Chapter 3: Affected Environment

CHAPTER 3: AFFECTED ENVIRONMENT

This “Affected Environment” chapter describes the existing environmental resources of the areas that would be affected if the Proposed Action were implemented. The descriptions, data, and analyses focus on the specific conditions or consequences that may result from implementing the Proposed Action as required by Director’s Order #12 and Handbook: *Conservation Planning, Environmental Impact Analysis, and Decision Making*, which sets forth the policy and procedures by which NPS will comply with NEPA (NPS 2001).

A description of existing environmental conditions provides a better understanding of planning issues and establishes a benchmark by which the magnitude of environmental effects of the proposed action, the no action alternative, and other alternatives can be compared. The information in chapter 3 is organized by the same environmental topics used to organize the impact analysis in chapter 4. Figures 17 through 19 present a general location map of Anacostia Park.

PHYSICAL RESOURCES

This section discusses soils within the study area.

SOILS

The Anacostia Watershed has seen major alterations to its soil from the past 150 years of development. Major alterations of the tidal portion of the Anacostia River by the USACE began in the 1920s and left fill materials (Udorthents soils) along much of the riparian buffer in the District portion of the Anacostia River. The majority of the soils within Anacostia Park are considered Udorthents (USDA NRCS 2006). Udorthents are comprised of very heterogeneous earth fill material that has deposited on poorly drained to somewhat excessively drained soils. Udorthents are composed of approximately 80 percent earthy material and 20 percent of other matter which may include bricks, or pieces of concrete or stone. The fill is a mixture of organic and inorganic waste materials, as well as sandy, gravelly, clayey, or silty soil materials. The thickness of the fill is variable, but is typically more than 20 inches. Permeability, available water capacity, runoff, and internal drainage are also quite variable (DCDOT 2006b). Most areas adjacent to the Anacostia River contain udorthents. In addition, udorthents are located at Poplar Point, park headquarters, RFK shoreline, Anacostia pavilion, picnic areas, ball fields, and Langston Golf Course (figures 20 through 22). Soils surrounding the park headquarters also contain urban lands (USDA NRCS 2006). The urban land mapping unit consists of areas where more than 80 percent of the surface is covered by asphalt, concrete, buildings, or other impervious surfaces (DCDOT 2006b). Soils considered urban lands are also located around the RFK stadium and on the west bank of the Anacostia River near the 11th Street Bridge (figure 20 through 22).

Other soil classifications throughout Anacostia Park include Iuka sandy loam, Matapeake silty loam, Bibb sandy loam, Fluvaquents, Galestone, and Rumford soils, Fallsington sandy loam, Christiana silt loam, Keyport fine sandy loam, Sassafras gravelly sandy loam, Woodstone sandy loam, and Melvin silt loam (figures 20 through 22). The Iuka series consists of deep, moderately well drained, moderately permeable soils that formed in stratified loamy and sandy alluvial sediments. These soils are on nearly level flood plains. They are saturated with water at depths of 1 foot to 3 feet below the surface during wet seasons and are subject to flooding. Slopes range from 0 to 2 percent. These soils are located at the tennis courts and picnic area just south of Pennsylvania Avenue and at the Langston Golf Course (in Kingman Marsh). Small pockets of Iuka soils are located throughout Kenilworth Marsh (USDA NRCS 2006) (figures 20 through 22). Iuka soils are considered hydric soils in the District (USDA NRCS 2008). The definition of a hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils are one of the required criteria for a site to be characterized as a wetland and include soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation.

The Matapeake series consists of very deep, well drained, moderate to moderately slow permeable soils that formed in silty eolian sediments underlain by coarser fluvial or marine sediments. Slopes range from 0 to 8 percent. These soils are located at the basketball courts just south of Benning Road (USDA NRCS 2006) (figures 20 through 22).

The Bibb series consists of very deep, poorly drained, moderately permeable soils that formed in stratified loamy and sandy alluvium. These soils are on floodplains of streams in the Coastal Plain. Runoff for this soil is very slow and permeability is moderate with the water table within eight inches of the surface most of the year. Slopes range from 0 to 2 percent and the erosion hazard is none to slight. This soil is limited in use for building, gardens, lawns, and recreational uses because of the high water table and potential of flooding. These soils can provide suitable habitat for many wildlife species. These soils are located within the small islands and Langston Golf Course at Kingman Marsh and the wetland areas on the west bank of the Anacostia River just south of the Baltimore Washington Parkway. The Bibb series also make up the majority of the soils within the Kenilworth Marsh area (USDA NRCS 2006) (figures 20 through 22). Bibb soils are also considered hydric soils in the District (USDA NRCS 2008).

Fluvaquents are typically found in floodplains and have a slope of 0 to 2 percent. These soils have a high potential for flooding and a high water table. Because of these characteristics, these soils have severe limitations for buildings, gardens, lawns, and recreational uses. Although they have these limitations, these soils do provide suitable habitat for many wildlife species and can be used as natural areas and habitat. A small area of fluvaquent soils is located in the fringe wetland area adjacent to the Anacostia River just south of Benning Road. Additionally, small pockets of fluvaquent soils are located throughout Kenilworth Marsh (USDA NRCS 2006) (figures 20 through 22). Fluvaquents are also considered a hydric soil in the District (USDA NRCS 2008).

Small areas Galestone and Rumford soils and Fallsington sandy loam are located near the entrance to the Kenilworth Aquatic Gardens (USDA NRCS 2006) (figure 20). Galestone and Rumford soils consist of very deep, somewhat excessively drained, moderately rapid permeable soils that formed in marine deposits. Slopes range from 0 to 15 percent. The Fallsington soils consist of very deep, poorly drained, moderate to moderately slow permeable soils that formed in loamy marine and old alluvial sediments. Slopes range from 0 to 2 percent.

