Appendix C.1
NATURAL RESOURCES DATA INVENTORY

A. DATA INVENTORY

Appendix C contains the supporting natural resources information for the EIS, and contains the following information:

Appendix C.2, "Protected Plants and Wildlife and Species of Interest for the Mid-Island Area" provides information on the endangered, threatened, special concern species important communities and essential fish habitat that have been reported within the Oakwood Beach, New Creek, and South Beach watersheds.

Appendix C.3, "Natural Resources Data Inventory of the Oakwood Beach Watershed," provides natural resources data specific for the Oakwood Beach watershed.

Appendix C.4, "Natural Resources Data Inventory of the New Creek Watershed," provides natural resources data to the New Creek watershed.

Appendix C.5, "Natural Resources Data Inventory of the South Beach Watershed," provides natural resources data to the South Beach watershed.

Appendix C.6, Natural Resources Reference and Cited Literature

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A. INTRODUCTION

A description of the endangered, threatened, and special concern plant and wildlife species and communities of the Mid Island area including the Oakwood Beach, New Creek, and South Beach watersheds is provided below. Also included are the essential fish habitat species for the Lower Bay. The discussion is organized by source.

Information on endangered, threatened, special concern, rare, and exploitably vulnerable species was obtained from the National Marine Fisheries Service (NMFS), NYSDEC through the New York Natural Heritage Program (NYNHP), the U.S. Fish and Wildlife Service (USFWS), DPR data, other literature sources, and field observations. Impacts presented in this DGEIS were determined based on observations, or the potential presence of such species at a BMP site or the potential for the appropriate habitat to be present at a BMP site. The potential for impacts was determined based on the potential for clearing and/or installation of a BMP or outfalls to Raritan Bay.

B. USFWS RECORDS

Shortnose sturgeon is a state-and federally endangered anadromous bottom-feeding fish that can be found throughout the Hudson River system. These fish spawn, develop, and overwinter well upriver of the Tappan Zee Bridge, and prefer colder, deeper waters for all lifestages. Shortnose sturgeon use the lower Hudson River when traveling to or from the upriver spawning, nursery and overwintering areas. However, the Hudson River below Tappan Zee is not considered optimal shortnose sturgeon habitat (Bain 2004). Although the sturgeon may transit the bay in the spawning season, it would not be expected in the near shore shallow waters of the Lower Bay where the Mid-Island outfalls are proposed.

C. NMFS RECORDS

MARINE TURTLES

Four species of marine turtles, all state- and federally listed, can be found seasonally in New York waters typically between May 1 and November 30 when the waters are warm. Marine turtle occurrences in the Harbor Estuary are typically as small juveniles. Nesting sites for marine turtles are typically in sandy habitats with sparse or moderate vegetation cover (USFWS 1997).

Kemp's ridley sea turtle (*Lepidochelys kempii*) is a state- and federally endangered species that is the most abundant state- and federally listed sea turtle that enters the Harbor Estuary. This species typically occurs as a juvenile within the Lower Bay (NMFS 2009). Females reach sexual maturity at about six years or older (NYSDEC 2011). Nesting is restricted to a stretch of beach near Rancho Nuevo, Tamaulipas, Mexico (NYSDEC 2011).

In the northeast, this species remains briefly in open ocean waters, and retreats to harbors and estuarine waters in the summer months (NMFS 2009). Although Kemp's ridley sea turtles have been recorded near Sandy Hook (USFWS 1997), this species is pelagic in nature, and would be expected only in the deeper waters of the Lower Bay. Thus, this species would not be expected in the vicinity of the proposed Mid-Island outfalls.

Loggerhead sea turtle (*Caretta caretta*) is a state-threatened and federally threatened turtle that, with the Kemp's ridley sea turtle, is one of the most abundant state- and federally listed sea turtles that enters the Harbor Estuary. In the northeast, this species remains briefly in open ocean waters, and retreats to harbors and estuarine waters in the summer months (NMFS 2009). This species reaches sexual maturity at about 10 to 15 years of age with most nesting occurring at beaches off of the Gulf of Mexico, southeastern United States, and Caribbean waters (NYSDEC 2011). Loggerhead turtles have been recorded near Sandy Hook (USFWS 1997). However, it would be unlikely for this species to use the beach in the vicinity of the proposed outfalls for nesting since nesting is uncommon in New York. In addition, this species is pelagic in nature, and be expected in the deeper waters of the Lower Bay, but would not be in the shallow waters in the vicinity of the proposed outfall sites. Thus, this species would not be expected in the vicinity of the proposed Mid-Island outfalls.

Green sea turtle (*Chelonia mydas*) is a state-threatened and federally threatened turtle that occasionally, when the waters are warm enough (June through October), occurs within the Harbor Estuary (NMFS 2009). This species prefers shallow waters of shoals, lagoons, estuaries, bays, and inlets with submerged aquatic vegetation. Nesting occurs is tropical waters that remain above 68 degrees Fahrenheit during the winter months (NYSDEC 2011). In the northeast, this species remains briefly in open ocean waters, and retreats to harbors and estuarine waters in the summer months (NMFS 2009). It would be unlikely for this species to use the project sites for nesting due to the cold climate and waters of New York. In addition, submerged aquatic vegetation beds are not present in the vicinity of the proposed outfalls. Thus, this species would not be likely to occur within the vicinity of the proposed outfall sites.

Leatherback sea turtle (*Dermochelys coriacea*) is a state- and federally endangered turtle that is usually restricted to warmer waters with higher salinity levels offshore, and would less likely be found inshore (USFWS 1997, NMFS 2009). Nesting takes place from the Caribbean up to mid-Atlantic coast waters, typically on high energy, coarse sand beaches that are subject to erosion and adjacent to deep waters. Thus, this species would not be expected to occur within the vicinity of the proposed outfall sites.

MARINE MAMMALS

The state- and federally endangered North Atlantic right whale (*Eubalaena glacialis*) and the humpback whale (*Megaptera novaeanglia*) occur in the offshore waters of New York on a seasonal basis (NMFS 2009). North Atlantic right whales occur from September 1 to March 31 and humpback whales occur from February to April and September to November. The state-and federally endangered Fin (*Balaenoptera physalus*) and Sperm (*Physter macrocephalus*) whales are also seasonally present, but typically in deep offshore waters (NMFS 2009). Sightings of these species within New York/New Jersey Harbor are relatively rare (USFWS 1997). Although marine mammals are known to occur in the waters of the New York Bight, and occasionally come into New York/New Jersey Harbor, they are extremely unlikely in the waters associated with the proposed outfall sites (NMFS 2009).

ESSENTIAL FISH HABITAT

Table C.2-1 lists the Essential Fish Habitat-designated species for the Lower New York Bay.

Table C.2-1
Essential Fish Habitat Designated Species for the Lower New York Bay

Species	Eggs	Larvae	Juveniles	Adults
Red hake *(Urophycis chuss)*	X	X	X	
Winter flounder *(Pleuronectes americanus)*	X	X	X	X
Windowpane flounder *(Scopthalmus aquosus)*	X	X	X	X
Atlantic sea herring *(Clupea harengus)*		X	X	X
Bluefish *(Pomatomus saltatrix)*			X	X
Atlantic butterfish *(Peprilus triacanthus)*		X	X	X
Atlantic mackerel *(Scomber scombrus)*			X	X
Summer flounder *(Paralicthys dentatus)*		X	X	X
Scup *(Stenotomus chrysops)*	X	X	X	X
Black sea bass *(Centropristus striata)*	n/a		X	X
King mackerel *(Scomberomorus cavalla)*	X	X	X	X
Spanish mackerel *(Scomberomorus maculatus)*	X	X	X	X
Cobia *(Rachycentron canadum)*	X	X	X	X
Clearnose skate (*Raja eglanteria*)			X	X
Little skate (*Leucoraja erinacea*)			X	X
Winter skate (*Leucoraja ocellata)*			X	X
Dusky shark *(Charcharinus obscurus)*		X[1]		
Sandbar shark *(Charcharinus plumbeus)*		X[1]		X

Notes:[1] Neither of these species have a free-swimming larval stage; rather they are live bearers that give birth to fully formed juveniles. For the purposes of this table, "larvae" for sand tiger and sandbar sharks refers to neonates and early juveniles.
Source: National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the internet at: http://www.nero.noaa.gov/hcd/STATES4/conn_li_ny/40307350.html and http://www.nero.noaa.gov/hcd/skateefhmaps.htm

D. NEW YORK NATURAL HERITAGE PROGRAM (NYNHP) RECORDS

ECOLOGICAL COMMUNITIES

SERPENTINE BARRENS

The NYNHP has identified the Serpentine Barrens as in the vicinity of the South Beach watershed. Edinger et. al. (2002) describes serpentine barrens as a grass-savanna community that occurs on shallow soils over outcrops of serpentine bedrock. In New York this community is known to occur on Staten Island, where the remnants are relatively disturbed. Serpentine barrens are dominated by little bluestem (*Schizachyrium scoparium*), panic grasses (such as *Panicum virgatum* and *P. philadelphicum*), Indian grass (*Sorghastrum nutans*), and poverty-grass (*Danthonia spicata*). Characteristic forbs include heath aster (*Aster ericoides*), calico aster (*A. lateriflorus*), small white snakeroot (*Eupatorium aromaticum*), old-field cinquefoil (*Potentilla simplex*), and green milkweed (*Asclepias viridiflora*). Trees and shrubs are scattered in the barrens. Characteristic woody plants are gray birch, black oak, sassafras, quaking aspen (*Populus tremuloides*), bayberry (*Myrica pensylvanica*), shining sumac, sawbrier, arrowwood, and blueberries. A characteristic butterfly is the arogos skipper (*Atrytone arogos arogos*) (Edinger et. al 2002).

The last recorded observation of serpentine barrens within the three watersheds indicates that the community is in fair to poor condition surrounded by extensive development (NYSDEC Natural Heritage Program, 2009). This community is there not expected at the proposed BMP locations nor was the "grass savanna" cover present at any of the upper watershed sites.

OAK-TULIP TREE FOREST

The NYNHP has identified the Oak-Tulip Tree Forest as in the vicinity of the three Mid-Island watersheds. Edinger et. al. (2002) describes the oak-tulip tree forest community as a "mesophytic hardwood forest community that occurs on moist, well-drained sites in southeastern New York. The dominant trees include a mix of oaks and tulip trees, American beech (*Fagus grandifolia)*, black birch (*Betula lenta*), and red maple (*Acer rubrum*). The subcanopy often includes flowering dogwood (*Cornus florida*), and common understory associates include witch hazel (*Hamamelis*), sassafras (*Sassafras albidum*), and lowbush blueberries. The herb layer is moderate to sparse and may include New York fern (*Thelytris noveboracensis*), white wood aster (*Eurybia divaricata*), and Solomon's plume (*Maianthemum racemosum*)." NYNHP identifies the oak-tulip tree forest as a special concern vegetative community ((NYSDEC Natural Heritage Program, 2009). It should be noted that Edinger et. al. (2002) lists the Staten Island Greenbelt as an example of the oak-tulip tree community type. Field observations of this community indicate that it is represented within Reed's Basket Willow Swamp Park, but none at other locations in the three watersheds.

WILDLIFE

BIRDS

Barn owl (*Tyto alba*) is a bird species that was included within database records from NYNHP (NYSDEC Natural Heritage Program, 2009). The barn owl is not protected as an endangered, threatened, or special concern species by the state, but has been ranked as "S3" by NYNHP indicating that there are typically 21 to 100 occurrences statewide. Habitat for barn owls is of open to partially open grasslands, marshes, and agricultural areas and often around human residents. As cavity-nesting birds, barn owls are known to occur in natural areas of dead trees as well as human-made structures such as large platforms of barns and silos and ledges, spaces, and crevices within the tops of homes and buildings. Foraging habitat includes grassy fields, wet meadows, and fresh and saltwater marshes (NYNHP 2009). Within New York, barn owls can be found throughout the year although they are difficult to locate because they rarely vocalize and they are nocturnal. Within New York City and Long Island, barn owls are most often found during the breeding season (NYNHP 2009). Therefore, this species has the potential to occur within the Mid-Island areas, particularly the coastal marshes for foraging and wooded areas for nesting. Since the proposed project would expand and diversify marsh habitats in the Mid-Island lower watershed, and would not impact nesting sites that are common for this species, it is not expected that the proposed project would adversely impact barn owls.

Osprey (*Pandion haliaetus*) is not a protected species, but is listed by the state as a species of special concern. In New York, osprey can be found along the coastline, and on lakes and rivers, but there are two main breeding populations, one on Long Island and the other in the Adirondack Mountains. The female lays one to four, but usually three, eggs in the spring in a large nest of sticks constructed at the top of a dead tree, but nesting platforms and other human-made platforms are also commonly used. The nest is often used year after year and tends to grow in size over time as more material is added before each nesting season. The young fledge at about

eight weeks of age and remain in the vicinity of the nest for about two months (NYSDEC 2010a). Osprey are typically in New York State from April to September (NYSDEC 2010b). It is potentially in the lower coastal areas of each of the Mid-Island watersheds.

Northern harrier is a state-listed threatened species. Northern harriers breed in marshes, grasslands, meadows and cultivated fields. Breeding in coastal areas is preferred, but inland areas are also used when coastal habitats are limited (NYSDEC 2010). Nests are weakly built of sticks and grass on the ground either in dense vegetation or in a slightly elevated area. The clutch averages 5 eggs. The young fledge in 30 to 41 days and remain near the nest, dependent on their parents for 3 to 4 weeks. Northern Harriers occur in New York throughout the year. During the breeding season, the best time to see Northern Harriers is May through June (NYNHP 2009). Based on the information provided in the Breeding Bird Atlas (none were observed during the spring or fall 2009/2010 field investigations) this species is potentially the in lower Mid-Island watersheds.

