

A. INTRODUCTION

An assessment of natural resources is conducted when a natural resource is present on or near a building site and the proposed project may involve the direct or indirect disturbance of that resource. The 2014 *New York City Environmental Quality Review (CEQR) Technical Manual* defines natural resources 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.”

Under CEQR, a natural resources assessment considers species in the context of the surrounding environment, habitat, or ecosystem and examines a project's potential to impact those resources.

As described in Chapter 1, “Project Description,” the proposed project would result in a new building, the Richard Gilder Center for Science, Education, and Innovation (the Gilder Center) in a 105-foot-tall (five stories above grade; taking into account mechanical and elevator bulkheads, a portion of the rooftop would reach 115 feet) addition to the American Museum of Natural History (AMNH or the Museum), with a mix of glass and granite façade treatments. Chapter 15, “Construction,” considers the potential impacts from construction of the proposed project on natural resources within Theodore Roosevelt Park. This chapter examines the potential impacts from the proposed project on natural resources near the project site, which is located in Theodore Roosevelt Park on Manhattan’s Upper West Side. A natural resources assessment includes:

- The regulatory programs that protect wildlife, threatened or endangered species, or other natural resources within the study area;
- The current condition of natural resources within the project area, including groundwater, terrestrial biota, and threatened or endangered species and species of special concern;
- Natural resources conditions in the future without the proposed project (the No Action condition);
- The potential impacts of the proposed project on natural resources (the With Action condition); and
- The measures that would be developed, as necessary, to mitigate and/or reduce any of the proposed project’s potential significant adverse effects on natural resources.

PRINCIPAL CONCLUSIONS

Construction of the proposed project would result in disturbance of “mowed lawn with trees”¹, “urban structure exterior”² habitat, and “paved road/path”³ communities that provide limited habitat to wildlife species common to urban areas. While the loss of this habitat area may displace individual wildlife to suitable available habitat in the vicinity of the project area, the displacement of some individuals of common urban species would not result in significant adverse impact to populations of these species within the New York City metropolitan region. The new building would incorporate design features that are recommended in the bird-safe building guidelines developed by NYC Audubon and others, including fritted glass, to deter daytime bird collisions. The new building would have a maximum height of 115 feet (with mechanical and elevator bulkheads), similar to that of the existing AMNH buildings, and would be far below building and other artificial structure heights (650 to 2,500 feet) associated with nighttime bird collisions. Thus, the new building is not expected to contribute to increased bird collision rates within the study area. Three planted willow oak (*Quercus phellos*) are to be removed during construction of the new building, however these individuals are not part of a natural population and do not constitute one of the “five or fewer sites or very few remaining individuals” of this species in New York State as is intended by the New York Natural Heritage Program (NYNHP) “S1” rank. Therefore the removal of these trees would not be considered a significant adverse impact to protected willow oak populations. In addition, landscaping and replacement and/or restitution for removed trees in compliance with Local Law 3 and Chapter 5 of Title 56 of the Rules of the City of New York would prevent adverse significant impacts to natural resources.

B. EFFECTS ASSESSMENT

METHODOLOGY

The Museum is located within, and bounded by, Theodore Roosevelt Park, on the 765,784-square foot (17.58-acre) superblock formed by West 81st Street, West 77th Street, Central Park West, and Columbus Avenue. Outside of the Museum complex, Theodore Roosevelt Park consists of 430,372 square feet (9.88 acres) of maintained parkland, surrounded by residential and commercial buildings and paved roads. The below-grade footprint of the Gilder Center would be 35,307 square feet (approximately 0.81 acres) for new construction and 14,222 square

¹ Edinger et al. (2014) defines the mowed lawn with trees 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 cover 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.”

² Edinger et al. (2014) defines the urban structure exterior community as “the exterior surfaces of metal, wood, or concrete structures (such as commercial buildings, apartment buildings, hours, 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.”

