Chapter 9: Natural Resources

A. INTRODUCTION

This chapter examines the potential for the development of three new mixed-use developments containing residential, retail, and community facility uses on Site 4 (4A/4B), Site 5, and Site 6A within the Two Bridges Large Scale Residential Development (LSRD) (the project sites) to result in impacts on natural resources[1] and floodplains.

This chapter describes:

- The regulatory programs that protect floodplains and natural resources (e.g., groundwater, wildlife, and threatened, endangered, and special concern species);
- The current condition of the floodplains and natural resources within the natural resources study area (e.g., groundwater, ecological communities, wildlife, and threatened, endangered, and special concern species);
- The floodplains and natural resources conditions in the future without the proposed projects (the No Action condition); and
- The potential for impacts on floodplains and natural resources in the future with the proposed projects (the With Action condition).

PRINCIPAL CONCLUSIONS

The proposed projects would not result in any significant adverse impacts to natural resources. Although the proposed actions would result in the disturbance of certain habitats identified in the 2014 *City Environmental Quality Review (CEQR) Technical Manual* that include "paved roads/paths," "urban vacant lots," "mowed lawns with trees," and "urban structure exteriors," these four ecological communities provide limited habitat to wildlife other than species common to urban areas. Loss of this habitat area may adversely affect individual wildlife unable to find suitable available habitat in the vicinity of the study area; however, loss of individuals of these common species would not result in a significant adverse impact to populations of these species within the New York City metropolitan region. In addition, all landscaping and tree replacement and/or restitution for removed trees would occur in compliance with Local Law 3 and Chapter 5 of Title 56 of the Rules of the City of New York, and would have the potential to benefit natural resources by improving the quality of existing wildlife habitat.

Because nighttime collisions with buildings at night are relatively rare and are largely limited to sporadic episodes of mass mortality that can occur with the right mix of extremely poor weather

[1] According to the *CEQR Technical Manual*, a natural resource is defined as (1) the City's biodiversity (plants, wildlife, and other organisms); (2) any aquatic or terrestrial areas capable of providing suitable habitat to sustain the life processes of plants, wildlife, and other organisms; and (3) any areas capable of functioning in support of the ecological systems that maintain the City's environmental stability.

conditions and particularly disorienting lighting characteristics; nighttime collisions with the proposed buildings would likely be a similarly rare occurrence and the proposed projects would not represent a significant nighttime collision hazard to migratory birds. The potential for daytime window collisions at the proposed buildings would depend on the architecture, and the amount, location, and orientation of reflective glass, as well as the location of landscaping adjacent to any reflective glass surfaces located within the first two stories. To reduce the likelihood of daytime bird collisions, the proposed projects would consider design features within the first two stories, such as reducing the proportion of reflective glass to other building materials, using low reflectivity glass for vertically oriented windows, and fritting glass with dots or other shapes and patterns to further reduce reflectivity as well as transparency to enable birds to recognize glass as a solid object. Where glass materials are present within the first two stories that could reflect landscaping vegetation, vegetation would be located far enough away from buildings to not be clearly reflected by glass, or close enough to buildings such that birds would not be capable of attaining sufficient momentum to result in harmful collisions if they were to fly towards the buildings from that vegetation. With these measures in place, the proposed projects would not represent a significant collision hazard to resident or migratory birds.

Further, the proposed projects would include approximately 22,779 square feet (sf) of new open space—including both private and publicly accessible open space—and approximately 80,020 sf of existing private open space that would be altered with amenities, including new landscaping and open areas that would contain new trees and other plantings and increased permeable surfaces. In addition, on Site 5, the Rutgers Slip Open Space would be dedicated as publicly accessible, totaling approximately 33,550 sf (approximately 0.77 acres), including alterations to approximately 22,440 sf of existing open space and approximately 11,110 sf of new open space. These project components would have the potential to provide new habitat for wildlife currently found within and adjacent to the study area. ~~The proposed projects would consider design features to minimize the potential for nighttime and daytime bird collisions, and thus potential impacts to migratory bird populations. Nighttime collisions with the proposed buildings would likely be a rare occurrence and have no significant impact on migratory birds. The potential for daytime collisions at the proposed buildings would depend on the design and glass coverage of the proposed buildings as well as the presence of nearby vegetation. To minimize the potential for daytime bird collisions, design features would be considered, such as the use of patterned or fritted glass on the first two stories of the buildings at locations where trees would be adjacent to the project site buildings.~~ Therefore, the proposed projects would not result in significant adverse impacts to wildlife.~~ at the individual or population level.~~

The incremental shadows from the proposed projects would not adversely affect aquatic resources (plankton or fish) in the East River. Therefore, project-generated shadows would not result in any significant adverse impacts to aquatic biota of the East River. Therefore, the proposed actions would not result in significant adverse impacts to natural resources.

B. METHODOLOGY

STUDY AREA

The project sites are bounded by New York City streets, and comprise developed and undeveloped lots, and open spaces located in a highly developed urban area with limited existing natural resources; thus, the study area for natural resources is the boundary of the Two Bridges

LSRD, as described in Chapter 1, "Project Description," and shown in **Figures 9-1 and 9-2**. Threatened, endangered, or special concern species and significant natural communities were evaluated for a distance of 0.5 miles from the Two Bridges LSRD boundary to ensure that potential indirect impacts were considered.

