

## Chapter 15:

## Water and Natural Resources

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### 15.1 INTRODUCTION

This chapter presents the analysis FRA conducted of the potential effects of the No Action Alternative and the Preferred Alternative on natural resources and water quality. FRA evaluated the following natural resources: floodplains; groundwater; aquatic resources such as water quality, sediment quality, aquatic biota, essential fish habitat (EFH), and significant coastal fish and wildlife habitat; terrestrial resources; and threatened and endangered species and species of special concern. This chapter also discusses the avoidance, minimization, and mitigation measures proposed to reduce potential impacts to floodplains, aquatic resources, and natural resources due to the Preferred Alternative.

### 15.2 REGULATORY CONTEXT AND METHODOLOGY

For information on the regulatory context and analysis methodology for this resource category, please refer to Chapter 12 of **Appendix B**, “Methodology Report.” The Methodology Report summarizes the Federal, State, and city legislation and regulatory programs that pertain to activities in floodplains, groundwater, wildlife, protected species, and aquatic resources that would apply to the Preferred Alternative and the methodology employed for the assessment of potential impacts to floodplains and natural resources.

#### 15.2.1 STUDY AREA

The Project Site, as described in Chapter 1, “Introduction,” consists of the 13-acre Western Rail Yard site (see Figure 1-1). The Project Site is bound by Eleventh Avenue to the east, West 33rd Street to the north, Twelfth Avenue to the west, and West 30th Street to the south.

For floodplains, groundwater, and terrestrial resources, the Study Area comprises the Project Site and its immediate surroundings (i.e., the adjacent roadways and portion of the High Line) because of the highly developed nature of the surrounding land uses. The Study Area for threatened, endangered, or special concern species and significant natural communities is within ½-mile from the Project Site. This Study Area is consistent with study areas for the environmental analysis of similar projects in New York City.

The Study Area for NYSDEC tidal wetlands, water quality, and aquatic biota comprises the Lower Hudson River, with a focus on the area of the Hudson River with the potential to receive stormwater runoff from the Project Site, CSOs with the potential to be affected by the No Action Alternative and Preferred Alternative, and effluent from the North River WWTP. This Study Area is consistent with study areas for the environmental analysis of similar projects in New York City.

#### 15.2.2 FEDERAL REGULATIONS

In addition to the regulations outlined in **Appendix B**, FRA determined that the following federal legislation and regulatory programs apply to the project:

- **Migratory Bird Treaty Act (50 CFR 10, 20, 21, EO 13186):** The Migratory Bird Treaty Act (MBTA) of 1918 was implemented following the 1916 convention between the U.S. and Great Britain (on behalf of Canada) for the protection of birds migrating between the U.S. and Canada. Subsequent amendments implemented treaties between the U.S. and Mexico, Japan, and the former Soviet Union. The MBTA makes it unlawful to pursue, hunt, take, capture, kill, or sell birds listed therein. Over 800 species are currently protected under the Act. The statute applies equally to both live and dead birds, and grants full protection to any bird parts, including feathers, eggs, and nests.
- **Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§ 1801 et seq.):** Section 305(b)(2)-(4) of the Magnuson-Stevens Fishery Conservation and Management Act outlines the process for the National Oceanic and Atmospheric Administration's (NOAA's) 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 EFH. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 USC §1802[10]). Adverse impacts on EFH, as defined in 50 CFR 600.910(A), include any impact that reduces the quality and/or quantity of EFH. Adverse impacts may include direct impacts, such as physical disruption or the release of contaminants; indirect impacts, such as the loss of prey or reduction in the fecundity (number of offspring produced) of a managed species; and site-specific or habitat-wide impacts that may include individual, cumulative, or synergistic consequences of a federal action. Portions of the Project Sites fall within waters designated as EFH; therefore, FRA has evaluated potential effects of the project on EFH.

## 15.3 AFFECTED ENVIRONMENT

The following sections describe the existing conditions of natural resources and aquatic resources in the Study Area in detail. Additionally, the Affected Environment includes other transportation infrastructure and private development projects planned or expected to be implemented within the same timeframe as the Preferred Alternative. These projects are described in detail in Chapter 4, "Analysis Framework."

NYCDCP developed the *Vision 2020: New York City Comprehensive Waterfront Plan* to establish goals for the New York City waterfront, with the intention of promoting various ecological objectives and enhancing sustainability and climate resilience planning through the incorporation of climate change considerations, among other goals. The plan seeks to make improvements to water quality and aquatic resources through measures such as additional nitrogen reduction at the Bowery Bay, Tallman Island, Hunts Point, and Wards Island wastewater treatment plants (WWTPs) (NYCDCP 2011); additional reduction in CSOs with the increased capture of stormwater runoff through implementation of the New York City Green Infrastructure Plan (NYCDEP 2016); improved flushing of constrained water bodies; and optimization of existing sewer systems through improvements to drainage, interceptors, and tide gates (NYCDCP 2011). In addition to reducing nitrogen discharges from WWTPs, *PlaNYC* goals that would result in improvements to water quality and aquatic resources include construction of grey infrastructure projects to reduce the discharge of untreated water to waterways, and reintroduction of oysters and eel grass. *OneNYC*, an update to *PlaNYC*, focuses on growth, equity, sustainability, and resiliency, and includes similar initiatives to improve water quality through wastewater treatment and stormwater management, as well as initiatives focusing on the resiliency and adaptability of the New York City's infrastructure.

As required by USEPA's CSO Control Policy, NYCDEP initiated the development of the Long-Term Control Plan (LTCP) project in 2004. The LTCP project, recently amended in 2012 through an agreement between NYCDEP and NYSDEC, integrates CSO Facility Planning projects and the Comprehensive City-Wide Floatables Abatement Plan, and incorporates ongoing Use and Standards Attainment Program (USA) project work. As part of the 2012 agreement, NYCDEP will develop 10 waterbody-specific LTCPs and a citywide LTCP (anticipated in 2017) with the goal of achieving waterbody-specific water quality standards consistent with the Federal CSO Policy and the water quality goals of the Clean Water Act.