³ Edinger et al. (2014) defines the paved road/path 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.”

feet (approximately 0.33 acres) for renovated space and the at-grade footprint would be 43,691 square feet (approximately 1.00 acres). Of the at-grade footprint, 11,600 square feet (approximately 0.27 acres) would be outside the existing built area of the Museum. The proposed project would also include improvements to approximately 75,000 square feet (approximately 1.72 acres) of adjacent public open space. The proposed project would be located in a highly developed urban area with limited natural resources; thus the study area for natural resources site reconnaissance investigations was determined to be Theodore Roosevelt Park. Terrestrial natural resources were evaluated within the study area. Threatened, endangered, and special concern species and significant natural communities were evaluated for within the project site and a distance of 0.5 miles from the project site. Because there are no waterbodies, wetlands, or floodplains within the study area and the proposed project has no potential to adversely affect such resources outside the study area, water quality, aquatic resources, wetlands, and floodplains are not included in this assessment.

Existing conditions for natural resources within the study area were summarized from:

- Existing information identified in literature and obtained from governmental and nongovernmental sources, such as the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps and Information for Planning and Conservation system (IPaC) list of federally threatened and endangered species in New York County (<http://ecos.fws.gov/ipac>); New York State Department of Environmental Conservation (NYSDEC) Herp Atlas Project (1990-1999) and Breeding Bird Atlas (2000-2005); and Federal Emergency Management Agency (FEMA) preliminary Flood Insurance Rate Maps (FIRMs).
- Responses to requests for information on rare, threatened, or endangered species in the vicinity of the project site from the NYNHP dated March 9, 2016 (see **Appendix B**).
- Observations made during site reconnaissance investigations conducted within the study area on February 22, 2016, and August 12, 2016, by a professional ecologist.

REGULATORY CONTEXT

The following sections identify the federal and state legislation and regulatory programs with respect to natural resources that would apply to the proposed project.

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. 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.

Migratory Bird Treaty Act [50 CFR 10, 20, 21, Executive Order 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 (New York Environmental Conservation Law, 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.

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.

EXISTING CONDITIONS

GROUNDWATER

As discussed in Chapter 8, "Hazardous Materials," groundwater is first encountered at approximately 20 to 30 feet below grade. Groundwater within the study area is most likely to flow toward the Hudson River based on the local topography. Groundwater in Manhattan is not used as a source of potable water (the municipal water supply uses upstate reservoirs).

TERRESTRIAL RESOURCES

Ecological Communities

The study area is located within the urban landscape of Manhattan's Upper West Side neighborhood. Consequently, the ecological communities in the study area consist of manicured lawns, paved city streets, and exteriors of urban buildings that would fall under the "Terrestrial Cultural" communities defined by Edinger et al. (2014), in the mowed lawn with trees community. Dominant tree species within the mowed lawn with trees community include London planetree (*Platanus acerfolia*), pin oak (*Quercus palustris*), willow oak, English elm (*Ulmus procera*), and ginkgo (*Ginkgo biloba*). Ornamental shrubs common within this community are euonymus (*Euonymus* sp), hydrangea (*Hydrangea* sp), and yew (*Taxus* sp). The lawn is dominated by Kentucky bluegrass (*Poa pratensis*) with pachysandra (*Pachysandra* sp) and hostas (*Hosta* sp) common throughout the community.

The exteriors of the urban buildings fall under the urban structure exterior community. The only plant observed growing in the urban structure exterior community during the February 22, 2016, and August 12, 2016, reconnaissance investigations was Virginia creeper (*Parthenocissus quinquefolia*).

The paved driveways and walking paths located within the study area fall under the paved road/path community. The paved road/path community within the study area is largely unvegetated, except for a few ruderal species growing in cracks in the asphalt or in between paving stones.

Table 7-1, Appendix B lists the plant species observed within the site and study area during the February 22, 2016, and August 12, 2016, reconnaissance investigations.

Wildlife

Natural habitats available to terrestrial wildlife within the study area are limited to parkland (Theodore Roosevelt Park) adjacent to urban institutional and residential/commercial land use and areas influenced by human disturbance. Consequently, these habitats support mostly urban-adapted, generalist species that can tolerate high levels of human activity.