EXISTING CONDITIONS AND FUTURE WITH AND WITHOUT THE PROPOSED ACTIONS

Existing conditions of natural resources within the study area were characterized using available information such as:

- United States Fish and Wildlife Service (USFWS) Information, Planning, and Consultation (IPaC) system for federally threatened and endangered species and National Wetlands Inventory (NWI) maps;
- Response from the New York Natural Heritage Program (NYNHP) records of federally and state-listed species;
- 2000–2005 New York State Breeding Bird Atlas;
- 1990–1999 New York State Herp Atlas;
- Federal Emergency Management Agency (FEMA) Preliminary Floodplain Insurance Rate Maps (PFIRMs);
- New York State Department of Environmental Conservation (DEC) wetland maps and Environmental Resource Mapper; and
- Observations made during site reconnaissance conducted on April 12, 2017.

The future without the proposed projects, or No Action condition, assumes that natural resources within the study area would remain largely unchanged from existing conditions.

The proposed actions would result in construction and occupation of three new mixed-use buildings within a highly urbanized neighborhood that would have limited potential to adversely affect natural resources. Potential impacts to natural resources resulting from the proposed actions were assessed by considering the effects within the study area on floodplains, vegetation, groundwater, and wildlife (including federally and state-listed species) from temporary and permanent land disturbance, tree removal, and disturbances to wildlife due to changes in human activity. Further, consideration was given to the potential changes to habitats resulting from alterations to new and existing landscaping and open areas on the project sites.

REGULATORY CONTEXT

The following sections identify the federal, state, and city legislation and regulatory programs that pertain to activities in floodplains, groundwater, wildlife, and the protection of species of special concern that would apply to the proposed actions.

FEDERAL

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

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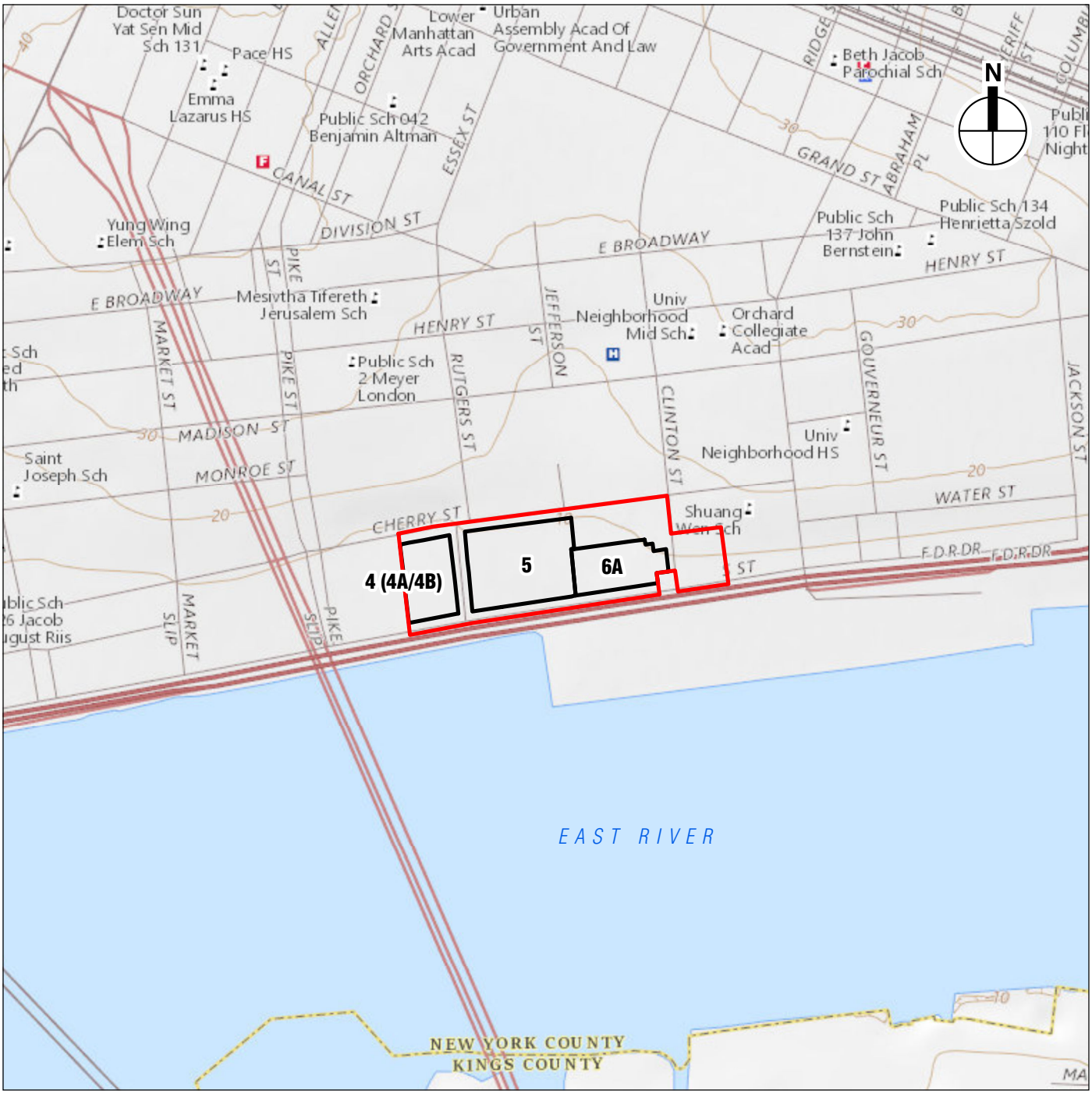


Source: USGS The National Map, https://basemap.nationalmap.gov/arcgis/rest/services/USGSTopo/MapServer

