native generalist birds such as house sparrow, European starling, rock dove, song sparrow, and northern mockingbird. Double-crested cormorants and a great egret were observed in Maspeth Creek during a visit to the site.

Threatened or Endangered Species, Species of Special Concern, and Special Habitat Areas

No federally or state listed species occur near Fresh Pond Yard, Montauk Branch West, or Maspeth Yard.

FRESH POND YARD TO OAK POINT YARD AND HUNTS POINT, FREEMONT SECONDARY LINE

Aquatic Biota

Aquatic habitats present along the Freemont Secondary line from Fresh Pond Yard to Oak Point Yard are limited to where elevated tracks briefly cross over the East River and Harlem River. Aquatic biota expected to occur in this portion of the Upper New York Harbor are as described for the regional study area.

Wetlands

Where the Freemont Secondary line passes over Astoria Park, the park's shoreline on the East River is mapped by the NYSDEC as littoral zone tidal wetlands and by the NWI as estuarine subtidal unconsolidated bottom subtidal (see **Figure 6.8-5 and Figure 6.8-6**, respectively). Where the Freemont Secondary line passes over Randall's Island, shoreline areas of the island are mapped by the NYSDEC as littoral zone tidal wetlands and by the NWI as estuarine subtidal open water subtidal wetlands. No other NWI or NYSDEC freshwater or tidal wetlands are mapped along the Fremont Secondary line and no NWI or NYSDEC wetlands are mapped within the Oak Point Yard study area. The East River shoreline in the study area is mapped as NYSDEC-regulated unvegetated wetlands (littoral zone) and NWI estuarine subtidal open water subtidal wetlands.

Vegetation

From Fresh Point Yard to the Bronx, the majority of the Freemont Secondary line runs through urban and suburban neighborhoods, and urban structure exterior (Edinger et al. 2002) is the dominant ecological community type. Heavily vegetated areas along the Freemont Secondary line are limited to Lutheran Cemetery, Juniper Valley Park, Astoria Park, and Randall's Island. Each of these areas generally consists of expansive areas of mowed lawn with shade trees. Common tree species include red pine (*Pinus resinosa*), red oak, pin oak, Norway maple, dogwood (*Cornus* sp.), sweetgum (*Liquidambar styraciflua*), weeping willow (*Salix babylonica*), London plane, cherry (*Prunus sp.*), and Chinese scholar tree (*Sophora japonica*). Vegetation is nearly nonexistent at Oak Point Yard and Hunts Point except for intermittent weedy areas between the upland impervious surfaces and the riprap at the shoreline.

Wildlife

Wildlife habitat along the Freemont Secondary line is primarily restricted to Lutheran Cemetery, Juniper Valley Park, Astoria Park, and Randall's Island. As discussed above, these green spaces mostly consist of mowed lawn and isolated shade trees, which offers suitable habitat to only generalist, urban-adapted species. Birds observed during visits to these sites include house sparrow, European starling, and ring-billed gull. Other wildlife species that are common to urban habitats, such as gray squirrel, rock dove, American robin, and mourning dove, are also expected to occur in these areas. Due to the lack of vegetation around the Oak Point Yard and Hunts Point study areas, only the most urban-adapted wildlife species such as house sparrow, European starling, and rock dove would be expected to occur.

Threatened or Endangered Species, Species of Special Concern, and Special Habitat Areas

Peregrine falcons (NY endangered) have sporadically nested on the Hell Gate Bridge (over which the Freemont Secondary Line passes) in past years. No other federally or state listed species are known to occur in the study area between Fresh Pond the Bronx.

LONG ISLAND FACILITIES

As discussed previously, it was assumed that rail facilities that could process the projected demand for carload, intermodal, and international container traffic would be developed in the Nassau/Suffolk area, independent of the CHFP. Depending on the location of those facilities, the effects on natural resources would vary. Generally, areas on Long Island identified or proposed as potential sites for freight facilities by others are less developed than other sites in New York City and New Jersey that would be developed and/or used to process Cross Harbor freight. As examples of natural resources that are present on Long Island, the following sections describe the natural resources at the Pilgrim Intermodal Terminal and the Brookhaven Rail Terminal. It is important to note that natural resources at other sites could be very different and that any adverse effects that could result from the development and use of facilities at different locations would require additional environmental review.

Pilgrim Intermodal Terminal

Aquatic Biota

A storm water retention basin in the southeastern corner of the site represents the only aquatic habitat present. The basin is dry for part of the year (New York State Department of Transportation [NYSDOT] 2007), and is therefore unlikely to support aquatic biota that require water to be present throughout the year. Semi-aquatic organisms such as bullfrog and green frog (*Rana clamitans*) would have the potential to use the basin when it contains water. Waterfowl, such as Canada geese, have been observed on the basin during winter (NYSDOT 2007).

Wetlands

There are no NYSDEC mapped wetlands within the study area (see **Figure 6.8-7**). The storm water basin in the southeastern corner of the site is mapped by the NWI as excavated palustrine open water systems semi-permanently flooded (See **Figure 6.8-8**).

Vegetation

Much of the site is covered by unvegetated areas of bare sand. The vegetated areas are primarily in a regenerative state due to past clearing activities and ongoing disturbances resulting from off-road vehicle use. The dominant vegetation community within and around the site is early successional pitch pine-oak forest, with patches of early old field and shrubland also present.

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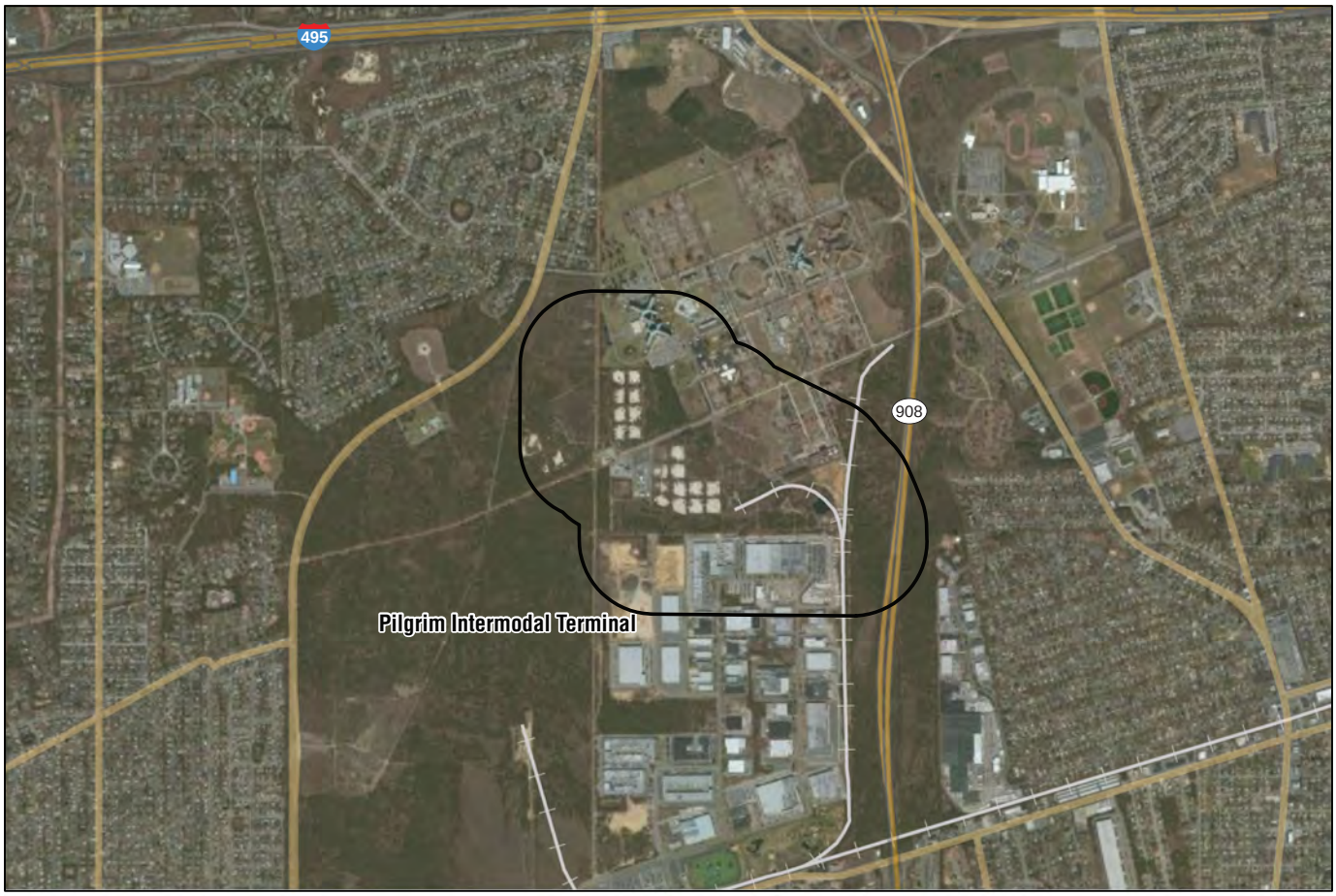