Cooper's hawk is listed by the state as a special concern species. Cooper's Hawks are found in woodland settings and travel through dense tree canopies at high speeds in pursuit of other birds. Although this species is more often in woodlands, in an urban setting it can be found in parks, neighborhoods, fields, yards, and within trees along busy tree-lined streets. The diet of the Cooper's Hawks is mostly of medium-sized birds such as European starling, mourning dove, rock pigeon, American robin, northern flicker, and quail, pheasants, grouse, and chickens. Occasionally, Cooper's Hawks rob nests and also eat chipmunks, mice, squirrels, and bats. Cooper's Hawks nests are often built in pines, oaks, Douglas-firs, beeches, spruces, among other species found in dense woods. Cooper's Hawks are known to occur in southern New York year around. Cooper's hawk was observed at BMP sites OB-1 and OB-3 during fall 2009 and spring 2010 site investigations.

Whip-poor-will is a state-listed special concern species that is potentially in the Oakwood Beach watershed based on the Breeding Bird Atlas (none were observed during the spring/fall 2009/2010 field investigations). It is named for its distinctive call and is more commonly heard than seen. During the day the whip-poor will roosts on the low limbs of trees where it is well-camouflaged (NYSDEC 2010). A clutch of two eggs is laid directly on leaf litter on the ground. Incubation is shared by both parents and lasts 19 to 21 days. The winter range of this species includes the southeastern United States and Central America. Whip-poor-will is potentially in the Mid-Island watersheds based on the Breeding Bird Atlas. However, it was not observed during the field investigations and given the types of habitats typically used by this species, it is not expected at the BMP locations.

DRAGONFLIES AND DAMSELFLIES

Needham's skimmer (*Libellula needhami*) is a dragonfly species that is not listed as an endangered, threatened, or special concern species by the state, but was included within database records for the New Creek and South Beach watersheds from NYNHP (NYSDEC Natural Heritage Program, 2009). The Needham's skimmer is ranked as "S2S3-Imperiled" by NYNHP indicating that there are typically 6 to 20 occurrences statewide and that it is rare in the state (usually 21-35 extant sites). This species is known to occur in coastal areas of brackish marshes, tidal rivers, ponds, and lakes (NYNHP 2009). Adults are largely terrestrial and occur in surrounding habitats, but tend to feed in marshes of coastal areas while larvae are found within the water (NYNHP 2009). Therefore, this species has the potential to occur within the lower New Creek and South Beach watersheds. Its last reported observation was 1997 along a creek

bordered by common reed in the South Beach Watershed. Improvements in coastal marsh habitats with the proposed project would be expected to improve habitats for this species, to the extent it is present in the watershed.

Rambur's forktail (*Ischnura ramburii*) is a damselfly species that is not listed as an endangered, threatened, or special concern species by the state, but was included within database records for the Oakwood Beach watershed furnished by NYNHP (NYSDEC Natural Heritage Program, 2009). The Rambur's forktail but has been ranked as "S2S3-Imperiled" by NYNHP indicating that there are typically 6 to 20 occurrences statewide and rare in the state (usually 21–35 extant sites). The last recorded observation of this species within the vicinity of the Oakwood Beach Watershed was before 1913 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the Mid Island area.

PLANTS

Purple milkweed *(Asclepias purpurascens)* is a plant species that is not listed as a protected plant in New York State, but was included within database records for the New Creek watershed from NYNHP (NYSDEC Natural Heritage Program, 2009). This plant has been ranked as "S2S3-Imperiled" by NYNHP indicating that there are typically 6 to 20 occurrences statewide and that it is rare in the state (usually 21–35 extant sites). Purple milkweed habitat includes dry (Garguillo 2007, Gleason and Cronquist 1963) to moist woods and shady woodland edges, (Garguillo 2007), dry fields and thickets, roadsides, shorelines, prairies, swamp forests, and alluvial woods (VandeWater Natural Resources Services 2003). This species flowers between the middle of June and the end of July; its fruiting period begins in early August and extends into the middle of October (Young 2008). Within the watershed, this plant is known to occur in a burned soil thicket with rough-stemmed goldenrod (*Solidago rugosa*), switch grass, and sumac species (NYSDEC Natural Heritage Program, 2009). Based on the wide-range of known preferred habitats, this species has the potential to occur in a number of habitats within the upper New Creek watershed, but was not observed during the field surveys, nor would it be expected in the disturbed areas of NC-1 through NC-5.

Green milkweed (*Asclepias viridiflora*) is a protected state-threatened plant that has been reported by the NYNHP in the New Creek watershed (along Todt Hill Road). It is known to occur within a variety of habitats including recently burned slopes on serpentine rock, serpentine grasslands, mowed golf course rough atop serpentine bedrock, open maritime grassland habitats on sandy soil, open limestone slopes within cedar glades, open rocky summit grasslands on diabase rock formations, open calcareous rocky summits, alkaline sandstone ridges within open cedar glades, old pastures with alkaline soils, open cedar glades with exposed sandstone, and dry shale slopes. Green milkweed can also occur in dry upland woods, prairies, and barrens, especially those with sandy soil (Gleason and Cronquist 1963). The flowering period for this species extends from the beginning of July to the end of August; its fruiting period starts at the beginning of August and extends to the end of October (Young 2008). These plants are known to occur at the edges of maintained grasslands within the watershed. Based on habitat preferences, this species has the potential to occur in a variety of upland habitats within the New Creek watershed, although it was not observed during the field surveys. The last recorded observation of this species was in 1998. Since the BMP sites NC-1 through NC-5 have been eroded by runoff, and there is no evidence of serpentine outcrop at these sites, the potential for the presence of these species at the Upper Watershed BMPs is expected to be low.

Globose flatsedge (*Cyperus echinatus*) is a state-endangered upland species that has been reported in the vicinity of the South Beach watershed. It grows in sandy soil, sometimes fill, open woods, oak barren edges and in dry soil mostly on the coastal plain to New Jersey and the interior to Missouri (Gleason and Cronquist 1963). The fruiting period of globose flatsedge lasts from the middle of July to the end of September (Young 2008). Based on the NYNHP database it was last observed in the area in 1998 and large numbers of this species have been reported in Ocean Breeze Park by local naturalists as recently as 2003 (Lynch 2003). Thus, this species is reported to be within the South Beach Watershed. It was not observed during the DEIS field observations.

Lowland fragile fern (*Cystopteris protrusa*) is a state-endangered fern of rich, open woods, borders, and thickets in New York. Based on the NYNHP database it was last observed in the area in 1996. It is also known to occur in swamps and marshes in other states (Mitchell and Sheviak 1983). In the New York City region, lowland fragile fern requires moist, rocky, wooded slopes, or shady ravines with circumneutral soil (Gargiullo 2007). The lowland fragile fern is vegetative from early May to the middle of October. Its fruiting period extends from the beginning of July to the middle of October (Young 2008). This species has the potential to occur within the upper New Creek watershed, although it was not observed during the field surveys. In addition, given the prior disturbance and erosion at proposed BMPs NC-1 through NC-5, the probability that this species is located at these sites is low.

Jacob's-ladder (*Smilax pulverulenta*) is a state-endangered species that occurs in rich woods (Mitchell and Sheviak 1983), moist soil of open woods, roadsides, and thickets (Gleason and Cronquist 1963), or moist to dry upland woods (Gargiullo 2007). Based on the NYNHP database it was last observed in the area in 1997; however the area it was observed was in ravines to the west of the New Creek watershed (in LaTourette Park). Vegetation of Jacob's ladder is visible starting at the beginning of March until the end of November. This species flowering and fruiting periods extend from the middle of April to the end of May and early May to the middle of August, respectively (Young 2008). Historical occurrences of this species in other portions of the watershed have been also documented (NYSDEC Natural Heritage Program, 2009). Within the watershed these species are known to occur along creek channels in conjunction with arrowwood, red maple, and cinnamon fern. Thus, although this species has the potential to occur in the New Creek watershed, although it was not observed during the field surveys and local observations place it more in the vicinity of the Richmond Creek watershed to the west. This species is more commonly found in rich woods and thickets and the proposed project would have a minimal impact on these habitats. The sites of the proposed BMPs NC-1 through NC-5 are also generally previously disturbed due to landscaping (golf course) or erosive runoff and it is therefore not expected that the proposed project would impact Jacob's ladder.

E. NEW YORK CITY DEPARTMENT OF PARKS AND RECREATION RECORDS

PLANTS

Butterfly milkweed (*Asclepias tuberosa*) is not a protected plant, but is listed as an exploitably vulnerable species of dry fields and banks (Newcomb 1977). This plant was identified within the South Beach watershed by DPR NRG in 2008 (DPR NRG 2009). Thus, this species is reported to be within the South Beach Watershed.

Slender rose gentian (*Sabatia campanulata*) is a state endangered plant of salt or brackish marshes (Gleason and Cronquist 1963). This plant was identified within the South Beach watershed by DPR NRG in 2008 (DPR NRG 2009).This species flowers from the beginning of August to the middle of September; fruiting extends into the middle of October (Young 2008). Thus, this species is reported to be in the South Beach Watershed.

Slender blue iris (*Iris prismatica*) is a state-listed threatened species of fresh, brackish, and salt marshes, shores, or meadows of coastal areas (CT Botanical Society 2005). It was identified within OB-1 by DPR NRG in the spring of 2009 (Stanley 2009). Vegetation of this species is visible from the beginning of May through the end of November. Its flowering period extends from the beginning of June through the middle of July. Fruits are visible throughout the year with the exception of the flowering period (Young 2008).

Nodding ladies tresses (*Spiranthes cernua*) is a not a protected plant, but is state-listed as an exploitably vulnerable species of wet to dry open soils, bogs, low thickets, shores (Fernald 1950), and deep wooded swamps of the coastal plain (Gleason and Cronquist 1963). This plant was identified within the South Beach watershed by DPR NRG in 2008 (DPR NRG 2009). Thus, this species is reported to be within the South Beach Watershed.

Turks-cap-lily (*Lilium superbum*) is not a protected species, but is a state-listed exploitably vulnerable lily of wet meadows and woods. This species was identified by DPR within OB-1 in the spring of 2009 (Stanley 2009; Lynch 2009). Its flowering period is between May and September (CT Botanical Society 2005). Thus, this species has been reported in the Oakwood Beach watershed.

F. NYNHP HISTORICAL RECORDS

INTRODUCTION

Historical records of unique species are provided by the NYNHP. Since these species are extirpated and have not been observed in many decades and the data is an historical account, it is not expected that these species are present in the watershed. Historical records from the NYNHP are provided below.

WILDLIFE

AMPHIBIANS

Northern cricket frog (*Acris crepitans*) is a state-endangered species that inhabits the edges of sunny marshes, marshy ponds. NYNHP records indicate that the last species noted within the three watersheds was in 1967, with the last recorded sighting at Reeds Basket Willow Swamp in 1897 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the New Creek watershed. NYNHP records indicate that the last report of this species within the Oakwood Beach Watershed was in 1919 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the Oakwood Beach Watershed.

DRAGONFLIES AND DAMSELFLIES

Comet darner (*Anax longipes*) is a dragonfly species that was included within database records furnished by NYNHP (NYSDEC Natural Heritage Program, 2009). The comet darner is not listed as an endangered, threatened, or special concern species by the state, but has been ranked

as "S2-Imperiled" by NYNHP indicating that there are typically 6 to 20 occurrences statewide. The last recorded observation of this species within the vicinity of the New Creek watershed was in 1908 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the New Creek watershed.

Rambur's forktail (*Ischnura ramburii*) is a damselfly found on coastal plains that is not listed as an endangered, threatened, or special concern, but has been ranked as "S2S3-Imperiled" by NYNHP indicating that there are typically 6 to 20 occurrences statewide and rare in the state. The last recorded observation of this species within the vicinity of the New Creek watershed was before 1913 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the New Creek watershed.

Mocha emerald (*Somatochlora linearis*) is a dragonfly species typically found along shaded streams. It is not listed as an endangered, threatened, or special concern species by the state, but has been ranked as "S2-Imperiled" by NYNHP indicating that there are typically 6 to 20 occurrences statewide. The last recorded observation of this species within the vicinity of the New Creek watershed was before 1926 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the New Creek watershed.

PLANTS

Straw sedge (*Carex straminea*) is a state-endangered specie, and is a clumping sedge usually found in New York along swamp margins and marshes. The last recorded observation of this species within the watershed was in 1915 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the New Creek watershed.

Fairy wand (*Chamaelirium luteum*) is a state-threatened species that occurs in moist to wet soil in sun to partial shade of bogs, moist woods, and shady edges and that reaches the northern limit of its range in the Harlem Valley. The vegetation of this plant is visible between the middle of April to the end of November with flowers from mid-May to mid-July. The flowering period for fairy wand is between mid-May and mid-July; its fruiting period extends from mid-June to the end of October (Young 2008). The last recorded observation of this species within all three watersheds was in 1905 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the New Creek or Oakwood Beach watershed.

Purple everlasting *(Gamochaeta purpurea)* is a state-endangered forb of sandplain heathland communities that flowers between the beginning of July and the middle of September; its fruiting period begins in the middle of August and extends into the end of October (Young 2008). The last recorded observation of this species within the Oakwood Beach Watershed was in 1905 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the Oakwood Beach Watershed. The last recorded observation of this species within the New Creek watershed was in 1894 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the New Creek watershed.

Large twayblade (*Liparis liliifolia*) is a state-listed endangered species of both wetland and upland areas. It is known to grow in hummocks in sphagnous peat in red maple-dominated swamps and is also known to occur in dry woods in limestone soils, wooded talus slopes, and at railroad right-of-ways at the edge of swamps (NYNHP 2009). Large twayblade is known to occur in early to mid-successional forests in areas recovering from disturbance. This species flowers from June to the middle of July. The fruiting period for this species extends from the beginning of July to the middle of October (Young 2010). The last recorded observation of this

species within the New Creek watershed was in 1905 (NYSDEC Natural Heritage Program, 2009). While searches for this plant have occurred, no plants were found (NYSDEC Natural Heritage Program, 2009); however, wooded habitat is available and NYNHP indicates that additional searches should be conducted (NYSDEC Natural Heritage Program, 2009). Thus, there is the potential for this species to occur within the New Creek watershed, although it was not observed during the field surveys.