While these anticipated programs and initiatives should gradually improve living conditions for aquatic biota and potentially allow more pollution-intolerant species to occur in the Hudson River, the aquatic biota communities within the Lower Hudson River in the Build Year (2026) would be similar to the communities present today.

The LIRR is planning the West Side Yard/Hudson Yards Perimeter Protection Project, a flood protection project that would include perimeter protection and drainage improvements around West Side Yard/Hudson Yards and the NRT's vent shaft and portal. The project would include a permanent wall with deployable barriers to be implemented across driveways and access points in advance of storm events. The purpose of the project is to protect West Side Yard/Hudson Yards and railroad infrastructure, including proposed infrastructure under the Hudson Tunnel Project, from flooding during storm events. While the project would not alter the existing floodplain within the Study Area, potential flooding conditions in the Study Area would be anticipated to improve with the implementation of the West Side Yard/Hudson Yards Perimeter Protection Project in its anticipated Build Year (2026).

Below-grade structures associated with the other projects planned in the area may have the potential to modify groundwater flow patterns on a local scale. However, groundwater would still be expected to flow around these structures and continue to flow toward the Hudson River.

Temporary disturbances to terrestrial resources, including the relocation of wildlife species, would be anticipated as a result of the various development projects in the area. Landscaping as part of the various development projects, including the High Line and Hudson River Park Projects, may improve ecological communities and wildlife habitat in the vicinity of the Study Area.

Water quality in the Lower Hudson River is anticipated to gradually improve as a result of the ongoing implementation of several initiatives in New York and New Jersey. Examples of these initiatives include the HEP, Hudson Raritan Estuary (HRE) Ecosystem Restoration Project, New York City Citywide Long-Term Control Plan, and the New Jersey Environmental Infrastructure Financing Program (NJEIFP) to address CSO discharges, Vision 2020, the New York City Green Infrastructure Plan, and *PlaNYC/OneNYC*. Opportunities for restoration at the Hudson River Park Estuarine Sanctuary, located to the west of the Study Area, exist to create, restore, and enhance shallow water habitat and provide environmental interpretation (USACE and PANYNJ 2009, and Hudson River Park Trust 2002).

As part of the existing conditions, NJ TRANSIT, PANYNJ, and Amtrak are planning the Hudson Tunnel Project. FRA is advancing the EIS for the Hudson Tunnel Project with these agencies; the DEIS was published for public review in June 2017, and the FEIS is presently under development. The preferred alternative for the Hudson Tunnel Project consists of a new two-track passenger rail tunnel on the Northeast Corridor between New Jersey and New York, referred to as the Hudson River Tunnel, and the rehabilitation of the existing North River Tunnel. Construction of the Hudson Tunnel Project is planned to commence in 2022. As part of the preferred alternative, a ventilation shaft and fan plant building would be constructed near Twelfth Avenue between West 29th Street and West 30th Street (Block 675). Proposed mitigation for the preferred alternative includes treatment of all water discharged from the Twelfth Avenue shaft to the city combined sewer in accordance with the NYSDEC SPDES permit. Therefore, the preferred alternative would not result in adverse impacts to water quality. The operation of the preferred alternative would alter the characteristics of bottom habitat in a portion of the Hudson River, which may have an impact on aquatic biota and EFH in the vicinity of the Hudson Tunnel Project Study Area. In-water construction of the preferred alternative for the Hudson Tunnel Project would result in temporary impacts to water quality and aquatic resources.

### **15.3.1 FLOODPLAINS**

FEMA released preliminary FIRMs for this Study Area in December 2013 in advance of the publication of new, duly adopted, final FIRMs in the future. The preliminary FIRMs represent the Best Available Flood Hazard Data at this time. FEMA encourages communities to use the preliminary FIRMs when making decisions about floodplain management until final maps are available.