Source: Tidal and Freshwater Wetlands, NYSDEC, 1974/1999

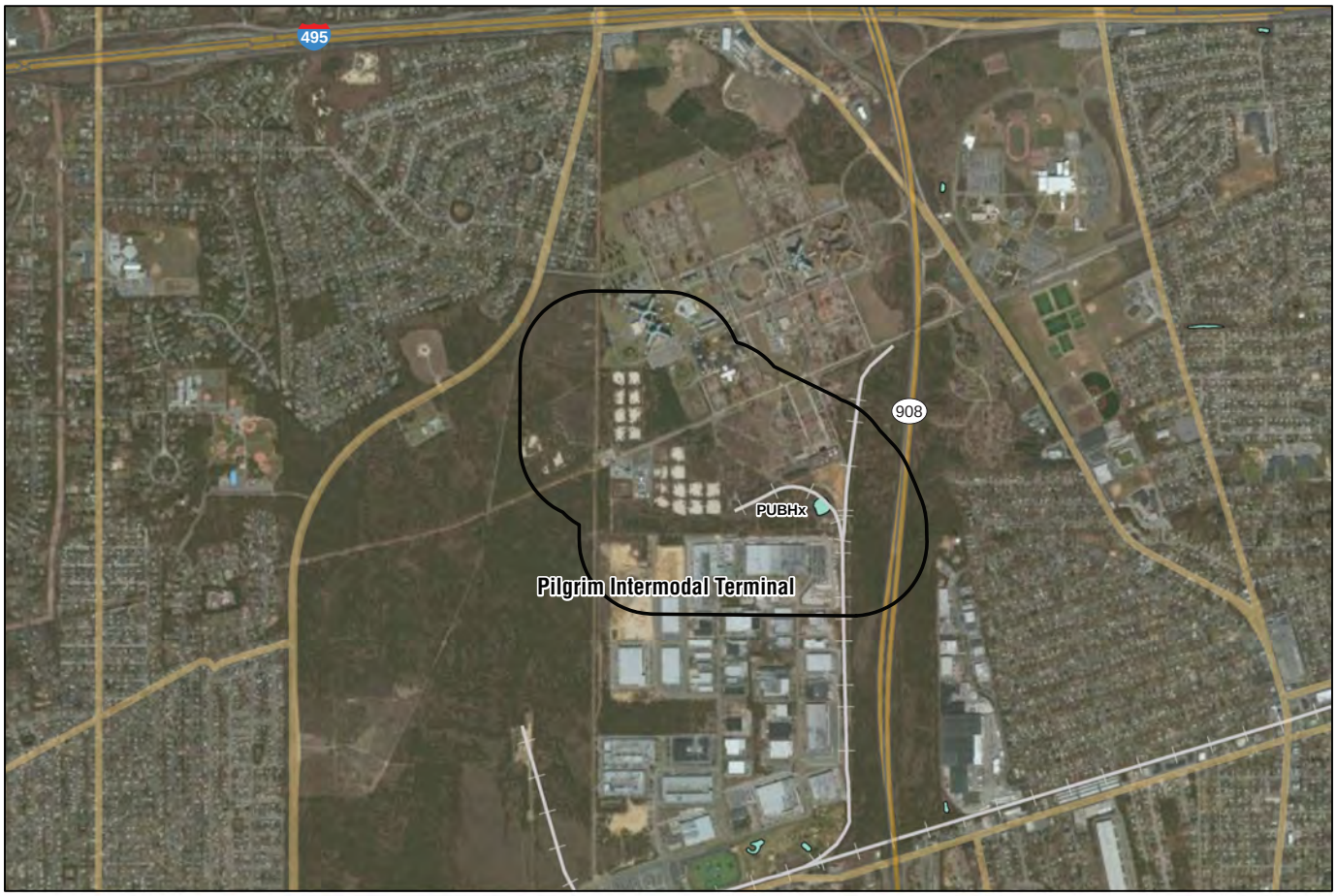
1000-Foot Study Area

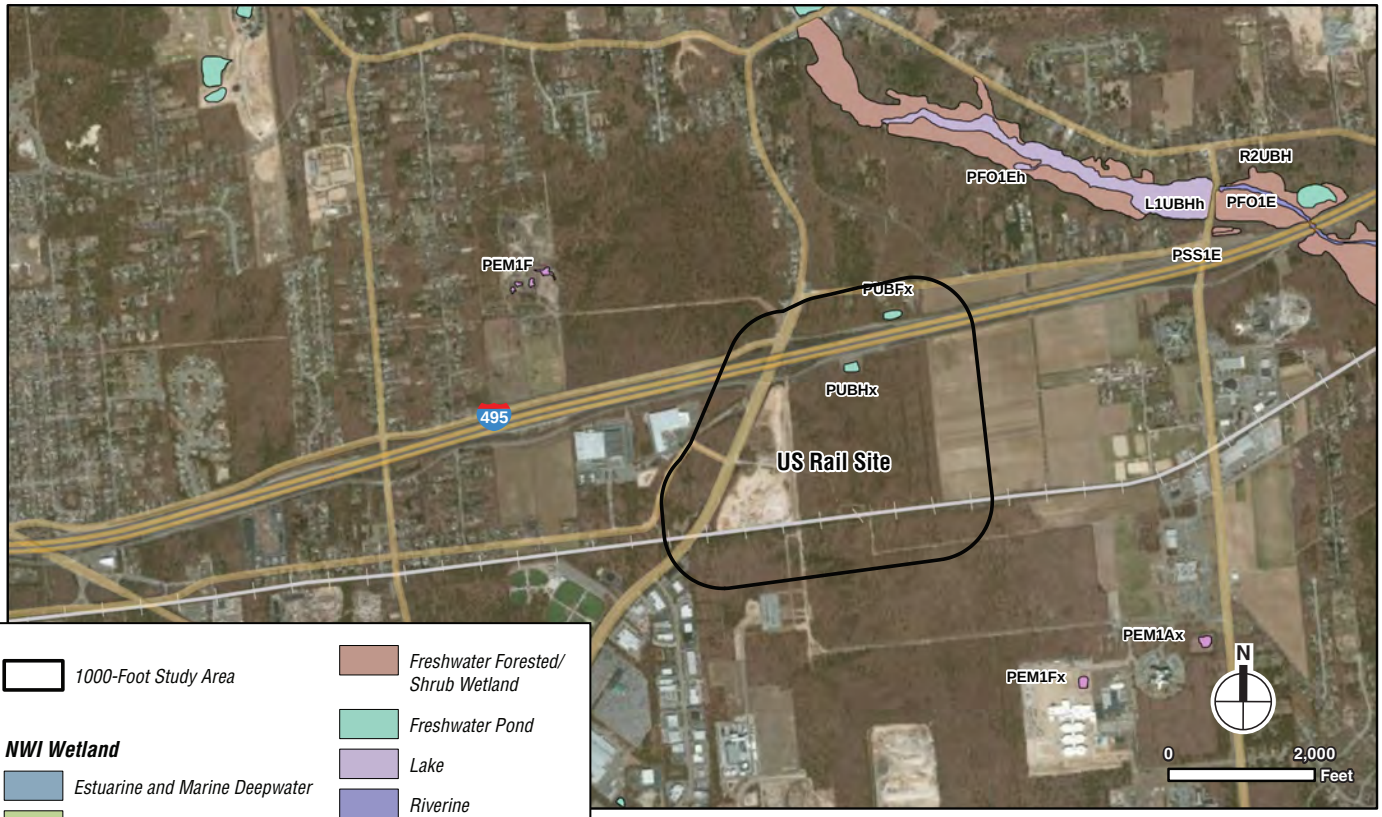
Freshwater Wetlands

FIGURE 6.8-7

NYSDEC Wetlands

CROSS HARBOR FREIGHT PROGRAM





Source: National Wetlands Inventory, USFWS

1000-Foot Study Area

NWI Wetland

- *Estuarine and Marine Deepwater*
- *Estuarine and Marine Wetland*
- *Freshwater Emergent Wetland*
- *Freshwater Forested/ Shrub Wetland*
- *Freshwater Pond*
- *Lake*
- *Riverine*
- *Other*

FIGURE 6.8-8

National Wetland Inventory Mapped Wetlands

CROSS HARBOR FREIGHT PROGRAM

Dozens of plant species that are typical of xeric, pine barren habitats of eastern Long Island occur at the site (NYSDOT 2007). The tree community is mostly composed of pitch pine (*Pinus rigida*), white oak, and red oak, with abundant black cherry and black oak saplings in the subcanopy. The understory is primarily scrub oak (*Quercus berberidifolia*), lowbush blueberry (*Vaccinium angustifolium*), and black huckleberry (*Gaylussacia baccata*) (NYSDOT 2007).

Wildlife

The habitat types present in the study area can support numerous species of birds. The breeding bird community at the site has been previously described (NYSDOT 2007) and includes eastern towhee (*Pipilo erythrophthalmus*), northern mockingbird, common yellowthroat, field sparrow (*Spizella pusilla*), prairie warbler (*Dendroica discolor*), pine warbler (*Dendroica pinus*), northern cardinal, brown-headed cowbird (*Molothrus ater*), blue jay, indigo bunting (*Passerina cyanea*), brown thrasher (*Toxostoma rufum*), chipping sparrow (*Spizella passerina*), gray catbird, killdeer, American goldfinch, orchard oriole (*Icterus spurius*), and Baltimore oriole, among others. During winter, black-capped chickadee, tufted titmouse, blue jay, white-breasted nuthatch, red-bellied woodpecker, mourning dove, northern cardinal, and white-throated sparrow are likely among the most abundant bird species at the site. During spring and fall, numerous migratory landbirds are apt to use the area as a stopover site. Examples include ovenbird, black-throated green warbler, black and white warbler, magnolia warbler, American redstart, red-eyed vireo, ruby-crowned kinglet, golden-crowned kinglet, veery (*Catharus fuscescens*), and Swainson's thrush, among others. Birds of prey such as sharp-sinned hawk, American kestrel, and red-tailed hawk are likely common to the area during migration as well.

The mammal community at the site is composed of mostly disturbance-tolerant species that are associated with thickets and other dense habitat fragments in suburban landscapes (NYSDOT 2007). Eastern cottontail rabbits and eastern chipmunks appear to be among the most abundant mammals at the site. Red fox, a key predator of these smaller mammals, also occurs at the site (NYSDOT 2007). Other mammals expected to occur at the site include gray squirrel, white-footed mouse, pine vole (*Microtus subterraneus*), raccoon, opossum, striped skunk (*Mephitis mephitis*), muskrat, little brown bat, and white-tailed deer (*Odocoileus virginianus*).

Pine barrens and similar xeric areas support unique assemblages of herpetile species that are not often found in other habitat types. Eastern hognose snake, eastern spadefoot toad (*Scaphiopus holbrookii*), tiger salamander, and gray tree frog (*Hyla versicolor*) are examples of species that prefer xeric upland forest habitats (Mitchell et al. 2006, Gibbs et al. 2007), and may occur at the project site. Previous reptile and amphibian surveys conducted within and around the site documented bullfrog, green frog, Fowler's toad (*Bufo fowleri*), garter snake, milk snake (*Lampropeltis triangulum*), and eastern ribbon snake (*Thamnophis sauritus sauritus*) (NYSDOT 2007). Other species expected to occur at the site include spring peeper, black racer (*Coluber constrictor*), eastern box turtle (*Terrapene carolina*), and snapping turtle (*Chelydra serpentina*).

Threatened or Endangered Species, Species of Special Concern, and Special Habitat Areas

Pitch pine-oak forest and pitch pine-scrub oak barrens are significant natural communities recorded by NYNHP in the study area, and the project site is adjacent to the Pine Brush State Preserve—a NYSDEC Critical Environmental Area. NYNHP records of protected plants in the study area include American ipecac (*Gillenia stipulate;* NYS endangered), sandplain wild flax (*Linum intercursum;* NYS threatened), southern yellow flax (*Linum medium* var. *texanum;* NYS threatened), velvety bush-clover (*Lespedeza stuevei;* NYS threatened), and wild pink (*Dianthus plumarius;* NYS exploitably vulnerable). Coastal barrens buckmoth (*Hemileuca maia;* NYS

special concern) is the only listed wildlife species identified by NYNHP as occurring in the study area.

Although not identified by NYNHP, eastern tiger salamander (NYS endangered), eastern spadefoot toad (NYS special concern), eastern box turtle (NYS special concern), and eastern hognose snake (NYS special concern) are considered to have the potential to occur within the study area based on their geographic ranges and associations with the xeric habitat types present (Mitchell et al. 2006, Gibbs et al. 2007). Sharp-shinned hawk (NYS special concern) and Cooper's hawk (NYS special concern) are listed bird species that have the potential to occur in the study area during migration and possibly winter.

Northern-long eared bats (Proposed Endangered) are listed by the USFWS IPaC System as occurring in Suffolk County and have been documented using pitch-pine oak forests of eastern Long Island as summer habitat. As such, this species would have the potential to occur in the vicinity of both Long Island yards during the summer months.

Brookhaven Rail Terminal, Suffolk County

Aquatic Biota

No permanent bodies of water that would support fish and other aquatic life are present in the study area.

Wetlands

A drainage basin that receives runoff from the Long Island Expressway is present at the northern end of the study area and is classified as a palustrine unconsolidated bottom permanently flooded excavated wetland on NWI maps (see **Figure 6.8-8**). No NYSDEC-mapped wetlands occur in the study area (see **Figure 6.8-7**).

Vegetation

A large area on the western side of the proposed project site has been almost entirely cleared and is nearly devoid of vegetation, representing an urban vacant lot with construction spoils (Edinger et al. 2002). The remainder of the study area is mostly mature pitch pine-oak forest. Dominant tree species include pitch pine, scarlet oak, white oak, red oak, and black oak (STB 2010). This forest extends nearly intact beyond the study area boundary to the south, comprising a relatively large and unfragmented component of the greater Long Island pine barrens complex. The eastern extent of the study area includes part of an agricultural field.

Wildlife

Much of the western half of the study area contains bare earth and offers limited habitat for wildlife. The western end of the study area is bisected by a busy two-way, four-lane road (County Road 101) and the northern end of the study area is crossed by the Long Island Expressway which effectively isolate the project site from any wildlife habitat to the west and north. To the south, however, the project site is nearly contiguous with a large tract of pitch pine-oak forest that extends more than a mile before reaching County Road 16. Due to its connection to this large forest remnant, the project site is considered a relatively high quality wildlife habitat that likely supports numerous species that would not be found in smaller forest fragments. In addition, pitch-pine oak forest is an uncommon and range-limited habitat type in New York that often contains diverse and unique wildlife species assemblages. Forest and shrubland species are both supported by pitch pine-oak forest, contributing to the high levels of species richness typically found in such areas.

Birds expected to breed in the study area include common yellowthroat, blue-winged warbler, prairie warbler, pine warbler, yellow warbler, ovenbird, brown thrasher, common nighthawk (*Chordeiles minor*), whip-poor-will (*Caprimulgus vociferous*), willow flycatcher (*Empidonax traillii*), wood thrush, northern cardinal, brown-headed cowbird, blue jay, gray catbird, American goldfinch, field sparrow, Baltimore oriole, mourning dove, wild turkey, northern bobwhite (*Colinus virgianus*), and Cooper's hawk. Black-capped chickadee, tufted titmouse, blue jay, white-breasted nuthatch, red-bellied woodpecker, mourning dove, northern cardinal, and white-throated sparrow are expected to be among the most abundant bird species in the area during winter. Many migratory bird species that may not nest or winter in the study area likely occur briefly during spring and fall stopovers. Examples include black-throated green warbler, black and white warbler, magnolia warbler, American redstart, red-eyed vireo, ruby-crowned kinglet, golden-crowned kinglet, veery, Swainson's thrush, sharp-sinned hawk, American kestrel, and red-tailed hawk.

The mammal species expected to occur within the study area include eastern cottontail rabbit, eastern chipmunk, gray squirrel, white-footed mouse, pine vole, raccoon, opossum, striped skunk, little brown bat, red fox, and white-tailed deer.