Bayard's Adder's-mouth orchid (*Malaxis bayardii*) is a state-endangered orchid of dry chestnut oak forests with shallow soil and exposed bedrock and pitch pine scrub oak barrens on sandy soils (NYNHP 2009). The only known New York population has been in decline and may no longer exist (NYNHP 2009). The last recorded observation of this species within the New Creek watershed was in 1890 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the New Creek watershed.

Rose-pink (*Sabatia angularis*) is a state-endangered species that occurs in moist fields and roadsides (CT Botanical Society 2005), open meadows with rich, moist, sandy upland soil (Garguillo 2007) or in peaty soil and damp woods (Gleason and Cronquist 1963). This species flowers between the middle of July and the middle of September and fruits appear between the beginning of September and the middle of October (Young 2008). The last recorded observation for this species within the Oakwood Beach Watershed occurred in 1889 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the Oakwood Beach Watershed. The last recorded observation for these species within these watersheds occurred in 1908 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the New Creek watershed.

Hyssop-skullcap (*Scutellaria integrifolia*) is a state-endangered plant that occupies a variety of habitats that range from pine barrens to bogs. In New York City region, habitat requirements for this species include moist fields and open woods (Garguillo 2007). Flowers of this species appear in the middle of June and extend into the middle of July and the fruiting period begins in the middle of July and lasts until the end of September. The last record of this species for the three watersheds is prior to 1879 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the Oakwood Beach Watershed. Therefore, it is not likely that this species is present in the New Creek watershed.

False China-root (*Smilax pseudochina*) is a state-endangered plant of bogs, wet woods, marshes, pocosins (Flora of North America undated), sphagnum bogs, low woods, moist sandy soil, and coastal plain habitat from New Jersey and south (Garguillo 2007). Vegetation of this species is visible from early May to late November. Investigations for these species on the banks of a brook occurred in 1931, but no plants were found (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the New Creek watershed.

Spring ladies'-tresses (*Spiranthes vernalis*) is a state-endangered orchid of acidic soil, usually in moist, open sites (CT Botanical Society 2005). This species was last observed in the area of Staten Island in 1892 (NYSDEC Natural Heritage Program, 2009). Therefore, it is not likely that this species is present in the New Creek watershed.

Primrose-leaf violet (*Viola primulifolia*) is a state-threatened violet of moist meadows and open woods (CT Botanical Society 2005). Vegetation of this species is visible between early May and the middle of September. This species flowers between early May and mid-June with its fruiting period between the middle of June and the middle of September (Young 2008). The last recorded observation of this species within the three watersheds was in 1907 (NYSDEC Natural

Heritage Program, 2009). Therefore, it is not likely that this species is present in the Oakwood Beach Watershed. Therefore, it is not likely that this species is present in the New Creek watershed.

G. EIS FIELD OBSERVATIONS

WILDLIFE (AVIAN)

Peregrine falcon is a protected species (endangered) and is ranked "S3B" by NYNHP, indicating that there are typically 21 to 100 breeding occurrences or limited breeding acreage in the state. 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. In the New York City area, wintering birds frequent buildings and open areas with plentiful prey in more natural settings. Peregrine falcon diets primarily consist of birds, ranging from songbirds to small geese, and also bats and other small mammals (Cornell 2010). The current Peregrine Falcon range within the state includes the Adirondacks, the New York City area, and the Hudson Valley (NYNHP 2009). Peregrine falcon was observed flying overhead of BMP NC-7 during the Spring 2010 site investigation and has been reported by NYSDEC in the vicinity of the South Beach Watershed. No peregrine falcons were observed nesting and foraging at any of the proposed BMP sites.

Common nighthawk is not listed as a protected, threatened, or endangered species in New York State, but is a state-listed special concern species. In New York, this species is a widespread, but localized breeder that is found in a variety of open habitats that include coastal dunes and beaches, forest clearings, and gravel roof tops. Wintering habitat is not well documented, but does include open areas similar to those used during the breeding season. Nests are not constructed prior to breeding. Instead, two eggs are laid directly on the ground or human-made surface and young hatch after 18 to 20 days (NYSDEC 2010d). This species was not observed during the field surveys, but may use the watershed for foraging and flyover.

Glossy ibis is not a protected species in New York State, but is ranked "S2" by NYNHP, indicating that there are typically 6-20 occurrences statewide and is listed as a "species of greatest conservation need" in New York. This species is known to nest on nearby Hoffman Island offshore to the south of the Mid-Island area. Hoffman Island is part of the "Harbor Herons Complex" consisting of several nesting islands and foraging areas throughout the New York City area. The continued success of the glossy ibis depends on the security of coastal wetlands, including wooded and shrubby islands for nesting and roosting, and grassy marshes and shallow freshwater for foraging. Glossy ibis was observed at OB-1 utilizing the common reed dominated wetlands for foraging and within the New Creek watershed at the proposed BMP's NC-16 and NC-8, utilizing the common reed dominated wetlands for foraging and flying above NC-17.and was observed. Glossy ibis has been documented through the breeding bird atlas for the South Beach watershed. While this species is known to occur within the South Beach Watershed, no glossy ibis were observed at any of the proposed South Beach BMP sites during the field investigations. Since the glossy ibis prefers marshes and wetlands, in the long term, the open water and enhanced wetlands of the proposed project would be expected to benefit this species.

PLANTS

Marsh fern is not a protected species, but is listed as a state-exploitably vulnerable fern of wet soils. Marsh fern is found in sunny edges of marshes and wet meadows, ditches or woods;

typically in rich, wet soil (CT botanical Society 2005). Marsh fern was observed in the common reed marsh of NC-17 during spring 2010 site investigations.

Royal fern (*Osmunda regalis*) is not a protected species, but is a state-listed exploitably vulnerable fern of wet soils. Habitat of this species typically occurs along streams, lakes shores, bogs, and wet meadows (CT Botanical Society 2005). Royal fern was reported in OB-1 by DPR in spring 2009 (Stanley 2009) and was observed during the fall 2009 and spring 2010 investigations at BMP sites OB-1, OB-2, and OB-3. It was also observed in the transition community of NC-7 during Spring 2010 site investigations. Finally, royal fern was observed in SBE-1 during the spring 2010 site investigation.

Cinnamon fern (*Osmunda cinnamomea*) is not a protected species, but is a state-listed exploitably vulnerable fern of swamps, stream banks, and shores (CT Botanical Society 2005) with subacid soils (Gleason and Cronquist 1963). Cinnamon fern was observed at BMP sites OB-1, OB-2, and OB-3 during the fall 2009 and spring 2010 site investigations. It was also observed within Reeds Basket Willow Swamp Park and BMPs NC-6, NC-14, and NC-11. Finally, cinnamon fern was observed in SBE-1A and SBE-3 during the fall 2009 and spring 2010 site investigations.

Spinulose wood fern is not a protected species, but is a state-listed exploitably vulnerable fern of moist or wet woods, swamps (CT Botanical Society 2005), and circumneutral soil (Gargiullo 2007). Spinulose wood fern was observed within BMP NC-7 during spring 2009 site investigations.

H. OTHER LITERATURE SOURCES AND REPORTED OBSERVATIONS

Dune sandspur (*Cenchrus tribuloides*) has been documented within literature sources within the South Beach Watershed (Cheplick 2000). This species is a state listed-threatened species of coastal sands (Fernald 1950; Gleason and Cronquist 1963). The flowering period for this species is the middle of June to the end of July. Its fruiting period is from the middle of July to the end of October (Young 2008).

Hop sedge (*Cyperus lupulinus* ssp. *lupulinus*) has been documented within literature sources as occurring within the South Beach Watershed (Lynch 2003). Hop sedge is a state-threatened sedge of sandy soils at beaches, railroads, roadsides, and pastures (NYNHP 2009). The fruiting period is between the middle of July and the middle of October (Young 2008).

Fringed boneset (*Eupatorium hyssopifolium* var. *laciniatum*) has been documented within literature sources as occurring within the South Beach Watershed (Lynch 2003). Fringed boneset is a state-threatened species of dry sandy soil of fields and other open areas (Gleason and Cronquist 1963) and sandy or peaty dry or damp open woods and clearings (Fernald 1950). The vegetation of this species is visible from the middle of June to the end of October. The flowering period is from the beginning of July to the end of August with the fruiting period extending from the end of August to the middle of November (Young 2008).

Needlepod rush (*Juncus scirpoides*) has been documented within literature sources as occurring within the South Beach Watershed (Lynch 2003). Needlepod rush is a state-endangered plant of shallow pools, damp sandy soil of pinelands (Fernald 1950), meadows, and shores mostly of the coastal plain (Gleason and Cronquist 1963). The fruiting period for this species is from the

beginning of July through the middle of October (Young 2008). Thus, this species is reported to occur within the South Beach Watershed.

Seaside knotweed (*Polygonum glaucum*) has been documented within literature sources as occurring within the South Beach Watershed (Johnson and Matarazzo 2003). Seaside knotweed is a state-listed rare species of sandy sea beaches, saline pond-shores, and dune hollows (Fernald 1950). The flowering period for this species is from the middle of July to the middle of November. The fruiting period is between the middle of August and the middle of November (Young 2008).

Globose flatsedge (*Cyperus echinatus*) is a state-endangered upland species that has been reported by in the vicinity of the South Beach watershed (in Ocean Breeze Park) by local naturalists as recently as 2003 (Lynch 2003). Thus, this species is reported to be within the South Beach Watershed. It was not observed during the DEIS field observations.

I. NEW YORK STATE LEGAL STATUS DESCRIPTIONS

WILDLIFE

E—ENDANGERED SPECIES

Any species that meet one of the following criteria:

- Native species in imminent dangers of extirpation or extinction in New York.
- Species listed as endangered by the United States Department of the Interior, as enumerated in the Code of Federal Regulations 50 CFR 17.11.

T—THREATENED SPECIES

Any species that meet one of the following criteria:

- Native species likely to become an endangered species within the foreseeable future in NY.
- Species listed as threatened by the U.S. Department of the Interior, as enumerated in the Code of the Federal Regulations 50 CFR 17.11.

SC—SPECIAL CONCERN SPECIES

Those species not yet recognized as endangered or threatened, but for which documented concern exists for their continued welfare in New York.

P—PROTECTED WILDLIFE (DEFINED IN ENVIRONMENTAL CONSERVATION LAW SECTION 11-0103)

Wild game, protected wild birds, and endangered species of wildlife.

U—UNPROTECTED (DEFINED IN ENVIRONMENTAL CONSERVATION LAW SECTION 11-0103)

The species may be taken at any time without limit; however a license to take may be required.

G—GAME (DEFINED IN ENVIRONMENTAL CONSERVATION LAW SECTION 11-0103)

Any of a variety of big game or small game species as stated in the Environmental Conservation Law; many normally have an open season for at least part of the year, and are protected at other times, with respect to hunting or trapping.

PLANTS

The following categories are defined in regulation 6NYCRR part 193.3 and apply to NYS Environmental Conservation Law section 9-1503.

E—ENDANGERED SPECIES

Listed as species are those with:

- 5 or fewer extant sites, or
- Fewer than 1,000 individuals, or
- Restricted to fewer than 4 U.S.G.S. 7½ minute topographical maps, or
- Species listed as endangered by U.S. Department of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11.

T—THREATENED

Listed species are those with:

- 6 to fewer than 20 extant sites, or
- 1,000 to fewer than 3,000 individuals, or
- Restricted to not less than 4 or more than 7 U.S.G.S. 7½ minute topographical maps, or
- Listed as threatened by U.S. Department of Interior, as enumerated in Code of Federal Regulations 50 CFR 17.11.

R—RARE

Listed species have:

- 20 to 35 extant sites, or
- 3,000 to 5,000 individuals statewide.

V—EXPLOITABLY VULNERABLE

Listed species are likely to become threatened in the near future throughout all or a significant portion of their range within the state if causal factors continue unchecked.

U—UNPROTECTED

No state status.

FEDERAL STATUS (PLANTS AND ANIMALS)

The categories of federal status are defined by the United States Department of the Interior as part of the 1974 Endangered Species Act (see Code of Federal Regulations 50 CFR 17). The

species listed under this law are enumerated in the Federal Register of vol. 50, no. 188, pp. 39526 – 39527.

GLOBAL AND STATE RANKS (ANIMALS, PLANTS, ECOLOGICAL COMMUNITIES AND OTHERS):

Each listing has a global and state rank as determined by the NY Natural Heritage Program. These ranks carry no legal weight. The global rank reflects the rarity of the element throughout the world and the state rank reflects the rarity within New York State. Infraspecific taxa are also assigned a taxon rank to reflect the infraspecific taxon's rank throughout the world. ? = Indicates a question exists about the rank. Range ranks, e.g., S1S2, indicate not enough information is available to distinguish between two ranks.

GLOBAL RANK

- G1: Critically imperiled globally because of extreme rarity (5 or fewer occurrences, or very few remaining acres, or miles of stream), or especially vulnerable to extinction because of some factor of its biology.
- G2: Imperiled globally because of rarity (6–20 occurrences, or few remaining acres, or miles of stream) or very vulnerable to extinction throughout its range because of other factors.
- G3: Either rare and local throughout its range (21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range (e.g., a physiographic region), or vulnerable to extinction throughout its range because of other factors.
- G4: Apparently secure globally, though it may be quite rare in some parts of its range, especially at the periphery.
- G5: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
- GH: Historically known, with the expectation that it might be rediscovered.
- GX: Species believed to be extinct.

NYS RANK

- S1: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State.
- S2: Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably making it very vulnerable in New York State.
- S3: Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.
- S4: Apparently secure in New York State.
- S5: Demonstrably secure in New York State.
- SH: Historically known from New York State, but not seen in the past 15 years.
- SX: Apparently extirpated from New York State.
- SZ: Present in New York State only as a transient migrant.