Small areas of Beltsville silt loam, Sassafras gravelly silt loam, Sunnyside fine sandy loam, Muirkirk variant complex, and Woodstown sandy loam are located on the west bank of the Anacostia River just north and south of the Maryland line (USDA NRCS 2006) (figure 20). The Beltsville silt loam and Woodstown sandy loam are very deep, moderately well drained soils with moderate permeability. The Sunnyside fine sandy loam and Sassafras gravelly silt loam are very deep, well drained soils with moderate permeability. The Muirkirk series consists of very deep, well drained to somewhat excessively drained, moderately slow to slowly permeable soils on uplands.

An area of Christiana silt loam and Keyport fine sandy loam soils are located within the Langston Golf Course (USDA NRCS 2006) (figure 20). These soils are considered very deep and moderately well drained. Permeability is very slow to slow in the Keyport series and moderate to moderately slow in the Christiana series.

FIGURE 17: ANACOSTIA PARK, NORTH AREA

FIGURE 18: ANACOSTIA PARK, CENTRAL AREA

FIGURE 19: ANACOSTIA PARK, SOUTH AREA

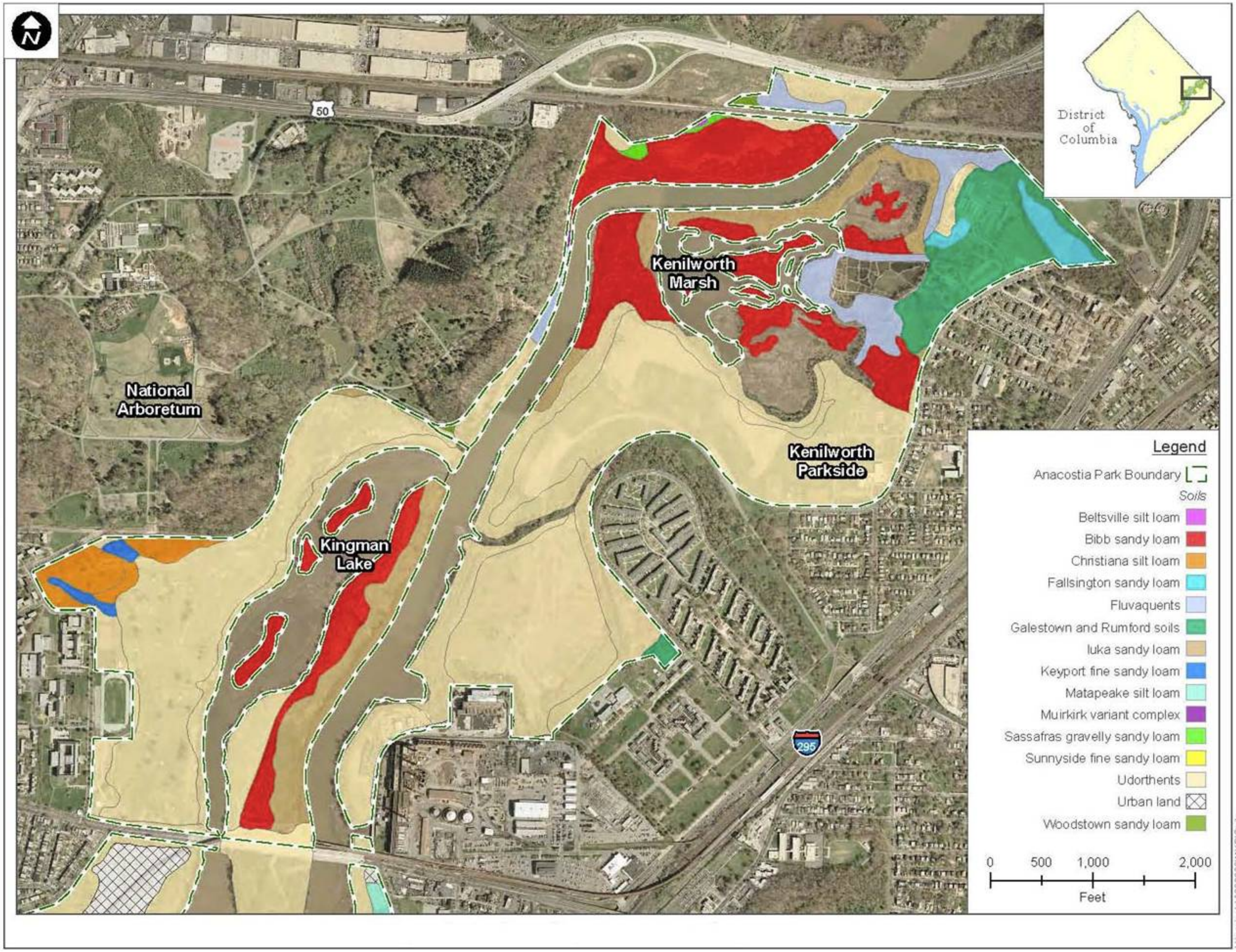


FIGURE 20: SOILS MAP OF ANACOSTIA PARK, NORTH AREA

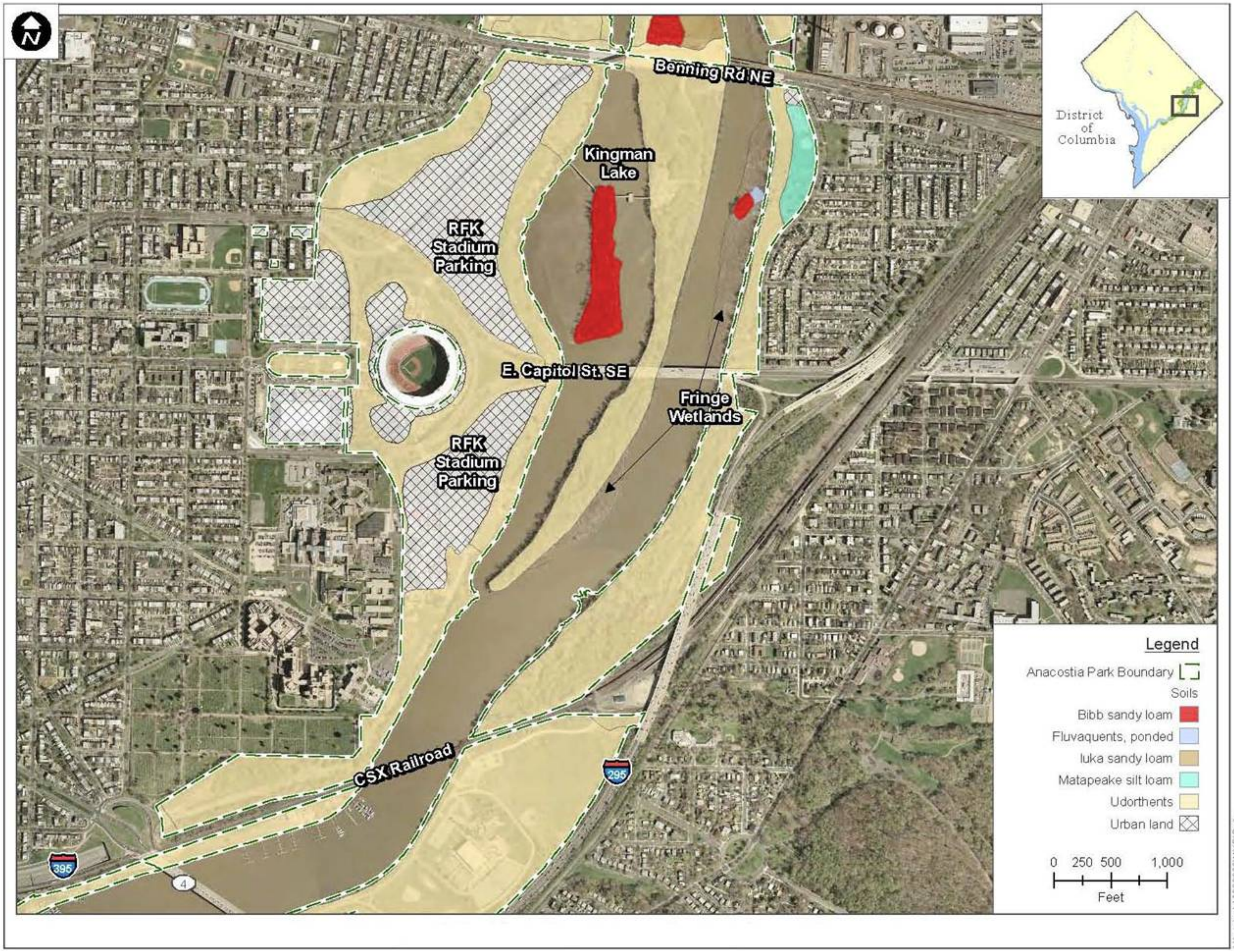


FIGURE 21: SOILS MAP OF ANACOSTIA PARK, CENTRAL AREA

FIGURE 22: SOILS MAP OF ANACOSTIA PARK, SOUTH AREA

A small area of Melvin silt loam is located just east of the South Capitol Street Bridge near the park headquarters (USDA NRCS 2006) (figure 22). The Melvin series consists of very deep, poorly drained soils formed in silty alluvium on flood plains and in upland depressions. Slopes range from 0 to 2 percent.

Soil erosion occurs along the Anacostia River and its tributaries from the large amounts of stormwater rushing over the concrete and spilling out of stormwater pipes. Erosion has occurred in the tributaries from urban runoff and flash floods. Soil surrounding the outfall pipes along the seawall has eroded away due to the high velocity of the water spilling into the river. The seawall runs along the east and west bank of the Anacostia River. The seawall has failed in various areas, due to concrete stones falling out and water flow washing out the soil from behind the seawall. The loss of soil has created large scour holes behind the seawall, particularly in areas along the river bank below the CSX railroad tracks near the park headquarters. Construction along the river has also resulted in erosion of soils. Some small-scale erosion occurs due to the tidal action on the mud flats.