The study area lacks permanent surface waters such as streams and ponds, which prevents it from being suitable for many reptile and amphibian species. Species that are adapted to xeric pitch pine-oak forests and expected to occur in the area include eastern spadefoot toad, eastern hognose snake, milksnake, black racer, and eastern box turtle.

Threatened or Endangered Species, Species of Special Concern, and Special Habitat Areas

Pitch pine-oak forest is a significant natural community and is recorded by NYNHP as occurring within the study area. NYNHP records of protected plants in the study area include dwarf hawthorn (*Crataegus uniflora;* NYS endangered), pale duckweed (*Lemna valdiviana;* NYS endangered), and slender pinweed (*Lechea tenuifolia;* NYS threatened). There are no other state or federally listed species known to occur in the study area. However, eastern spadefoot toad (NYS special concern), eastern box turtle (NYS special concern), and eastern hognose snake (NYS special concern) are considered to have the potential to occur within the study area based on their geographic ranges and associations with the habitat types present (Mitchell et al. 2006, Gibbs et al. 2007). Sharp-shinned hawk (NYS special concern) and Cooper's hawk (NYS special concern) are listed bird species that may also occur in the study area.

E. POTENTIAL EFFECTS OF THE PROJECT ALTERNATIVES

OPERATIONAL EFFECTS

WATERBORNE ALTERNATIVES

Enhanced Railcar Float Alternative

The Enhanced Railcar Float Alternative would increase the frequency of railcar float service between Greenville Yard and 65th Street and 51st Street Yards. Potential impacts on natural resources from operation of this and other Waterborne Alternatives would be limited to increased levels of disturbance to and risk of collisions with aquatic biota occurring in the vicinity of the waterborne routes across Upper New York Harbor, and disturbances to terrestrial wildlife resulting from additional freight movement. However, marine traffic is already heavy in the harbor, and the surrounding industrial land uses make conditions unsuitable for any species that are not disturbance-tolerant. Nearby Newark Liberty International Airport (EWR) also

contributes substantial noise disturbance to the area. The additional movement resulting from the operation of these alternatives would represent negligible increases in daily maritime traffic in the harbor and existing levels of disturbance to which wildlife and aquatic biota occurring in the area are accustomed.

Similarly, aquatic biota and wildlife occurring near the Brooklyn waterfront currently experience, and are habituated to, high levels of marine traffic and other forms of human disturbance. Increased waterborne activity during the operation of these alternatives would result in a negligible rise in existing disturbance levels and would not be expected to adversely affect these species at either the individual or population levels.

Sea turtles and marine mammals such as seals and whales are prone to propeller strikes and collisions with marine vessels; other marine organisms may also be struck by marine vessel propellers. As discussed above in "Existing Conditions," multiple species of sea turtles and marine mammals, most of which are federally endangered, can occur throughout upper New York Harbor and along the railcar float route, as well as the federally listed shornose sturgeon and Atlantic sturgeon. However, most of these species only occur in the area as transients and in low abundance (USFWS 1997, Ruben and Morreale 1999). Increased traffic through New York Harbor's waterways during operation of this alternative would negligibly increase total maritime traffic in the harbor and the risk for collisions with marine turtles and mammals, and fish. Overall, operation of these alternatives would not be expected to affect populations of species with the potential to occur in the study area.

The Enhanced Railcar Float Alternative would not substantially increase existing levels of disturbances to waterbirds and other wildlife occurring in the area, and would be unlikely to displace or otherwise negatively affect these species. No species that are expected to currently occur in the area would be likely to avoid the area in the future during operation of this alternative. Waterbirds such as double-crested cormorants, brant, ring-billed gulls, and common terns foraging within the harbor may occasionally be displaced by waterborne traffic. Increases in this brief and temporary form of disturbance that could result from operation of the alternatives would be minimal and have no adverse effect on these species. The expansiveness of open water in the harbor and the slow traveling speed of the railcar floats used for this alternative would allow birds to easily distance themselves from any approaching traffic. There would be no disturbance to colonial waterbird species that are associated with the region's Harbor Herons Complex, as recent surveys found no active nesting colonies anywhere near the waterborne routes comprising the project (Craig 2010) and little foraging habitat is available due to the mostly bulkheaded and rip-rapped shoreline, and lack of shallow waters and exposed mudflats.

Other Local Study Areas

Potential impacts on natural resources from upland movement of additional freight during operation of the Enhanced Railcar Float Alternative, the only Waterborne Alternative with the potential to increase rail traffic in the study area, are limited to auditory disturbances to terrestrial wildlife. Anthropogenic noise influences wildlife community composition by displacing some species, while increasing the abundance of others (Bayne et al. 2008, Francis et al. 2009). At the population level, noise can decrease reproductive output and increase predation rates (Habib et al. 2007, Chan et al. 2010). At the individual level, physiological and behavioral responses of animals to anthropogenic noise generally include increased acute stress levels, increased heart rates, and fleeing from the source of the noise. However, such responses are

usually in response to novel, newly introduced disturbances, and animals often gradually habituate to and tolerate loud noises after initial exposure (Bowles 1995).

At the existing rail yards and along the existing branch segments, which are located in heavily urbanized settings that have been developed and operate under their present land uses for many years, surrounding wildlife communities have already been shaped in part by the high existing levels of noise and overall human activity. As detailed above, these communities are primarily composed of urban-adapted, generalist species that are acclimated to and tolerant of rail passage through the area. Increased train passage through these existing yards during operation of the Enhanced Railcar Float Alternative would not significantly increase noise disturbances above current levels, and any species currently inhabiting the areas would continue to occur in the future. Animals currently inhabiting the areas are habituated to high levels of noise and other disturbances currently generated by the rail traffic and largely industrial land uses in the surrounding areas. Increased rail passage would not elicit any negative physiological or behavioral responses, and would not be expected to alter current rates of predation or reproductive success.

Overall, noise resulting from operation of this alternative would not have any adverse impacts on wildlife occurring within or near the existing yards and rights-of-way. This includes the state-listed least terns, pied-billed grebes, and peregrine falcons that may occur in the vicinity of the Greenville Yard, and peregrine falcons that nest on the top of Hell Gate Bridge along the Freemont Secondary Line. Individuals occurring in these areas that are tolerant of the presently high levels of disturbance are unlikely to be adversely affected by increased rail passage. Peregrine falcons, which nest on many New York City bridges with heavy traffic flow (Frank 1994, Cade et al. 1996), are particularly tolerant of disturbances below the nest (Ratcliffe 1972) and unlikely to be affected by increased rail passage on Hell Gate Bridge.

Truck Ferry Alternative

As part of this alternative, new ferry traffic would be introduced to Upper New York Harbor, traveling between Port Newark/Port Elizabeth in New Jersey and 65th Street Yard, 51st Street Yard, South Brooklyn Marine Terminal, Oak Point, or Hunts Point in New York. However, potential impacts on natural resources from operation of this alternative would be limited to increased levels of disturbance to and risk of collisions with aquatic biota occurring in the vicinity of the waterborne routes across Upper New York Harbor, and disturbances to terrestrial wildlife resulting from additional freight movement. As noted above, marine traffic is already heavy in the harbor, and the surrounding industrial land uses make conditions unsuitable for any species that are not disturbance-tolerant. Nearby EWR also contributes substantial noise disturbance to the area. The additional movement resulting from the operation of these alternatives would represent negligible increases in daily maritime traffic in the harbor and existing levels of disturbance to which wildlife and aquatic biota occurring in the area are accustomed.

Similarly, aquatic biota and wildlife occurring near the Brooklyn and Bronx waterfronts currently experience, and are habituated to, high levels of marine traffic and other forms of human disturbance. Increased waterborne activity during the operation of these alternatives would result in a negligible rise in existing disturbance levels and would not be expected to adversely affect these species at either the individual or population levels.

Sea turtles and marine mammals such as seals and whales are prone to propeller strikes and collisions with marine vessels. As discussed above in “Existing Conditions,” multiple species of

sea turtles and marine mammals, most of which are federally endangered, can occur throughout upper New York Harbor and in the areas of the proposed ferry routes, as well as the federally listed shornose sturgeon and Atlantic sturgeon. However, most of these species only occur in the area as transients and in low abundance (USFWS 1997, Ruben and Morreale 1999). Increased traffic through New York Harbor's waterways during operation of this and other Waterborne Alternatives would negligibly increase total maritime traffic in the harbor and the risk for collisions with marine turtles and mammals. Overall, operation of this alternative would not be expected to affect populations of species with the potential to occur in the study area.

The Truck Ferry Alternative would not substantially increase existing levels of disturbances to waterbirds and other wildlife occurring in the area, and would be unlikely to displace or otherwise negatively affect these species. No species that are expected to currently occur in the area would be likely to avoid the area in the future during operation of this alternative. Waterbirds such as double-crested cormorants, brant, ring-billed gulls, and common terns foraging within the harbor may occasionally be displaced by waterborne traffic. Increases in this brief and temporary form of disturbance that could result from operation of the alternatives would be minimal and have no adverse effect on these species. The expansiveness of open water in the harbor and the slow traveling speed of the ferries used for this alternative would allow birds to easily distance themselves from any approaching traffic. There would be no disturbance to colonial waterbird species that are associated with the region's Harbor Herons Complex, as recent surveys found no active nesting colonies anywhere near the waterborne routes comprising the project (Craig 2010) and little foraging habitat is available due to the mostly bulkheaded and rip-rapped shoreline, and lack of shallow waters and exposed mudflats.

Other Local Study Areas

Noise resulting from operation of this alternative would not have any adverse impacts on wildlife occurring within or near the existing yards and rights-of-way. This includes the state-listed least terns, pied-billed grebes, and peregrine falcons that may occur in the vicinity of the Greenville Yard. Individuals occurring in these areas that are tolerant of the presently high levels of disturbance are unlikely to be adversely affected by increased additional freight traffic. Peregrine falcons, which nest on many New York City bridges with heavy traffic flow (Frank 1994, Cade et al. 1996), are particularly tolerant of disturbances below the nest (Ratcliffe 1972) and unlikely to be affected by this alternative.

Truck Float Alternative

Potential impacts from this alternative on natural resources are identical to those identified under the Truck Float Alternative above. As part of this alternative, new float traffic would be introduced to Upper New York Harbor, traveling between Port Newark/Port Elizabeth in New Jersey and 65th Street Yard, 51st Street Yard, South Brooklyn Marine Terminal, Oak Point, or Hunts Point in New York. However, potential impacts on natural resources from operation of this alternative would be limited to increased levels of disturbance to and risk of collisions with aquatic biota occurring in the vicinity of the waterborne routes across Upper New York Harbor, and disturbances to terrestrial wildlife resulting from additional freight movement. As noted above, marine traffic is already heavy in the harbor, and the surrounding industrial land uses make conditions unsuitable for any species that are not disturbance-tolerant. Nearby EWR also contributes substantial noise disturbance to the area. The additional movement resulting from the operation of these alternatives would represent negligible increases in daily maritime traffic in the harbor and existing levels of disturbance to which wildlife and aquatic biota occurring in the area are accustomed.

Similarly, aquatic biota and wildlife occurring near the Brooklyn and Bronx waterfronts currently experience, and are habituated to, high levels of marine traffic and other forms of human disturbance. Increased waterborne activity during the operation of these alternatives would result in a negligible rise in existing disturbance levels and would not be expected to adversely affect these species at either the individual or population levels.

Sea turtles and marine mammals such as seals and whales are prone to propeller strikes and collisions with marine vessels. As discussed above in "Existing Conditions," multiple species of sea turtles and marine mammals, most of which are federally endangered, can occur throughout upper New York Harbor and in the areas of the proposed float route, as well as the federally listed shornose sturgeon and Atlantic sturgeon. However, most of these species only occur in the area as transients and in low abundance (USFWS 1997, Ruben and Morreale 1999). Increased traffic through New York Harbor's waterways during operation of this and other Waterborne Alternatives would negligibly increase total maritime traffic in the harbor and the risk for collisions with marine turtles and mammals. Overall, operation of this alternative would not be expected to affect populations of species with the potential to occur in the study area.

The Truck Float Alternative would not substantially increase existing levels of disturbances to waterbirds and other wildlife occurring in the area, and would be unlikely to displace or otherwise negatively affect these species. No species that are expected to currently occur in the area would be likely to avoid the area in the future during operation of this alternative. Waterbirds such as double-crested cormorants, brant, ring-billed gulls, and common terns foraging within the harbor may occasionally be displaced by waterborne traffic. Increases in this brief and temporary form of disturbance that could result from operation of the alternatives would be minimal and have no adverse effect on these species. The expansiveness of open water in the harbor and the slow traveling speed of the float used for the Waterborne Alternatives would allow birds to easily distance themselves from any approaching traffic. There would be no disturbance to colonial waterbird species that are associated with the region's Harbor Herons Complex, as recent surveys found no active nesting colonies anywhere near the waterborne routes comprising the project (Craig 2010) and little foraging habitat is available due to the mostly bulkheaded and rip-rapped shoreline, and lack of shallow waters and exposed mudflats.