SxB and SxN, where Sx is one of the codes above, are used for migratory animals, and refer to the rarity within New York State of the breeding (b) populations and the non-breeding populations (N), respectively, of the species. ✷

A. NEW YORK STATE BREEDING BIRD ATLAS

All of the proposed BMP sites within the Oakwood Beach Watershed are located within one of 3 New York State Breeding Atlas Blocks: 5648B, 5748A, and 5649D. The inventory from the Breeding Bird Surveys for these 3 blocks is presented below.

- BMP OB-1--See Table C.3-2, “Breeding Birds for Block 5748A”
- BMP OB-2-- See Table C.3-2, “Breeding Birds for Block 5748A”
- BMP OB-3-- See Table C.3-1, “Breeding Bird Table for Block 5648B”
- BMP OB-4-- See Table C.3-1, “Breeding Bird Table for Block 5648B”
- BMP OB-5-- See Table C.3-3; “Breeding Bird Table for Block 5649D”

Table C.3-1
Breeding Birds Documented in Block 5648B

Common Name	Scientific Name
Canada Goose	*Branta canadensis*
Mute Swan	*Cygnus olor*
Gadwall	*Anas strepera*
American Black Duck	*Anas rubripes*
Mallard	*Anas platyrhynchos*
Ring-necked Pheasant	*Phasianus colchicus*
Green Heron	*Butorides virescens*
Osprey	*Pandion haliaetus*
Northern Harrier	*Circus cyaneus*
Cooper's Hawk	*Accipiter cooperii*
American Kestrel	*Falco sparverius*
Clapper Rail	*Rallus longirostris*
Killdeer	*Charadrius vociferus*
American Oystercatcher	*Haematopus palliatus*
Spotted Sandpiper	*Actitis macularius*
Willet	*Tringa semipalmata*
American Woodcock	*Scolopax minor*
Rock Pigeon	*Columba livia*
Mourning Dove	*Zenaida macroura*
Black-billed Cuckoo	*Coccyzus erythropthalmus*
Barn Owl	*Tyto alba*
Eastern Screech-Owl	*Megascops asio*
Great Horned Owl	*Bubo virginianus*
Whip-poor-will	*Caprimulgus vociferus*
Belted Kingfisher	*Megaceryle alcyon*
Red-bellied Woodpecker	*Melanerpes carolinus*
Downy Woodpecker	*Picoides pubescens*
Northern Flicker	*Colaptes auratus*
Willow Flycatcher	*Empidonax traillii*
Eastern Kingbird	*Tyrannus tyrannus*
White-eyed Vireo	*Vireo griseus*
Warbling Vireo	*Vireo gilvus*
Red-eyed Vireo	*Vireo olivaceus*
Blue Jay	*Cyanocitta cristata*
American Crow	*Corvus brachyrhynchos*
Tree Swallow	*Tachycineta bicolor*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Black-capped Chickadee	*Poecile atricapillus*
Carolina Wren	*Thryothorus ludovicianus*
House Wren	*Troglodytes aedon*
Marsh Wren	*Cistothorus palustris*
Hermit Thrush	*Catharus guttatus*
American Robin	*Turdus migratorius*
Gray Catbird	*Dumetella carolinensis*
Northern Mockingbird	*Mimus polyglottos*
Brown Thrasher	*Toxostoma rufum*

Table C.3-1 (cont'd)
Breeding Birds documented in Block 5648B

Common Name	Scientific Name
European Starling	*Sturnus vulgaris*
Yellow Warbler	*Dendroica petechia*
Common Yellowthroat	*Geothlypis trichas*
Eastern Towhee	*Pipilo erythrophthalmus*
Chipping Sparrow	*Spizella passerina*
Field Sparrow	*Spizella pusilla*
Savannah Sparrow	*Passerculus sandwichensis*
Saltmarsh Sparrow	*Ammodramus caudacutus*
Song Sparrow	*Melospiza melodia*
Swamp Sparrow	*Melospiza georgiana*
Northern Cardinal	*Cardinalis cardinalis*
Indigo Bunting	*Passerina cyanea*
Red-winged Blackbird	*Agelaius phoeniceus*
Eastern Meadowlark	*Sturnella magna*
Common Grackle	*Quiscalus quiscula*
Boat-tailed Grackle	*Quiscalus major*
Brown-headed Cowbird	*Molothrus ater*
House Finch	*Carpodacus mexicanus*
American Goldfinch	*Spinus tristis*
House Sparrow	*Passer domesticus*

Source: NYS Breeding Bird Atlas, 2000.
Note: Highlighted species were observed at the BMP sites. A description of the species observed during the DEIS field observations is provided in the individual BMP descriptions.

Table C.3-2
Breeding Birds documented in Block 5748A

Common Name	Scientific Name
Canada Goose	*Branta canadensis*
Mallard	*Anas platyrhynchos*
Clapper Rail	*Rallus longirostris*
Killdeer	*Charadrius vociferus*
American Woodcock	*Scolopax minor*
Mourning Dove	*Zenaida macroura*
Downy Woodpecker	*Picoides pubescens*
Willow Flycatcher	*Empidonax traillii*
Eastern Kingbird	*Tyrannus tyrannus*
Blue Jay	*Cyanocitta cristata*
American Crow	*Corvus brachyrhynchos*
Tree Swallow	*Tachycineta bicolor*
Barn Swallow	*Hirundo rustica*
Carolina Wren	*Thryothorus ludovicianus*
House Wren	*Troglodytes aedon*
Marsh Wren	*Cistothorus palustris*
American Robin	*Turdus migratorius*
Gray Catbird	*Dumetella carolinensis*
Northern Mockingbird	*Mimus polyglottos*
Brown Thrasher	*Toxostoma rufum*
Yellow Warbler	*Dendroica petechia*
Common Yellowthroat	*Geothlypis trichas*
Song Sparrow	*Melospiza melodia*
Northern Cardinal	*Cardinalis cardinalis*
Red-winged Blackbird	*Agelaius phoeniceus*
Common Grackle	*Quiscalus quiscula*
Baltimore Oriole	*Icterus galbula*
House Finch	*Carpodacus mexicanus*
American Goldfinch	*Spinus tristis*
House Sparrow	*Passer domesticus*

Source: NYS Breeding Bird Atlas, 2000.
Note: Highlighted species were observed at the BMP sites
A description of the species observed during the DEIS field observations is provided in the individual BMP descriptions.

Table C.3-3
Breeding Birds for Block 5649D

Common Name	Scientific Name
Canada Goose	*Branta canadensis*
Wood Duck	*Aix sponsa*
American Black Duck	*Anas rubripes*
Mallard	*Anas platyrhynchos*
Ring-necked Pheasant	*Phasianus colchicus*
Green Heron	*Butorides virescens*
Turkey Vulture	*Cathartes aura*
Broad-winged Hawk	*Buteo platypterus*
Red-tailed Hawk	*Buteo jamaicensis*
Killdeer	*Charadrius vociferus*
American Woodcock	*Scolopax minor*
Rock Pigeon	*Columba livia*
Mourning Dove	*Zenaida macroura*
Yellow-billed Cuckoo	*Coccyzus americanus*
Black-billed Cuckoo	*Coccyzus erythropthalmus*
Eastern Screech-Owl	*Megascops asio*
Great Horned Owl	*Bubo virginianus*
Chimney Swift	*Chaetura pelagica*
Red-bellied Woodpecker	*Melanerpes carolinus*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Northern Flicker	*Colaptes auratus*
Eastern Wood-Pewee	*Contopus virens*
Acadian Flycatcher	*Empidonax virescens*
Willow Flycatcher	*Empidonax traillii*
Eastern Phoebe	*Sayornis phoebe*
Great Crested Flycatcher	*Myiarchus crinitus*
Eastern Kingbird	*Tyrannus tyrannus*
White-eyed Vireo	*Vireo griseus*
Warbling Vireo	*Vireo gilvus*
Red-eyed Vireo	*Vireo olivaceus*
Blue Jay	*Cyanocitta cristata*
American Crow	*Corvus brachyrhynchos*
Tree Swallow	*Tachycineta bicolor*

Table C.3-3 (cont'd)
Breeding Birds for Block 5649D

Common Name	Scientific Name
Barn Swallow	*Hirundo rustica*
Black-capped Chickadee	*Poecile atricapillus*
Tufted Titmouse	*Baeolophus bicolor*
White-breasted Nuthatch	*Sitta carolinensis*
Carolina Wren	*Thryothorus ludovicianus*
House Wren	*Troglodytes aedon*
Veery	*Catharus fuscescens*
Wood Thrush	*Hylocichla mustelina*
American Robin	*Turdus migratorius*
Gray Catbird	*Dumetella carolinensis*
Northern Mockingbird	*Mimus polyglottos*
Brown Thrasher	*Toxostoma rufum*
European Starling	*Sturnus vulgaris*
Tufted Titmouse	*Baeolophus bicolor*
White-breasted Nuthatch	*Sitta carolinensis*
Carolina Wren	*Thryothorus ludovicianus*
House Wren	*Troglodytes aedon*
Veery	*Catharus fuscescens*
Wood Thrush	*Hylocichla mustelina*
American Robin	*Turdus migratorius*
Gray Catbird	*Dumetella carolinensis*
Northern Mockingbird	*Mimus polyglottos*
Brown Thrasher	*Toxostoma rufum*
European Starling	*Sturnus vulgaris*
Cedar Waxwing	*Bombycilla cedrorum*
Yellow Warbler	*Dendroica petechia*
Ovenbird	*Seiurus aurocapilla*
Common Yellowthroat	*Geothlypis trichas*
Eastern Towhee	*Pipilo erythrophthalmus*
Field Sparrow	*Spizella pusilla*
Song Sparrow	*Melospiza melodia*
Scarlet Tanager	*Piranga olivacea*
Northern Cardinal	*Cardinalis cardinalis*
Indigo Bunting	*Passerina cyanea*
Red-winged Blackbird	*Agelaius phoeniceus*
Common Grackle	*Quiscalus quiscula*
Brown-headed Cowbird	*Molothrus ater*
Orchard Oriole	*Icterus spurius*
Baltimore Oriole	*Icterus galbula*
House Finch	*Carpodacus mexicanus*
American Goldfinch	*Spinus tristis*
House Sparrow	*Passer domesticus*

Source: NYS Breeding Bird Atlas, 2000.
Note: Highlighted species were observed at the BMP sites .A description of the species observed during the DEIS field observations is provided in the individual BMP descriptions.

B. NEW YORK STATE AMPHIBIAN AND REPTILE ATLAS PROJECT

All of the proposed BMP sites within the New Creek Watershed are located within "The Narrows" Survey Block. Table C.3-4 provides species lists and their potential occurrence within each of the proposed BMPs.

Table C.3-4
Reptiles and Amphibans with the Potential to Occur at Oakwood Beach BMP Sites

Common Name	Scientific Name	Protective Status (Federal/NYS)	Potential for Occurrence Onsite at Individual BMPs				
			OB-1	OB-2	OB-3	OB-4	OB-5
Salamanders							
Eastern Red-backed Salamander	*Plethodon cinereus*	Not Listed	Yes	Yes	Yes	Yes	Yes
Red Salamander	*Pseudotriton ruber*	Not Listed	No	No	No	No	No
Northern Two-lined Salamander	*Eurycea bislineata*	Not Listed	No	No	No	No	No
Toads							
Fowler's Toad	*Anaxyrus fowleri*	Not Listed	Yes	Yes	Yes	Yes	Yes
Frogs							
Spring Peeper	*Pseudacris crucifer*	Not Listed	Yes	Yes	Yes	Yes	Yes
American Bullfrog	*Lithobates catesbeiana*	Not Listed	Yes	Yes	Yes	Yes	No
Green Frog	*Lithobates clamitans*	Not Listed	Yes	Yes	Yes	Yes	No
Snakes							
Northern Brown Snake	*Storeria dekayi*	Not Listed	Yes	Yes	Yes	Yes	Yes
Common Garter Snake	*Thamnophis sirtalis*	Not Listed	Yes	Yes	Yes	Yes	Yes
Northern Water snake	*Nerodia sipedon*	Not Listed	Yes	Yes	Yes	Yes	No
Eastern Milk Snake	*Lampropeltis triangulum*	Not Listed	Yes	Yes	Yes	Yes	Yes
Turtles							
Snapping Turtle	*Chelydra serpentina*	Not Listed	Yes	Yes	Yes	Yes	No
Northern Diamondback Terrapin	*Malaclemys terrapin*	Game Species	No	No	No	No	No
Red-eared Slider	*Trachemys scripta*	Not Listed	Yes	Yes	Yes	Yes	No
Leatherback turtle	*Dermochelys coriacea*	Federally and State Endangered	No	No	No	No	No
Painted Turtle	*Chrysemys picta*	Not Listed	Yes	Yes	Yes	Yes	No

Source: New York State Department of Environmental Conservation. 2010. http://www.dec.ny.gov/animals/7140.html.
Note: Highlighted species were observed at the BMP sites. A description of the species observed during the DEIS field observations is provided in the individual BMP descriptions.

C. VEGETATION IN THE OAKWOOD BEACH WATERSHED

Table C.3-5 shows the plants observed in the Oakwood Beach Watershed during site visits in 2009 and 2010.