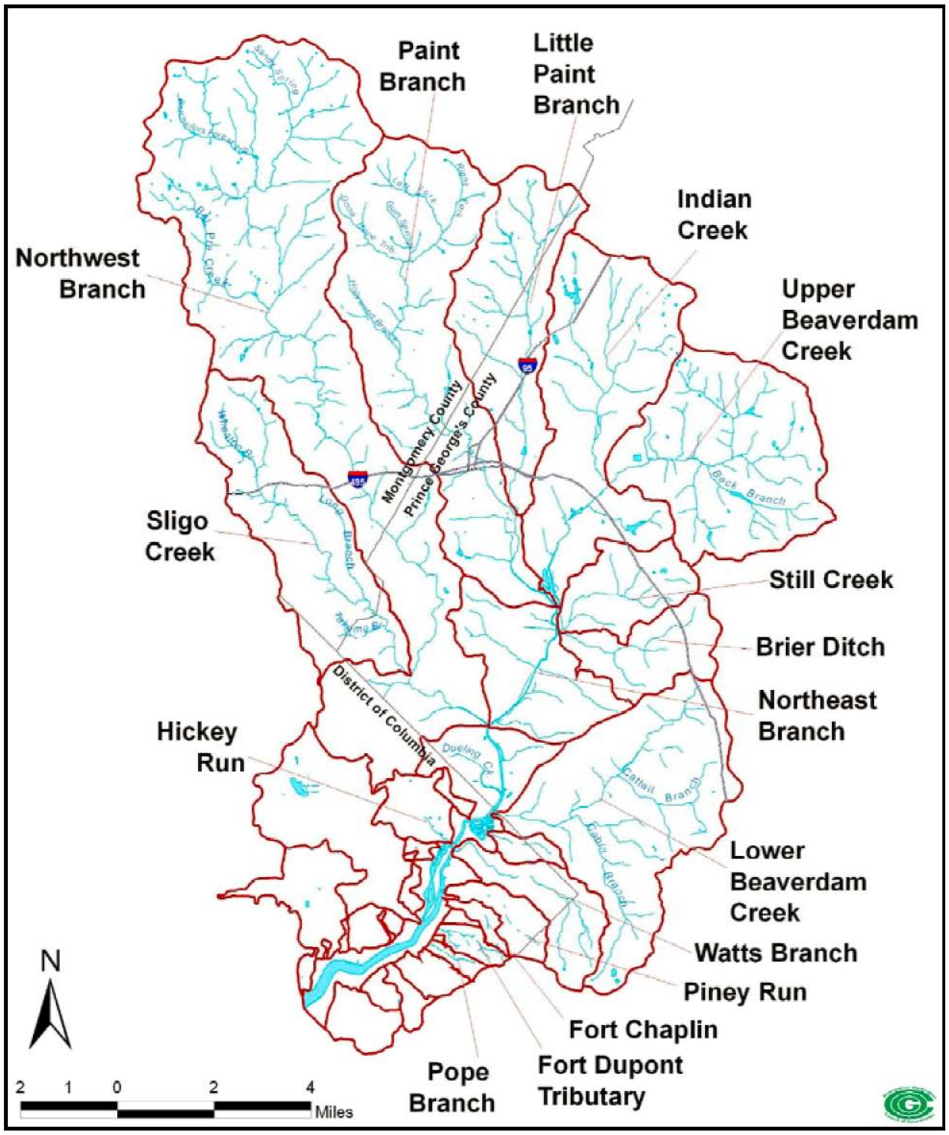
WATER RESOURCES

This topic includes hydrology, water quality, and floodplains.

HYDROLOGY

Anacostia Park is located within the greater Anacostia Watershed (figure 23), estimated at approximately 170 square miles, and drains portions of Montgomery and Prince George’s Counties in Maryland as well as the eastern portion of the District. The Anacostia River is formed by the confluence of the free-flowing (non-tidal) Northeast and Northwest Branches at Bladensburg, Maryland in Prince George’s County. The tidal influence in the Anacostia River extends approximately 1,000 feet upstream of this confluence in both Branches; therefore, the entire tidal Anacostia River from Bladensburg to the Potomac River contains only freshwater. The salt wedge from the ocean and the Chesapeake Bay does not persist past the District. Below the confluence in Bladensburg, the Anacostia River flows in a southwesterly direction for approximately 2.0 miles in Maryland and for approximately 6.7 miles through the eastern portion of the District. The Anacostia River joins the Potomac River at Hains Point in DC, approximately 108 miles upstream of the Chesapeake Bay near Point Lookout, Maryland. The NPS owns approximately 16 miles of shoreline along the Anacostia River. Overall, the morphology of the tidal Anacostia River system has been dramatically altered. This condition reflects the impacts of seawall construction, mainstem navigational dredging and associated filling, which collectively led to the destruction of the river's once-thriving riverine fringe wetlands (DCOP 2003).

The Anacostia River receives drainage from Hickey Run, Lower Beaverdam Creek and Watts Branch subwatersheds (figure 23). Tributaries of the Anacostia River within Anacostia Park and the District of Columbia include Watts Branch, Hickey Run, Fort Dupont Creek, and Pope Branch (figure 23). Most of the lateral tributaries of the Anacostia River have been modified, to varying degrees, through enclosure within storm drain systems, and some are contained in combined storm/sanitary sewers (DCOP 2003). Watts Branch is the largest tributary to the Anacostia River and is partially in the District jurisdiction; the mainstem of Watts Branch is classified as a perennial stream by the USGS. The USGS maintains a stage recorder in the lower portion of Watts Branch and provides real-time stage data on line (DCDOH 2005). Hickey Run is a western tributary of the Anacostia River and discharges into the river just north of Kingman Marsh, near the southern border of the USDA National Arboretum (DCDOH 2003a). The mouth of the tributary is a broad tidal area and runs through the national arboretum to New York Avenue (DCDOH 2005). Fort Dupont Creek is located south of the East Capital Street Bridge and its confluence is located along the eastern shoreline of the Anacostia River. Popes Branch is located south of Fort Dupont Creek and its confluence is located along the eastern shoreline of the Anacostia River.



Source: AWRP and MWCOG 2009

FIGURE 23: ANACOSTIA WATERSHED AND SUBWATERSHEDS

Kenilworth Park and Aquatic Gardens is located within the upper, northeastern section of Anacostia Park and constitutes approximately 700 acres. This portion of the park includes the historic aquatic gardens, Kenilworth Marsh, ball fields, and other recreational facilities. Kenilworth Marsh is a restored freshwater tidal marsh on the Anacostia River located adjacent to the Kenilworth Aquatic Gardens. This area is a tidal wetland that was restored in 1993 by depositing dredged material onto existing mudflats. The current marsh has a direct hydrologic connection to the Anacostia River via a breach in the seawall along the Anacostia River. Kenilworth Aquatic Gardens is a 14-acre historic site dedicated to the cultivation and display of exotic aquatic plants located along the east bank of the Anacostia River.

