

CHAPTER 3: AFFECTED ENVIRONMENT

This chapter of the EA describes existing environmental conditions in the areas potentially affected by the proposed actions. These following resource areas are described: visitor use and experience, public safety, Park management and operations, utilities and infrastructure, soils, vegetation, visual resources, cultural resources (historic structures and districts and cultural landscapes), and archeology. Potential impacts are discussed in the same order in “Chapter 4: Environmental Consequences.”

Visitor Use and Experience

The project area is located within the NAMA unit of the NPS, which encompasses portions of the Monumental Core in downtown Washington, D.C., and includes the National Mall, one of the most popular tourist destinations in the country. Many elements contribute to the project area’s popularity and inform visitor experience and visitor use, both of which are considered separately within this analysis. Visitor experience is the overall perception of a place and is, in this context, informed by things such as adjacent attractions (i.e., museums and memorials), public access, and visual quality. Visitor use describes the multiple ways in which a site is used. In this context, the project area is used as a circulation thoroughfare, a recreational destination, and a civic stage for demonstrations and events.

Visitor Experience

The project area includes some of the oldest and most prominent parkland in the NPS. In addition to being one of the largest public parks in Washington, D.C., the project area is bounded on all sides by some of the nation’s most noteworthy museums, monuments, memorials, and buildings, making it one of the most-visited destinations in the country. The project area is open 24 hours a day for public visitation, and NPS rangers are onsite from 9:30 a.m. to 11:30 p.m. daily.

ATTRACTIONS

The majority of attractions adjacent to the project area are museums, but monuments and noteworthy buildings beyond the project area also contribute to the overall visitor experience. Figure 3.1 shows the attractions in the project area.

Museums - Museums immediately surrounding the project area include the National Gallery of Art and the Smithsonian Institution’s National Museum of American History, National Museum of Natural History, National Museum of the American Indian, National Air and Space Museum, African Art Museum, International Gallery (Ripley Center), Freer Gallery of Art / Sackler Gallery, Arts and Industries Building, Hirshhorn Museum and Sculpture Gallery, and the Smithsonian Castle. Table 3.1 shows the hours of operation for these museums.

Monuments - The project area falls along the prominent axis of national monuments in downtown Washington, D.C., that includes the Washington Monument, World War II Memorial, and Lincoln Memorial. The Vietnam War Memorial and Korean War Veterans Memorial are located to the north and south of the Lincoln Memorial, respectively.

Other Buildings - The east end of the project area terminates at the U.S. Capitol Building. Congress is in session January through the end of July and resumes September through mid-October. To the east of the U.S. Capitol are the U.S. Supreme Court, Library of Congress, and Senate and House Office Buildings which also attract a similar number of visitors. To the southwest of the U.S. Capitol Building are the U.S. Botanical Gardens.

Table 3.1 details the hours of availability of the attractions in and around the project area.