Table C.3-5
Plants Observed During Site Reconnaissance 2009 and 2010: Oakwood Beach Watershed

Scientific Name	Common Name	Scientific Name	Common Name
Trees		**Vines**	
Acer platanoides	Norway Maple	*Ampelopsis brevipedunculata*	Porcelain-berry
Acer pseudo-platanus	Sycamore maple	*Celastrus orbiculatus*	Asiatic bittersweet
Acer rubrum	Red Maple	*Hedera simplex*	English Ivy
Acer saccharinum	Silver Maple	*Lonicera japonica*	Japanese Honeysuckle
Ailanthus altissima	Tree-of-heaven	*Parthenocissus quinquefolia*	Virginia Creeper
Betula populifolia	Gray Birch	*Smilax glauca*	Catbrier
Carya glabra	Pignut hickory	*Smilax sp.*	Greenbrier
Carya sp.	Hickory	*Toxicodendron radicans*	Poison Ivy
Celtis occidentalis	Hackberry	*Vinca minor*	Periwinkle
Fraxinus pennsylvanica	Green Ash	*Vitis sp.*	Grape
Fraxinus sp.	Ash sp.	**Forbs**	
Liquidambar stryaciflua	Sweetgum	*Achillea millefolium*	Common Yarrow
Liriodendron tulipifera	Tuliptree	*Ageratina altissima*	White Snakeroot
Morus alba	Mulberry	*Alliaria petiolata*	Garlic Mustard
Nyssa sylvatica	Black Gum	*Apocynum cannabinum*	Dogbane hemp
Populus grandidentata	Bigtooth Aspen	*Artemis vulgaris*	Mugwort
Populus sp.	Poplar	*Asclepias sp.*	Milkweed
Prunus serotina	Black Cherry	*Aster umbellatus*	White Aster
Quercus palustris	Pin Oak	*Aster vimineus*	Small White Aster
Quercus sp.	Oaks	*Eupatorium pilosum*	Rough -leaved Thoroughwort
Quercus velutina	Black Oak	*Euthamia sp.*	Goldenrod sp.
Robinia pseudoacacia	Black Locust	*Gallium sp.*	Bedstraw
Salix babylonica	Weeping Willow	*Geranium maculatum*	Wild Geranium
Salix sp.	Willow sp.	*Hemerocallis fulva*	Day Lily
Sassafras albidum	Sassafrass	*Hypoxis hirusta*	Yellow Star Grass
Ulmus Americana	American Elm	*Impatiens sp.*	Jewelweed
Viburnum dentatum	Arrowwood	*Iris sp.*	Iris sp.
Shrubs		*Lysimachia quadrifolia*	Whorled Loosestrife
Aronia arbutifolia	Red Chokeberry	*Ornithogalum nutans*	Star of Bethlehem
Baccharis halimifolia	Groundsel Bush	*Osmorhiza berteroi*	Sweetcicely
Clethera alnifolia	Sweet Pepperbush	*Phytolacca americana*	Pokeberry
Cornus amomum	Silky Dogwood	*Polygonum cuspidatum*	Japanese Knotweed
Cornus sp.	Dogwood sp.	*Polygonum sp.*	Smartweed
Elaeagnus umbellata	Autumn Olive	*Pycnanthemum sp.*	Mountainmint
Elaeagnussp.	Olive sp.	*Rubus allegheniensis*	Blackberry
Euonymus alatus	Burning Bush	*Rubus hisbidus*	Swamp Dewberry
Hibiscus palustris	Swamp Rose Mallow	*Rumex*	Dock sp.
Ligustrum vulgare	Privet	*Sanguisorba canadensis*	Canadian Burnet
Lindera benzoin	Spicebush	*Smilacina racemosa*	False Solomon's Seal
Lonicera sp.	Bush Honeysuckle	*Solanum dulcamara*	Climbing Nightshade
Myrica pensylvanica	Northern Bayberry	*Solanum ptycanthum*	Black Nightshade
Myrica sp.	Bayberry	*Solidago graminifolia*	Narrow-leaved Goldenrod
Rhus coppalina	Winged Sumac	*Solidago sempervirens*	Seaside Goldenrod
Rhus glabra	Smooth Sumac	*Solidago sp.*	Goldenrod
Rhus sp.	Sumac sp.	*Thalictrum sp.*	Meadow Rue
Rhus typhina	Staghorn Sumac	*Triadenum virginicum*	Marsh St. Johnswort
Rosa multiflora	Multiflora Rose	*Trillium sp.*	Trillium
Rosa palustris	Swamp Rose	*Uvularia sessilifolia*	Sessileleaf Bellwort
Rosa rugosa	Rugosa rose	*Viola lanceolata*	Lance-leaved violet
Rosa virginiana	Virginia Rose	*Viola spp.*	Violet
Sambucus canadensis	Common Elderberry		

Table C.3-5 (cont'd)
Plants Observed During Site Reconnaissance
2009 and 2010: Oakwood Beach Watershed

Scientific Name	Common Name	Scientific Name	Common Name
Ferns		**Grasses, Rushes, and Sedges**	
Dennstaedtia punctilobula	Hayscented Fern	*Ammophila breviligulata*	American Beachgrass
Osmunda cinnamomea	Cinnamon Fern	*Andropogodon sp.*	Beardgrass
Osmunda regalis	Royal Fern	*Anthoxanthum odoratum*	Sweet Vernalgrass
Pteridium aquilinum	Bracken Fern	*Bromus tectorum*	Downy Brome
		Carex stricta	Upright Sedge
		Carex vulpinoidea	Fox Sedge
		Dactylis glomerata	Orchard Grass
		Festuca sp.	Fescue
		Juncus bufonius	Toad Rush
		Juncus effusus	Soft Rush
		Juncus tenuis	Path Rush
		Panicum clandestinum	Deer Tongue Grass
		Panicum virgatum	Switchgrass
		Phragmites australis	Common reed
		Poa pratensis	Kentucky Bluegrass
		Scirpus americanus	Three-square Bulrush
		Scirpus cyperinus	Wool Grass

Source: AKRF, Inc. 2009 and 2010.
Note: A description of the species observed during the DEIS field observations is provided in the individual BMP descriptions.

D. FISH RESOURCES

DEC WETLAND DESIGNATION REPORTS

The DEC wetland designation report for the Oakwood Beach wetlands (NA-10: Oakwood Beach) identified the small channel wetlands of the Oakwood Beach watershed as potential habitat for small fish habitat. The fish that were identified in the designation report included the following:

- Bullhead catfish;
- Gambusia;
- Pumpkinseed goldfish;
- Goldfish;
- Mummichog; and
- Other species.

FISH SAMPLING

Fish sampling performed in September 2011 near the confluence of the Main Channel and the East Branch of the Oakwood Beach watershed. Field observations were limited but identified banded killifish *(Fundulus diaphanus)* along with blue claw crab, fiddler crab, and grass shrimp.

ESSENTIAL FISH HABITAT

Table C.3-6 lists the Essential Fish Habitat-designated species for the Lower Bay as reported by the NMFS.

Table C.3-6
Essential Fish Habitat Designated Species for the Lower New York Bay

Species	Eggs	Larvae	Juveniles	Adults
Red hake *(Urophycis chuss)*	X	X	X	
Winter flounder *(Pleuronectes americanus)*	X	X	X	X
Windowpane flounder *(Scopthalmus aquosus)*	X	X	X	X
Atlantic sea herring *(Clupea harengus)*		X	X	X
Bluefish *(Pomatomus saltatrix)*			X	X
Atlantic butterfish *(Peprilus triacanthus)*		X	X	X
Atlantic mackerel *(Scomber scombrus)*			X	X
Summer flounder *(Paralicthys dentatus)*		X	X	X
Scup *(Stenotomus chrysops)*	X	X	X	X
Black sea bass *(Centropristus striata)*	n/a		X	X
King mackerel *(Scomberomorus cavalla)*	X	X	X	X
Spanish mackerel *(Scomberomorus maculatus)*	X	X	X	X
Cobia *(Rachycentron canadum)*	X	X	X	X
Clearnose skate (*Raja eglanteria*)			X	X
Little skate (*Leucoraja erinacea*)			X	X
Winter skate (*Leucoraja ocellata)*			X	X
Dusky shark *(Charcharinus obscurus)*		X[1]		
Sandbar shark *(Charcharinus plumbeus)*		X[1]		X

Notes:[1] Neither of these species have a free-swimming larval stage; rather they are live bearers that give birth to fully formed juveniles. For the purposes of this table, "larvae" for sand tiger and sandbar sharks refers to neonates and early juveniles.
Source: National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the internet at: http://www.nero.noaa.gov/hcd/STATES4/conn_li_ny/40307350.html and http://www.nero.noaa.gov/hcd/skateefhmaps.htm

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A. NEW YORK STATE BREEDING BIRD ATLAS

All of the proposed BMP sites within the New Creek Watershed are located within New York State Breeding Atlas Block 5749C (70 species). Table C.4-1 shows the Breeding Bird Atlas records for this block.

Table C.4-1
Breeding Bird Atlas Records for Block 5749C

Common Name	Scientific Name
Canada Goose	*Branta canadensis*
Mute Swan	*Cygnus olor*
Gadwall	*Anas strepera*
American Black Duck	*Anas rubripes*
Mallard	*Anas platyrhynchos*
Wild Turkey	*Meleagris gallopavo*
Double-crested Cormorant	*Phalacrocorax auritus*
Great Egret	*Ardea alba*
Snowy Egret	*Egretta thula*
Little Blue Heron	*Egretta caerulea*
Tricolored Heron	*Egretta tricolor*
Cattle Egret	*Bubulcus ibis*
Green Heron	*Butorides virescens*
Black-crowned Night-Heron	*Nycticorax nycticorax*
Yellow-crowned Night-Heron	*Nyctanassa violacea*
Glossy Ibis	*Plegadis falcinellus*
American Kestrel	*Falco sparverius*
Peregrine Falcon	*Falco peregrinus*
Clapper Rail	*Rallus longirostris*
Killdeer	*Charadrius vociferus*
American Oystercatcher	*Haematopus palliatus*
Spotted Sandpiper	*Actitis macularius*
Willet	*Tringa semipalmata*
American Woodcock	*Scolopax minor*
Herring Gull	*Larus argentatus*
Great Black-backed Gull	*Larus marinus*
Rock Pigeon	*Columba livia*
Mourning Dove	*Zenaida macroura*
Black-billed Cuckoo	*Coccyzus erythropthalmus*
Barn Owl	*Tyto alba*

Table C.4-1 (cont'd)
Breeding Bird Atlas Records for Block 5749C

Common Name	Scientific Name
Common Nighthawk	*Chordeiles minor*
Chimney Swift	*Chaetura pelagica*
Red-bellied Woodpecker	*Melanerpes carolinus*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Northern Flicker	*Colaptes auratus*
Willow Flycatcher	*Empidonax traillii*
Great Crested Flycatcher	*Myiarchus crinitus*
Eastern Kingbird	*Tyrannus tyrannus*
White-eyed Vireo	*Vireo griseus*
Blue Jay	*Cyanocitta cristata*
American Crow	*Corvus brachyrhynchos*
Fish Crow	*Corvus ossifragus*
Barn Swallow	*Hirundo rustica*
Black-capped Chickadee	*Poecile atricapillus*
Tufted Titmouse	*Baeolophus bicolor*
Carolina Wren	*Thryothorus ludovicianus*
House Wren	*Troglodytes aedon*
Marsh Wren	*Cistothorus palustris*
American Robin	*Turdus migratorius*
Gray Catbird	*Dumetella carolinensis*
Northern Mockingbird	*Mimus polyglottos*
Brown Thrasher	*Toxostoma rufum*
European Starling	*Sturnus vulgaris*
Cedar Waxwing	*Bombycilla cedrorum*
Yellow Warbler	*Dendroica petechia*
Common Yellowthroat	*Geothlypis trichas*
Eastern Towhee	*Pipilo erythrophthalmus*
Chipping Sparrow	*Spizella passerina*
Field Sparrow	*Spizella pusilla*
Song Sparrow	*Melospiza melodia*
Swamp Sparrow	*Melospiza georgiana*
Northern Cardinal	*Cardinalis cardinalis*
Red-winged Blackbird	*Agelaius phoeniceus*
Common Grackle	*Quiscalus quiscula*
Boat-tailed Grackle	*Quiscalus major*
Brown-headed Cowbird	*Molothrus ater*
Baltimore Oriole	*Icterus galbula*
House Finch	*Carpodacus mexicanus*
House Sparrow	*Passer domesticus*

Source: NYS Breeding Bird Atlas (2000-2005)
Note: Highlighted species were observed at the BMP sites. A description of the species observed during the DEIS field observations is provided in the individual BMP descriptions.

B. NEW YORK STATE AMPHIBIAN AND REPTILE ATLAS PROJECT

All of the proposed BMP sites within the New Creek Watershed are located within "The Narrows" Survey Block (16 species). Six species of salamanders and a variety of toads, frogs,

and snakes are expected in the habitats of the upper New Creek watershed (see Table C.4-2). Northern red salamanders and northern dusky salamanders are known to be present in and near streams, springs, ponds, and bogs in deciduous, conifer, and mixed forests of the upper watershed (Gibbs et. al. 2007). Ponds are the primary habitat for the spotted salamander and the red spotted newt on Staten Island. Within the lower watershed, the eastern red-backed salamander is the only species of salamander expected to occupy the BMP sites. With respect to other reptile and amphibian fauna, all of the frogs, toads, and snakes common to the Mid-Island area would be expected to occur within the lower reaches of the New Creek watershed.

Table C.4-2
New York State Amphibian and Reptile Atlas Project:
"The Narrows" Survey Block

Common Name	Scientific Name	Protective Status (Federal/NYS)
	Salamanders	
Eastern Red-backed Salamander	*Plethodon cinereus*	Not Listed
Red Salamander	*Pseudotriton ruber*	Not Listed
Northern Two-line Salamander	*Eurycea bislineata*	Not Listed
	Toads	
Fowler's Toad	*Anaxyrus fowleri*	Game Species
	Frogs	
Spring Peeper	*Pseudacris crucifer*	Game Species
American Bullfrog	*Lithobates catesbeiana*	Game Species
Green Frog	*Lithobates clamitans*	Game Species
	Snakes	
Northern Brown Snake	*Storeria dekayi*	Not Listed
Common Garter Snake	*Thamnophis sirtalis*	Not Listed
Northern Water Snake	*Nerodia sipedon*	Not Listed
Eastern Milk Snake	*Lampropeltis triangulum*	Not Listed
	Turtles	
Snapping Turtle	*Chelydra serpentina*	Game Species
Northern Diamondback Terrapin	*Malaclemys terrapin*	Game Species
Red-eared Slider	*Trachemys scripta*	Not Listed
Leatherback Turtle	*Dermochelys coriacea*	Federally and State Endangered
Painted Turtle	*Chrysemys picta*	Not Listed

Source: New York State Department of Environmental Conservation. 2010 http://www.dec.ny.gov/animals/7140.html.
Note: Highlighted species were observed at the BMP sites. A description of the species observed during the DEIS field observations is provided in the individual BMP descriptions.