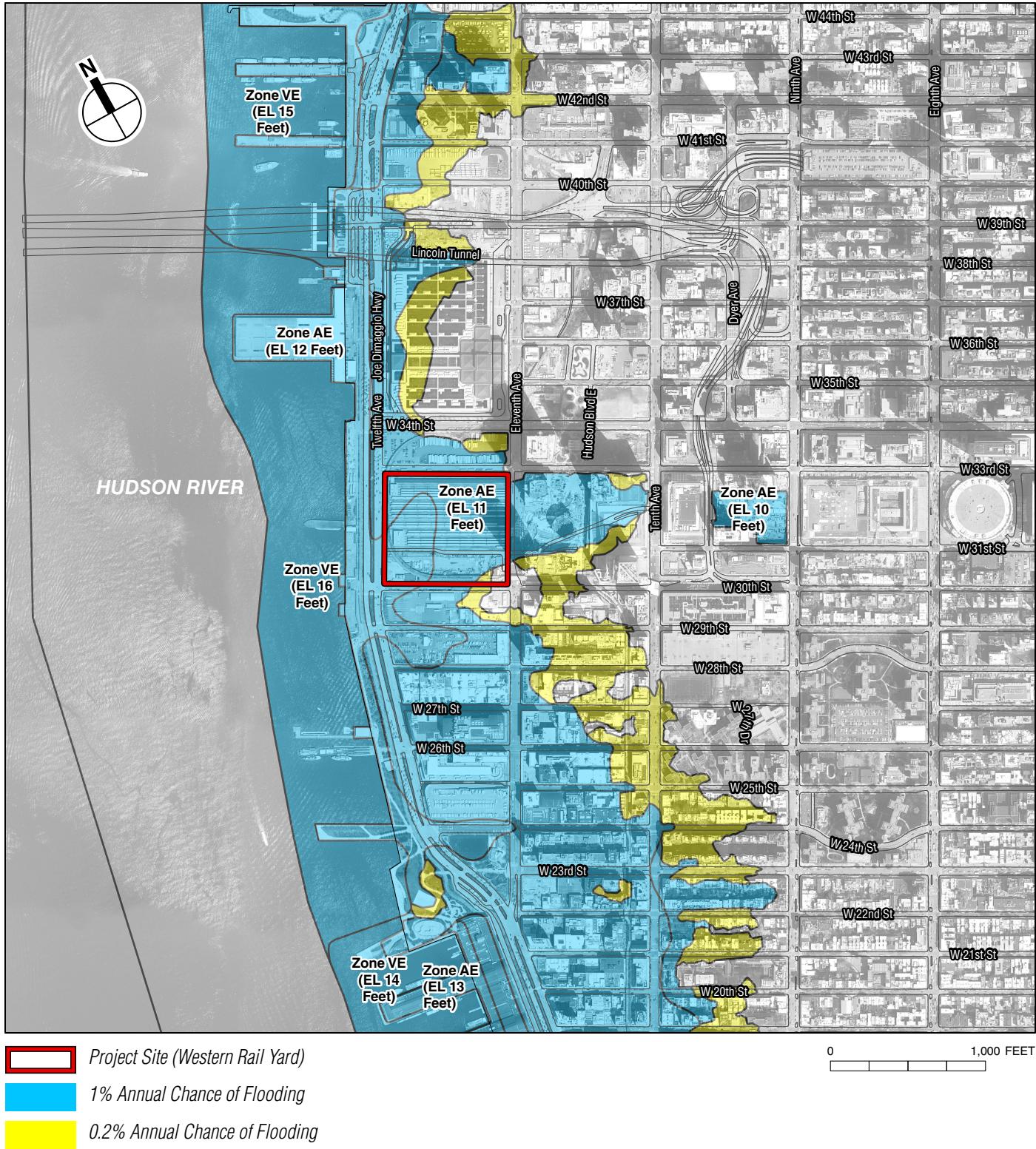
Much of the Study Area is located within the one-percent annual chance (100-year) floodplain (Zone AE). The BFE for Zone AE is 11 to 12 feet NAVD88 (see **Figure 15-1**). A small portion of the Study Area along West 30th Street falls within the 0.2-percent annual chance (500-year) floodplain (Zone X).

### **15.3.2 WETLANDS**

Based on the NYSDEC tidal and freshwater maps and United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, FRA has determined that there are no NYSDEC-classified surface waters, no NYSDEC-regulated freshwater wetlands, and no NWI mapped wetlands within the Project Site.

NWI maps indicate that the Lower Hudson River within the aquatic Study Area comprises subtidal estuarine wetland habitat with an unconsolidated bottom (E1UBL). NYSDEC categorizes the Hudson River as littoral zone tidal wetlands (LZ), which are defined as permanently flooded lands under waters less than or equal to 6 feet of tidal waters at mean low water (MLW) that are not included in another tidal wetland category. Actual water depths determine whether an area is a littoral zone. In the vicinity of the Project Site, water depths at mean-lower-low-water (MLLW) generally range from 4 feet to 15 feet to the pierhead line (NOAA Chart 12335, 2020). The reported water depths less than 6 feet near the Project Site suggest littoral zone wetlands may be present in the Study Area. Water depths at MLLW in the vicinity of the North River WWTP range from 12 to 14 feet to the pierhead line (NOAA Chart 12341, 2011), suggesting that littoral zone wetlands are not present.

Although the Project Site is near the Hudson River, the Project Site does not fall within the NYSDEC-regulated tidal wetland adjacent area because of the presence of substantial fabricated structures (i.e., Hudson River Greenway and Twelfth Avenue), which were constructed prior to August 20, 1977 and resulted in the limit of the NYSDEC tidal wetland adjacent area being located at the Hudson River bulkhead and outside the Project Site.



### 15.3.3 GROUNDWATER

Groundwater is not used as a potable drinking water supply in New York City. New York City's system of upstate reservoirs supplies all drinking water to the city. Groundwater levels west of Eleventh Avenue are within five to seven feet of the ground surface and vary by about four feet with the tidal cycle of the Hudson River. Groundwater is expected to flow toward the Hudson River. Actual groundwater depth and flow direction may be influenced by other factors, such as subway lines, utilities, and building basements.

### 15.3.4 TERRESTRIAL RESOURCES

#### 15.3.4.1 ECOLOGICAL COMMUNITIES

The Study Area for the evaluation of terrestrial resources is located within the urban landscape of Manhattan's Hudson Yards neighborhood, and the habitat primarily consists of roadways, railyards, and buildings. It is best described as having "terrestrial cultural" communities, which are defined as "communities that are either created and maintained by human activities, or are modified by human influence to such a degree that the physical conformations of the substrate (e.g., soil, bedrock, etc.), or the biological composition of the resident community is substantially different from the character of the substrate or community as it existed prior to human influence" (Edinger et al. 2014). Terrestrial cultural communities within the Study Area include paved road/path,<sup>1</sup> urban structure exterior,<sup>2</sup> railroad,<sup>3</sup> and flower/herb garden<sup>4</sup> (Edinger et al. 2014). The paved road/path community represents the sidewalks and surrounding streets, the railroad community represents the railyards, and the urban structure exterior community represents the residential/commercial buildings respectively. These communities are unvegetated and provide little ecological value. The High Line Park is a public park built on a converted former railroad trestle that cuts through the Study Area. The flower/herb garden community is found planted along the High Line. Vegetation along the High Line consists of trees, shrubs, wildflower, and grasses that are generally selected for their vigor and benefit to wildlife, including pollinators.