Kingman Marsh is located along the Anacostia River, and separated from the river by Kingman Island; the island is intersected by both the Benning Road Bridge and the East Capital Street Bridge. Kingman Marsh (lake) is a 110-acre tidal freshwater impoundment that was created during the 1920s and 1930s to provide a recreational boating area for the District residents. The lake is hydrologically connected to the tidal Anacostia River by two inlets located at the northern and southern portions of Kingman Island (historically known as Burnham Barrier). The upper section of the lake is characterized by a dendritic tidal canal system, and during a low tide consists primarily of barren mudflats and areas with shallow water (DCDOH 2003b). The lower section of the lake has an average depth of 3 feet at low tide, with fewer mudflats and no tidal canal system. During a rising tide, water enters the lake through the inlets. The range between mean low and mean high tide is approximately 3.0 feet. Mean high tide elevation is 2.09 feet NGVD (DCDOH 2003b). The majority of sources of water entering the lake include tidal flow, sheet flow from periods of heavy rain, and stormwater outfalls. The lower and upper portion of the lake is connected by a 30-foot culvert located under the Benning Road Bridge (USACE 1994). In 2000, the USACE initiated the restoration of 42 acres of a freshwater tidal emergent wetland in Kingman Marsh.

The Kingman and Kenilworth tidal marshes experience on average a 3.0-foot tidal exchange twice daily such that portions of marsh area that are too low to support vegetation become exposed mudflat at low tide. Both marshes are low energy in that they lie behind island/berm structures that protect them from the energies of the main Anacostia channel (USGS 2004).

Generally, the Anacostia River Basin receives approximately 40 inches of precipitation annually, and this precipitation is fairly evenly distributed throughout the seasons of the year. Therefore, high river flows can occur during any month. Water slows as it leaves the Piedmont Plateau and enters the Coastal Plain physiographic province (DCFWD 2001). In this location, the Anacostia River acts like a lake or sink due to slow water movement. Because time flushing in the Anacostia is dependent upon the tide, water may reside in the river for extended periods of time before reaching the downstream Potomac River (DCFWD 2001). The average flush time for the Anacostia River is 20 days, but a 40-day flush time is not uncommon during the fall season (DCFWD 2001). Under periods of extremely low flow, this residence time can be as long as 100 to 110 days (MWCOG 2007). Flow in many segments of the tidal of the river can move either upstream or downstream, depending on tidal conditions. In the downstream portions of the river, hydrodynamics are dominated by the direction and magnitude of the tidal surge. The mean annual stream flow for the Anacostia, as measured at the upstream flow gages, is 139 cubic feet per second (DCDOH 2003).

WATER QUALITY

Although the designated use of the Anacostia River has been a Class A Water (Primary Contact Recreation) by Federal Water Quality Standards, it has been recognized for many years that water quality in the Anacostia River are highly degraded due to point source, non-point source pollution, and refuse (USEPA and NOAA 2009) from historic toxic contamination, sewer overflows and leaks, and urban stormwater runoff. The Chesapeake Bay Program (CBP) designated the Anacostia River as one of the three most polluted watersheds in the Chesapeake Bay (CBF 2006). The lower Anacostia River is essentially an embayment of the Potomac River with very low flow. Even though the lower portion of the Anacostia River located within the District is tidally influenced and exhibits a 3.0 foot average tide height twice daily, the river has a very slow flushing rate, which prevents flushing that might otherwise remove some of the contamination (USEPA and NOAA 2009). Therefore, heavy siltation, accumulation of toxic metals and organic chemicals in sediments, and sewage overflows all contribute to poor water quality in this section of the river (NPS 2004a). The District Water Quality Standards (WQS), Title 21 of the District of Columbia Municipal Regulations (DCMR) specifies the categories of beneficial uses of waterbodies. Class A and Class B waters must achieve or exceed water quality standards for specified pollutants. The waters are classified on the basis of current use and designated beneficial uses as described in table 7.

TABLE 1: WATERBODY CLASSIFICATION AND DESIGNATED USE

Waterbody Name	Current Use	Designated Use
Anacostia River	B, C, D, E	A, B, C, D, E
Hickey Run	B, C, D	B, C, D
Watts Branch	B, C, D	B, C, D
Other Anacostia River Tributaries	B, C, D	A, B, C, D

Source: DCDOH 2003a

NOTES: Class A - primary contact recreation
Class B- secondary contact recreation
Class C- protection and propagation of fish, shellfish, and wildlife
Class D- protection of human health related to consumption of fish and shellfish
Class E- navigation

Water quality conditions in the tidal Anacostia River have historically been poor. Generally, low dissolved oxygen (DO) concentrations, suspended solids, and high fecal coliform bacteria counts are characterized as major water quality issues (USACE 2002). The water quality of (Kingman) Marsh has also been characterized as poor due to high water temperatures, low DO concentrations, and pollution (USACE 1994). Total suspended solids (TSS) have been listed by the USEPA for total maximum daily loads (TMDLs) as a pollutant in the Anacostia River which directly affects water quality. TSS reduces water clarity, blocks sunlight necessary for SAV, reduces oxygen levels, clogs fish gills, and smothers fish eggs and aquatic insects (CBF 2006). Other specific contaminants of concern in the Anacostia River include lead, mercury, PCBs, PAHs, dichlorodiphenyltrichloroethane (DDT) and chlordane (NPS-USGS 2007). Many water quality parameters that are monitored violate the District's water quality standards to support aquatic life, including DO concentrations. Specifically, the Anacostia River and Kingman Marsh continue to receive nonpoint discharges derived from the intensively developed (impervious) adjacent areas as well as impacts from combined sewer overflows (CSOs) along the river. These CSOs cause high fecal coliform concentrations in violation of the District standards for swimming and elevated levels for nutrients (USACE 1994). The existing poor water quality in the Anacostia has led to fish advisories and consumption restrictions and has severely limited recreational fishing. Stormwater runoff from RFK and the surrounding parking lots is discharged into Kingman Marsh. Overall, poor water quality in Kingman Marsh and the Anacostia River contributes to aquatic ecosystem issues including low numbers of tolerant fish and macroinvertebrate species (USACE 2002).

The water quality of the Anacostia River is being affected by the resident Canada geese due to herbivory on wetland plants and as a result of fecal droppings.