C. VEGETATION OF NEW CREEK WATERSHED

Table C.4-3 provides a list of plants observed during site visits to the New Creek Watershed in 2009 and 2010.

Table C.4-3
Plants Observed during Site Reconnaissance 2009 and 2010 in New Creek Watershed

Scientific Name	Common Name	Scientific Name	Common Name
Trees		**Shrubs**	
Acer negundo	Box Elder	*Aralia spinosa*	Devil's Walking Stick
Acer palmatum	Japanese Maple	*Aronia melancarpa*	Black Chokeberry
Acer platanoides	Norway Maple	*Baccharis halimifolia*	Groundsel Bush
Acer pseudo-platanus	Sycamore Maple	*Cephalanthus occidentalis*	Buttonbush
Acer rubrum	Red Maple	*Clethra alnifolia*	Sweet Pepperbush
Acer rubrum trilobum	Red Maple	*Cornus amomum*	Silky Dogwood
Acer saccharinum	Silver Maple	*Cornus sericea*	Red Osier Dogwood
Ailanthus altissima	Tree-of-Heaven	*Elaeagnus sp.*	Olive sp.
Alnus glutinosa	European Black Alder	*Hamamelis virginiana*	Witch hazel
Betula lenta	Black Birch	*Hibiscus moscheutos*	Rose Mallow
Betula populifolia	Gray Birch	*Ilex verticillata*	Winterberry
Carpinus caroliniana	Ironwood	*Ligustrum sp.*	Privet
Carya alba	Mockernut Hickory	*Lindera benzoin*	Spicebush
Carya glabra	Pignut Hickory	*Photinia pyrifolia*	Red Chokeberry
Carya sp.	Hickory	*Rhododendron viscosum*	Swamp White Azalea
Celtis occidentalis	Hackberry	*Rhus copallina*	Winged Sumac
Fagus grandifolia	American Beech	*Rhus sp.*	Sumac sp.
Fraxinus pennsylvanica	Green Ash	*Rosa multiflora*	Multiflora Rose
Juglans nigra	Black Walnut	*Rubus allegheniensis*	Common Blackberry
Liriodendron tulipifera	Tulip Tree	*Rubus occidentalis*	Black Raspberry
Morus alba	Mulberry	*Rubus phoenicolasius*	Wineberry
Nyssa sylvatica	Black Gum	*Salix discolor*	Pussy Willow
Pinus strobus	Eastern White Pine	*Sambucus canadensis*	Elderberry
Platanus occidentalis	Sycamore	*Vaccinium corymbosum*	Highbush Blueberry
Populus alba	White Poplar	*Vaccinium vacillans*	Low Bush Blueberry
Populus deltoides	Eastern Cottonwood	*Viburnum acerifolium*	Maple-leaf Viburnum
Populus grandidentata	Bigtooth Aspen	*Viburnum dentatum*	Northern Arrowwood
Prunus avium	Sweet Cherry	*Pyrola rotundifolia*	Round-leaf Wintergreen
Prunus serotina	Black Cherry	**Vines**	
Prunus virginiana	Chokecherry	*Ampelopsis brevipedunculata*	Porcelain-berry
Pyrus coronaria	American Crabapple	*Celastrus orbiculatus*	Asiatic Bittersweet
Quercus alba	White Oak	*Dioscorea villosa*	Wild Yamroot
Quercus coccinea	Scarlet Oak	*Lonicera japonica*	Japanese Honeysuckle
Quercus palustris	Pin Oak	*Parthenocissus quinquefolia*	Virginia Creeper
Quercus prinus	Chestnut Oak	*Smilax glauca*	Catbrier
Quercus rubra	Red Oak	*Smilax rotundifolia*	Common Greenbrier
Robinia pseudoacacia	Black Locust	*Toxicodendron radicans*	Poison Ivy
Salix alba	White Willow	*Vitis labrusca*	Fox Grape
Salix nigra	Black Willow	*Wisteria sinensis*	Chinese Wisteria
Sassafras albidum	Sassafras		
Ulmus Americana	American Elm		

Table C.4-3 (cont'd)
Plants Observed during Site Reconnaissance 2009 and 2010 in New Creek Watershed

Scientific Name	Common Name	Scientific Name	Common Name
Forbs		**Ferns**	
Ageratina altissima	White Snakeroot	*Dennstaedita punctilobula*	Hayscented Fern
Alliaria petiolata	Garlic Mustard	*Dryopteris carthusiana*	Spinulose Woodfern
Allium canadense	Meadow Garlic	*Onoclea sensibilis*	Sensitive Fern
Allium vineale	Wild Onion	*Osmunda cinnamomea*	Cinnamon Fern
Ambrosia trifida	Great Ragweed	*Osmunda regalis*	Royal Fern
Ansaemia atrorubens	Jack-in-the-Pulpit	*Thelypteris simulate*	Massachusetts Fern
Apocynum androsaemifolium	Spreading Dogbane	**Grasses, Rushes, and Sedges**	
Apocynum cannabinum	Indian Hemp	*Bromus commutatus*	Field Brome
Aralia nudicaulis	Wild Sarsaparilla	*Carex blanda*	Woodland Sedge or Thicket Sedge
Artemis vulgaris	Mugwort	*Carex lurida*	Lurid Sedge
Asclepias sp.	Milkweed	*Carex pensylvanica*	Pennsylvania Sedge
Asclepias syriaca	Common Milkweed	*Carex rosea*	Rosy Sedge
Aster lanceolatus	Panicled Aster	*Carex spp.*	Sedge spp.
Barbarea vulgaris	Common Wintercress	*Carex stipata*	Awl-fruited Sedge
Circaea quadrisulcata	Enchanter's Nightshade	*Carex stricta*	Tussock Sedge
Equisetum sp.	Horsetail	*Dactylis glomerata*	Orchard Grass
Eupatorium fistulosum	Joe-Pye Weed	*Echinochloa muricata*	Rough Barnyard Grass
Eurybia divaricata	White-wood Aster	*Festuca pratensis*	Meadow Fescue
Heracleum lanatum	Cow Parsnip	*Festuca sp.*	Fescue
Impatiens sp.	Jewel Weed	*Juncus bufonius*	Toad Rush
Iris versicolor	Blue-Flag Iris	*Juncus effuses*	Common Rush
Lychnis alba	White Campion	*Juncus effuses*	Common Rush
Lythrum salicaria	Purple Loosestrife	*Panicum clandestinum*	Deer-Tongue Grass
Maianthemum canadense	Canada Mayflower	*Panicum virgatum*	Switch grass
Melilotus alba	White Sweet Clover	*Phragmites australis*	Common Reed
Monotropa uniflora	Indian Pipe	*Schedonorus pratensis*	Meadow Fescue
Oenothera biennis	Common Evening Primrose	*Scirpus cyperinus*	Wool Grass
Oxalis sp.	Sorrel	*Typha latifolia*	Broad-leaved Cattail
Pilia pumila	Clearweed	*Andropogon sp.*	Beardgrass
Polygonatum biflorum	Smooth Solomon's Seal		
Polygonum cespitosum	Oriental Lady's Thumb		
Polygonum cuspidatum	Japanese Knotweed		
Polygonum hydropiper	Smartweed		
Polygonum pensylvanicum	Pennsylvania Smartweed		
Sagittaria latifolia	Arrowhead		
Sisyrinchium montanum	Blue-Eyed Grass		
Smilacina racemosa	False Solomon's Seal		
Solanum dulcamara	Climbing Nightshade		
Solidago canadensis	Canada Goldenrod		
Solidago rugosa	Wrinkleleaf Goldenrod		
Solidago sp.	Goldenrod		
Symplocarpus foetidus	Skunk Cabbage		
Trifolium pratense	Red Clover		
Viola spp.	Violet		

Source: AKRF, Inc. 2009, 2010

Note: A description of the species observed during the DEIS field observations is provided in the individual BMP descriptions.

D. REEDS BASKET WILLOW SWAMP PARK

OVERVIEW

Because Reeds Basket Willow Swamp Park is an important ecological feature of the upper watershed as a 48-acre preserve, a summary description of ecological and wildlife conditions within the park is provided below.

ECOLOGICAL COMMUNITIES

The topography of the upland portion of Reed's Basket Willow Swamp Park consists of a gradual to steep forested slope comprised of NYSDEC-mapped wetlands (NA-5) and NWI-mapped PUBHh and PEM5Fh wetlands. Observations of the wetlands indicate that open portions of the lower basin in the park are partially dominated by common reed, but skunk cabbage (*Symlocarpus foetidus*) and jewelweed form monotypic stands. In addition, individuals of common elderberry were observed in the central portions of the lower basin. The species composition in transition areas from wetland to upland habitats contains dense areas of invasive and opportunistic species such as multiflora rose, Japanese knotweed, Japanese honeysuckle, poison ivy, and porcelain-berry in the shrub and herbaceous layers. However, pockets of spicebush, swamp white azalea (*Rhododendron viscosum*), black chokeberry (*Aronia melancarpa*), common elderberry, Massachusetts fern (*Thelypteris simulata/Parathelypteris simulata*), jewelweed, and sweet pepperbush (*Clethra alnifolia*) are also present along portions of the wetland edge.

Red oak is the dominant tree in the canopy of the upland portions of the forest. Other commonly occurring species in the canopy include red maple, sweet gum, white oak, and tulip tree. In some locations, healthy stands of American beech are present. Black birch and red maple are dominants in the subcanopy. Black cherry, pignut hickory, mockernut hickory, sassafras, and ironwood were also observed in the subcanopy stratum in some locations. The understory of the forest is fairly open with scattered maple-leaf viburnum on upland slopes and spicebush at lower elevations. Pockets of highbush blueberry, chokecherry, and witch hazel (*Hamamelis virginiana*) are also present. The herbaceous layer is characterized by patches of Canada mayflower (*Maianthemum canadense*), hayscented fern (*Dennstaedtia punctilobula*), wild sarsaparilla (*Aralia nudicaulis*), white-wood aster, and low bush blueberry. Other species observed in the herbaceous layer include chestnut oak (*Quercus prinus*), cinnamon fern, poison ivy, Chinese wisteria (*Wisteria sinensis*), garlic mustard, multiflora rose, roundleaf greenbrier, Asiatic bittersweet, round-leaf wintergreen (*Pyrola rotundifolia*), Indian pipe (*Monotropa uniflora*), jewelweed, and Japanese knotweed.

The vegetative community at the edges of the forest (i.e., along the streets and behind residences) has been disturbed and contains a number of non-native species including Japanese knotweed and garlic mustard along with ornamental species. However, in general, the ecological community of Reeds Basket Willow Swamp Park is in good condition. The upland forest is comprised of a number of well-established native species in all strata and invasive species within the upland portions of the area inspected are minimal. With respect to the wetlands, invasive species are more prominent, but species richness along the edge of the wetland is quite high and a number of native shrubs and herbaceous plants are represented and well established.

WILDLIFE

The upland and wetland portions of Reeds Basket Willow Swamp Park have the potential to provide a wide range of habitats for feeding, nesting, perching, and cover opportunities to a wide spectrum of wildlife including species that are less tolerant of disturbance (i.e., amphibians). Trees of the park provide perching opportunities for aerial foragers, such as flycatchers, and canopy birds (i.e., warblers) as well as cover and foraging opportunities for ground feeders such as the brown thrasher, American robin, and wood thrush. The downy woodpecker, black-capped chickadee, American robin, white-throated sparrow, slate-colored junco, and American crow have been observed within this community (NYSDEC 1987).

In general, despite the presence of invasive plant species along the edges of the park and at the wetland edges, the plant assemblages and ecological communities present within the park provide high value habitat to a wide range of species. Observations of Reeds Basket Willow Swamp Park indicate that habitat (i.e., terrestrial, stream, and pond habitat) is present for all of salamanders known to occur on Staten Island and decomposing logs and rich organic matter would be expected to provide cover to a number of salamanders and frogs. Furthermore, this wetland is a known breeding location for the dusky and northern red salamanders (Pehek 2007) and is likely the breeding habitat for amphibians such as the green frog and bull frog. However, the pond area is becoming invaded by common reed, which tends to lead to the stagnation and sediment retention that could lead to further degradation of the pond and salamander habitat (Pehek 2007). Despite this degradation in discrete areas, the overall habitat within Reeds Basket Willow Swamp Park is in excellent condition and would be expected to support all of the species of salamanders, toads, frogs, and snakes that occur within the watershed, as described above.

With respect to mammals, the diverse upland and wetland habitats would be expected to provide food sources and cover to all of the mammals described above including opossum, raccoon, eastern cottontail, chipmunk, groundhog, and white-tailed deer.

E. LOWER WATERSHED ECOLOGICAL CONDITIONS

INTRODUCTION

Because there are common features among the Lower Watershed BMPs sites (NC-7 though NC-19, but excluding NC-11, Last Chance Pond), this section provides an overview of ecological conditions in the lower watershed. Also provided below are descriptions for each BMP site/

ECOLOGICAL COMMUNITIES

WETLANDS

Although separated by several roads, most notably Hylan Boulevard, the wetlands of the lower watershed collectively form a single, largely contiguous and interconnected habitat complex. The hydrologic connection, vegetative composition, and structure, of these sites are very similar, as they are all part of the Dongan Hills Wetland (NA-9). The BMP profiles below follow general ecological community and wildlife descriptions and provide site-specific ecological community and wildlife details.

These wetlands possess distinctive features: (1) an open common reed marsh with a creek channel (i.e., New Creek or its tributaries) that transects the wetland area; (2) a transition zone

between the wetland and upland communities; and (3) an upland area that is limited in size and width due to roadways and/or residential development. Additional description follows.