0 1,000 FEET

Approximate coordinates of Project Site:
73°59'19"W 40°42'39"N

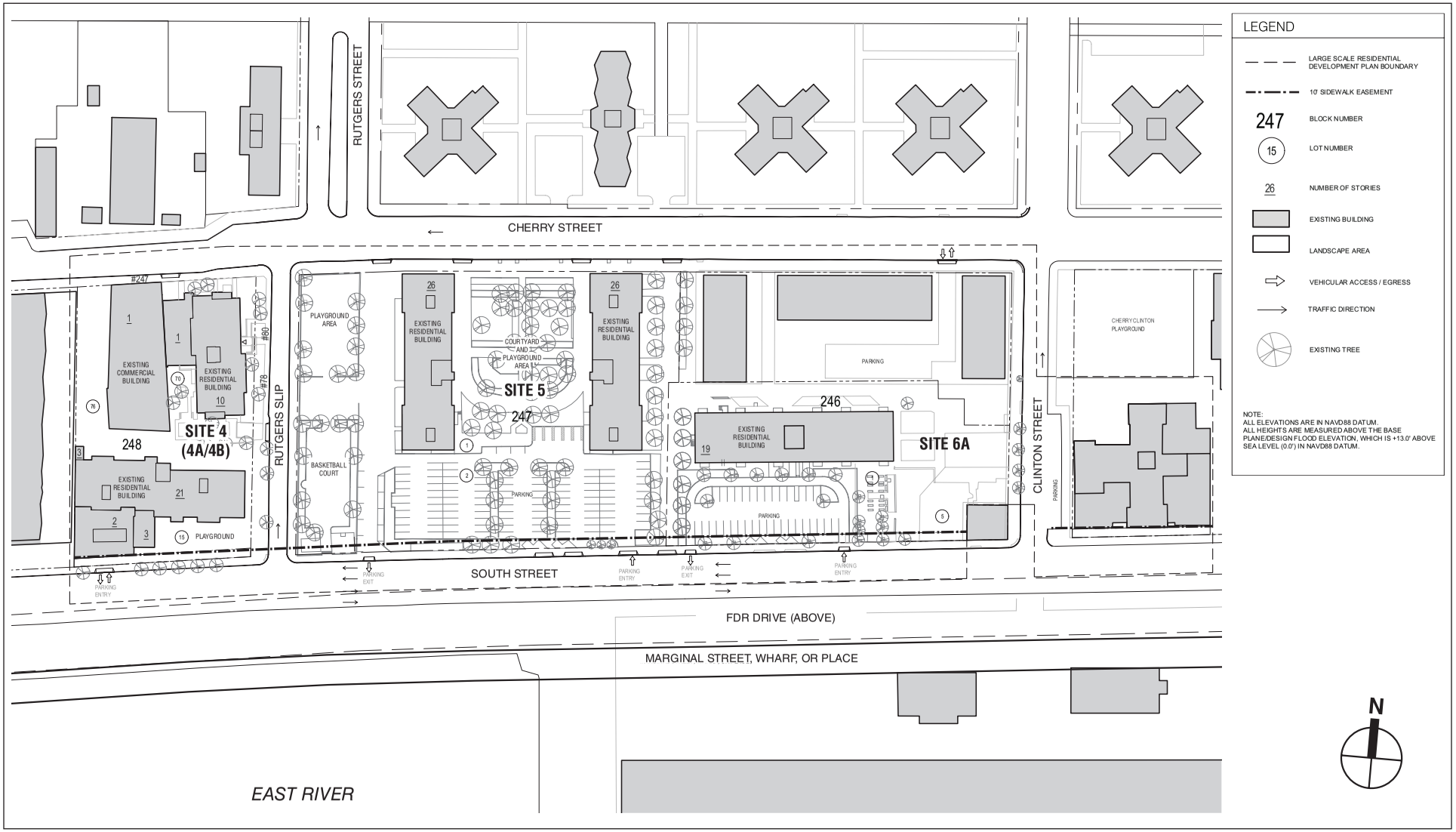
Project Site

Boundary of Two Bridges LSRD

USGS 7.5 Minute Topographic Map (Brooklyn Quad)

TWO BRIDGES LSRD

Figure 9-1



Source: SHoP Architects PC

Existing Conditions Site Plan
All Projects

TWO BRIDGES LSRD

Figure 9-2

commercial activities. The Act also provides for the protection of critical habitats on which endangered or threatened species depend for survival.

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.

NEW YORK STATE

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.

State Pollutant Discharge Elimination System (ECL Article 3, Title 3; Article 15; Article 17, Titles 3, 5, 7, 8; Article 21; Article 70, Title 1; Article 71, Title 19; Implementing Regulations 6 NYCRR Articles 2, 3).

Title 8 of Article 17, Environmental Conservation Law (ECL), Water Pollution Control, authorized the creation of SPDES to regulate discharges to New York State's waters pursuant to a delegation by the U.S. Environmental Protection Agency (EPA) to New York State of permitting authority pursuant to the Clean Water Act. Activities requiring a State Pollutant Discharge Elimination System (SPDES) permit include point source discharges of wastewater into surface or groundwater of the state, constructing or operating a disposal system (sewage treatment plant), discharge of stormwater, and construction activities that disturb one or more acres.

NEW YORK CITY

New York City Local Law 3 (NYCRR Chapter 5)

Local Law 3 of 2010 amended Section 18-107 of the Administrative Code of the City of New York and codifies the New York City Department of Parks and Recreation's (NYC Parks) ability to regulate the replacement of trees on or within jurisdiction of NYC Parks, which includes all trees growing in the public right-of-way and on land mapped as City parkland. The law requires permits from NYC Parks for the removal of trees within NYC Parks jurisdiction and requires replacement of trees that are removed. The law protects against the unauthorized removal, destruction, irreparable damage, and injury to trees under the jurisdiction of NYC Parks.