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<sup>1</sup> Edinger et al. (2014) define this community as "a road or pathway that is paved with asphalt, concrete, brick, stone, etc. There may be sparse vegetation rooted in cracks in the paved surface."

<sup>2</sup> Edinger et al. (2014) define this community as "the exterior surfaces of metal, wood, or concrete structures (such as commercial buildings, apartment buildings, houses, bridges) or any structural surface composed of inorganic materials (glass, plastics, etc.) in an urban or densely populated suburban area. These sites may be sparsely vegetated with lichens, mosses, and terrestrial algae; occasionally vascular plants may grow in cracks. Nooks and crannies may provide nesting habitat for birds and insects, and roosting sites for bats."

<sup>3</sup> Edinger et al. (2014) define this community as "a permanent road having a line of steel rails fixed to wood ties and laid on a gravel roadbed that provides a track for cars or equipment drawn by locomotives or propelled by self-contained motors. There may be sparse vegetation rooted in the gravel substrate along regularly maintained railroads. The railroad right of way may be maintained by mowing or herbicide spraying."

<sup>4</sup> Edinger et al. (2014) define this community as "residential, commercial, or horticultural land cultivated for the production of ornamental herbs and shrubs. This community includes gardens cultivated for the production of culinary herbs."

#### 15.3.4.2 WILDLIFE

Natural habitats available to terrestrial wildlife within the Study Area are limited to small buffers between areas of urban residential/commercial land use and human disturbance. These habitats are of limited value to native wildlife. The Study Area is primarily developed and covered by buildings, railyards, and asphalt. Vegetation along the High Line provide habitat for some wildlife, including pollinators. As such, only the most urban-adapted, generalist species that can tolerate highly degraded environments and high levels of human activity currently have the potential to occur within the Study Area.

##### 15.3.4.2.1 Birds

The New York State Breeding Bird Atlas is a periodic census of the distribution of breeding birds across New York State. The most recent survey was conducted from 2000 to 2005 and documented eight species as confirmed or probable/possible breeders in the survey block where the Study Area is located (Block 5751D) (see **Table 15-1**). The 9-square-mile survey block spans different habitat types with larger, less disturbed areas with habitat to support these species. The Study Area contains habitat that is suitable for mostly urban-adapted birds. The bird species considered most likely to breed within the Study Area are the non-native European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), and rock pigeon (*Columba livia*). These are disturbance-tolerant, generalist species that can thrive in heavily developed, urban environments.

**Table 15-1**  
**Birds Documented by the New York State Breeding Bird Atlas in Block 5751D**

Common Name	Scientific Name
Northern cardinal	<i>Cardinalis cardinalis</i>
House finch	<i>Carpodacus mexicanus</i>
Rock pigeon*	<i>Columba livia</i> *
American kestrel	<i>Falco sparverius</i>
Northern mockingbird	<i>Mimus polyglottos</i>
House sparrow*	<i>Passer domesticus</i> *
European starling*	<i>Sturnus vulgaris</i> *
Mourning dove	<i>Zenaida macroura</i>

**Notes:** \* indicates species with the potential to occur within the Study Area.

**Sources:** 2000–2005 NYS Breeding Bird Atlas for Block 5751D

##### 15.3.4.2.2 Mammals

Habitat for mammals is limited within the Study Area and is likely to be used only by urban-adapted and synanthropic species (those that benefit from an association with humans). These include the raccoon (*Procyon lotor*), Norway rat (*Rattus norvegicus*), gray squirrel (*Sciurus carolinensis*), and domestic cat (*Felis catus*).

##### 15.3.4.2.3 Reptiles and Amphibians

The Study Area consists mainly of lots covered by buildings, asphalt, and railyards in a heavily urbanized and residential/commercial setting. The Study Area does not provide habitat for reptiles or amphibians.

#### 15.3.5 THREATENED AND ENDANGERED SPECIES

The USFWS Information, Planning, and Consultation System (IPaC) system (2020) did not identify any federally listed species with the potential to occur within the Study Area.

The NMFS ESA Section 7 Mapper identified the Hudson River within the Study Area as providing migrating and foraging habitat for juvenile and adult shortnose sturgeon (*Acipenser brevirostrum*, endangered) and juvenile, subadult, and adult Atlantic sturgeon (*Acipenser oxyrinchus*, endangered), and as overwintering habitat for juvenile shortnose sturgeon (NMFS 2021). The Hudson River within the Study Area is designated as Critical Habitat for Atlantic sturgeon (New York Bight DPS, Hudson River Unit).

The New York Natural Heritage Program (NYNHP 2021) identified yellow bumblebee (*Bombus [thoracobombus] fervidus*; unlisted species identified as of conservation concern), Atlantic sturgeon, and shortnose sturgeon within the vicinity of the Study Area (see **Appendix J**). These species are described below.

#### **15.3.5.1 YELLOW BUMBLEBEE**

The yellow bumblebee is an unlisted species that NYNHP considers critically imperiled at the state level. The primary threats to yellow bumble bees are exotic pathogens in addition to habitat loss, insecticides, and urbanization. Yellow bumblebees are generalist foragers that nest both above and below ground (NYNHP 2020). Within the Study Area, the yellow bumblebee would have the potential to occur along the High Line where there is ample vegetation and flowering plants for foraging and nesting.

#### **15.3.5.2 ATLANTIC STURGEON**

The Atlantic sturgeon is a federally listed anadromous (migrating from salt water to spawn in fresh water) bottom-feeding fish that occurs within the New York–New Jersey Harbor and Hudson River estuaries (Woodhead 1990). Adults of this species spawn in freshwater rivers and migrate between riverine and coastal marine waters. From late April to early July, adult sturgeon migrate from the ocean to the Hudson River to spawn (Smith 1985, Stegemann 1999). After spawning, female sturgeon will migrate back to the ocean, but males will remain in the river until October or November. Atlantic sturgeon are not expected to occur in significant numbers near the Project Site; however, Atlantic sturgeon at various life stages may be present as they use the Hudson River as a migratory corridor for spawning.