Figure 3.1 – Attractions in the Project Area



Table 3.1 – Attractions in the Project Area

Attraction	Hours of Operation		Closures
African Art Museum	10:00 a.m. – 5:30 p.m.	7 days/week	December 25
Arts and Industries Building	Closed in preparation for renovation.		
Freer Gallery of Art / Sackler Gallery	10:00 a.m. - 5:30 p.m.	7 days/week	December 25
Hirshhorn Museum and Sculpture Gallery	10:00 a.m. - 5:30 p.m.	7 days/week	December 25
Library of Congress	8:30 a.m. – 9:30 p.m. 8:30 a.m. – 5:00 p.m.	Monday – Friday Saturday	Thanksgiving Day, December 24, January 1
National Air and Space Museum	10:00 a.m. - 5:30 p.m.	7 days/week	December 25
National Archives	9:00 a.m. – 9:00 p.m.	Varies depending on the day	All Federal Holidays
National Building Museum	10:00 a.m. – 5:00 p.m. 11:00 a.m. – 5:00 p.m.	Monday – Saturday Sunday	Thanksgiving Day, December 25, and January 1
National Gallery of Art (East and West Buildings)	9:30 a.m. – 5:00 p.m. 11:00 a.m. – 6:00 p.m.	Monday – Saturday Sunday	December 25 and January 1
National Gallery of Art Sculpture Garden	10:00 a.m. – 9:30 p.m.	Varies depending on the day	None
National Museum of African Art	10:00 a.m. - 5:30 p.m.	7 days/week	December 25
National Museum of American History	10:00 a.m. - 5:30 p.m.	7 days/week	December 25
National Museum of the American Indian	10:00 a.m. - 5:30 p.m.	7 days/week	December 25
National Museum of Natural History	10:00 a.m. - 5:30 p.m.	7 days/week	December 25
Newseum	9:00 a.m. – 5:00 p.m.	7 days/week	Thanksgiving Day, December 25, and January 1
Ripley Center	10:00 a.m. - 5:30 p.m.	7 days/week	December 25
Smithsonian Castle	8:30 a.m. – 5:30 p.m.	7 days/week	December 25
U.S. Botanical Gardens	10:00 a.m. – 5:00 p.m.	7 days/week	None
U.S. Capitol Building	8:30 a.m. – 4:30 p.m.	Monday – Saturday	Thanksgiving, December 25, January 1, Inauguration Day
U.S. Holocaust Memorial Museum	10:00 a.m. – 5:20 p.m.	7 days/week	Yom Kippur and December 25
Washington Monument	9:00 a.m. – 5:00 p.m. (10:00 p.m. between Memorial and Labor Day)	7 days/week	December 25 and July 4
World War II Memorial	9:30 a.m. – Midnight	7 days/week	July 4

VISITOR COMFORT

The National Mall has visitor amenities including information and refreshment kiosks, site furnishings, and museum stores. There are no public restrooms in the project area, but there are rest rooms in each of the surrounding museums. In the project area, site furnishings (benches, trash receptacles, and lighting fixtures) flank both the central turf panel and the adjacent walkways.

PUBLIC ACCESS

The project area is served by multiple modes of transportation, and visitors have access to and from the project area on the Mall via Metrorail, Metrobus, NPS Tourmobile, DC Circulator, or by car. Limited off-street parking can be found along Madison Drive and Jefferson Drive as can paid parking lots within a half-mile radius of the project area.

Once within the project area, a network of gravel and concrete paths traverse the area, enabling easy access to all destinations along its borders. The walking paths are generous in width and range from 20 to 40 feet. Since the overall project area is relatively flat, with only a minor topographical change occurring at the west end, the paths are mostly even but vary in quality and condition due to prevailing patterns of movement and circulation. Some parts of the gravel paths have been worn by constant visitor use and are more eroded than others, yielding a more inconsistent and irregular walking surface than the concrete walking paths. Gravel migration amplifies the irregular walking surfaces making portions of the paths difficult to traverse for wheelchairs and strollers. The existing gravel mix is neither firm, stable, nor slip resistant and does not meet the standards of accessibility. Existing concrete walks can also become slippery as gravel migrates from the gravel paths onto the concrete walks. In addition, snow removal is not possible given the irregular, gravel surfaces of the paths leaving much of the project area inaccessible during snow periods.

VISUAL QUALITY

The visual quality of the Mall is an integral part of the visitor experience. The project area is defined by prominent vistas and a strong visual axis that connects many of the most recognizable national landmarks including the U.S. Capitol Building to the east and the Washington Monument, World War II Memorial, Lincoln Memorial Reflecting Pool, and Lincoln Memorial to the west. The north-south visual cross-axes align with entrances to museums or views off the National Mall. The overall visual quality, or bird's eye view, of this public place is exceptional. The surrounding buildings provide strong visual anchors, and the grass and turf panels are well-defined landscape elements. However, in its details, the project area suffers from worn turf, uneven and deteriorating walking surfaces, and trees that do not appear to be thriving. Additional analysis on the visual character and views and vistas is contained in the Visual Resources section of this chapter.