Other Local Study Areas

Noise resulting from operation of this alternative would not have any adverse impacts on wildlife occurring within or near the existing yards and rights-of-way. This includes the state-listed least terns, pied-billed grebes, and peregrine falcons that may occur in the vicinity of the Greenville Yard. Individuals occurring in these areas that are tolerant of the presently high levels of disturbance are unlikely to be adversely affected by increased additional freight traffic. Peregrine falcons, which nest on many New York City bridges with heavy traffic flow (Frank 1994, Cade et al. 1996), are particularly tolerant of disturbances below the nest (Ratcliffe 1972) and unlikely to be affected by this alternative.

Lift On-Lift Off (LOLO) Container Barge Alternative

Potential impacts from this alternative on natural resources are identical to those identified above for the other Waterborne Alternatives. As part of this alternative, new barge traffic would be introduced to Upper New York Harbor for international containerized cargo traveling between Greenville Yard or Port Newark/Port Elizabeth and SBMT, 65th Street Yard, 51st Street Yard, Red Hook Container Terminal, or Maspeth Yard, in New York. Service to New England is also considered, as described in Chapter 4. However, potential impacts on natural resources from

operation of this alternative would be limited to increased levels of disturbance to and risk of collisions with aquatic biota occurring in the vicinity of the waterborne routes across Upper New York Harbor, and disturbances to terrestrial wildlife resulting from additional freight movement. As noted above, marine traffic is already heavy in the harbor, and the surrounding industrial land uses make conditions unsuitable for any species that are not disturbance-tolerant. Nearby EWR also contributes substantial noise disturbance to the area. The additional movement resulting from the operation of these alternatives would represent negligible increases in daily maritime traffic in the harbor and existing levels of disturbance to which wildlife and aquatic biota occurring in the area are accustomed.

Similarly, aquatic biota and wildlife occurring near the Brooklyn and Bronx waterfronts currently experience, and are habituated to, high levels of marine traffic and other forms of human disturbance. Increased waterborne activity during the operation of these alternatives would result in a negligible rise in existing disturbance levels and would not be expected to adversely affect these species at either the individual or population levels.

Sea turtles and marine mammals such as seals and whales are prone to propeller strikes and collisions with marine vessels. As discussed above in "Existing Conditions," multiple species of sea turtles and marine mammals, most of which are federally endangered, can occur throughout upper New York Harbor and in the areas of the proposed barge route, as well as the federally listed shortnose sturgeon and Atlantic sturgeon. However, most of these species only occur in the area as transients and in low abundance (USFWS 1997, Ruben and Morreale 1999). Increased traffic through New York Harbor's waterways during operation of this and other Waterborne Alternatives would negligibly increase total maritime traffic in the harbor and the risk for collisions with marine turtles and mammals. Overall, operation of this alternative would not be expected to affect populations of species with the potential to occur in the study area.

The LOLO Container Barge Alternative would not substantially increase existing levels of disturbances to waterbirds and other wildlife occurring in the area, and would be unlikely to displace or otherwise negatively affect these species. No species that are expected to currently occur in the area would be likely to avoid the area in the future during operation of this alternative. Waterbirds such as double-crested cormorants, brant, ring-billed gulls, and common terns foraging within the harbor may occasionally be displaced by waterborne traffic. Increases in this brief and temporary form of disturbance that could result from operation of the alternatives would be minimal and have no adverse effect on these species. The expansiveness of open water in the harbor and the slow traveling speed of the barge used for this alternative would allow birds to easily distance themselves from any approaching traffic. There would be no disturbance to colonial waterbird species that are associated with the region's Harbor Herons Complex, as recent surveys found no active nesting colonies anywhere near the waterborne routes comprising the project (Craig 2010) and little foraging habitat is available due to the mostly bulkheaded and rip-rapped shoreline, and lack of shallow waters and exposed mudflats.

Other Local Study Areas

Noise resulting from operation of this alternative would not have any adverse impacts on wildlife occurring within or near the existing yards and rights-of-way. This includes the state-listed least terns, pied-billed grebes, and peregrine falcons that may occur in the vicinity of the Greenville Yard. Individuals occurring in these areas that are tolerant of the presently high levels of disturbance are unlikely to be adversely affected by increased additional freight traffic. Peregrine falcons, which nest on many New York City bridges with heavy traffic flow (Frank

1994, Cade et al. 1996), are particularly tolerant of disturbances below the nest (Ratcliffe 1972) and unlikely to be affected by this alternative.

Roll On-Roll Off (RORO) Container Barge Alternative

Potential impacts from this alternative on natural resources are identical to those identified above for the other Waterborne Alternatives. As part of this alternative, new barge traffic would be introduced to Upper New York Harbor for international containerized cargo traveling between Greenville Yard or Port Newark/Port Elizabeth, and SBMT, 65th Street Yard, 51st Street Yard, Red Hook Container Terminal, or Maspeth Yard, in New York. Service to New England is also considered, as described in Chapter 4. However, potential impacts on natural resources from operation of this alternative would be limited to increased levels of disturbance to and risk of collisions with aquatic biota occurring in the vicinity of the waterborne routes across Upper New York Harbor, and disturbances to terrestrial wildlife resulting from additional freight movement. As noted above, marine traffic is already heavy in the harbor, and the surrounding industrial land uses make conditions unsuitable for any species that are not disturbance-tolerant. Nearby EWR also contributes substantial noise disturbance to the area. The additional movement resulting from the operation of these alternatives would represent negligible increases in daily maritime traffic in the harbor and existing levels of disturbance to which wildlife and aquatic biota occurring in the area are accustomed.

Similarly, aquatic biota and wildlife occurring near the Brooklyn and Bronx waterfronts currently experience, and are habituated to, high levels of marine traffic and other forms of human disturbance. Increased waterborne activity during the operation of these alternatives would result in a negligible rise in existing disturbance levels and would not be expected to adversely affect these species at either the individual or population levels.

Sea turtles and marine mammals such as seals and whales are prone to propeller strikes and collisions with marine vessels. As discussed above in "Existing Conditions," multiple species of sea turtles and marine mammals, most of which are federally endangered, can occur throughout upper New York Harbor and in the areas of the proposed barge route, as well as the federally listed shornose sturgeon and Atlantic sturgeon. However, most of these species only occur in the area as transients and in low abundance (USFWS 1997, Ruben and Morreale 1999). Increased traffic through New York Harbor's waterways during operation of this and other Waterborne Alternatives would negligibly increase total maritime traffic in the harbor and the risk for collisions with marine turtles and mammals. Overall, operation of this alternative would not be expected to affect populations of species with the potential to occur in the study area.

The RORO Container Barge Alternative would not substantially increase existing levels of disturbances to waterbirds and other wildlife occurring in the area, and would be unlikely to displace or otherwise negatively affect these species. No species that are expected to currently occur in the area would be likely to avoid the area in the future during operation of this alternative. Waterbirds such as double-crested cormorants, brant, ring-billed gulls, and common terns foraging within the harbor may occasionally be displaced by waterborne traffic. Increases in this brief and temporary form of disturbance that could result from operation of the alternatives would be minimal and have no adverse effect on these species. The expansiveness of open water in the harbor and the slow traveling speed of the barge used for this alternative would allow birds to easily distance themselves from any approaching traffic. There would be no disturbance to colonial waterbird species that are associated with the region's Harbor Herons Complex, as recent surveys found no active nesting colonies anywhere near the waterborne

routes comprising the project (Craig 2010) and little foraging habitat is available due to the mostly bulkheaded and rip-rapped shoreline, and lack of shallow waters and exposed mudflats.

Other Local Study Areas

Noise resulting from operation of this alternative would not have any adverse impacts on wildlife occurring within or near the existing yards and rights-of-way. This includes the state-listed least terns, pied-billed grebes, and peregrine falcons that may occur in the vicinity of the Greenville Yard. Individuals occurring in these areas that are tolerant of the presently high levels of disturbance are unlikely to be adversely affected by increased additional freight traffic. Peregrine falcons, which nest on many New York City bridges with heavy traffic flow (Frank 1994, Cade et al. 1996), are particularly tolerant of disturbances below the nest (Ratcliffe 1972) and unlikely to be affected by this alternative.

RAIL TUNNEL ALTERNATIVES

Rail Tunnel Alternative

As described in Chapter 6.1, "Land Use, Neighborhood Character, and Social Conditions," the operation of all Rail Tunnel Alternatives, including this alternative, would require expansions at a number of rail yards and terminal facilities. Since the operation of these facilities would be similar to the existing facilities in these heavily industrial areas, wildlife occurring in the vicinity would not be affected, as it is largely limited to disturbance-tolerant, urban-adapted species. The potential sites on Long Island contain habitats that are capable of supporting more diverse wildlife communities and more sensitive species that those that occur in the local study areas in Jersey City and New York City. Operation or increased use of sites in Nassau and Suffolk counties would elevate noise levels and the overall level of human activity beyond those to which wildlife inhabiting the areas are accustomed. Wildlife would either habituate to any noise generated by operation of the facility, or move into more interior habitat, depending on each species' sensitivity to disturbance. However, the incremental increase in noise that would be attributable to the CHFP alone would not be expected to exacerbate any of these potential effects on wildlife and therefore would not have an adverse effect on wildlife or other natural resources in these areas. Subsequent Tier II investigations would assess any potential impacts in detail.

In addition to the aforementioned operational impacts, potential operational impacts of the Rail Tunnel Alternative would include visual and noise disturbances to terrestrial wildlife generated by the tunnel ventilation structures and freight movement at the tunnel approaches. There would be no operational impacts on aquatic biota, wetlands, or vegetation.

Wildlife occurring near the tunnel approach locations at Greenville Yard and the Bay Ridge Branch is composed of urban-adapted species that are tolerant of the heavy existing levels of disturbance and a lack of non-degraded habitat. As such, freight movement in and out of the tunnel approaches at the Greenville Yard and the Bay Ridge Branch would not be expected to disturb or otherwise adversely impact wildlife. Similarly, fan noise from operation of the vent structures would be unlikely to increase existing noise levels to the point that wildlife would avoid the area or experience any other negative impacts at either the individual or population levels. As mentioned above, natural resources at the potential termini and inland facility sites are extremely limited, and wildlife consists of generalist species that are common to disturbed areas and tolerant of urban conditions, such as house sparrow, European starling, and Norway rat. Increased train and truck traffic during operation of the Rail Tunnel Alternative would not substantially increase disturbances to wildlife above current levels, and any species currently inhabiting the area would continue to occur in the future. Individual animals currently inhabiting

the area are habituated to high levels of noise and other disturbances currently generated by existing rail activity and the largely industrial and commercial land uses in the surrounding area. Therefore, the operation of the Rail Tunnel Alternative would not result in an increase in anthropogenic activity that would adversely affect wildlife or other natural resources occurring in the area.

Noise from the ventilation fans and the presence of the ventilation structure itself could potentially reduce breeding habitat suitability for the least tern colony that is in close proximity to a possible location of the structure. However, even complete abandonment of this nesting area, which typically supports less than ten breeding pairs, would not have adverse effects on the size or viability of local populations which number over 2,000 breeding pairs in New Jersey and 4,000 breeding pairs on Long Island (Thompson et al. 1997). In addition, abandonment of this nesting area is unlikely because this colony has demonstrated a tolerance of, and successfully nested amongst, the high levels of noise and other disturbances currently generated by the operation of the Global Marine Terminal adjacent to the colony and overhead aircraft arriving at and departing from nearby EWR. Operation of the ventilation structures would not be expected to elevate existing disturbances to a level that would cause colony abandonment or otherwise adversely affect least terns nesting in the area.

Rail Tunnel with Shuttle ("Open Technology") Service Alternative

The differences between the infrastructure requirements for the Rail Tunnel with Shuttle Service Alternative and the Rail Tunnel Alternative would not have an observable effect on natural resources, therefore all of the potential impacts described above apply to this alternative.