C. EXISTING CONDITIONS

The study area is located within the urban landscape of the Lower East Side neighborhood in Manhattan (see **Figure 9-2**). Natural resources are limited throughout the study area, and consist primarily of street trees and vegetation in open spaces. Site reconnaissance was conducted on April 12, 2017. One survey was appropriate for the proposed projects since the study area comprises an urban landscape dominated by mowed lawns, garden species growing in planters and garden beds, street trees growing in tree pits within the sidewalks, species growing in cracks in the pavement, and plants and vines growing on the exteriors of buildings. As such, two seasonal surveys were not warranted to characterize the ecological communities and wildlife with the potential to use the study area. Existing conditions of natural resources within the study area are described in detail below.

FLOODPLAINS

FEMA released preliminary FIRMs on January 30, 2015, 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 100-year floodplain (Zone AE, the area with a 1 percent probability of flooding each year). The base flood elevation for Zone AE is 11 to 12 feet North American Vertical Datum (NAVD88) (see Figure 2-4). The northern portion of the study area falls within the 500-year floodplain (Zone X, the area with a 0.2 percent probability of flooding each year). The southwest portion of the Two Bridges LSRD along the Franklin D. Roosevelt (FDR) Drive falls within Zone VE (an area of high flood risk subject to inundation by the 1 percent annual-chance flood event with additional hazards due to storm-induced velocity wave action, a 3-foot or higher breaking wave). Zone VE is considered a Special Flood Hazard Area (SFHA).

GROUNDWATER

As discussed in Chapter 10, "Hazardous Materials," groundwater is anticipated to be approximately 7 to 12 feet below-grade across the three project sites and is likely to flow in a general southerly direction toward the East River. Actual groundwater depth and flow direction may be influenced by other factors, such as subway lines, utilities, and building basements. Groundwater in Manhattan is not used as a source of potable water.

AQUATIC RESOURCES

While outside the study area, the East River is located south of the project sites, beyond the FDR Drive and the Piers 35, 36, and 42. The East River is a tidal strait connecting western Long Island Sound with upper New York Harbor. The East River provides a variety of habitats that support a diverse and productive aquatic community that is similar in composition to other parts of New York Harbor (New York City Department of Environmental Protection [DEP] 2007). Aquatic organisms include phytoplankton, submerged aquatic vegetation, benthic macroalgae, zooplankton, benthic invertebrates, and fish. On very rare occasions, marine mammals and sea turtles have also been documented in the East River.

WETLANDS

On the basis of the DEC tidal and freshwater maps and NWI maps, there are no DEC-classified surface waters, no DEC-regulated freshwater wetlands, and no wetlands mapped by the NWI within the study area. Although the study area is near the East River, the study area does not fall within the DEC-regulated tidal wetland adjacent area because of the presence of substantial fabricated structures (i.e., FDR Drive and Pier 35), which were constructed prior to August 20, 1977 and result in the limit of the DEC tidal wetland adjacent area being located at the East River bulkhead and outside the study area.