Birds

The Breeding Bird Atlas is a periodic census of the distribution of breeding birds across New York State. The most recent census was conducted from 2000-2005 and documented 46 species as confirmed or probable/possible breeders in the survey blocks in which the study area is located (Blocks 5851A and 5851C) (see **Table 7-2 in Appendix B**). The 9 square mile survey blocks span different habitat types and larger, less disturbed habitats than what is present within the study area, and as such, only a subset of these species are considered to have the potential to breed in the vicinity of the project site. The bird species that are considered most likely to breed within the study area are the non-native European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), and rock pigeon (*Columbia livia*). These are disturbance-tolerant, generalist species that can thrive in heavily developed, urban environments. Bird species observed during the February 22, 2016, and August 12, 2016, reconnaissance investigations include rock pigeon, house sparrow, European starling, blue jay (*Cyanocitta cristata*), and American robin (*Turdus migratorius*).

Red-tailed hawk (*Buteo jamaicensis*) is New York State's most common hawk species (Loucks 1999), and along with over 800 other bird species, is legally protected under the Migratory Bird Treaty Act of 1918. Red-tailed hawks frequently nest in New York City parks, including Central Park, and on urban structures (NYC Audubon 2008). Red-tailed hawks prey on small mammals and birds (Cornell University 2015).

Mammals

Habitat for mammals is limited within the site, and is likely to be used only by urban-adapted species. These include the raccoon (*Procyon lotor*), Norway rat (*Rattus norvegicus*), gray squirrel (*Sciurus carolinensis*) and domestic/feral cat (*Felis catus*). The Norway rat population of Theodore Roosevelt Park has been at a problematic level requiring the use of Integrated Pest Management to control the population (e.g., special garbage bins, garbage removal, and cleaning to remove food sources, ensuring proper drainage to remove water sources, and collapsing burrows or using irritants to remove shelters). The only mammal species observed in the study area during the February 22, 2016, and August 12, 2016, reconnaissance investigations was gray squirrel.

Reptiles and Amphibians

The NYSDEC Herp Atlas Project identified 17 species of reptiles and amphibians occurring within the atlas block that covers the study area (Central Park USGS quadrangle) (see **Table 7-3** in **Appendix B**). The atlas block spans a large geographic area that includes multiple different habitat types that are not present in or near the project site. The study area mainly consists of lots covered by buildings and asphalt in a heavily urbanized and institutional/residential/commercial setting. Absent a suitable habitat, no reptiles or amphibians are considered to have the potential to occur in the project site and no reptiles or amphibians were observed during the February 22, 2016, and August 12, 2016, reconnaissance investigations.

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

There are no federally-listed species indicated by the USFWS IPaC system as occurring within the study area.

A response from NYNHP to requests for information on rare, threatened, and endangered species, and significant natural communities within a half mile of the site, dated March 9, 2016, indicated no records of rare, state-listed animals or plants or significant natural communities within the study area.

The federally- or state-listed species of birds, reptiles, or amphibians documented by the 2000-2005 Breeding Bird Atlas and Herp Atlas Projects in the respective census blocks in which the proposed project would be located are the eastern box turtle (*Terrapene carolina*; special concern) and peregrine falcon (*Falco peregrinus*; endangered). However, as discussed under “Reptiles and Amphibians,” due to lack of appropriate habitat in the project area, the eastern box turtle is not considered to have the potential to occur within the project area. Peregrine falcons do not nest on or near AMNH and would not be expected to otherwise occur near the project site.

The only federally- or state-listed species observed within the project area or study area during the February 22, 2016, and August 12, 2016, reconnaissance investigations was willow oak (endangered).