As described in Chapter 6.1, "Land Use, Neighborhood Character, and Social Conditions," the operation of all Rail Tunnel Alternatives, including this alternative, would require expansions at a number of rail yards and terminal facilities. Since the operation of these facilities would be similar to the existing facilities in these heavily industrial areas, wildlife occurring in the vicinity would not be affected, as it is largely limited to disturbance-tolerant, urban-adapted species. The potential sites on Long Island contain habitats that are capable of supporting more diverse wildlife communities and more sensitive species that those that occur in the local study areas in Jersey City and New York City. Operation or increased use of sites in Nassau and Suffolk counties would elevate noise levels and the overall level of human activity beyond those to which wildlife inhabiting the areas are accustomed. Wildlife would either habituate to any noise generated by operation of the facility, or move into more interior habitat, depending on each species' sensitivity to disturbance. However, the incremental increase in noise that would be attributable to the CHFP alone would not be expected to exacerbate any of these potential effects on wildlife and therefore would not have an adverse effect on wildlife or other natural resources in these areas. Subsequent Tier II investigations would assess any potential impacts in detail.

In addition to the aforementioned operational impacts, potential operational impacts of this alternative would include visual and noise disturbances to terrestrial wildlife generated by the tunnel ventilation structures and freight movement at the tunnel approaches. There would be no operational impacts on aquatic biota, wetlands, or vegetation.

Wildlife occurring near the tunnel approach locations at Greenville Yard and the Bay Ridge Branch is composed of urban-adapted species that are tolerant of the heavy existing levels of disturbance and a lack of non-degraded habitat. As such, freight movement in and out of the tunnel approaches at the Greenville Yard and the Bay Ridge Branch would not be expected to disturb or otherwise adversely impact wildlife. Similarly, fan noise from operation of the vent

structures would be unlikely to increase existing noise levels to the point that wildlife would avoid the area or experience any other negative impacts at either the individual or population levels. As mentioned above, natural resources at the potential termini and inland facility sites are extremely limited, and wildlife consists of generalist species that are common to disturbed areas and tolerant of urban conditions, such as house sparrow, European starling, and Norway rat. Increased train and truck traffic during operation of this alternative would not substantially increase disturbances to wildlife above current levels, and any species currently inhabiting the area would continue to occur in the future. Individual animals currently inhabiting the area are habituated to high levels of noise and other disturbances currently generated by existing rail activity and the largely industrial and commercial land uses in the surrounding area. Therefore, the operation of this alternative would not result in an increase in anthropogenic activity that would adversely affect wildlife or other natural resources occurring in the area.

Noise from the ventilation fans and the presence of the ventilation structure itself could potentially reduce breeding habitat suitability for the least tern colony that is in close proximity to a possible location of the structure. However, even complete abandonment of this nesting area, which typically supports less than ten breeding pairs, would not have adverse effects on the size or viability of local populations which number over 2,000 breeding pairs in New Jersey and 4,000 breeding pairs on Long Island (Thompson et al. 1997). In addition, abandonment of this nesting area is unlikely because this colony has demonstrated a tolerance of, and successfully nested amongst, the high levels of noise and other disturbances currently generated by the operation of the Global Marine Terminal adjacent to the colony and overhead aircraft arriving at and departing from nearby EWR. Operation of the ventilation structures would not be expected to elevate existing disturbances to a level that would cause colony abandonment or otherwise adversely affect least terns nesting in the area.

Rail Tunnel with Chunnel Service Alternative

The differences between the infrastructure requirements for this and other Rail Tunnel Alternatives would not have an observable effect on natural resources; therefore, all of the potential impacts described above apply to this alternative.

As described in Chapter 6.1, “Land Use, Neighborhood Character, and Social Conditions,” the operation of all Rail Tunnel Alternatives, including this alternative, would require expansions at a number of rail yards and terminal facilities. Since the operation of these facilities would be similar to the existing facilities in these heavily industrial areas, wildlife occurring in the vicinity would not be affected, as it is largely limited to disturbance-tolerant, urban-adapted species. The potential sites on Long Island contain habitats that are capable of supporting more diverse wildlife communities and more sensitive species that those that occur in the local study areas in Jersey City and New York City. Operation or increased use of sites in Nassau and Suffolk counties would elevate noise levels and the overall level of human activity beyond those to which wildlife inhabiting the areas are accustomed. Wildlife would either habituate to any noise generated by operation of the facility, or move into more interior habitat, depending on each species’ sensitivity to disturbance. However, the incremental increase in noise that would be attributable to the CHFP alone would not be expected to exacerbate any of these potential effects on wildlife and therefore would not have an adverse effect on wildlife or other natural resources in these areas. Subsequent Tier II investigations would assess any potential impacts in detail.

In addition to the aforementioned operational impacts, potential operational impacts of this alternative would include visual and noise disturbances to terrestrial wildlife generated by the

tunnel ventilation structures and freight movement at the tunnel approaches. There would be no operational impacts on aquatic biota, wetlands, or vegetation.

Wildlife occurring near the tunnel approach locations at Greenville Yard and the Bay Ridge Branch is composed of urban-adapted species that are tolerant of the heavy existing levels of disturbance and a lack of non-degraded habitat. As such, freight movement in and out of the tunnel approaches at the Greenville Yard and the Bay Ridge Branch would not be expected to disturb or otherwise adversely impact wildlife. Similarly, fan noise from operation of the vent structures would be unlikely to increase existing noise levels to the point that wildlife would avoid the area or experience any other negative impacts at either the individual or population levels. As mentioned above, natural resources at the potential termini and inland facility sites are extremely limited, and wildlife consists of generalist species that are common to disturbed areas and tolerant of urban conditions, such as house sparrow, European starling, and Norway rat. Increased train and truck traffic during operation of this alternative would not substantially increase disturbances to wildlife above current levels, and any species currently inhabiting the area would continue to occur in the future. Individual animals currently inhabiting the area are habituated to high levels of noise and other disturbances currently generated by existing rail activity and the largely industrial and commercial land uses in the surrounding area. Therefore, the operation of this alternative would not result in an increase in anthropogenic activity that would adversely affect wildlife or other natural resources occurring in the area.

Noise from the ventilation fans and the presence of the ventilation structure itself could potentially reduce breeding habitat suitability for the least tern colony that is in close proximity to a possible location of the structure. However, even complete abandonment of this nesting area, which typically supports less than ten breeding pairs, would not have adverse effects on the size or viability of local populations which number over 2,000 breeding pairs in New Jersey and 4,000 breeding pairs on Long Island (Thompson et al. 1997). In addition, abandonment of this nesting area is unlikely because this colony has demonstrated a tolerance of, and successfully nested amongst, the high levels of noise and other disturbances currently generated by the operation of the Global Marine Terminal adjacent to the colony and overhead aircraft arriving at and departing from nearby EWR. Operation of the ventilation structures would not be expected to elevate existing disturbances to a level that would cause colony abandonment or otherwise adversely affect least terns nesting in the area.

Rail Tunnel with Automated Guided Vehicle (AGV) Technology Alternative

The differences between the infrastructure requirements for this and other Rail Tunnel Alternatives would not have an observable effect on natural resources; therefore all of the potential impacts described above apply to this alternative.

As described in Chapter 6.1, “Land Use, Neighborhood Character, and Social Conditions,” the operation of all Rail Tunnel Alternatives, including this alternative, would require expansions at a number of rail yards and terminal facilities. Since the operation of these facilities would be similar to the existing facilities in these heavily industrial areas, wildlife occurring in the vicinity would not be affected, as it is largely limited to disturbance-tolerant, urban-adapted species. The potential sites on Long Island contain habitats that are capable of supporting more diverse wildlife communities and more sensitive species that those that occur in the local study areas in Jersey City and New York City. Operation or increased use of sites in Nassau and Suffolk counties would elevate noise levels and the overall level of human activity beyond those to which wildlife inhabiting the areas are accustomed. Wildlife would either habituate to any noise generated by operation of the facility, or move into more interior habitat, depending on each

species' sensitivity to disturbance. However, the incremental increase in noise that would be attributable to the CHFP alone would not be expected to exacerbate any of these potential effects on wildlife and therefore would not have an adverse effect on wildlife or other natural resources in these areas. Subsequent Tier II investigations would assess any potential impacts in detail.

In addition to the aforementioned operational impacts, potential operational impacts of this alternative would include visual and noise disturbances to terrestrial wildlife generated by the tunnel ventilation structures and freight movement at the tunnel approaches. There would be no operational impacts on aquatic biota, wetlands, or vegetation.

Wildlife occurring near the tunnel approach locations at Greenville Yard and the Bay Ridge Branch is composed of urban-adapted species that are tolerant of the heavy existing levels of disturbance and a lack of non-degraded habitat. As such, freight movement in and out of the tunnel approaches at the Greenville Yard and the Bay Ridge Branch would not be expected to disturb or otherwise adversely impact wildlife. Similarly, fan noise from operation of the vent structures would be unlikely to increase existing noise levels to the point that wildlife would avoid the area or experience any other negative impacts at either the individual or population levels. As mentioned above, natural resources at the potential termini and inland facility sites are extremely limited, and wildlife consists of generalist species that are common to disturbed areas and tolerant of urban conditions, such as house sparrow, European starling, and Norway rat. Increased train and truck traffic during operation of this alternative would not substantially increase disturbances to wildlife above current levels, and any species currently inhabiting the area would continue to occur in the future. Individual animals currently inhabiting the area are habituated to high levels of noise and other disturbances currently generated by existing rail activity and the largely industrial and commercial land uses in the surrounding area. Therefore, the operation of this alternative would not result in an increase in anthropogenic activity that would adversely affect wildlife or other natural resources occurring in the area.

Noise from the ventilation fans and the presence of the ventilation structure itself could potentially reduce breeding habitat suitability for the least tern colony that is in close proximity to a possible location of the structure. However, even complete abandonment of this nesting area, which typically supports less than ten breeding pairs, would not have adverse effects on the size or viability of local populations which number over 2,000 breeding pairs in New Jersey and 4,000 breeding pairs on Long Island (Thompson et al. 1997). In addition, abandonment of this nesting area is unlikely because this colony has demonstrated a tolerance of, and successfully nested amongst, the high levels of noise and other disturbances currently generated by the operation of the Global Marine Terminal adjacent to the colony and overhead aircraft arriving at and departing from nearby EWR. Operation of the ventilation structures would not be expected to elevate existing disturbances to a level that would cause colony abandonment or otherwise adversely affect least terns nesting in the area.

Rail Tunnel with Truck Access Alternative

The differences between the infrastructure requirements for this and other Rail Tunnel Alternatives would not have an observable effect on natural resources; therefore, all of the potential impacts described above apply to this alternative.

As described in Chapter 6.1 "Land Use, Neighborhood Character, and Social Conditions," the operation of all Rail Tunnel Alternatives, including this alternative, would require expansions at a number of rail yards and terminal facilities. Since the operation of these facilities would be similar to the existing facilities in these heavily industrial areas, wildlife occurring in the vicinity

would not be affected, since it is largely limited to disturbance-tolerant, urban-adapted species. The potential sites on Long Island contain habitats that are capable of supporting more diverse wildlife communities and more sensitive species that those that occur in the local study areas in Jersey City and New York City. Operation or increased use of sites in Nassau and Suffolk counties would elevate noise levels and the overall level of human activity beyond those to which wildlife inhabiting the areas are accustomed. Wildlife would either habituate to any noise generated by operation of the facility, or move into more interior habitat, depending on each species' sensitivity to disturbance. However, the incremental increase in noise that would be attributable to the CHFP alone would not be expected to exacerbate any of these potential effects on wildlife and therefore would not have an adverse effect on wildlife or other natural resources in these areas. Subsequent Tier II investigations would assess any potential impacts in detail.

In addition to the aforementioned operational impacts, potential operational impacts of this alternative would include visual and noise disturbances to terrestrial wildlife generated by the tunnel ventilation structures and freight movement at the tunnel approaches. There would be no operational impacts on aquatic biota, wetlands, or vegetation.

Wildlife occurring near the tunnel approach locations at Greenville Yard and the Bay Ridge Branch is composed of urban-adapted species that are tolerant of the heavy existing levels of disturbance and a lack of non-degraded habitat. As such, freight movement in and out of the tunnel approaches at the Greenville Yard and the Bay Ridge Branch would not be expected to disturb or otherwise adversely impact wildlife. Similarly, fan noise from operation of the vent structures would be unlikely to increase existing noise levels to the point that wildlife would avoid the area or experience any other negative impacts at either the individual or population levels. As mentioned above, natural resources at the potential termini and inland facility sites are extremely limited, and wildlife consists of generalist species that are common to disturbed areas and tolerant of urban conditions, such as house sparrow, European starling, and Norway rat. Increased train and truck traffic during operation of this alternative would not substantially increase disturbances to wildlife above current levels, and any species currently inhabiting the area would continue to occur in the future. Individual animals currently inhabiting the area are habituated to high levels of noise and other disturbances currently generated by existing rail activity and the largely industrial and commercial land uses in the surrounding area. Therefore, the operation of this alternative would not result in an increase in anthropogenic activity that would adversely affect wildlife or other natural resources occurring in the area.