#### **15.3.5.3 SHORTNOSE STURGEON**

The shortnose sturgeon is a state-listed and federally listed endangered anadromous bottom-feeding fish that can be found throughout the Hudson River from the Battery to the Federal Dam at Troy. Like Atlantic sturgeon, shortnose sturgeon migrate from the ocean to freshwater to spawn. Shortnose sturgeon may occasionally use areas of the lower Hudson River downstream of the George Washington Bridge; however, spawning, nursery, and overwintering areas are located well upstream of the Project Site and the portion of the lower Hudson River in the vicinity of the Project Site is not considered optimal shortnose sturgeon habitat (Bain 1997). Shortnose sturgeon may be in the vicinity of the Project Site while migrating through the area for spawning.

### **15.3.6 AQUATIC RESOURCES**

The Study Area for aquatic resources comprises the Lower Hudson River Estuary. This portion of the Hudson River is part of the New York–New Jersey Harbor Estuary, which also includes upper and lower New York Harbor, Arthur Kill, Kill Van Kull, East River, Raritan Bay, and Jamaica Bay. Saltwater from Upper New York Harbor enters the Lower Hudson River Estuary during the flood phase of the tidal cycle and lower salinity water is discharged from the Estuary to the Harbor during the ebb phase. (Geyer and Chant 2006). Average tidal velocities near the Study Area are about 2.4 feet per second, and the average predicted ebb flow is about 2.6 feet per second (NOAA 2013).

USACE maintains a federally authorized navigation channel at a depth of 40 to 48 feet below MLW from the mouth of the Hudson River upstream to approximately 59th Street (USACE 2016). Shallower depths are found near or adjacent to piers and other structures. NOAA's Nautical Chart #12335 shows current water depths ranging from 3 to 17 feet below MLLW around the piers outside the navigation channel, and from 40 to 54 feet below MLW within the navigation channel (NOAA 2016).

#### **15.3.6.1 WATER QUALITY**

NYSDEC classifies the Lower Hudson River as Class I saline surface waters from Battery Park in Manhattan upstream to Spuyten Duyvil, New York, including the Study Area. Secondary contact recreation,<sup>5</sup> fishing, and fish propagation and survival are suitable uses of Class I waters.

The portion of the Hudson River in the vicinity of the Study Area falls within the NYCDEP Harbor Survey Inner Harbor Study Area. The NYCDEP Harbor Survey Inner Harbor Study Area includes the Hudson River from the New York City–Westchester County line through the Battery to the Verrazano Narrows; the Lower East River from north end of Roosevelt Island to the Battery; and the Kill Van Kull–Arthur Kill system (NYCDEP 2018). Class I portions of the Hudson River in New York County are listed as impaired for polychlorinated biphenyls (PCBs) and other toxins, which may include mercury, dioxins/furans, PAHs, pesticides, and other heavy metals (NYSDEC 2016). The 2018 NYCDEP New York Harbor Water Quality Report indicated that average fecal coliform concentrations and average enterococci concentrations were in compliance with their respective NYS Bathing Standards. Average dissolved oxygen levels at the surface and bottom of the Inner Harbor were in compliance with the NYS Bathing Standard and Fishing Standard. On average, chlorophyll “a” levels in the Inner Harbor were consistent with previous years' averages. While no water quality standards exist for Secchi transparency, the average Secchi transparency has been low since 2010, which indicated more turbid (i.e., less clear) water. While nitrogen levels, comprising inorganic nitrogen and ammonia, in the Inner Harbor remain the highest of the entire Hudson Harbor, the average nitrogen levels are lowest in the vicinity of the Project Site (Monitoring Station N4). The results of the NYCDEP Harbor Survey indicate that water quality of New York–New Jersey Harbor, including the lower Hudson River within the Inner Harbor, has improved since the 1970s as a result of measures undertaken by New York City (e.g., improvements to wastewater treatment plants and increased capture of stormwater runoff) and others (NYCDEP 2018).

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<sup>5</sup> “Secondary contact recreation” means recreational activities where the probability of water ingestion is minimal and includes, but is not limited to, boating and fishing.

### 15.3.6.2 AQUATIC BIOTA

The New York–New Jersey Harbor Estuary, including the Lower Hudson River, supports a diverse and productive aquatic community of more than 100 species of finfish, more than 100 invertebrate species, and a variety of phytoplankton and zooplankton. A variety of estuarine, marine, catadromous (migrating from fresh water to spawn in the sea), and anadromous fish species use the Lower Hudson River for spawning and nursery, migratory, and foraging purposes. The most abundant finfish include bay anchovy (*Anchoa mitchilli*), Atlantic herring (*Clupea harengus*), striped bass (*Morone saxatilis*), and blueback herring (*Alosa aestivalis*), all of which use open water habitat (Bain et al. 2006). Major benthic invertebrate groups in the New York–New Jersey Harbor Estuary include aquatic earthworms (oligochaetes), segmented worms (polychaetes), snails (gastropods), bivalves, barnacles, cumaceans, amphipods, isopods, crabs, and shrimp (EEA 1988, EA 1990, Coastal 1987, PBS&J 1998). The zooplankton community includes *Tintinnopsis* spp. and nauplius of copepods, and the phytoplankton community includes diatoms, dinoflagellates,<sup>6</sup> and green algae (NYCDEP 2007, Brosnan and O’Shea 1995). The most common benthic macroalgae, or large multicellular algae, present in the vicinity of the Study Area include sea lettuce (*Ulva* spp.), green fleece (*Codium fragile*), and brown algae (*Fucus* spp.) (PBS&J 1998). Limited light penetration restricts the distribution of submerged aquatic vegetation (SAV) in the vicinity of the Study Area (Olson et al. 1996). Extensively developed shorelines and swift currents further limit SAV growth in this area.