Peregrine Falcon

The peregrine falcon is ranked as “S3B” by NYNHP, indicating that there are typically 21 to 100 breeding occurrences or limited breeding acreage in the state. Currently, New York City is expected to have the largest urban population of peregrine falcons within the state (DEP 2011). Peregrine falcons often nest on ledges or holes on the faces of rocky cliffs but will nest on human-made structures such as bridges and tall buildings, especially near or in urban areas. Although the peregrine falcon is known to occur within New York City, they do not nest within the project site. In addition, no peregrine falcons were observed during the February 22, 2016, and August 12, 2016, reconnaissance investigations.

Willow Oak

While naturally occurring willow oak is ranked as “S1” by NYNHP, willow oak is a commonly planted tree in New York City (the New York City street tree map identifies 3,177 willow oaks planted as street trees within the five boroughs). For naturally occurring trees, the “S1” rank indicates that they are critically imperiled in the state because of extreme rarity (i.e., five or fewer sites or very few remaining individuals) (NYNHP 2015). However, according to the *New*

York City, New York Municipal Forest Resource Analysis (Peper et al. 2007), planted willow oak trees do not constitute one of the five or fewer sites or very few remaining individuals of this species in New York State as is intended by the NYNHP “S1” rank. Thus, the willow oak individuals within the study area are not considered part of a critically imperiled population. Habitat for this species is mostly on the coastal plain in moist soils or swamps (Gleason and Cronquist 1963). Planted Willow oaks were observed within the project site during the February 22, 2016, reconnaissance investigation. Except as planted trees, due to the urbanized nature and absence of moist soils, this species would not occur within the project area.

THE FUTURE WITHOUT THE PROPOSED PROJECT

In the No Action condition, the project site is assumed to remain in its current condition. The portion of the Park within and adjacent to the building site is anticipated to continue to be utilized as a park. Norway rat populations would continue to be controlled using Integrated Pest Management techniques thereby substantially diminishing the need for the use of pesticides. Therefore, natural resources under the No Action condition are expected to remain similar to the existing conditions within the project site and study area.

PROBABLE IMPACTS OF THE PROPOSED PROJECT

This section assesses the probable impacts of the proposed project on natural resources once it is built and operational. Chapter 15, “Construction,” examines the potential impacts from construction of the proposed project on natural resources within Theodore Roosevelt Park.

GROUNDWATER

As discussed above, under “Existing Conditions,” groundwater within Manhattan is not used as a source of potable water. Therefore, construction and operation of the proposed project would not result in significant adverse impacts to groundwater.

TERRESTRIAL RESOURCES

Ecological Communities

As discussed above, under “Existing Conditions,” ecological communities within the study area are limited to mowed lawn with trees, urban structure exterior, and paved road/path communities. These ecological communities, in addition to being common throughout the region, are defined by human disturbance. These ecological communities provide limited habitat value to wildlife in the area. Construction of the proposed project would result in approximately 75,000 square feet (approximately 1.72 acres) of disturbance to vegetated ecological communities. In addition, it is currently expected that the proposed project would directly affect seven canopy trees in Theodore Roosevelt Park that would be removed and one understory tree that would be relocated. The trees to be removed range from 19 to 42 inches diameter at breast height (dbh) and include four pin oak and three willow oak. However, all work would be performed in compliance with Local Law 3 of 2010 and NYC Parks’ Tree Protection Protocol, to minimize potential adverse impacts. Any trees that are removed and not transplanted would be replaced, consistent with NYC Parks rules and regulations, which would include six new canopy trees and thirteen new understory trees that would be planted post-construction as part of the landscape plan for the western portion of the Park (see Figure 1-12 for reference). 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. All tree work would be carried out under the supervision of a certified arborist, following a tree protection plan approved by NYC Parks' Manhattan Borough Forester. The tree protection plan would include measures to protect both the above ground and below ground structure of trees within Theodore Roosevelt Park. Therefore, the construction and operation of the proposed project would not result in significant adverse impacts to vegetation and ecological communities.

Wildlife

Terrestrial wildlife habitat within the study area is presently limited to a mowed lawn with trees, urban structure exterior, and paved road/path communities in a highly urbanized setting. Therefore, construction activities would not eliminate any high quality or valuable habitat for wildlife, and would not adversely affect wildlife within the area. Disturbance from construction activities would be temporary. Any individuals that may be displaced from the site during project construction would be expected to move to alternative habitat.