Noise from the ventilation fans and the presence of the ventilation structure itself could potentially reduce breeding habitat suitability for the least tern colony that is in close proximity to a possible location of the structure. However, even complete abandonment of this nesting area, which typically supports less than ten breeding pairs, would not have adverse effects on the size or viability of local populations which number over 2,000 breeding pairs in New Jersey and 4,000 breeding pairs on Long Island (Thompson et al. 1997). In addition, abandonment of this nesting area is unlikely because this colony has demonstrated a tolerance of, and successfully nested amongst, the high levels of noise and other disturbances currently generated by the operation of the Global Marine Terminal adjacent to the colony and overhead aircraft arriving at and departing from nearby EWR. Operation of the ventilation structures would not be expected to elevate existing disturbances to a level that would cause colony abandonment or otherwise adversely affect least terns nesting in the area.

CONSTRUCTION EFFECTS

WATERBORNE ALTERNATIVES

Enhanced Railcar Float Alternative

As described in Chapter 4, "Alternatives," at Greenville Yard, the hydraulic lift bridges installed by the Port Authority of New York and New Jersey (PANYNJ) under the No Action Alternative would be expanded with a third float bridge to accommodate the projected freight service demand for the Enhanced Railcar Float Alternative. Some of this construction would be limited to augmenting existing structures and would therefore have limited potential to adversely impact natural resources. Where possible, existing engineered shorelines would be used to support the construction of the waterfront facilities, to avoid impacts that may result from in-water work. The upland areas where these waterfront facilities would be constructed or expanded represent heavily developed urban areas with weedy, ruderal vegetation. No sensitive natural resources would be adversely affected by any land disturbance or noise from construction of these facilities. Some wildlife would potentially avoid these areas during construction; however, these effects would be temporary, and the same vegetation and wildlife would be expected to return to the area immediately following any land disturbance and construction activity.

Truck Ferry Alternative

The Truck Ferry Alternative would require the construction of waterfront terminals, vehicle ramps, staging and parking areas, and other infrastructure required to support operations. New or improved bulkhead and fendering systems may also be required. Some of this construction would be limited to augmenting existing structures and would therefore have limited potential to adversely impact natural resources. Where possible, existing engineered shorelines would be used to support the construction of the waterfront facilities, to avoid impacts that may result from in-water work, however some dredging would be required to establish new waterfront facilities. The upland areas where these waterfront facilities would be constructed or expanded represent heavily developed urban areas with weedy, ruderal vegetation. No sensitive natural resources would be adversely affected by any land disturbance or noise from construction of these facilities. Some wildlife would potentially avoid these areas during construction; however, these effects would be temporary, and the same vegetation and wildlife would be expected to return to the area immediately following any land disturbance and construction activity.

Truck Float Alternative

The Truck Float Alternative would require the construction of waterfront terminals, vehicle ramps, staging and parking areas, and other infrastructure required to support operations. New or improved bulkhead and fendering systems may also be required. Some of this construction would be limited to augmenting existing structures and would therefore have limited potential to adversely impact natural resources. Where possible, existing engineered shorelines would be used to support the construction of the waterfront facilities, to avoid impacts that may result from in-water work, however some dredging would be required to establish new waterfront facilities. The upland areas where these waterfront facilities would be constructed or expanded represent heavily developed urban areas with weedy, ruderal vegetation. No sensitive natural resources would be adversely affected by any land disturbance or noise from construction of these facilities. Some wildlife would potentially avoid these areas during construction; however, these effects would be temporary, and the same vegetation and wildlife would be expected to return to the area immediately following any land disturbance and construction activity.

Lift On-Lift Off (LOLO) Container Barge Alternative

The LOLO Container Barge would require the construction of waterfront terminals—with berths and cranes capable of lifting containers from the wharf, or from a chassis, onto the barge—vehicle ramps, staging and parking areas, and other infrastructure required to support operations. New or improved bulkhead and fendering systems may also be required. Some of this construction would be limited to augmenting existing structures and would therefore have limited potential to adversely impact natural resources. Where possible, existing engineered shorelines would be used to support the construction of the waterfront facilities, to avoid impacts that may result from in-water work, however some dredging would be required to establish new waterfront facilities. The upland areas where these waterfront facilities would be constructed or expanded represent heavily developed urban areas with weedy, ruderal vegetation. No sensitive natural resources would be adversely affected by any land disturbance or noise from construction of these facilities. Some wildlife would potentially avoid these areas during construction; however, these effects would be temporary, and the same vegetation and wildlife would be expected to return to the area immediately following any land disturbance and construction activity.

Roll On-Roll Off (RORO) Container Barge Alternative

The RORO Container Barge would require the construction of waterfront terminals, vehicle ramps, staging and parking areas, and other infrastructure required to support operations. New or improved bulkhead and fendering systems may also be required. Some of this construction would be limited to augmenting existing structures and would therefore have limited potential to adversely impact natural resources. Where possible, existing engineered shorelines would be used to support the construction of the waterfront facilities, to avoid impacts that may result from in-water work, however some dredging would be required to establish new waterfront facilities. The upland areas where these waterfront facilities would be constructed or expanded represent heavily developed urban areas with weedy, ruderal vegetation. No sensitive natural resources would be adversely affected by any land disturbance or noise from construction of these facilities. Some wildlife would potentially avoid these areas during construction; however, these effects would be temporary, and the same vegetation and wildlife would be expected to return to the area immediately following any land disturbance and construction activity.

RAIL TUNNEL ALTERNATIVES

Rail Tunnel Alternative

Tunnel Alignment

The rail tunnel would be constructed by either boring the entire length of the tunnel alignment underneath the harbor floor, or boring for part of the way and then trenching and immersing the remaining segment. Boring the entire distance would cause no disturbance to the harbor's benthic habitat or water quality, such that there would be no impacts on aquatic biota. The immersed tube option would require dredging approximately 2 million cubic yards of the harbor floor to create a trench in which to lay the tunnel tube segments.

The potential impacts of dredging to aquatic biota stem from changes in water quality such as increased concentrations of suspended sediment, decreased dissolved oxygen, release of contaminants contained in the sediment, sediment deposition, entrainment of organisms by hydraulic dredges, blockage of channels due to suspended sediment plumes or dredging

equipment, noise associated with dredging, and loss or change of habitat and benthic organisms used as food to support other invertebrates and fish.

Suspended Sediment

Modeling performed for the 2004 DEIS concluded that increases in suspended sediment within the water column as a result of dredging would be minimal in terms of change in concentration and aerial extent, and would not result in significant changes in water quality. Because the increase in suspended sediment would not elevate concentrations beyond the range reported within this portion of New York Harbor, significant impacts on fish, benthic macroinvertebrates or plankton would not be expected. The projected increases in suspended sediment from tunnel construction were well below those that are known to adversely affect aquatic organisms. Moreover, the maximum spatial extent of the suspended sediment was projected to be 200 meters, which represents a small proportion of expansive Upper New York Harbor. Fish and mobile benthic macroinvertebrates would be expected to avoid the suspended sediment plume in the immediate vicinity of the trench location and would have ample alternative habitat available nearby. Sessile macroinvertebrates (non-motile organisms attached to the substrate) would not be expected to be adversely affected by increases in suspended sediment concentration near the bottom since adverse impacts on these organisms have only been observed at concentrations far in excess of those that commonly occur from dredging.

Dissolved Oxygen

As discussed in Chapter 6.9, "Water Resources," significant decreases in dissolved oxygen rarely occur during dredging and would not be expected to occur as a result of tunnel construction because the dredging area has a high degree tidal exchange.

Sediment Contaminants

Sediment contaminants known to occur in the Upper Harbor include those tightly bound to sediments and with little potential to dissolve in the water column such as PCBs, chlorinated pesticides, and dioxin. Contaminants that are not tightly bound to sediment and have the potential to go into solution within the water column include heavy metals such as cadmium, copper, chromium, lead, mercury and zinc. The latter group of compounds has a greater effect on organisms than those compounds bound to sediment (LaSalle et al. 1991). An ecological risk assessment performed for the 2004 DEIS concluded that increases in metal concentrations within the water column that could result during construction of the immersed tunnel would be well below toxicity levels and benign to aquatic organisms. Because water quality in New York Harbor has consistently improved in recent decades due to numerous government, private, and multi-organizational initiatives to reduce pollution in the harbor, it can be assumed for the purposes of this Tier I assessment that the ecological risk assessment performed in 2004 represents a more conservative projection than present day. Thus, construction of the tunnel would not be expected to have any adverse effects to aquatic biota in New York Harbor by mobilizing sediment contaminants.

Sediment Deposition

Deposition of sediment resuspended during dredging operations has been found to adversely affect sessile macroinvertebrates such as bivalves, and adversely affect demersal fish eggs. Mobile benthic macroinvertebrates and fish, however, have not been found to be adversely affected by deposition of sediment associated with dredging (LaSalle et al. 1991 and references within). Modeling performed for the 2004 DEIS projected that a total of 0.55mm of sediment

would be deposited in the area of the dredging (within 100 meters) over the course of the tunnel construction. Approximately 0.0005 mm of sediment deposition was projected to occur within 100 meters of the dredge over one tidal cycle. The furthest distance from the dredge location where sediment was projected to settle was 300 meters. The amount projected to be deposited over one tidal cycle is much lower than that found to affect demersal eggs of some fish species (0.45 mm) and below that found to affect settling of oyster spat (LaSalle et al. 1991). Although the amount projected to be deposited over the entire construction period is within the range found to affect hatching of demersal eggs of some fish (0.5 to 1mm) it is not possible for fish eggs to be exposed to this depth of sediment since they would hatch long before the end of the construction period (estimated to span 72-76 weeks). The small amount of material projected to be deposited near the dredging location would not be expected to adversely affect burrowing benthic organisms because benthic organisms have been found to be able to burrow deeper than that, as much as 10 to 30 cm (100 to 300 mm), without adverse effects (LaSalle et al. 1991).

The ecological risk assessment presented in the 2004 DEIS examined the potential effects to benthic macroinvertebrates from the deposition of sediments contaminated with metals and PAHs, and the potential food chain effects to fish and birds that would consume benthic invertebrates and mammals that would eat aquatic organisms. The major mechanisms by which contaminated sediments and dredged material may adversely affect fish and wildlife is through bioaccumulation of chemicals through consumption of contaminated prey associated with the sediments. The process requires bioaccumulation (uptake and retention of a chemical by an organisms from water, food, sediment, and air) of the contaminant in the sediment by the benthic macroinvertebrate, consumption of the macroinvertebrate by other invertebrates or fish, and possibly biomagnification (concentration of the contaminant in the tissues of the consumer is higher than in the prey item) (Bridges et al. 1996). Exposure to chemical contaminants dissolved from contaminated dredged material into the water column or to chemicals adsorbed to resuspended sediment is not considered to be a quantitatively important exposure pathway (Bridges et al. 1996). Biomagnification in freshwater and marine food webs typically only occurs with highly hydrophobic chemicals such as PAHs or those bound tightly to tissue macromolecules. The results of the ecological risk assessment suggested that tunnel construction would not pose a significant risk to benthic macroinvertebrates, fish or birds or mammals from the deposition of small amounts of sediment contaminated with metals or PAHs. Because pollution in New York Harbor has decreased and water quality has improved steadily in recent years, the projections of the ecological risk assessment are likely more conservative at present than at 2004. Thus, it is assumed that tunnel construction would still pose no risk to aquatic biota through deposition of contaminated sediment.

Entrainment

Entrainment associated with dredging is the uptake of aquatic organisms by the suction field generated by hydraulic dredges (Reine and Clarke 1998). It occurs less frequently with mechanical dredges because mobile organisms can typically escape from them. Entrainment of fish eggs is unlikely to cause adverse impacts on estuarine species since most spawn offshore, away from dredging operations, or to anadromous species such as striped bass because most spawn upriver in freshwater. For other fish species, fish eggs and larvae naturally suffer high mortality such that the loss that may be associated with entrainment by hydraulic dredges would not be significant. Entrainment by hydraulic dredges has the potential to affect demersal fish such as flounder and Atlantic and shortnose sturgeon, but given the size of the area to be dredged in relation to the New York/New Jersey Harbor Estuary, the potential loss of some individuals would not be expected to adversely affect local populations of these species. Similarly, potential

impacts on benthic macroinvertebrates such as crabs are not expected to be significant. Mitigation measures described below can further avoid potential for impacts. Entrainment of phytoplankton and zooplankton I in the relatively small area to be dredged would not result in adverse impacts on populations of these organisms within the Harbor Estuary.