Visitor Use

CIRCULATION

As much as the project area is a destination, it is also a point of connection between the adjacent attractions. The network of paths that traverses the project area provides easy access to the north and south between the Smithsonian Institution and the National Gallery Museums as well as east to west between the U.S. Capitol Building and the Washington Monument. The paths are wide enough to accommodate a variety of uses including walking, jogging, cycling, and most recently, segway use in some areas. Due to the relative irregularity of the gravel paths, many joggers and cyclists elect to use the wider concrete paths to the periphery of the project area.

RECREATION

The project area is one of the largest public parks in Washington, D.C., used for both passive and active recreational purposes. The peripheral paths are lined with benches and trash receptacles to accommodate public use. The turf panels between the paths are used for passive recreational activities such as picnics and small gatherings, as well as for more intensive uses such as Frisbee playing, kite flying, and ball games. Formal use of the turf panels for organized games and sports is only allowed with a permit. When the grounds are wet or otherwise unsuitable for play without damage to the turf, all recreational activity is prohibited regardless of the issuance of a permit (NPS 2006a). However, although fences and signage can be used to limit recreational activity in areas of the Park, the NPS has no control over pick-up games on the Mall. Nevertheless, recreational use is part of the Park's mission and there has always been a tradition of informal recreational use on the Mall.

SPECIAL EVENTS

The project area is heavily used for special events. The number and frequency of these activities and the related temporary facilities such as stages, tents, trailers, storage and staging areas, and portable toilets affect the quality and condition of turf and tress, the experiences of tourists, and the overall visual quality of the Mall. In 2009 there were 115 permitted activities on the Mall resulting in 821 permit days and 750 event days (NPS 2009b). Special events may be held in the project area pursuant to the regulations set forth in the 36 CFR 1.5 and 7.96, the NPS National Capital Region Requirements for Special Events Held on Parkland, and the NAMA 2006 Superintendent's Compendium (NPS 2006a; NPS 2007). All special uses and special events are regulated by permits. These regulations and related guidelines control site access, staging, risk management, comfort facilities, first aid, security, transportation, and cost recovery for the special events to minimize impacts to Park resources and to the public. The majority of special events on the National Mall have 5,000 or fewer participants with only one percent of events exceeding this attendance (NPS 2009c). Most events last approximately 10 days, including set up and take down, with the exception of the Smithsonian Institution Folklife Festival lasting 59 days, and the Solar Decathlon lasting 21 days (HOK 2009).

Figure 3.2 –Folklife Festival Aerial View



LARGE RECURRING SPECIAL EVENTS

Special events of a great variety and size take place on the Mall. Large recurring events include the Black Family Reunion, the Library of Congress Book Festival, and the Solar Decathlon.

Black Family Reunion – Sponsored by the National Council of Negro Women, the Black Family Reunion is a multi-day celebration of culture and family that typically occurs mid-September on the National Mall. This event features themed pavilions that showcase

Figure 3.3 – Solar Decathlon Aerial View



African American businesses and organizations (NCNW 2010).

National Book Festival – The National Book Festival is held by the Library of Congress annually in early autumn on the National Mall. The Festival features many well renowned authors, scholars, illustrators, and poets for readings, lectures, book signings, interviews, and children’s activities. In 2009, the Festival attracted well over 130,000 people (Library of Congress 2010).

Solar Decathlon - The Solar Decathlon is a bi-annual competition sponsored by the U.S. Department of Energy that challenges 20 national and international college and university teams to design, build, and operate the most attractive and energy-efficient solar-powered house.

The contest takes place in the project area for three weeks every other October, most recently between October 8 – 21, 2009 (DOE 2010). During the contest, the project area is covered by walkways, tents, and the solar houses. Figure 3.4 shows an aerial view of the project area during this event.

FIRST AMENDMENT ACTIVITIES

First Amendment demonstrations are part of the essential democratic right of citizens on the National Mall. These activities include prayer vigils, peace vigils, anti-war demonstrations, rallies, religious activities, and many others. There are approximately 1,000 First Amendment demonstrations annually on the National Mall (NPS 2009b). The project area is often a popular civic stage for these activities given the historic and symbolic backdrop. Attendance ranges from dozens of participants to hundreds of thousands for the larger historic demonstrations such as the 1963 “I Have a Dream” speech by Dr. Martin Luther King Jr. (Lincoln Memorial), and the 1995 Million Man March (NPS 2009b).