### 15.3.6.3 ESSENTIAL FISH HABITAT (EFH)

NMFS defines EFH as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. **Table 15-2** lists the fish species and corresponding life stages with designated EFH in the portion of the Lower Hudson River in the vicinity of the Project Site (NOAA 2016).

**Table 15-2**  
**Essential Fish Habitat Designated Species in the Vicinity of the Study Area**

Species	Eggs	Larvae	Juveniles	Adults
Red hake ( <i>Urophycis chuss</i> )	X	X	X	X
Winter flounder ( <i>Pseudopleuronectes americanus</i> )	X	X	X	X
Windowpane flounder ( <i>Scophthalmus aquosus</i> )	X	X	X	X
Atlantic herring ( <i>Clupea harengus</i> )			X	X
Bluefish ( <i>Pomatomus saltatrix</i> )			X	X
Longfin inshore squid ( <i>Doryteuthis pealeii</i> )	X			
Atlantic butterfish ( <i>Peprilus triacanthus</i> )			X	
Summer flounder ( <i>Paralichthys dentatus</i> )			X	X
Clearnose skate ( <i>Raja eglanteria</i> )			X	X
Little skate ( <i>Leucoraja erinacea</i> )			X	X
Winter skate ( <i>Leucoraja ocellata</i> )			X	X

Source: NMFS EFH Mapper at <http://www.habitat.noaa.gov/protection/efh/habitatmapper.html>.

### 15.3.6.4 SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

As discussed in Chapter 16, “Coastal Zone Consistency,” the Study Area is located within the New York City coastal zone. NYSDOS has designated 15 Significant Coastal Fish and Wildlife Habitats within New York City, including the Lower Hudson Reach Significant Coastal Fish and Wildlife Habitat.

<sup>6</sup> Dinoflagellates are a type of photosynthetic plankton (a microscopic marine plant that uses sunlight to synthesize foods from carbon dioxide and water).

The Lower Hudson Reach comprises the 19-mile stretch of the Hudson River from Battery Park to the tip of Manhattan and from there north to Yonkers near Glenwood, and includes areas with deep waters, shallows, piers, and interpier basins. The Lower Hudson Reach provides an important wintering habitat for young-of-the-year, yearling, and older striped bass and supports a diverse and historically highly productive ecosystem of fish and invertebrate species (Briggs and Waldman 2002, NYDOS 1992). Significant numbers of fish species use the Lower Hudson Reach, including winter flounder, summer flounder, white perch, Atlantic tomcod, Atlantic silversides, bay anchovy, hogchoker, and American eel. Wintering waterfowl that use habitat in the Lower Hudson Reach include canvasback, scaup, mergansers, mallards, and Canada geese (NYSDOS 1992).

## **15.4 ENVIRONMENTAL CONSEQUENCES**

### **15.4.1 NO ACTION ALTERNATIVE**

The Preferred Alternative would not be implemented under the No Action Alternative, and natural resources and aquatic resources would not be changed as a result of the No Action Alternative. The No Action Alternative includes only those projects that are necessary to keep the Western Rail Yard and the associated LIRR facilities in service and provide continued maintenance.

### **15.4.2 OPERATIONAL IMPACTS OF THE PREFERRED ALTERNATIVE**

#### *15.4.2.1 FLOODPLAINS*

As discussed under “Affected Environment” (see Section 15.3.1 for Floodplains), the majority of the Study Area is located within the one-percent annual chance floodplain and a small portion of the Study Area along West 30th Street falls within the 0.2-percent annual chance floodplain.

Tidal flooding is the primary cause of flood damage in New York City. The Preferred Alternative would occur within the one-percent annual chance floodplain, which is affected by tidal flooding. Coastal floodplains are influenced by astronomical tide and meteorological forces (e.g., northeasters and hurricanes) and not by fluvial flooding (e.g., streams overflowing their banks) (FEMA 2013). Therefore, unlike a riverine floodplain, the coastal floodplain within the Study Area would not be affected by any additional structures.

All critical life safety and mechanical, electrical, and plumbing support services for the LIRR in the West Side Yard would be located above the base flood elevation.

Therefore, the operation of the Preferred Alternative would not have the potential to result in adverse impacts to the one percent or 0.2-percent annual chance floodplains or result in additional flooding adjacent to the Study Area.

#### *15.4.2.2 WETLANDS*

As discussed under “Affected Environment” (see Section 15.3.2 for Wetlands), the terrestrial Study Area does not contain wetlands or NYSDEC-regulated adjacent area. All stormwater runoff from the Platform would be managed in accordance with the NYCDEP MS4 permit, and stormwater would not have the potential to adversely affect tidal wetlands in the vicinity of the outfalls. The North River WWTP has capacity to treat all potential wastewater from the Preferred Alternative in accordance with its SPDES permit prior to discharging it the Hudson River. Therefore, the operation of the Preferred Alternative would not have the potential to result in adverse impacts to littoral zone wetlands in the Hudson River near the Project Site or the North River WWTP.

#### *15.4.2.3 GROUNDWATER*

Groundwater in Manhattan is not used as a source of potable water. Therefore, operation of the Preferred Alternative would not have the potential to affect drinking water supplies.

Although the below-grade structures, including the caissons supporting the Platform, would have the potential to modify groundwater flow patterns, groundwater would be expected to flow around these structures and continue to flow toward the Hudson River. The overall direction of groundwater flow would not be adversely affected by the permanent placement of below-grade structures associated with the Platform and Tunnel Encasement. Therefore, operation of the Preferred Alternative would not have the potential to result in adverse impacts to groundwater.