The water quality of the Anacostia River is being affected by the resident Canada geese due to herbivory on wetland plants and as a result of fecal droppings. Wetlands are generally considered nitrogen- or nitrogen and phosphorus limited, which results in the rapid uptake of nitrogen and phosphorus from the water column. The herbivory on wetland plants by the resident Canada goose population decreases the function of the wetlands, which ultimately increases the amount of nutrients within the Anacostia River. In addition, fecal droppings from the geese can degrade overall water quality, particularly in areas where the pathogens can concentrate (USFWS 1999). Fecal droppings increase the amount of fecal coliform, nitrogen, and phosphorus levels, and can carry pathogens such as *Cryptosporidium* species, *Giardia* species, *Salmonella* species, and *Escherichia coli* bacteria (Rutgers 2004).

In addition to these water quality issues, the lower tidal section of the Anacostia as well as Kingman Marsh and tributaries to the Anacostia River within Anacostia Park have been classified by the District as an Impaired Segment under Section 303(d) of the Clean Water Act. Section 303(d) of the Federal Clean Water Act and regulations developed by USEPA require states to prepare a list of waterbodies or waterbody segments that do not meet water quality standards even after all the pollution controls required by law are in place. Waterbodies or waterbody segments not meeting the appropriate water quality standards are considered to be impaired. Impaired segments are waters that do not or are not expected to meet water quality standards as given in the Clean Water Act. The law requires that states place the impaired waterbody segments on a list referred to as the 303(d) list and develop TMDLs for the waterbodies on the list. The USEPA has established TMDLs, which limit the amount of pollutants that can enter a waterbody, and a high priority has been placed on controlling these factors along the lower Anacostia River (NPS 2004a). As a result of the impairment of the Anacostia River, human fish consumption advisories have been placed by the District and Maryland due to PCB, methlymercury, and pesticide contamination. This issue is discussed in more detail in *Visitor Health and Safety*.

The pollutants causing impairment have been listed through the Section 303(d) Program in a draft 2008 document for the lower Anacostia River and Kingman Marsh (DCDE 2008). Additional tributaries to the Anacostia River that also have pollutants on the 303(d) list include the following: Watts Branch, Hickey Run, Fort Dupont Creek, and Popes Branch (DCDE 2008). The 2008 list included the following pollutants causing impairment in the waterbodies mentioned above: bacteria, organics, TSS, metals, oil & grease, biological oxygen demand (BOD), total PCBs, Bis(2-ethylhexyl) phthalate, total residual chlorine, and trash (DCDE 2008). Table 8 presents the pollutants causing impairment for each waterbody within Anacostia Park as well as the TMDL establishment date and the priority ranking for TMDL development. The 2008 list includes for the first time trash as a pollutant causing impairment. Recent estimates from the Metropolitan Washington Council of Governments (MWCOG) indicate that approximately 20,000 tons of trash and debris enter the Anacostia River annually. The main source of this trash problem is litter and illegal dumping (AWRP and MWCOG 2007).

Additionally, the 2008 list includes bacteria (fecal coliform bacteria). The Anacostia is affected by high levels of bacteria, due to leaking sewers, sewer overflows, pet waste and wildlife (MWCOG 2007). The majority of the fecal coliform bacteria enter the Anacostia River through CSO outfalls that are typically found in older cities such as the District. These systems were designed to collect rainwater runoff, domestic sewage, and industrial wastewater all in the same system. Most of the time, combined sewer systems transport all of their wastewater to a sewage treatment plant. However, during periods of heavy rainfall or melting snow the volume of wastewater going into the sewers can exceed the capacity and excess wastewater empties directly into nearby streams, rivers, or other water bodies (USEPA 2007). There are 15 CSO outfalls located on the Anacostia River (DCWASA 2008). The two largest CSO outfalls include the Northeast Boundary CSO, which drains into the Anacostia River near RFK Stadium and East Capitol Street, and the “O” Street Pump Station, which drains into the Anacostia River just below the Washington Navy Yard. DCWASA estimates that combined sewers overflow into the Anacostia and Potomac Rivers about 75 times annually, and spill approximately 1.5 billion gallons per year into the Anacostia River alone (DCWASA 2008). This combination of untreated sewage and stormwater has negative effects on water quality and aquatic life and is the main reason for the bacteria TMDL for the Anacostia River. As a result of a consent decree that the USEPA signed with the DCWASA in 2004 to improve water quality in the Anacostia and Potomac Rivers and Rock Creek, a 20-year Long-Term CSO Control Plan has been drafted. This plan includes three deep underground storage tunnels, including side tunnels to reduce flooding rehabilitation of existing pumping stations and the elimination of 14 overflow outfalls, four of which are located in the Anacostia Watershed (DCWASA 2008). When the project is fully implemented, CSO discharge will be reduced by a projected 98 percent along the Anacostia River (DCWASA 2010).

Table 2: Impaired District Waters and Pollutants within and Adjacent to Anacostia Park

303(d) Listing Year and Category	Waterbody or Segment Name	Pollutants or Pollutant Categories Causing Impairment	TMDL Establishment Date	Priority Ranking for TMDL Development
1998, Category 4A	Lower Anacostia River (Segment 1)	• BOD	December 2001	High
		• Bacteria • Organics • Metals • Oil & Grease	October 2003	High
		• TSS	July 2007	High
		• PCBs	October 2007	High
1998, Category 5	Lower Anacostia River (Segment 1)	• Trash	December 2012	High
1998, Category 4A	Kingman Marsh	• Bacteria • Organics • Metals • Oil & Grease	October 2003	High
Tributaries to the Anacostia River Adjacent to Anacostia Park				
1998, Category 4A	Lower Watts Branch (Segment 1)	• Bacteria • Organics • TSS	October 2003	High
1998, Category 4A	Hickey Run	• Bacteria • Organics	October 2003	High
2002, Category 5	Hickey Run	• Bis(2-ethylhexyl) phthalate • Chlorine (total residual)	December 2012	High
1998, Category 4A	Fort Dupont Creek	• Bacteria • Metals	October 2003	High
1998, Category 4A	Popes Branch	• Bacteria • Organics • Metals	October 2003	High

Source: DCDE 2008

Category 4A: Waterbody or segment of a waterbody for which TMDLs for pollutants causing impairments have been approved or established by USEPA may be placed in this category.