Channel Blockage

Dredging equipment and the sediment plume have the potential to affect the distribution and movement of juvenile and adult organisms, particularly anadromous fish, turtles and some marine mammals. Modeling results presented in the 2004 DEIS suggested that dredging within the alignment for the immersed tube section of the tunnel would not result in a plume of suspended sediment that would interfere with the migration of fish, particularly anadromous species such as striped bass that would migrate through this portion of the Upper Harbor on the way to freshwater spawning locations. The projected increase in suspended sediment would be within the range of suspended sediment concentrations known to already occur within this portion of the Upper New York Harbor.

Noise

Noise from dredging and in-water construction activities associated with the immersed tube portion of the tunnel, as well as the construction of the vent structures have the potential to cause temporary impacts on fish by causing changes in activity patterns. Fish would likely be temporarily displaced from these areas of activity. Because abundant comparable habitat would remain available nearby, these temporary changes in activity patters would not be expected to adversely impact local fish populations or fish predators.

Habitat Loss

The primary impact to benthic macroinvertebrates from dredging is the direct loss of habitat and the individuals associated with the dredged material (Hirsch et al 1978). Effects on macroinvertebrate communities and their ability to recover following each dredging event are dependent on dredging frequency. Short-term, small-scale dredging and dredge disposal projects have been found to impact benthic communities less than long-term, large scale projects (Morton 1977 in Nightingale and Simenstad 2001). Recovery rates of benthic macroinvertebrate communities following dredging range from only a few weeks or months, to a few years depending upon the type of project, the type of bottom material, the physical characteristics of the environment and the timing of disturbance (Hirsch et al. 1978, LaSalle et al. 1991). In general, benthic communities found in stochastic environments, such as New York Harbor, have higher rates of recovery from disturbance (i.e., disturbance resilience).

Dredging for the immersed tunnel tube would temporarily remove benthic macroinvertebrates and macroinvertebrate and fish habitat over an area that would likely be approximately 30 acres, depending on final construction design details. Ventilation structures would result in the permanent loss of nearly two acres of benthic habitat, assuming their footprint would be comparable to that evaluated in the 2004 DEIS. Following construction of the immersed tube portion of the tunnel, the benthic habitat presently within the tunnel alignment would be permanently changed from primarily soft sediment to a hard substrate composed of rock over an area of approximately 15 acres.

The potential loss of benthic macroinvertebrates from the removal of sediment within the area occupied by the trench would not be expected to result in adverse impacts on populations of these species within the New York/New Jersey Harbor Estuary System. The majority of the

bottom habitat and associated benthic macroinvertebrates within the area to be impacted is the soft sediment community which dominates Upper New York Harbor. Therefore, the loss of this area is not expected to adversely impact the populations of the species that make up this community. However, because a portion of this area would be converted to a rock substrate, recolonization of the benthic macroinvertebrate community within the rock substrate has the potential to take longer than the 6 to 8 months typical for silts or muds, since organisms that prefer this type of habitat are not common within the vicinity of the area to be dredged. In addition, the benthic community within the rock substrate would change over time as it silts it. This may result in a decrease in food resources for fish for a period of time following completion of construction. The portions of the tunnel trench not covered by rock would be expected to recover quickly, within the 6 to 8 month time frame common for these areas. While the benthic community within the trench area following construction may be different than that prior to construction, it would still provide prey items for fish and may provide more prey items in the soft sediment areas during the time period it is dominated by opportunistic species. The loss of prey items for fish from the area of the trench during construction would be temporary, and suitable forage habitat would remain available elsewhere within the vicinity.

Environmental windows, the time period when dredging is permitted, have been imposed on dredging projects over the last 30 years (over 80 percent of USACE dredging projects are subject to windows) to protect sensitive biological resources and habitats. Within the New York District of USACE, dredging operations may be restricted in the winter months and the spring (February 1 to May 31) to protect striped bass, American shad, Atlantic tomcod (spawning), and winter flounder (spawning and hopper dredge entrainment). Dredging is also restricted from November through July to protect Atlantic and shortnose sturgeon populations. However, limiting dredging to certain times of the year to protect certain resources can extend the overall length of time that dredging occurs for specific projects and delay the recovery period. It may also increase impacts on species of lesser economic or regulatory interest (but not necessarily of lesser ecological importance), whose critical period may coincide with the period allowed for dredging (Grigalunas et al. 2001 in Nightingale and Simenstad 2001). Extensive coordination with USACE, NMFS, and NYSDEC would be undertaken during subsequent Tier II investigations to define appropriate dredging restriction windows.

Construction of the two vent structures would result in the permanent loss of tens of thousands of square feet of subtidal habitat and water column for each structure, depending on final design details. The loss of benthic macroinvertebrates and subtidal habitat within these small areas would not be expected to adversely affect macroinvertebrate or fish populations in the harbor. Extensive subtidal habitat would remain available within the vicinity of the vent structures and elsewhere in the harbor. In addition, the vent structures would provide additional hard substrate for attachment by benthic macroinvertebrates and to use as shelter areas by fish. Potential impacts on aquatic organisms associated with water quality changes that may occur as a result of the construction of the vent structures would be much less than those associated with dredging for the immersed tube or the float bridges, which are not projected to be significant.

Threatened or Endangered Species, and Special Habitat Areas

State and federally listed shortnose and Atlantic sturgeon, four species of sea turtles, and six marine mammals (whales) have the potential to occur near the proposed tunnel alignment. Shortnose and Atlantic sturgeon only move through the area to Hudson River spawning grounds using the deeper channel areas that run parallel to the main channel of the Hudson River, which would not be affected by the dredging and in-water construction associated with the project

alternatives. Further analysis of potential impacts on the various life stages of this and other listed species from the suspended sediment associated with dredging and in-water construction activities would be conducted in subsequent Tier II investigations.

The four endangered or threatened marine turtles that occur in New York's waters are primarily found within Long Island Sound and Peconic and Southern Bays (Standora et al. 1989, Morreale and Standora 1998), and would not be expected to occur within the vicinity of the immersed tube portion of the tunnel. Upper New York Harbor is marginal quality sea turtle habitat (Ruben and Morreale 1999, USACE 2001), and any occurrence of sea turtles in the harbor is likely limited to brief explorations by transient juveniles (USFWS 1997). Evidence of sea turtles in New York Harbor remains scarce despite extensive monitoring and sampling efforts (Ruben and Morreale 1999, USACE 2001). As such, sea turtles would not be expected to be affected by construction of the tunnel and ventilation shafts.

The six endangered whales known to occur within the New York City region are oceanic and would not occur within the areas affected by the project alternatives. Construction of the Rail Tunnel Alternatives would have no adverse impacts on these species.

EFH within the area of the immersed tube section would be temporarily adversely impacted by dredging and underwater construction activities, with possible longer term loss of some EFH due to the placement of rock material over the immersed tube portion of the tunnel. Adverse impacts on EFH species would also be temporary and most individuals would be expected to utilize the extensive areas of comparable habitat nearby and elsewhere in the harbor. The short dredging and underwater activity schedule (i.e., without a winter moratorium) would reduce the number of seasons that would be affected and allow restoration of the habitats to occur sooner than a schedule with breaks during the winter period. Potential impacts on aquatic organisms associated with other construction activities for the project alternatives would be much less than those associated with dredging for the immersed tube portion of the tunnel. Mitigation measures to address the potential impacts on fish habitat are presented below. On the basis of the modeling and risk assessment performed for the 2004 DEIS, no adverse impacts on EFH would be expected to occur to those habitats outside the immediate vicinity of the immersed tube portion of the tunnel.

Local Study Areas

As described in Chapter 4, "Alternatives," under the Rail Tunnel Alternative, Oak Island Yard would need to be expanded by approximately 50 acres Natural resources within this area are limited to ruderal vegetation and extremely urban-adapted generalist species of wildlife, most of which are likely non-native, and none of which are federally or state-listed. Expansion of the yard would not directly eliminate any ecologically valuable plant or wildlife habitat, or otherwise adversely impact local populations of the few species of plants and wildlife present in the area. Similarly, noise and other human activity generated during construction would not have adverse effects on wildlife occurring in adjacent areas because wildlife in these areas is also limited to urban-adapted, disturbance-tolerant species that are acclimated to the industrial surroundings and overall highly degraded conditions. NJDEP-mapped "phragmites-dominated interior wetland" is present on the fringe of the proposed expansion area (**Figure 6.8-1**). In the Tier II analysis, the current boundaries of this wetland would need to be delineated, and measures to avoid direct impacts on wetlands would need to be considered. Mitigation would need to be addressed if impacts are determined to be unavoidable.

Potential impacts on natural resources in the vicinity of Greenville Yard from the construction of the Rail Tunnel Alternative would be limited to construction noise disturbances to wildlife in the surrounding area. Because the area is heavily industrialized and already subjected to substantial anthropogenic disturbance (e.g., jet engine and other aircraft noise associated with adjacent EWR), construction near Greenville Yard would represent negligible increases in existing noise levels such that no adverse effects to wildlife would be expected to occur. Overall, construction of the Rail Tunnel Alternative would have no adverse effects to natural resources near Greenville Yard.

Similarly, construction activities at other locations throughout the study area (i.e., at the Brooklyn waterfront, along the Bay Ridge Branch, in Maspeth and at Fresh Pond, and in the Bronx) would not directly eliminate any ecologically valuable plant or wildlife habitat, or otherwise adversely impact local populations of the few species of plants and wildlife present in the area. Noise and other human activity generated during construction would not have adverse effects on wildlife occurring in adjacent areas because wildlife in these areas is also limited to urban-adapted, disturbance-tolerant species that are acclimated to the industrial surroundings and overall highly degraded conditions. Wildlife in the area, such as house sparrows and European starlings, may briefly avoid the site during construction, but any such effects would be temporary and unlikely to cause adverse effects on individuals or local populations of these ubiquitous species.

Rail Tunnel with Shuttle ("Open Technology") Service Alternative

The construction of the Rail Tunnel with Shuttle Service Alternative would, for the most part, be identical to the Rail Tunnel Alternative, with the exception of the construction of a western terminus for the alternative outside of the Port District. Therefore potential construction impacts mirror those described above for the Rail Tunnel Alternative. Please see the Tunnel Alignment section for a description of potential for impacts from the construction of the tunnel section, which will be the same for all Rail Tunnel Alternatives. The following describes potential impacts from the construction of support facilities for this alternative.

Local Study Areas

As described in Chapter 4, "Alternatives," under this and other Rail Tunnel Alternatives, Oak Island Yard would need to be expanded by approximately 50 acres Natural resources within this area are limited to ruderal vegetation and extremely urban-adapted generalist species of wildlife, most of which are likely non-native, and none of which are federally or state-listed. Expansion of the yard would not directly eliminate any ecologically valuable plant or wildlife habitat, or otherwise adversely impact local populations of the few species of plants and wildlife present in the area. Similarly, noise and other human activity generated during construction would not have adverse effects on wildlife occurring in adjacent areas because wildlife in these areas is also limited to urban-adapted, disturbance-tolerant species that are acclimated to the industrial surroundings and overall highly degraded conditions. NJDEP-mapped "phragmites-dominated interior wetland" is present on the fringe of the proposed expansion area (**Figure 6.8-1**). In the Tier II analysis, the current boundaries of this wetland would need to be delineated, and measures to avoid direct impacts on wetlands would need to be considered. Mitigation would need to be addressed if impacts are determined to be unavoidable.

Potential impacts on natural resources in the vicinity of Greenville Yard from the construction of this alternative would be limited to construction noise disturbances to wildlife in the surrounding area. Because the area is heavily industrialized and already subjected to substantial

anthropogenic disturbance (e.g., jet engine and other aircraft noise associated with adjacent EWR), construction near Greenville Yard would represent negligible increases in existing noise levels such that no adverse effects to wildlife would be expected to occur. Overall, construction of this alternative would have no adverse effects to natural resources near Greenville Yard.