NWI-classified PEM5E wetlands have the largest coverage throughout the lower watershed sites as confirmed during field investigations. Although common reed is the most obvious dominant species within the open portions of these wetlands, none of the sites represent an exclusive monoculture. Field observations of these wetlands confirmed that pockets of native wetland vegetation are also present. In a majority of the sites, sizable woodland patches of red maple, pin oak, grey birch, cottonwood, willow, and black gum are present. Other commonly occurring species within the common reed marsh include common elderberry, arrowwood, pussy willow, groundsel bush, red osier dogwood (*Cornus sericea*), and silky dogwood (*Cornus amomum*) in the shrub layer and sensitive fern and jewelweed in the herbaceous layer. Bur-reed (*Sparganium eurycarpum*), groundsel bush, and rose mallow are also in areas closest to the creek corridors.

The composition of the red maple-sweetgum swamp habitat is limited within the study area, and appears to be remnant native forest that occurs in pockets surrounded by ecological communities associated with disturbance. Red maple and sweetgum are present in the canopy and red maple, sweetgum and silver maple, in some locations are present in the sub-canopy. Other species common to the understory include arrowwood, silky dogwood, and chokeberry (*Photinia pyrifolia*).

TRANSITION AREAS

Transition areas from upland to wetland communities, in many areas, contain intact native plant compositions. Species that commonly occur in the shrub stratum of these edge communities include common elderberry, arrowwood, silky dogwood, and pussy willow (*Salix discolor*). In the herbaceous stratum, jewelweed and sensitive fern were observed at many locations at the edge growing with common reed. Other less commonly observed species along the wetland edges include jack-in the pulpit (*Ansaemia atrorubens*), blue-eyed grass (*Sisyrinchium montanum*), common rush, sedges, horsetail (*Equisetum* sp.), switch grass, and deer tongue grass.

UPLAND AREAS

Overview

The ecological communities of the upland habitat can be characterized by successional old field, and successional southern hardwoods, with the latter having the greatest coverage.

The successional old field community is a community dominated by forbs and grasses on sites that have been cleared and plowed (for farming or development) and then abandoned (Edinger et. al. 2002). Successional old field habitat dominated by forbs and grasses is rare in the overall study area, but where it does occur, in addition to a predominance of mugwort, it exhibits meadow fescue (*Festuca pratensis*), field brome (*Bromus commutatus/Bromus arvensis*), orchard grass, milkweed, red cover (*Trifolium pratense*), Indian hemp (*Apocynum cannabinum*), and small sedges (eastern woodland sedge (*Carex blanda*) or thicket sedge (*Carex abscondita*)). Pockets of this community type were observed in NC-16 and NC-18.

Trees that may be present in the more disturbed areas of the lower watershed typically include successional species such as quaking aspen, white poplar, common cottonwood, gray birch, and black locust. Dominant species of open areas are limited to mugwort. However, several other shrubs and herbs are present including olive, wineberry, milkweed, dogbane (*Apocynum*

androsaemifolium), porcelain-berry, goldenrods, and common blackberry (NC-9 and NC-18). Substrates of these sites have been disturbed and dumping of construction and demolition debris along with household garbage is evident.

With respect to the successional southern hardwoods community, typically two or more of the following five species assemblages occur in the lower watershed, as follows:

Successional Southern Hardwoods I

This successional southern hardwood community contains pockets of one or two species that are dominant in the canopy with a shrub stratum dominated by one or two species. Commonly observed combinations include stands of black locust and willow with Japanese knotweed, multi-flora rose, or mugwort in the shrub layer, and tree-of-heaven with a mugwort understory. Other species combinations include hackberry with a common reed dominated understory, box elder with a garlic mustard understory (NC-19), silver maple and grey birch with a Japanese knotweed dominated understory (NC-14), and tree-of-heaven and cottonwood with a jewelweed understory (NC-16). Although dominant species listed above are characteristic of these communities, other less dominant species noted in these areas include hackberry, sassafras, black cherry, pin oak, cottonwood, bigtooth aspen, and white poplar (*Populus alba*) in the canopy, staghorn, smooth, and winged sumac and common blackberry in the shrub layer, and blue-eyed grass, milkweed, and rough goldenrod (*Solidago rugosa*) in the herbaceous layer. Pockets of this community type were observed in NC-6, NC-9, NC-7, NC-14, and NC-19. The size and structure of these pocket communities vary between sites.

Successional Southern Hardwoods II

This successional southern hardwoods community contains a single dominant species in the canopy, but a mixture of species in the understory. Common dominants in the canopy stratum include black locust, silver maple, white willow, box elder and tree-of-heaven. Species commonly found in the shrub and herbaceous layers include Japanese honeysuckle, common reed, Japanese knotweed, multi-flora rose, mugwort, milkweed, porcelain-berry, Virginia creeper, poison ivy, field bindweed (*Convolvulus arvensis*), goldenrods, Asiatic bittersweet, bittersweet nightshade, and garlic mustard. Pockets of this community were noted in NC-17, NC-18, and NC-19.

Successional Southern Hardwoods III

This successional southern hardwoods community is characterized by a mixture of species in the canopy, but contains monotypic stands of one or two species in the understory. Species observed include black locust, tree-of-heaven, mulberry, silver maple, red maple, and black cherry in the canopy with multi-flora rose, Asiatic bittersweet, and/or Japanese knotweed in the understory. Pockets of this community were noted in NC-9, NC-17, and NC-18.

Successional Southern Hardwoods IV

This successional southern hardwoods community contains a mixture of species in all strata. Dominant species may not be readily observable and may include some or all of the following: silver maple, Norway maple, sycamore maple, European black alder, willows, hackberry, pin oak, red maple, sweet gum, black gum, big tooth aspen, white poplar, box elder, white mulberry, and grey birch in the canopy. Species common in the understory could include devils walking stick, arrowwood, silky dogwood, pussy willow, Japanese knotweed, false indigo (*Amorpha fruticosa*), multi-flora rose, mugwort, porcelain berry, common reed, olive, sumacs, and

Japanese honeysuckle. All of the BMP sites have areas characteristic of this species composition.

F. FISH RESOURCES

DEC WETLAND DESIGNATION REPORTS

The DEC wetland designation report for the New Creek wetlands (NA-8: Last Chance Pond and NA-9: Dongan Avenue) identified potential habitat for small fish along the New Creek Main Channel. No potential fish habitat was reported for the other wetlands of the watershed (NA: 12 St. Francis Woodlands, NA:5 Reeds Basket Willow Swamp Park). Individual fish species were identified for Last Chance Pond, but not for the Dongan Avenue wetlands. The fish that were identified in that designation report included the following:

- Bullhead catfish;
- Gambusia;
- Pumpkinseed goldfish; and
- Goldfish.

In addition to the above, local naturalists have reported (in the lower reaches of the New Creek Main Channel) Atlantic silversides, striped and branded killifish and three spine stickleback along with golden shiners and American eel.

FISH SAMPLING

Fish sampling performed in August 2011 along the stream identified the following species:

Table C.4-4
Fish Observed in the New Creek Main Channel

Species	Last Chance Pond	Hylan Boulevard (south side)	Olympia Boulevard
Banded Killifish *(Fundulus diaphanus)*	5	15	5
Mummichog (*Fundulus heteroclitus)*	N/A	6	N/A
Bluegill *(Lepomis macrochirus)*	N/A	3	N/A
American eel *(Anguilla rostrata)*	N/A	3	N/A
Source: NYCDEP, August 2011			

ESSENTIAL FISH HABITAT

Table C.4-5 lists the Essential Fish Habitat-designated species for the Lower Bay as reported by the NMFS.

Table C.4-5
Essential Fish Habitat Designated Species for the Lower New York Bay

Species	Eggs	Larvae	Juveniles	Adults
Red hake *(Urophycis chuss)*	X	X	X	
Winter flounder *(Pleuronectes americanus)*	X	X	X	X
Windowpane flounder *(Scopthalmus aquosus)*	X	X	X	X
Atlantic sea herring *(Clupea harengus)*		X	X	X
Bluefish *(Pomatomus saltatrix)*			X	X
Atlantic butterfish *(Peprilus triacanthus)*		X	X	X
Atlantic mackerel *(Scomber scombrus)*			X	X
Summer flounder *(Paralicthys dentatus)*		X	X	X
Scup *(Stenotomus chrysops)*	X	X	X	X
Black sea bass *(Centropristus striata)*	n/a		X	X
King mackerel *(Scomberomorus cavalla)*	X	X	X	X
Spanish mackerel *(Scomberomorus maculatus)*	X	X	X	X
Cobia *(Rachycentron canadum)*	X	X	X	X
Clearnose skate (*Raja eglanteria*)			X	X
Little skate (*Leucoraja erinacea*)			X	X
Winter skate (*Leucoraja ocellata)*			X	X
Dusky shark *(Charcharinus obscurus)*		X[1]		
Sandbar shark *(Charcharinus plumbeus)*		X[1]		X

Notes:[1] Neither of these species have a free-swimming larval stage; rather they are live bearers that give birth to fully formed juveniles. For the purposes of this table, "larvae" for sand tiger and sandbar sharks refers to neonates and early juveniles.
Source: National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the internet at: http://www.nero.noaa.gov/hcd/STATES4/conn_li_ny/40307350.html and http://www.nero.noaa.gov/hcd/skateefhmaps.htm

G. AQUATIC MACROINVERTEBRATE SAMPLING

A macroinvertebrate survey of New Creek was conducted to provide a baseline aquatic species list and an assessment of water and habitat quality. Macroinvertebrates are differentially sensitive to pollutants and thereby are a good rapid assessment tool to assess the condition of aquatic systems. Sampling was conducted August 11, 2011 at the following three sites along New Creek; upstream side of Olympia Boulevard, downstream side of Hylan Boulevard, and Last Chance Pond downstream of the storm sewer outlet. Sampling and assessment followed the DEC guidelines for biological monitoring of surface waters in New York State. Macroinvertebrates were collected with both the kick net and stab netting methods due to low stream flow conditions and a lack of cobble or stone substrate.

A total of seventeen species (see Table C.4-6) of macroinvertebrates from eight different orders were found in New Creek. No rare or endangered species were sampled at any location. The species present and community structure are indicative of a stream with low to moderate water quality. The majority of species are categorized as "tolerant" or "partially tolerant" to impaired waters with organic pollution. These include common macroinvertebrates of urban waters such as snails, leeches, aquatic worms, and fly larvae. No pollution intolerant species of the groups *Ephemoptera* (mayflies), *Plecoptera* (stoneflies), or *Trichoptera* (caddisflies) were identified. These groups are indicative of streams with a higher water quality.

Overall the Main Channel had a Hilsenhoff Biotic Index (HBI) value of 7.5, indicating a prevalence of pollution tolerant species and a lack of pollution intolerant species. The HBI index is an evaluative tool to assess the community structure and rank species based on water quality

tolerance. In sum, the macroinvertebrate community of New Creek can be characterized as that associated with low to mid water quality and is comparable to surveys of urban streams with similar environmental conditions. Some of the species present and community structure can also be explained by the low flow rate and soft muck/silt substrates in New Creek.

Table C.4-6
Macroinvertebrate Sampling Data

Taxonomic Classification						
Class	**Order**	**Suborder**	**Family**	**Genus**	**Species**	**Functional Group**
Insecta	Coleoptera		Dystiscidae	Acilius	mediatus	predator
			Dystiscidae	Hydroporus	sp.	predator
			Dystiscidae	sp.		predator
	Hemiptera		Corixidae	sp.		predator
			Notonectidae	Notonecta	undulata	predator
			Notonectidae	Notonecta	irrorata	predator
			Belostomatidae	Belostoma	lutarium	predator
	Odonata	Anisoptera	Libellulidae	sp.		predator
		Anisoptera	Corduliidae	sp.		predator
		Zygoptera	Coenargrionidae	sp.		predator
	Diptera		Chironominae	sp.		predator
			Chironominae	sp.		predator
Gastropoda			Planorbidae	sp.	sp.	
			Physidae	Physella	sp.	gathering collector
Bivalva	Veneroida		Sphaeriidae	Pisidium	sp.	filtering collector
Hirudinea	Rhynchobdellida		Glossiphoniidae			predator
Oligochaeta	Tubificida		Naidae			gathering collector

Source: DEP, August 2011

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Appendix C.5: Natural Resources Data Inventory: South Beach Watershed

A. NEW YORK STATE BREEDING BIRD ATLAS

All of the proposed BMP sites within the South Beach Watershed are located within New York State Breeding Atlas Block 5749C (70 species). Table C.5-1, below, lists the avian species within this block.