TERRESTRIAL RESOURCES

ECOLOGICAL COMMUNITIES

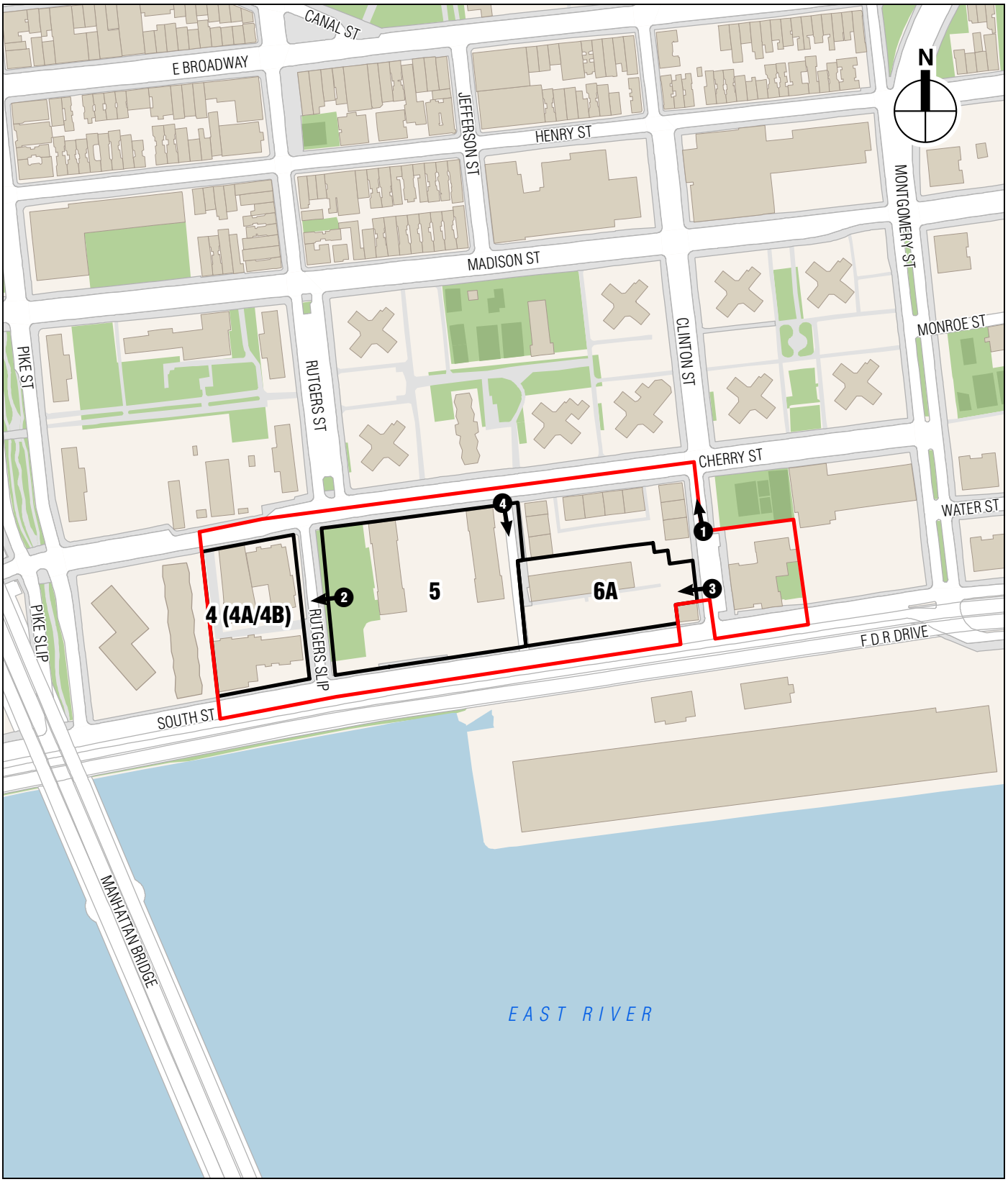
The study area is located within the urban landscape of Manhattan's Lower East Side neighborhood. As such, the ecological communities consist of paved roads/paths,[2] urban structure exteriors,[3] urban vacant lots,[4] and mowed lawns with trees,[5] as defined by Edinger (2014) (see **Figures 9-3 and 9-4**). Vegetation is sparse except for mowed lawns, garden species growing in planters and garden beds, street trees growing in tree pits within the sidewalks, species growing in cracks in the pavement, and plants and vines growing on the exteriors of buildings. Tree species planted throughout the study area include London planetree (*Platanus x acerifolia*), ginkgo (*Ginkgo biloba*), honey locust (*Gleditsia triacanthos*), callery pear (*Pyrus calleryana*), and black locust (*Robinia pseudoacacia*). The paved road/path community comprises the sidewalks, basketball courts, and parking lots within the study area. The urban structure exterior community comprises the exteriors of buildings and concrete walls within the study area. The urban vacant lot community comprises an unused paved area in the southern portion of Site 6A. Vegetation, within the urban vacant lot community, is limited to plant species growing within cracks in the pavement. The mowed lawn with trees community is present throughout the study area, including limited areas in Rutgers Park, Cherry Clinton Playground, and in small garden beds adjacent to buildings. Ruderal herbaceous species dominate the mowed lawn with trees ecological community, including common dandelion (*Taraxacum officinale*), crabgrass (*Digitaria sanguinalis*), ground ivy (*Glechoma hederacea*), and chickweed (*Stellaria media*). Common privet (*Ligustrum vulgare*) is the dominant shrub in this community.

[2] 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."

[3] 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 habitats for birds and insects, and roosting sites for bats."

[4] Edinger et al. (2014) define this community as "an open site in a developed urban area that has been cleared either for construction or following the demolition of a building. Vegetation may be sparse, with large areas of exposed soil, and often with rubble or other debris."

[5] Edinger et al. (2014) define this community as "residential, recreational, or commercial land in which the groundcover is dominated by clipped grasses and forbs, and is shaded by at least 30 percent of trees. Ornamental and/or native shrubs may be present, usually with less than 50 percent cover. The groundcover is maintained by mowing and broadleaf herbicide application."



Key to Photographs

TWO BRIDGES LSRD

Figure 9-3

Looking north at paved road/path ecological community and street trees planted in tree pits along Clinton Street **1**

Looking west from Rutgers Slip Open Space to urban structure exterior ecological community adjacent to 82 Rutgers Slip **2**

Looking west at urban vacant lot ecological community on Site 6A from along Clinton Street **3**

Looking south at mowed lawn with trees ecological community along demapped Jefferson Street **4**

Natural Resources Photographs

Appendix H, Table H-1, lists the vegetation observed in the study area during the April 12, 2017 reconnaissance investigation.

WILDLIFE

Although the study area is near the East River, the natural habitat available to terrestrial wildlife within the study area is limited. The majority of the study area comprises developed areas including buildings, asphalt, and maintained lawns. 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.

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 10 species as confirmed or probable/possible breeders in the survey block where the study area is located (Block 5850A) (see **Appendix H**, Table H-2). The three square miles of survey blocks span different habitat types and larger, less disturbed habitats than what is present within the study area. As such, only a subset of these species is considered to have the potential to breed in the study area, which 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. Rock pigeon and European starling were observed during the April 12, 2017, reconnaissance investigation.

Mammals

Habitat for mammals is limited within the study area, and is likely to be used by urban-adapted species. These include raccoon (*Procyon lotor*), Norway rat (*Rattus norvegicus*), gray squirrel (*Sciurus carolinensis*), and domestic cat (*Felis catus*). No mammals were observed during the April 12, 2017, reconnaissance investigation.

Reptiles and Amphibians

The study area consists mainly of lots covered by buildings, asphalt, and maintained lawns with roadside vegetation. Absent suitable habitat, no reptiles or amphibians are considered to have the potential to occur within the study area. No reptile or amphibian species were observed during the April 12, 2017 reconnaissance.

THREATENED, ENDANGERED, AND SPECIAL CONCERN SPECIES AND SIGNIFICANT NATURAL COMMUNITIES

The USFWS IPaC system (2017) did not identify any federally listed species with the potential to occur within the study area. In a letter dated March 17, 2017, NYNHP identified peregrine falcon (*Falco peregrinus*; endangered) as the only state-listed species with the potential to occur within the study area (area within one-half mile of the Two Bridges LSRD boundary).