Category 5: Waterbody or segment of a waterbody with at least one designated use not attained or threatened and a TMDL is needed. A waterbody or segment of a waterbody may be placed in this category even if TMDLs have been approved for some of the pollutants/pollution identified as causing non-attainment. All necessary TMDLs for a waterbody or segment of a waterbody must be approved or established by USEPA in order to be placed in category 4A.

The chemicals for which the Organics TMDL have been approved include chlordane, DDD, DDE, DDT, Dieldrin, Heptachlor Epoxide, PAH1, PAH2, PAH3, and Total PCBs.

The chemicals for which the metals TMDL have been approved include arsenic, copper, lead, and zinc.

Bacteria TMDLs have been approved for fecal coliform bacteria.

FLOODPLAINS

EO 11988, "Floodplain Management," issued May 24, 1977, directs all federal agencies to avoid both long- and short-term adverse effects associated with occupancy, modification, and development in the 100-year floodplain, when possible. Floodplains are defined in this order as "the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent greater chance of flooding in any given year." Flooding in the 100-year zone is expected to occur once every 100 years, on average.

NPS has adopted guidelines pursuant to EO 11998 stating that NPS policy is to restore and preserve natural floodplain values and avoid environmental impacts associated with the occupation and modification of floodplains. The guidelines also require that, where practicable alternatives exist, Class I actions should be avoided within a 100-year floodplain. Class I actions include the location or construction of administration, residential, warehouse, and maintenance buildings, non-excepted parking lots, or other man-made features that by their nature entice or require individuals to occupy the site. In addition, NPS proposed actions that may adversely affect floodplains must comply with Director's Order #77-2: *Floodplain Management*. *Floodplain Management* states that flood conditions and associated hazards must be quantified; appropriate actions (an alternative site, or effective mitigation and/or warning and/or evacuation planning) must be taken to manage floodplain conditions and flood hazards; and a formal statement of findings (SOF) must be prepared. In addition, NPS must protect and preserve the natural resources and functions of floodplains; avoid the long- and short-term environmental effects associated with the occupancy and modification of floodplains; and avoid direct and indirect support of floodplain development and actions that could adversely affect the natural resources and functions of floodplains or increase flood risks; and restore, when practicable, natural floodplain values previously affected by land use activities within floodplains.

The study area for floodplains includes all portions of the park within the park boundary. Generally, the 100-year floodplain extends several hundred feet from the river in the park boundary. Exceptions include the areas surrounding estuaries and tributaries of the Anacostia River. Figures 24 through 26 show the 100-year and 500-year floodplains along the Anacostia River.

The study area for floodplains includes all portions of the park within the park boundary.

A flood protection levee is located along the east bank of the Anacostia River and extends from Poplar Point to the southwest corner of the Naval District Washington (NDW) Anacostia Annex, approximately 9,700 feet (1.84 miles) (figure 26). The majority of the levee is an earthen berm, but approximately 1,100 feet of the levee is constructed of concrete. The concrete floodwall is located along the bulkhead of the NDW Anacostia Annex Marina (DCOP 2003). Additionally, a seawall stabilizes portions of both the western and eastern banks of the Anacostia River. Conditions of the seawall vary; some portions of the seawall are deteriorating due to vegetation growth, age, soil erosion, and leaking stormwater systems and other portions of the seawall are currently being replaced (DCOP 2003).