Table C.5-1
Breeding Bird Atlas Records for Block 5749C

Common Name	Scientific Name
Canada Goose	*Branta canadensis*
Mute Swan	*Cygnus olor*
Gadwall	*Anas strepera*
American Black Duck	*Anas rubripes*
Mallard	*Anas platyrhynchos*
Wild Turkey	*Meleagris gallopavo*
Double-crested Cormorant	*Phalacrocorax auritus*
Great Egret	*Ardea alba*
Snowy Egret	*Egretta thula*
Little Blue Heron	*Egretta caerulea*
Tricolored Heron	*Egretta tricolor*
Cattle Egret	*Bubulcus ibis*
Green Heron	*Butorides virescens*
Black-crowned Night-Heron	*Nycticorax nycticorax*
Yellow-crowned Night-Heron	*Nyctanassa violacea*
Glossy Ibis	*Plegadis falcinellus*
American Kestrel	*Falco sparverius*
Peregrine Falcon	*Falco peregrinus*
Clapper Rail	*Rallus longirostris*
Killdeer	*Charadrius vociferus*
American Oystercatcher	*Haematopus palliatus*
Spotted Sandpiper	*Actitis macularius*
Willet	*Tringa semipalmata*
American Woodcock	*Scolopax minor*
Herring Gull	*Larus argentatus*
Great Black-backed Gull	*Larus marinus*
Rock Pigeon	*Columba livia*
Mourning Dove	*Zenaida macroura*
Black-billed Cuckoo	*Coccyzus erythropthalmus*
Barn Owl	*Tyto alba*

Table C.5-1 (cont'd)
Breeding Bird Atlas Records for Block 5749C

Common Name	Scientific Name
Common Nighthawk	*Chordeiles minor*
Chimney Swift	*Chaetura pelagica*
Red-bellied Woodpecker	*Melanerpes carolinus*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Northern Flicker	*Colaptes auratus*
Willow Flycatcher	*Empidonax traillii*
Great Crested Flycatcher	*Myiarchus crinitus*
Eastern Kingbird	*Tyrannus tyrannus*
White-eyed Vireo	*Vireo griseus*
Blue Jay	*Cyanocitta cristata*
American Crow	*Corvus brachyrhynchos*
Fish Crow	*Corvus ossifragus*
Barn Swallow	*Hirundo rustica*
Black-capped Chickadee	*Poecile atricapillus*
Tufted Titmouse	*Baeolophus bicolor*
Carolina Wren	*Thryothorus ludovicianus*
House Wren	*Troglodytes aedon*
Marsh Wren	*Cistothorus palustris*
American Robin	*Turdus migratorius*
Gray Catbird	*Dumetella carolinensis*
Northern Mockingbird	*Mimus polyglottos*
Brown Thrasher	*Toxostoma rufum*
European Starling	*Sturnus vulgaris*
Cedar Waxwing	*Bombycilla cedrorum*
Yellow Warbler	*Dendroica petechia*
Common Yellowthroat	*Geothlypis trichas*
Eastern Towhee	*Pipilo erythrophthalmus*
Chipping Sparrow	*Spizella passerina*
Field Sparrow	*Spizella pusilla*
Song Sparrow	*Melospiza melodia*
Swamp Sparrow	*Melospiza georgiana*
Northern Cardinal	*Cardinalis cardinalis*
Red-winged Blackbird	*Agelaius phoeniceus*
Common Grackle	*Quiscalus quiscula*
Boat-tailed Grackle	*Quiscalus major*
Brown-headed Cowbird	*Molothrus ater*
Baltimore Oriole	*Icterus galbula*
House Finch	*Carpodacus mexicanus*
House Sparrow	*Passer domesticus*

Source: NYS Breeding Bird Atlas (2000-2005)
Note: Highlighted species were observed at the BMP sites. A description of the species observed during the DEIS field observations is provided in the individual BMP descriptions.

B. NEW YORK STATE AMPHIBIAN AND REPTILE ATLAS PROJECT

All of the proposed BMP sites within the New Creek Watershed are located within "The Narrows" Survey Block fro reptiles and amphibians. Table C.5-2 provides species lists and their

potential occurrence within each of the proposed BMPs. As shown in the table, a variety of salamanders, toads, frogs, and snakes may be found in the habitats of the South Beach watershed. Salamanders are known to be present in and near streams, springs, ponds, and bogs in deciduous, conifer, and mixed forests of the upper watershed (Gibbs et. al. 2007). Ponds are the primary habitat for the spotted salamander and the red spotted newt on Staten Island. Within the lower watershed, the eastern red-backed salamander is the only species of salamander expected to occupy the BMP sites. With respect to other reptile and amphibian fauna, all of the frogs, toads, and snakes common to the Mid-Island area may be present in the lower watershed.

Table C.5-2
Reptiles and Amphibans with the Potential to Occur at the South Beach BMP Sites

Common Name	Scientific Name	Protective Status (Federal/NYS)	Potential for Occurrence Onsite at Individual BMPs		
			SBE-1	SBE-2	SBE-3
Salamanders					
Eastern Red-backed Salamander	*Plethodon cinereus*	Not Listed	Yes	Yes	Yes
Red Salamander	*Pseudotriton ruber*	Not Listed	No	No	No
Northern Two-line Salamander	*Eurycea bislineata*	Not Listed	No	No	No
Toads					
Fowler's Toad	*Anaxyrus fowleri*	Not Listed	Yes	Yes	Yes
Frogs					
Spring Peeper	*Pseudacris crucifer*	Not Listed	Yes	Yes	Yes
American Bullfrog	*Lithobates catesbeiana*	Not Listed	Yes	Yes	No
Green Frog	*Lithobates clamitans*	Not Listed	Yes	Yes	No
Snakes					
Northern Brown Snake	*Storeria dekayi*	Not Listed	Yes	Yes	Yes
Common Garter Snake	*Thamnophis sirtalis*	Not Listed	Yes	Yes	Yes
Northern Water Snake	*Nerodia sipedon*	Not Listed	Yes	Yes	No
Eastern Milk Snake	*Lampropeltis triangulum*	Not Listed	Yes	Yes	Yes
Turtles					
Snapping Turtle	*Chelydra serpentina*	Not Listed	Yes	Yes	No
Northern Diamondback Terrapin	*Malaclemys terrapin*	Game Species	No	No	No
Red-eared Slider	*Trachemys scripta*	Not Listed	Yes	Yes	No
Leatherback turtle	*Dermochelys coriacea*	Federally and State Endangered	No	No	No
Painted Turtle	*Chrysemys picta*	Not Listed	Yes	Yes	No

Note: Highlighted species were observed at the BMP sites. A description of the species observed during the DEIS field observations is provided in the individual BMP descriptions.
Source: New York State Department of Environmental Conservation. 2010 http://www.dec.ny.gov/animals/7140.html.

C. VEGETATION OF SOUTH BEACH WATERSHED

Table C.5-3 provides a list of the plants observed in the South Beach Watershed during site visits in 2009 and 2010.

Table C.5-3
Plants Observed during Site Reconnaissance 2009 and 2010 in South Beach Watershed

Scientific Name	Common Name	Scientific Name	Common Name
Trees		**Shrubs**	
Acer negundo	Box Elder	*Aronia arbutifolia*	Red Chokeberry
Acer palmatum	Japanese maple	*Berberis thunbergii*	Japanese barberry
Acer platanoides	Norway Maple	*Clethera alnifolia*	Sweet Pepperbush
Acer pseudo-platanus	Sycamore maple	*Cornus sp.*	Dogwood sp.
Acer rubrum	Red Maple	*Elaeagnus sp.*	Olive sp.
Acer saccharinum	Silver Maple	*Elaeagnus umbellata*	Autumn Olive
Ailanthus altissima	Tree-of-heaven	*Euonymus alatus*	Burning Bush

Table C.5-3, cont'd
Plants Observed during Site Reconnaissance 2009 and 2010 in South Beach Watershed

Scientific Name	Common Name	Scientific Name	Common Name
Trees, con'td		**Shrubs, cont'd**	
Artemis vulgaris	Mulberry	*Forsythia sp.*	Forsythia
Betula nigra	Black Birch	*Hibiscus moscheutos*	Rose Mallow
Betula populifolia	Gray Birch	*Hibiscus sp.*	Mallow sp.
Carya alba	Mockernut hickory	*Ilex glabra*	Inkberry
Fraxinus sp.	Ash sp.	*Ligustrum vulgare*	Privet
Juniperus virginiana	Red Cedar	*Lindera benzoin*	Spicebush
Liquidambar stryaciflua	Sweetgum	*Maclura pomifera*	Osage Orange
Morus alba	White Mulberry	*Myrica pensylvanica*	Northern Bayberry
Platanus occidentalis	Sycamore	*Rhododendron sp.*	Azalea sp.
Platanus x acerifolia	Londonplane	*Rhus coppallina*	Winged Sumac
Populus deltoides	Cottonwood	*Rhus glabra*	Smooth Sumac
Prunus avium	Sweet cherry	*Rhus typhina*	Staghorn Sumac
Prunus serotina	Black Cherry	*Rosa multiflora*	Multiflora Rose
Pyrus calleryana	Callery Pear	*Rubus allegheniensis*	Common Blackberry
Quercus palustris	Pin oak	*Sambucus canadensis*	Elderberry
Quercus rubra	Red Oak	*Vaccinium corymbosum*	Northern Highbush Blueberry
Robinia pseudoacacia	Black Locust	*Viburnum dentatum*	Arrowwood
Salix babylonica	Weeping Willow	**Ferns**	
Salix discolor	Pussy Willow	*Onoclea sensibilis*	Sensitive Fern
Salix nigra	Black Willow	*Osmunda cinnamomea*	Cinnamon Fern
Salix sp.	Willow	*Osmunda regalis*	Royal Fern
Sassafras albidum	Sassafras		
Vines		**Forbs**	
Ampelopsis brevipedunculata	Porcelainberry	*Ageratina altissima*	White Snakeroot
Celastrus orbiculatus	Asiatic bittersweet	*Alliaria petiolata*	Garlic Mustard
Hedera simplex	English Ivy	*Artemis vulgaris*	Mugwort
Lonicer japonica	Japanese Honeysuckle	*Asclepias syriaca*	Common Milkweed
Parthenocissus quinquefolia	Virginia Creeper	*Aster sp.*	Aster
Smilax sp.	Greenbrier	*Daucus carota*	Queen Anne's Lace
Toxicodendron radicans	Poison Ivy	*Decodon verticillatus*	Swamp Loosestrife
Vinca minor	Periwinkle	*Dioscorea villosa*	Wild Yam
Vitis sp.	Grape sp.	*Eupatorium altissimum*	Tall Thoroughwort
Wisteria sinensis	Wisteria	*Eupatorium hyssopifolium*	Hyssop-leaved Thoroughwort
Grasses, Sedges, and Rushes		*Eurybia divaricata*	White Wood Aster
Bambusa sp.	Bamboo	*Gallium sp.*	Bedstraw
Carex stricta	Tussock Sedge	*Heracleum lanatum*	Cow parsnip
Carex vulpinoidea	Fox Sedge	*Impatiens canadensis*	Jewelweed
Dactylis glomerata	Orchard Grass	*Lemna minor*	Duckweed
Equisetum hyemale	Horsetail	*Lythrum salicaria*	Purple Loosestrife
Festuca sp.	Fescue	*Melilotus alba*	White Sweet clover
Juncus bufonius	Toad Rush	*Melilotus officinalis*	Yellow Sweet Clover
Juncus effusus	Soft Rush	*Nuphar luteum*	Spatterdock
Panicum virgatum	Switchgrass	*Oenothera beinnis*	Evening Primrose
Phragmites australis	Common Reed	*Phytolacca americana*	Pokeweed
Poa pratensis	Kentucky Bluegrass	*Plantago major*	Common Plantain
Sorghastrum nutans	Indiangrass	*Polygonum cuspidatum*	Japanese knotweed

Table C.5-3 (cont'd)
Plants Observed during Site Reconnaissance 2009 and 2010
in South Beach Watershed

Scientific Name	Common Name	Scientific Name	Common Name
		Forbs, con'td	
		Polygonum sp.	Smartweed
		Potentilla recta	Rough fruited cinquefoil
		Rumex sp.	Dock sp.
		Solanum dulcamara	Climbing Nightshade
		Solidago sempervirens	Seaside Goldenrod
		Solidago sp.	Goldenrod
		Symplocarpus foetidus	Skunk Cabbage
		Taraxacum officinale	Common Dandelion
		Thlaspi arvense	Field Pennycress
		Trifolium pratense	Red Clover
		Ulivaria sessifolia	Sessileleaf Bellwort
		Viola sp.	Violet

Source: AKRF, Inc. 2009 and 2010

D. FISH RESOURCES

DEC WETLAND DESIGNATION REPORTS/FRESHWATER FISH

In the South Beach watershed, Cameron's Lake and Brady's Pond are both identified as fish habitat with bluegill and pumpkinseed sunfish reported for both waterbodies (largemouth bass were reported but not observed) with bullhead catfish, gambusia, pumpkinseeds, goldfish and largemouth bass reported in Brady's Pond. The lower South Beach wetlands of the lower watershed were not identified as a potential fish habitat and are believed to be more ephemeral and would not support a viable fish habitat (this condition was also confirmed by summer 2011 field observations).

MARINE FISH AND ESSENTIAL FISH HABITAT

Table C.5-4 lists the Essential Fish Habitat-designated species for the Lower Bay as reported by the NMFS.

Table C.5-4
Essential Fish Habitat Designated Species for the Lower New York Bay

Species	Eggs	Larvae	Juveniles	Adults
Red hake *(Urophycis chuss)*	X	X	X	
Winter flounder *(Pleuronectes americanus)*	X	X	X	X
Windowpane flounder *(Scopthalmus aquosus)*	X	X	X	X
Atlantic sea herring *(Clupea harengus)*		X	X	X
Bluefish *(Pomatomus saltatrix)*			X	X
Atlantic butterfish *(Peprilus triacanthus)*		X	X	X
Atlantic mackerel *(Scomber scombrus)*			X	X
Summer flounder *(Paralicthys dentatus)*		X	X	X
Scup *(Stenotomus chrysops)*	X	X	X	X
Black sea bass *(Centropristus striata)*	n/a		X	X
King mackerel *(Scomberomorus cavalla)*	X	X	X	X
Spanish mackerel *(Scomberomorus maculatus)*	X	X	X	X
Cobia *(Rachycentron canadum)*	X	X	X	X
Clearnose skate (*Raja eglanteria*)			X	X
Little skate (*Leucoraja erinacea*)			X	X
Winter skate (*Leucoraja ocellata)*			X	X
Dusky shark *(Charcharinus obscurus)*		X[1]		
Sandbar shark *(Charcharinus plumbeus)*		X[1]		X

Notes:[1] Neither of these species have a free-swimming larval stage; rather they are live bearers that give birth to fully formed juveniles. For the purposes of this table, "larvae" for sand tiger and sandbar sharks refers to neonates and early juveniles.
Source: National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the internet at: http://www.nero.noaa.gov/hcd/STATES4/conn_li_ny/40307350.html and http://www.nero.noaa.gov/hcd/skateefhmaps.htm

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