The proposed project would not present a collision hazard to resident or migratory birds. The overwhelming majority of bird-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 proposed project will implement multiple measures that are recommended by NYC Audubon (NYCA 2007), the American Bird Conservancy (Sheppard and Phillips 2011), and several others (e.g., Klem et al. 2009, Audubon Minnesota 2010, SFPD 2011) for effectively reducing the likelihood of daytime collisions of birds with windows. These measures include (1) reduced usage of glass relative to other building materials on the building's façade, (2) usage of low reflectivity glass, (3) fritting of glass surfaces, and (4) minimization of after-hour indoor lighting when the building is not in use.

Reducing the proportion of glass to other building materials reduces bird collisions simply by limiting the total amount of space or surface area where the potential for collisions exists (Klem et al. 2009). The proposed building has been designed to reduce glass coverage to approximately 35 percent of the west façade. Low reflectivity glass reduces the clarity and strength of the images of vegetation and sky that are often reflected by windows and the primary cause of collisions. A study in New York City found window reflectivity to have a strong effect on bird mortality risk, with high reflectivity glass causing significantly more collisions than low reflectivity glass (Klem et al. 2009). The proposed building has been designed to use low reflectivity glass for all vertically oriented windows and other new glass surfaces. Fritting of glass with dots or other shapes and patterns further reduces reflectivity as well as transparency, and is a highly effective way of creating "visual noise" that enables birds to recognize the glass as a solid object. In glazed areas where there is potential for bird collisions, the proposed building will use fritted glass and the coverage of the markings will meet or exceed the recommended minimum density of 2 inches by 4 inches (NYCA 2007, Sheppard and Phillips 2011, Klem 2006). Also similar to lighting operations in other AMNH buildings, when the building is not in use during late hours, non-essential lighting would be turned off. This would limit potential disorientation and/or attraction of migrating birds (NYCA 2007, Audubon Minnesota 2011). With these measures in place, the proposed building will not represent a significant collision hazard to resident or migratory birds.

The Gilder Center would have a height of 105 feet (up to 115 feet with mechanical and elevator bulkheads), similar to that of the existing AMNH buildings, and would be far below building and other artificial structure heights (650 to 2,500 feet) associated with documented nighttime

collisions of birds (Able 1970, Kerlinger 2000, Longcore et al. 2008, Mabee and Cooper 2004, Mabee et al. 2006).

Integrated Pest Management techniques would be utilized by NYC Parks in Theodore Roosevelt Park to control Norway rat populations, thus diminishing the need for the use of pesticides. Methods to control the rat population include use of special garbage bins, garbage removal, and cleaning to remove food sources; ensuring proper drainage throughout the park to remove water sources; and burrow harassment measures (e.g., collapsing burrows and use of irritants) to remove shelter.

Overall, construction and operation of the proposed project 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 federal- or state-listed endangered, threatened, and special concern species, or significant natural communities occurring within the study area is willow oak.

Willow Oak

Willow oaks were observed within the site during the February 22, 2016, and August 12, 2016, reconnaissance investigations. A total of three willow oaks, ranging from 19 to 20 inches dbh, would be removed during construction. The willow oaks observed were planted within Theodore Roosevelt Park and do not represent a natural population. Because willow oak is a commonly planted tree in New York City (Peper et al. 2007), these trees do not constitute one of the “five or fewer sites or very few remaining individuals” of this species in New York State as is intended by the NYNHP “S1” rank. Therefore the removal of these trees would not be considered a significant adverse impact to protected willow oak populations. In addition, a total of seventeen trees would be planted post-construction as part of the landscaping plan. Willow oaks would be considered in the landscaping plans to the extent that it is appropriate for the landscape plan.

Therefore, construction and operation of the proposed project would not have significant adverse impacts to threatened, endangered, and special concern species and significant natural communities. *