Similarly, construction activities at other locations throughout the study area (i.e., at the Brooklyn waterfront, along the Bay Ridge Branch, in Maspeth and at Fresh Pond, and in the Bronx) would not directly eliminate any ecologically valuable plant or wildlife habitat, or otherwise adversely impact local populations of the few species of plants and wildlife present in the area. Noise and other human activity generated during construction would not have adverse effects on wildlife occurring in adjacent areas because wildlife in these areas is also limited to urban-adapted, disturbance-tolerant species that are acclimated to the industrial surroundings and overall highly degraded conditions. Wildlife in the area, such as house sparrows and European starlings, may briefly avoid the site during construction, but any such effects would be temporary and unlikely to cause adverse effects on individuals or local populations of these ubiquitous species.

Rail Tunnel with Chunnel Service Alternative

The construction of the Rail Tunnel with Chunnel Service Alternative would, for the most part, be identical to the Rail Tunnel Alternative, with the exception of the construction of an independent truck terminal at Oak Island Yard to accommodate the chunnel service. Therefore potential construction impacts mirror those described above for the Rail Tunnel Alternative. Please see the "Tunnel Alignment" section above for a description of potential for impacts from the construction of the tunnel section, which will be the same for all Rail Tunnel Alternatives. The following describes potential impacts from the construction of support facilities for this alternative.

Local Study Areas

As described in Chapter 4, "Alternatives," under this and other Rail Tunnel Alternatives, Oak Island Yard would need to be expanded by approximately 50 acres and an additional 20 acres to accommodate the chunnel service terminal. Natural resources within this area are limited to ruderal vegetation and extremely urban-adapted generalist species of wildlife, most of which are likely non-native, and none of which are federally or state-listed. Expansion of the yard would not directly eliminate any ecologically valuable plant or wildlife habitat, or otherwise adversely impact local populations of the few species of plants and wildlife present in the area. Similarly, noise and other human activity generated during construction would not have adverse effects on wildlife occurring in adjacent areas because wildlife in these areas is also limited to urban-adapted, disturbance-tolerant species that are acclimated to the industrial surroundings and overall highly degraded conditions. NJDEP-mapped "phragmites-dominated interior wetland" is present on the fringe of the proposed expansion area (**Figure 6.8-1**). In the Tier II analysis, the current boundaries of this wetland would need to be delineated, and measures to avoid direct impacts on wetlands would need to be considered. Mitigation would need to be addressed if impacts are determined to be unavoidable.

Potential impacts on natural resources in the vicinity of Greenville Yard from the construction of this alternative would be limited to construction noise disturbances to wildlife in the surrounding area. Because the area is heavily industrialized and already subjected to substantial anthropogenic disturbance (e.g., jet engine and other aircraft noise associated with adjacent EWR), construction near Greenville Yard would represent negligible increases in existing noise

levels such that no adverse effects to wildlife would be expected to occur. Overall, construction of this alternative would have no adverse effects to natural resources near Greenville Yard.

Similarly, construction activities at other locations throughout the study area (i.e., at the Brooklyn waterfront, along the Bay Ridge Branch, in Maspeth and at Fresh Pond, and in the Bronx) would not directly eliminate any ecologically valuable plant or wildlife habitat, or otherwise adversely impact local populations of the few species of plants and wildlife present in the area. Noise and other human activity generated during construction would not have adverse effects on wildlife occurring in adjacent areas because wildlife in these areas is also limited to urban-adapted, disturbance-tolerant species that are acclimated to the industrial surroundings and overall highly degraded conditions. Wildlife in the area, such as house sparrows and European starlings, may briefly avoid the site during construction, but any such effects would be temporary and unlikely to cause adverse effects on individuals or local populations of these ubiquitous species.

Rail Tunnel with Automated Guided Vehicle (AGV) Technology Alternative

The construction of the Rail Tunnel with AGV Technology Alternative would, for the most part, be identical to the Rail Tunnel Alternative, with the exception of the construction of AGV terminals in Greenville Yard and East New York Yard. Therefore potential construction impacts mirror those described above for the Rail Tunnel Alternative. Please see the "Tunnel Alignment" section above for a description of potential for impacts from the construction of the tunnel section, which will be the same for all Rail Tunnel Alternatives. The following describes potential impacts from the construction of support facilities for this alternative.

Local Study Areas

As described in Chapter 4, "Alternatives," under this and other Rail Tunnel Alternatives, Oak Island Yard would need to be expanded by approximately 50 acres Natural resources within this area are limited to ruderal vegetation and extremely urban-adapted generalist species of wildlife, most of which are likely non-native, and none of which are federally or state-listed. Expansion of the yard would not directly eliminate any ecologically valuable plant or wildlife habitat, or otherwise adversely impact local populations of the few species of plants and wildlife present in the area. Similarly, noise and other human activity generated during construction would not have adverse effects on wildlife occurring in adjacent areas because wildlife in these areas is also limited to urban-adapted, disturbance-tolerant species that are acclimated to the industrial surroundings and overall highly degraded conditions. NJDEP-mapped "phragmites-dominated interior wetland" is present on the fringe of the proposed expansion area (**Figure 6.8-1**). In the Tier II analysis, the current boundaries of this wetland would need to be delineated, and measures to avoid direct impacts on wetlands would need to be considered. Mitigation would need to be addressed if impacts are determined to be unavoidable.

Potential impacts on natural resources in the vicinity of Greenville Yard from the construction of this alternative would be limited to construction noise disturbances to wildlife in the surrounding area. Because the area is heavily industrialized and already subjected to substantial anthropogenic disturbance (e.g., jet engine and other aircraft noise associated with adjacent EWR), construction near Greenville Yard would represent negligible increases in existing noise levels such that no adverse effects to wildlife would be expected to occur. Overall, construction of this alternative would have no adverse effects to natural resources near Greenville Yard.

Similarly, construction activities at other locations throughout the study area (i.e., at the Brooklyn waterfront, along the Bay Ridge Branch, in Maspeth and at Fresh Pond, and in the

Bronx) would not directly eliminate any ecologically valuable plant or wildlife habitat, or otherwise adversely impact local populations of the few species of plants and wildlife present in the area. Noise and other human activity generated during construction would not have adverse effects on wildlife occurring in adjacent areas because wildlife in these areas is also limited to urban-adapted, disturbance-tolerant species that are acclimated to the industrial surroundings and overall highly degraded conditions. Wildlife in the area, such as house sparrows and European starlings, may briefly avoid the site during construction, but any such effects would be temporary and unlikely to cause adverse effects on individuals or local populations of these ubiquitous species.

Rail Tunnel with Truck Access Alternative

The construction of the Rail Tunnel with Truck Access Alternative would, for the most part, be identical to the Rail Tunnel Alternative. Therefore potential construction impacts mirror those described above for the Rail Tunnel Alternative. Please see the Tunnel Alignment section for a description of potential for impacts from the construction of the tunnel section, which will be the same for all Rail Tunnel Alternatives. The following describes potential impacts from the construction of support facilities for this alternative.

Local Study Areas

As described in Chapter 4, "Alternatives," under this and other Rail Tunnel Alternatives, Oak Island Yard would need to be expanded by approximately 50 acres. Natural resources within this area are limited to ruderal vegetation and extremely urban-adapted generalist species of wildlife, most of which are likely non-native, and none of which are federally or state-listed. Expansion of the yard would not directly eliminate any ecologically valuable plant or wildlife habitat, or otherwise adversely impact local populations of the few species of plants and wildlife present in the area. Similarly, noise and other human activity generated during construction would not have adverse effects on wildlife occurring in adjacent areas because wildlife in these areas is also limited to urban-adapted, disturbance-tolerant species that are acclimated to the industrial surroundings and overall highly degraded conditions. NJDEP-mapped "phragmites-dominated interior wetland" is present on the fringe of the proposed expansion area (**Figure 6.8-1**). In the Tier II analysis, the current boundaries of this wetland would need to be delineated, and measures to avoid direct impacts on wetlands would need to be considered. Mitigation would need to be addressed if impacts are determined to be unavoidable.

Potential impacts on natural resources in the vicinity of Greenville Yard from the construction of this alternative would be limited to construction noise disturbances to wildlife in the surrounding area. Because the area is heavily industrialized and already subjected to substantial anthropogenic disturbance (e.g., jet engine and other aircraft noise associated with adjacent EWR), construction near Greenville Yard would represent negligible increases in existing noise levels such that no adverse effects to wildlife would be expected to occur. Overall, construction of this alternative would have no adverse effects to natural resources near Greenville Yard.

Similarly, construction activities at other locations throughout the study area (i.e., at the Brooklyn waterfront, along the Bay Ridge Branch, in Maspeth and at Fresh Pond, and in the Bronx) would not directly eliminate any ecologically valuable plant or wildlife habitat, or otherwise adversely impact local populations of the few species of plants and wildlife present in the area. Noise and other human activity generated during construction would not have adverse effects on wildlife occurring in adjacent areas because wildlife in these areas is also limited to urban-adapted, disturbance-tolerant species that are acclimated to the industrial surroundings and

overall highly degraded conditions. Wildlife in the area, such as house sparrows and European starlings, may briefly avoid the site during construction, but any such effects would be temporary and unlikely to cause adverse effects on individuals or local populations of these ubiquitous species.

F. TIER II ANALYSIS AND POTENTIAL MITIGATION MEASURES

OPERATION

Operational impacts of the Build Alternatives are limited to noise disturbances to wildlife in surrounding areas generated by the increased activity at the rail yards. With the exception of the Long Island Facilities, however, wildlife in and around the yards is limited to urban-adapted, generalist species that are highly tolerant of disturbance and are acclimated to background levels of noise that are high due to industrial land uses in the area. Increased activity at the facilities would represent a negligible increase in noise and human activity that is not expected to have any effect on wildlife communities associated with the yards.

On Long Island, habitats surrounding the potential facilities are far less degraded and support significantly higher levels of biodiversity than at the Jersey City and New York City yards, including species that are specialists and more sensitive to human disturbance. Increased freight movement at these facilities may elevate noise and human activity levels to the point that there would be shifts in wildlife community composition toward more disturbance-tolerant generalist species. Further Tier II analysis would inform the need for mitigation measures, such as the erection of sound barriers around the facilities' perimeters to reduce the effect this activity could have on wildlife inhabiting adjacent habitats. Mitigation measures could incorporate lighting that is sensitive to adjacent habitats, since light pollution has been shown to have numerous adverse effects on biological processes such as timing of reproduction, mating behavior, and seasonal movements from one habitat type to another (Longcore and Rich 2004). For example, night lighting at the various rail facilities would be directed downward and shielded to contain the light within the facilities and avoid spillage into adjacent habitats.

CONSTRUCTION

Potential impacts on natural resources from construction of the Build Alternatives are primarily limited to impacts on aquatic biota and their habitat within the area of the proposed tunnel alignment, particularly if an immersed tube is used for a portion of the alignment. Although temporary impacts on aquatic biota may be expected from dredging, measures would be developed in consultation with USACE, NJDEP, NYSDEC, and NMFS to minimize potential effects. Best Management Practices specified by agencies when issuing dredging permits would be strictly followed. For example NJDEP recommends the following BMPs to minimize the potential for and magnitude of adverse environmental impacts from dredging operations:

- Using hydraulic dredging when feasible;
- Using a closed clamshell (required for dredging in Upper New York Harbor);
- Implementing certain dredging practices to reduce suspended sediments when using a clamshell dredge, such as maximizing the size of the bite taken by the clamshell, slowly withdrawing the clamshell through the water column, not hosing down or rinsing sediments off the sides and gunwales of the barge;
- No barge overflow (this is required for dredging in Upper New York Bay);

- Shunting, which is the active pumping of free water in a barge to the bottom of the water column at the dredging site used as an alternative to barge-overflow in reducing the volume of water in the barge;
- Seasonal restrictions to minimize potential adverse impacts on anadromous or other migratory finfish, nesting shorebirds, etc.;
- On-board independent dredging inspectors certified by NMFS to observe dredging operation and ensure compliance with permit conditions; and
- Silt curtains in waters where currents are less than 1 knot

In addition to the measures associated with dredging, mitigation measures associated with installation of the tunnel sections would be implemented to minimize suspended sediment in the water column during placement of any fill material or the rock layer. These measures may include moderating the speed at which the material is brought to the bottom to reduce suspension. Mitigation for temporary habitat loss during dredging of the immersed tube portion of the tunnel and the change in habitat type from soft bottom to hard bottom within the area above the immersed tube portion of the tunnel would be developed in coordination with USACE, NMFS, USEPA, NJDEP, NYSDEC, and any other involved agencies. Potential mitigation measures may include habitat enhancement or improvement within the area affected—or elsewhere as identified by state and federal agencies—or the application of construction activity moratorium windows. For example, any required tree removal would occur during the winter hibernation period of the northern long-eared bat to avoid the potential for direct impacts that could occur from the removal of an active summertime roost tree. ✷

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