PEREGRINE FALCON

The peregrine falcon is a state-listed endangered species. Peregrine falcon populations in New York have grown dramatically since the 1980s. Peregrine falcons nest on cliff ledges, man-made

platforms, bridges, and other tall, artificial structures. In New York City, nesting is almost exclusively atop bridge towers and buildings (DEC 2011). The project sites do not provide suitable nesting habitat, but peregrine falcons nesting elsewhere may hunt for prey in the study area and in the surrounding area, particularly the East River. Peregrine falcons primarily feed on birds, particularly waterfowl (White et al. 2002).

D. FUTURE WITHOUT THE PROPOSED PROJECTS

In the future without the proposed projects (No Action condition), the study area is assumed to remain unchanged from existing conditions.

E. FUTURE WITH THE PROPOSED PROJECTS

FLOODPLAINS

As discussed under "Existing Conditions," the majority of the study area—specifically the southern portion—is within either the 100-year or 500-year floodplain. Construction of the proposed projects would comply with applicable New York City Building Codes and FEMA requirements regarding non-residential and residential structures within the 100-year floodplain and would incorporate sea level rise resilience measures into the design of building structures in order to minimize losses due to flooding. New York City is affected by local flooding (e.g., flooding of inland portions of the City from short-term, high-intensity rain events in areas with poor drainage), and coastal flooding (e.g., long and short wave surges that affect the City's shorelines along the Atlantic Ocean and tidally influenced rivers and straights such as the Hudson River, Harlem River, and East River). Because coastal flooding is controlled by astronomic tides and meteorological forces (e.g., nor'easters and hurricanes) and is unaffected by occupancy of the floodplain, the proposed projects would not adversely affect the floodplain and would not result in increased coastal flooding within or adjacent to the study area.

GROUNDWATER

As discussed under "Existing Conditions," groundwater in Manhattan is not used as a source of potable water, thus the proposed projects would not have the potential to affect drinking water supplies.

A hazardous materials assessment identified potential historical and present sources of contamination on the project sites (see Chapter 10, "Hazardous Materials"). Therefore, it is anticipated that further environmental investigation would be required prior to development.

The proposed below-grade parking at Site 5 would have the potential to modify groundwater flow patterns in the immediate vicinity of the walls (i.e., groundwater would be expected to flow around the below-grade structure), but the overall direction of groundwater flow would not be adversely affected. In addition, operation of the below-grade parking structure for Site 5 and any stormwater detention systems would not adversely impact groundwater.

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

Therefore, the proposed projects would not have the potential to adversely affect groundwater.

AQUATIC RESOURCES

As discussed in Chapter 6, "Shadows," on the May 6/August 6 analysis day, incremental shadow from all three proposed buildings would fall on the surface of the East River southeast of the project sites at 4:55 PM and remain for the final 23 minutes of the analysis day (until 5:18 PM).

On the June 21 analysis day, incremental shadow from the proposed Site 5 and Site 6A buildings would fall on the East River surface southwest of the project sites at the start of the analysis day at 5:57 AM and move clockwise and north until exiting at 6:20 AM. Approaching the end of the analysis day, incremental shadow from all three proposed buildings would move onto the river surface southeast of the project sites at 5:00 PM and move over the East River in a southeastward direction until the end of the analysis day at 6:01 PM.

No incremental shadow would occur on the East River on any other analysis day.

The current flows swiftly in the East River and would move phytoplankton quickly through the shaded areas. Therefore, project-generated shadows would not be expected to affect primary productivity. The areas that receive the longest durations of new shadow would continue to receive many hours of direct sunlight because there are no intervening structures to the south. Therefore, incremental shadows from the proposed projects would not significantly affect aquatic resources (plankton or fish) in these areas of the East River. Consequently, project-generated shadows would not result in any significant adverse impacts to aquatic biota of the East River.

TERRESTRIAL RESOURCES

ECOLOGICAL COMMUNITIES

As discussed under "Existing Conditions," ecological communities within the study area are limited to mowed lawns with trees, urban structure exteriors, urban vacant lots, and paved road/path communities. These ecological communities, in addition to being common throughout the region, are defined by human disturbance and provide limited habitat value to wildlife in the area. Construction of the proposed projects would result in disturbance to vegetated ecological communities common to the urban environment. Construction and operation of the proposed projects may require temporary or permanent removal of street trees and other trees. At this time, no street tree removals are anticipated to be required for Site 5; existing street trees on Rutgers Slip adjacent to this site would be protected during construction. It is anticipated that two street trees on Rutgers Slip may be required to be temporarily removed during construction for the Site 4 (4A/4B) project. For the Site 6A project, it is possible that up to six street trees on Clinton Street would be replaced with marcescent trees in the With Action condition, to deflect and disperse wind gusts along that street (see Chapter 8, "Urban Design and Visual Resources"). In addition, the Site 4 (4A/4B) project would plant trees as required by NYC code and NYC Parks.

There are over 100 trees planted within the study area. Street tree replacement protocols would result in the replacement and addition of any street trees lost due to construction. All work would be performed in compliance with Local Law 3 of 2010 and NYC Parks' Tree Protection Protocol, to minimize potential adverse impacts. All required replacement and/or restitution for removed trees would be provided in compliance with Local Law 3 and Chapter 5 of Title 56 of the Rules of the City of New York. Further, the proposed projects would include approximately 22,779 sf of new open space—including both private and publicly accessible open space—and

approximately 80,020 sf of existing private open space that would be altered with new amenities, including landscaping and open areas that would contain new trees and other plantings and increased permeable surfaces (see **Figure 9-5**). These project components would have the potential to provide new habitat for wildlife currently found within and adjacent to the study area.