#### **15.4.2.4 TERRESTRIAL RESOURCES**

##### **15.4.2.4.1 Ecological Communities**

As discussed under “Affected Environment,” (see Section 15.3.4.1 for Ecological Communities), the Study Area is largely unvegetated and comprised of terrestrial cultural communities common to the urban environment. The Platform would not displace quality ecological communities or habitat. Similarly, the Tunnel Encasement and LIRR support facilities would be located below the Platform and would not displace any quality vegetated ecological communities. Furthermore, the vegetation along the High Line, comprising the flower/herb garden community, would not be affected by the Preferred Alternative. The operation of the Preferred Alternative would not adversely affect ecological communities and the habitat provided to wildlife within the High Line. Therefore, operation of the Preferred Alternative would not result in adverse impacts to quality habitat or terrestrial ecological communities.

##### **15.4.2.4.2 Wildlife**

As discussed under “Affected Environment,” (see Section 15.3.4.2 for Wildlife), wildlife within the Study Area is limited to the most urban-adapted, synanthropic species that can withstand the extremely high levels of human disturbance presently within the Study Area. Operation of the Preferred Alternative would not increase levels of disturbance to the extent that there would be alterations in species assemblages or otherwise negative changes to wildlife communities in the surrounding area. The same depauperate<sup>7</sup> community of generalist species of wildlife would exist within the Study Area during the operation of the Preferred Alternative that are currently present within the Study Area. Therefore, there would be no adverse impacts to wildlife in the Study Area due to the operation of the Preferred Alternative.

#### **15.4.2.5 THREATENED AND ENDANGERED SPECIES**

Operation of the Preferred Alternative would not adversely impact the yellow bumblebee within the Study Area because it would not impact the flower/herb garden community on the High Line that provides habitat for pollinators within the Study Area.

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<sup>7</sup> A depauperate community is a community of flora, fauna, or an ecosystem that is lacking in numbers or variety of species.

As described in Section 15.4.2.6, “Aquatic Resources,” the Preferred Alternative would not result in any temporary or permanent installation of any structure within the Hudson River and would not, therefore, result in any disturbance of substrate characteristics or result in any changes in water depth within the Hudson River. Similarly, it would not generate any new sources of underwater noise, require dredging, or result in a change in vessel traffic or in prey quantity or quality within the lower Hudson River. The continued discharge of stormwater runoff through the LIRR storm sewer in accordance with the existing NYCDEP MS4 permit for stormwater discharge from the Western Rail Yard would not result in any permanent or temporary impacts or changes in water quality. The incremental increase in sanitary sewage, and any additional stormwater runoff above what detained on-site for reuse, conveyed to the North River WWTP would be small and would not be expected to cause the North River WWTP to be above its permitted daily flow limit of 170 mgd or adversely affect compliance of the North River WWTP effluent with its SPDES permit limits. Therefore, the Preferred Alternative would not have the potential to affect water quality of the Hudson River due to additional discharges from the North River WWTP. For these reasons, FRA has determined that the operation of the Preferred Alternative would have no effect on Atlantic sturgeon or shortnose sturgeon, or critical habitat for Atlantic sturgeon.

#### **15.4.2.6 AQUATIC RESOURCES**

The Preferred Alternative would not involve the temporary or permanent installation of any structure within the Hudson River. As such, the operation of the Preferred Alternative would not physically alter EFH or the significant coastal fish and wildlife habitat within the Hudson River.

As discussed in Chapter 13, “Utilities and Energy,” although additional discharge of sanitary sewage would occur as a result of the Preferred Alternative, the incremental increase (5,497 gallons per day) would be small and would not be expected to cause the North River WWTP to be above its permitted daily flow limit of 170 mgd or adversely affect compliance of the North River WWTP effluent with its SPDES permit limits. In areas not covered by the Platform, runoff from the Preferred Alternative would be conveyed to the LIRR storm sewer, diverting runoff from the combined sewer and reducing the likelihood for additional CSOs to the Hudson River. Stormwater from the terra firma portion of the study area would be directly discharged to the Hudson River, and the LIRR storm sewer would continue to meet the requirements of the existing NYCDEP MS4 permit for stormwater discharge from the Western Rail Yard. Stormwater infrastructure would be constructed to support the new structures on the Project Site, and stormwater runoff collected on the Platform would be primarily detained on-site for reuse. Minimal incremental stormwater flows from the platform would be conveyed to the NYCDEP combined sewer system and would be processed and treated at the North River WWTP.

Operation of the Preferred Alternative would not have an adverse impact on aquatic resources in the Lower Hudson River, including water quality, and therefore would have no adverse impact on aquatic biota, EFH, and significant coastal fish and wildlife habitat.

### **15.4.3 CONSTRUCTION IMPACTS OF THE PREFERRED ALTERNATIVE**

#### **15.4.3.1 FLOODPLAINS**

Construction of the Preferred Alternative would not affect the coastal floodplain within the Study Area. The Project Site would be protected from flooding during storm events by the LIRR perimeter wall constructed around the West Side Yard as part of the West Side Yard Perimeter Protection Project. Therefore, construction of the Preferred Alternative would not have the potential to result in adverse impacts to the one percent or 0.2-percent annual chance floodplains or result in additional flooding adjacent to the Study Area.

#### **15.4.3.2 GROUNDWATER**

Groundwater recovered during dewatering would be treated in accordance with NYCDEP requirements prior to discharge to the municipal sewer.