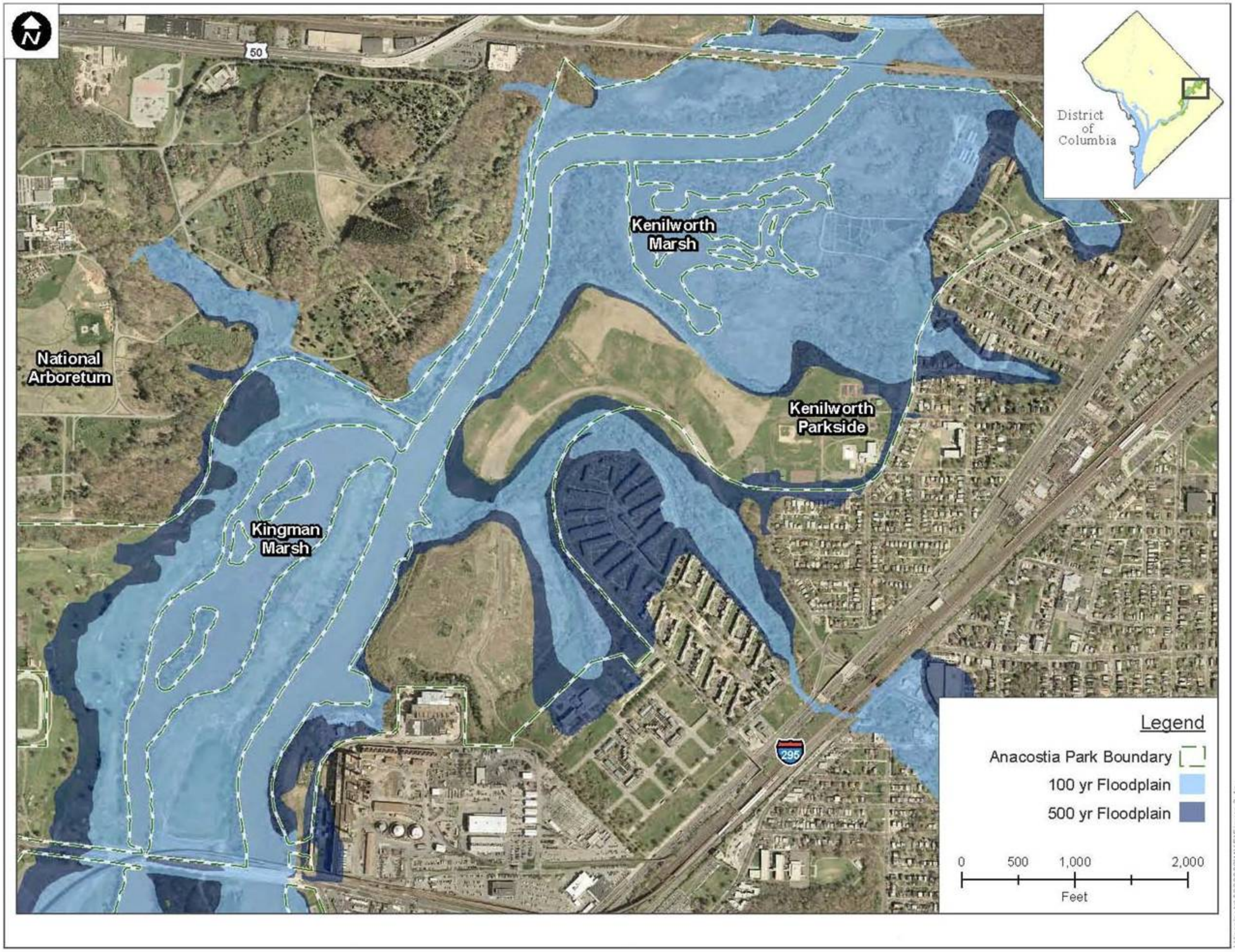


FIGURE 24: FEMA FLOODPLAIN MAP OF ANACOSTIA PARK, NORTH AREA

FIGURE 25: FEMA FLOODPLAIN MAP OF ANACOSTIA PARK, CENTRAL AREA

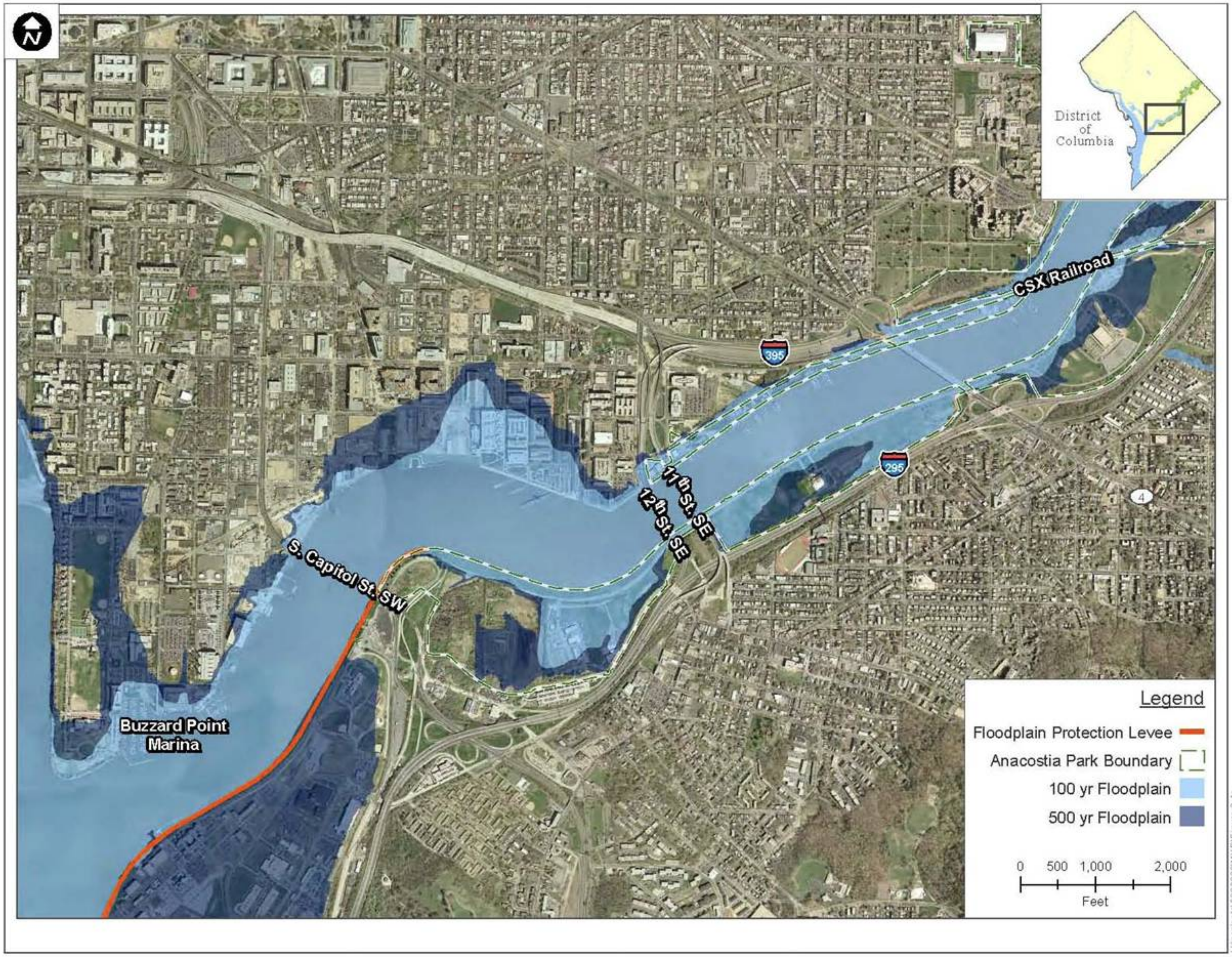


FIGURE 26: FEMA FLOODPLAIN MAP OF ANACOSTIA PARK, SOUTH AREA