Therefore, the proposed actions would not result in significant adverse impacts to ecological communities.

WILDLIFE

Construction of the proposed projects would not have significant adverse impacts to wildlife~~, at either the individual or population level.~~ Only urban-adapted, generalist species can tolerate the highly degraded environments and high levels of human activity currently present within the study area. As discussed above, terrestrial wildlife habitats within the study area are presently limited to mowed lawns with trees, urban structure exteriors, urban vacant lots, and paved road/path communities in a highly urbanized setting. Loss of some of this habitat may adversely affect individual wildlife unable to find suitable available habitat in the vicinity of the study area, however, the potential loss of individuals of these common species would not result in significant adverse impact to populations of these species within the New York City metropolitan region. In addition, construction activities would not eliminate any high quality or valuable habitats for wildlife. Further, as described above, the proposed projects would include approximately 22,779 sf of new private and publicly accessible open space and approximately 80,020 sf of existing private open space that would be altered with new amenities, including landscaping and open areas that would contain new trees and other plantings and increased permeable surfaces. These project components would have the potential to provide new habitat for wildlife currently found within the study area.

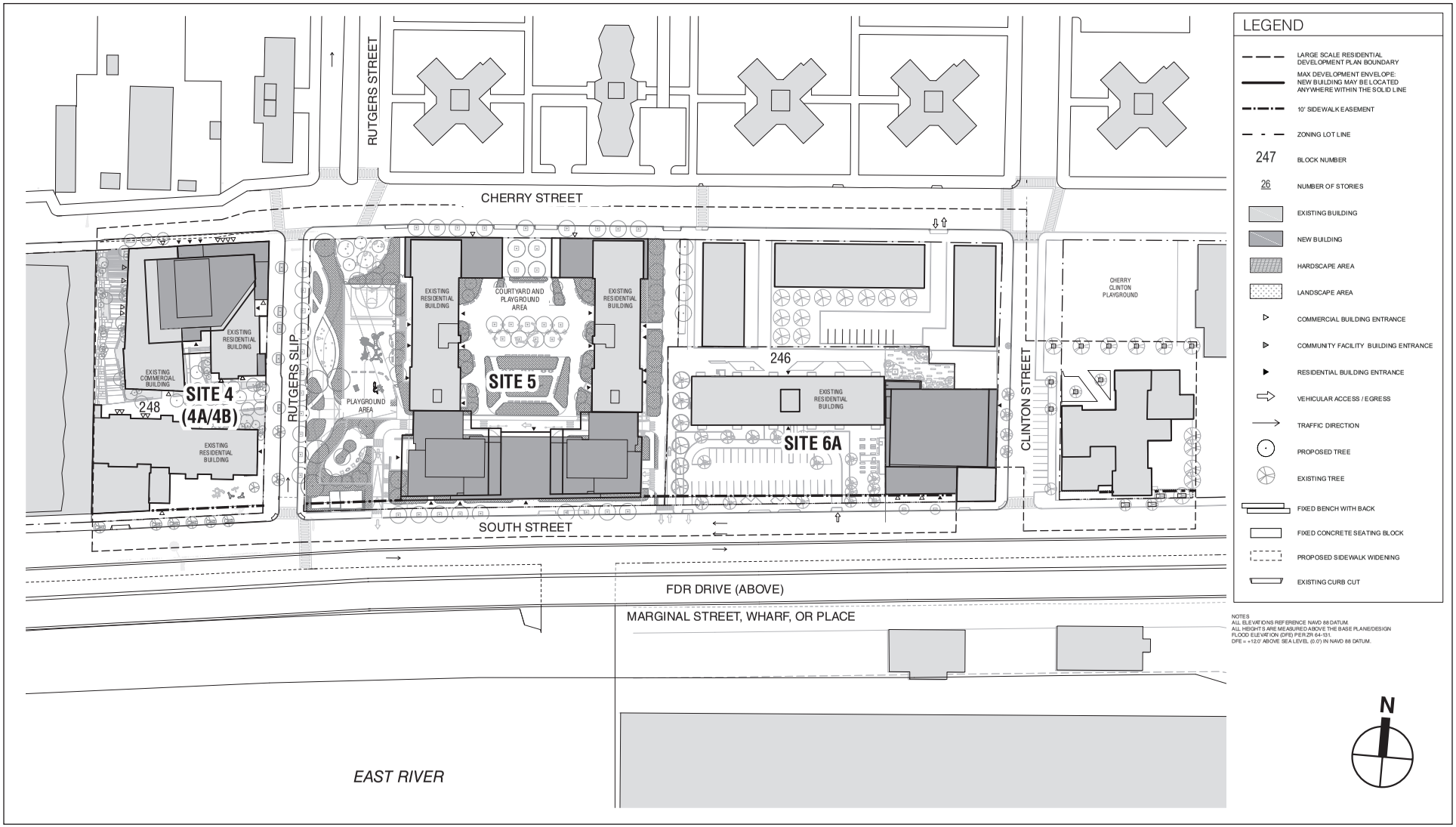
Indirect impacts to wildlife due to construction noise would be minimal as urban-tolerant species are acclimated to the increased noise of an urban environment. As disturbance from construction activities would be temporary, any wildlife individuals that may be displaced from the study area during project construction would be expected to easily move to alternative habitat.