Contaminants commonly found along rail lines include semi-volatile compounds, heavy metals, pesticides, and herbicides. The Tunnel Encasement would be constructed within the portion of the Study Area that is solid ground, which commonly contains fill and other contaminants in Manhattan. To avoid exposing construction workers and the general public to existing groundwater contaminants, the Project Sponsor would perform demolition, disposal, excavation, dewatering, and other construction activities in accordance with all applicable federal, state, and local regulations and guidelines. As such, the Project Sponsor would implement a site-specific CHASP during ground disturbance to protect workers, the public, and the environment from exposure to groundwater contaminants. With the implementation of these measures, construction of the Preferred Alternative is not anticipated to result in adverse impacts to groundwater.

#### **15.4.3.3 WETLANDS**

As discussed under “Affected Environment” (see Section 15.3.2 for Wetlands), the terrestrial Study Area does not contain wetlands or NYSDEC-regulated adjacent area. The Preferred Alternative would not involve any in-water construction that would affect tidal wetlands. Implementation of erosion and sediment control measures included in the stormwater pollution prevention plan (SWPPP) prepared by the Project Sponsor in accordance with a SPDES permit for the Project would minimize the discharge of sediment to NYSDEC littoral zone tidal wetlands of the Hudson River during construction activities. Therefore, construction of the Preferred Alternative is not anticipated to have the potential to result in adverse impacts to littoral zone tidal wetlands within the Study Area.

#### **15.4.3.4 TERRESTRIAL RESOURCES**

##### **15.4.3.4.1 Ecological Communities**

Ecological communities within the Study Area are primarily unvegetated terrestrial cultural communities common to the urban environment. Construction activities within the Study Area would not displace quality ecological communities or wildlife habitat. Construction of the Preferred Alternative would not disturb the flower/herb garden community planted along the walkway for the High Line. All construction staging and activities would occur within the Project Site. Therefore, construction of the Preferred Alternative is not anticipated to result in adverse impacts to quality habitat or terrestrial ecological communities.

##### **15.4.3.4.2 Wildlife**

Existing levels of human disturbance within the Study Area are extremely high. As such, wildlife within the Study Area is limited to the most urban-adapted, disturbance-tolerant species. Construction of the Preferred Alternative would likely result in the temporary displacement of wildlife; however, similar habitat would be available in the vicinity of the Study Area and the temporary disturbance of individuals of urban tolerant species would not result in adverse impacts to wildlife resources. Therefore, construction of the Project is not anticipated to result in adverse impacts to wildlife.

#### **15.4.3.5 THREATENED AND ENDANGERED SPECIES**

Construction activities within the Study Area would not affect existing flower/herb garden habitat on the High Line; therefore, construction of the Preferred Alternative would not have an adverse impact on the yellow bumblebee.

As described in Section 15.4.2.5, “Threatened and Endangered Species,” the Preferred Alternative would not result in any temporary or permanent installation of any structure within the Hudson River and would not, therefore, result in any disturbance of substrate characteristics or result in any changes in water depth within the Hudson River during construction of the Preferred Alternative. Similarly, construction of the Preferred Alternative would not generate any new sources of underwater noise, require dredging, or result in a change in vessel traffic or in prey quantity or quality within the lower Hudson River. The continued discharge of stormwater runoff through the LIRR storm sewer in accordance with the existing NYCDEP MS4 permit for stormwater discharge from the Western Rail Yard during construction of the Preferred Alternative would not result in any permanent or temporary impacts or changes in water quality of the Hudson River. For these reasons, FRA has determined the construction of the Preferred Alternative would have no effect on Atlantic sturgeon or shortnose sturgeon, or critical habitat for Atlantic sturgeon.

#### **15.4.3.6 AQUATIC RESOURCES**

The Preferred Alternative would not involve any in-water construction in, over, or adjacent to the Hudson River.

As described in Chapter 13, during construction, stormwater from the Project Site would be discharged to either the existing LIRR outfall that drains stormwater from the rail yard to the Hudson River, or the New York City sewer system, and from there directed to municipal wastewater treatment facilities for treatment before discharge to the Hudson River. The implementation of erosion and sediment control measures implemented in accordance with the SWPPP prepared by the Project Sponsor in accordance with the SPDES permit would minimize the potential for water quality impacts due to the discharge of sediment to the Hudson River during construction.

All contaminated material, including soil excavated and removed during construction activities, would be disposed of in accordance with applicable regulatory requirements, as described in Chapter 12, “Contaminated Materials.”

With the implementation of these measures, construction activities occurring from the Preferred Alternative are not anticipated to result in adverse impacts to water quality, aquatic biota, EFH or Significant Coastal Fish and Wildlife Habitat resource of the Hudson River.

### **15.5 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES**

The operation of the Preferred Alternative would not result in any adverse impacts to water quality or aquatic resources. However, the Project Sponsor would be required to implement the following construction-related avoidance, minimization, and/or mitigation measures.

#### **15.5.1 GROUNDWATER**

To avoid exposing construction workers and the general public to existing groundwater contaminants and to minimize potential adverse impacts to groundwater resources, the Project Sponsor would perform demolition, disposal, excavation, dewatering, and other construction activities in accordance with all applicable federal, state, and local regulations and guidelines. As such, the Project Sponsor would implement a site-specific CHASP during ground disturbance to protect workers, the public, and the environment from exposure to groundwater contaminants.

### **15.5.2 WETLANDS**

To minimize potential adverse impacts to NYSDEC littoral zone tidal wetlands of the Hudson River due to discharge of sediment during construction, the Project Sponsor would prepare and implement an SWPPP for the Project containing erosion and sediment control measures.

### **15.5.3 AQUATIC RESOURCES**

To minimize potential adverse impacts to water quality and aquatic biota of the Hudson River during construction, the Project Sponsor would treat all groundwater recovered during dewatering in accordance with NYCDEP requirements prior to discharge to the municipal sewer. Additionally, to minimize the potential for discharge of sediment to the Hudson River during construction, the Project Sponsor would implement erosion and sediment control measures contained in the SWPPP prepared for the Project in accordance with SPDES requirements. \*