Bird Collisions

Nighttime Collisions with Buildings

In addition to lighting and weather conditions, bird collision risk is highly dependent on structure height. For example, several studies have found bird mortality at communication towers taller than 300 meters (984 feet) to be significantly greater than mortality at towers that are less than 150 meters (492 feet) tall (Longcore et al. 2008). Most birds migrate at altitudes of 200–750 meters (656–2,461 feet; Able 1970, Mabee et al. 2006) and uncommonly fly below 90 meters (295 feet) during clear weather (Mabee and Cooper 2004). The heights of the three buildings range from 730 to 1,008 feet. Therefore, the buildings would intersect the strata of airspace in which migrating birds most commonly fly, resulting in increased risk of bird collision during the spring and fall migration periods.

Artificial lighting can disorient night-migrating birds and result in collisions with tall structures, particularly in foggy conditions and during low cloud cover when birds migrate at lower altitudes (Gauthreaux and Belser 2006; Longcore et al. 2008; Gehring et al. 2011). Thus, light emitted from the proposed buildings could impact birds migrating at night (primarily songbirds). Collisions with structures, however, are highly dependent on lighting characteristics. Per Federal



Source: SHoP Architects PC

NOTES:
CERTAIN ELEMENTS OF BUILDING DESIGN, SUCH AS THE MAXIMUM BUILDING ENVELOPE, WILL BE CONTROLLED UNDER THE PROPOSED MINOR MODIFICATIONS TO THE TWO BRIDGES LSRD APPROVALS.

OPEN SPACE DELINEATIONS AS SHOWN ARE APPROXIMATE.

0 200 FEET

Proposed Site Plan
All Projects

Figure 9-5

Aviation Administration (FAA) regulations, the proposed buildings will be marked with obstruction beacons, and the FAA recommends the uses of red lights for such beacons in urban areas (FAA Advisory Circular 70/7460-1K, FAA Advisory Circular 70/7460-1L). Flashing, rather than steady lights, are less detrimental to birds (Gehring et al. 2009), with the optimal flash rate of 27 to 33 flashes per minute (Patterson 2012). The FAA also recently issued a recommendation to use LEDs in place of traditional incandescent bulbs for flashing red obstruction lights to further reduce bird disorientation and collision risk, and such lights would be used on the three buildings.

Nighttime collisions of migratory birds with illuminated city skyscrapers have been well publicized, but the reality is that collisions with buildings at night are relatively rare and are largely limited to sporadic episodes of mass mortality that can occur with the right mix of extremely poor weather conditions and particularly disorienting lighting characteristics (DeCandido and Allen 2006). Nighttime collisions with the proposed buildings would likely be a similarly rare occurrence and the proposed projects would not represent a significant nighttime collision hazard to ~~have no significant impact on~~ migratory birds.

Daytime Collisions with Buildings

It is estimated that up to 1 billion birds are killed by building collisions every year in the United States (Loss et al. 2014). Despite popular opinion that most building collisions occur at the tops of tall buildings during nocturnal migration, the reality is that the overwhelming majority of building collisions, including in New York City (Gelb and Delacretaz 2006, 2009; Klem et al. 2009), occur during the daytime and near ground level when lower-story windows reflect images of nearby trees and other vegetation (Loss et al. 2014). The potential for daytime window collisions at the proposed buildings would ~~therefore~~ depend on the architecture, and the amount, location, and orientation of reflective glass, ~~coverage of the buildings~~ as well as the location of landscaping adjacent to any reflective glass surfaces located within the first two stories ~~presence of nearby vegetation~~ (Hager et al. 2008; Gelb and Delacretaz 2009; Klem et al. 2009; Sheppard and Philips 2015). To reduce the likelihood of daytime bird collisions, the proposed projects would consider design features within the first two stories, such as reducing the proportion of reflective glass to other building materials, using low reflectivity glass for vertically oriented windows, and fritting glass with dots or other shapes and patterns to further reduce reflectivity as well as transparency to enable birds to recognize glass as a solid object (Sheppard and Philips 2015).~~as the use of patterned or fritted glass on the first two stories in places where there are trees adjacent to the buildings.~~ Given the low quality habitat present within the study area, non-native European starlings, house sparrows, and rock pigeons are expected to be the most abundant birds in the area and these species seldom collide with windows relative to migrants (O'Connell 2001, Sloan 2007). However, it should be noted that even minimal amounts of vegetation can attract migrating birds and create conditions under which collisions with reflective glass can occur (Gelb and Delacretaz 2006, 2009; Klem et al. 2009). Therefore, where glass materials are present within the first two stories that could reflect landscaping vegetation, vegetation would be located far enough away from buildings to not be clearly reflected by glass, or close enough (e.g., within three feet[6] of buildings) such that birds would not be capable of attaining sufficient momentum to result in harmful collisions if they were to fly towards the buildings from that vegetation (Klem et al. 2004). With these measures in place, the proposed projects would not represent a significant collision hazard to resident or migratory birds.

[6] http://www.nycaudubon.org/pdf/BirdSafeBuildingGuidelines.pdf

Overall, the proposed projects would not have significant adverse impacts to wildlife. ~~at the individual or population level.~~

THREATENED, ENDANGERED, AND SPECIAL CONCERN SPECIES AND SIGNIFICANT NATURAL COMMUNITIES

As discussed under "Existing Conditions," the only federally or state-listed endangered, threatened, and special concern species, or significant natural communities with the potential to occur or are known to occur within the study area is the peregrine falcon. The proposed projects would not affect the availability of suitable habitat or prey within for peregrine falcons the study area. In addition, construction activities for the proposed projects would not occur within the immediate vicinity of peregrine falcon nests. Thus, the proposed projects would not impact peregrine falcons at the individual or population level. Therefore, the proposed projects would not have significant adverse impacts to threatened, endangered, and special concern species or significant natural communities.

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