NATIONAL CELEBRATIONS

Presidential Inaugurations - Every four years, the U.S. Presidential Inauguration and related events are held on the National Mall and in front of the U.S. Capitol Building. Events include the procession to the Capitol, the Vice President’s and President’s Swearing-in Ceremony, the Inaugural Address, the Departure of the Outgoing President, and the Inaugural Parade. The 56th Presidential Inauguration took place on January 20, 2009, for the inauguration of President Barack Obama (see aerial photo, Figure 3.2). This event had an unprecedented attendance exceeding 1.8 million people, concentrated from the Washington Monument grounds east toward the Capitol (NPS 2009c). The turf in the project was killed as a result of the large number of visitors and lack of turf cover for this event. The 55th Presidential Inauguration of President George W. Bush took place on January 20, 2005, with an estimated 300,000 people in attendance (Levine 2005).

Independence Day – Festivities occur throughout the Mall on July 4th, culminating in the pyrotechnics display staged in the area immediately around the Reflecting Pool and the World War II Memorial. Throughout the day and towards the timing of the pyrotechnics display in the evening, crowds gather in the project area. Independence Day visitation on the National Mall reached approximately 700,000 people in 2008 and 500,000 people each year in 2007, 2006, and 2005 (NPS 2008). Portions of the National Mall

Figure 3.4- Aerial View of People on the Mall during the 2009 Inauguration



and the Smithsonian Metro station are closed during July 4th, including the Reflecting Pool and surrounding areas, Madison and Jefferson Drives, and 14th, 15th, and 17th Streets to accommodate the pyrotechnics display and increased traffic (NPS 2009b).

Smithsonian Institution Folklife Festival – Each summer, the Smithsonian Institution sponsors an outdoor festival on the National Mall including international and American exhibitions of living cultural heritage.

The festival takes place in the project area between 7th and 14th Streets and spans a two-week period in late June and early July. However, set up and take down of equipment lasts approximately eight weeks (NPS 2009b). The festival has an estimated one million visitors each year (Smithsonian 2009).

Public Safety

The NPS is committed to providing high-quality opportunities for visitors and employees to enjoy Parks in a safe and healthy environment. Furthermore, the NPS strives to protect human life and provide for injury-free visits. Safety applies to both Park visitors and Park employees.

VISITOR SAFETY

A visitor incident is defined as an unintentional event or mishap affecting any person, other than an NPS employee, that results in serious injury or illness requiring medical treatment. In this project area, visitor incidents have statistically been related to trips and falls along the circulation paths, fatigue, exposure to the elements, and injuries related to permitted sports activities.

The NAMA Division of Interpretation and Education helps provide visitor safety as well as first-line response for medical emergencies. The U.S. Park Police have primary law enforcement jurisdiction on the National Mall, but also work with the U.S. Capitol Police, the U.S. Secret Service, the D.C. Metropolitan Police Department, and others to provide safety and security within the area (NPS 2009b).

According to the safety statistics collected by NAMA, a total of 12 visitor incidents caused by tripping and falling have occurred within the project area between 2006 and 2008 (Ashdown 2010). These incidents occurred in various locations of the project area with no significant repeating locations except that four of these incidents occurred during annual 4th of July celebrations (Ashdown 2010).

EMPLOYEE HEALTH AND SAFETY

NAMA Park staff members are subject to the same tripping hazards that pertain to the general public. However, most employee injuries or incidents are usually sustained by maintenance staff members who perform manual work and heavy material handling (e.g., construction and gardening). The most common type of injuries was maintenance activity related, such as low back, shoulder, and knee injuries; however, periodic NPS ergonomics training is offered to reduce repetitive motion disorders.

ACCESSIBILITY

The NPS is committed to enabling universal accessibility in all NPS facilities to ensure compliance with various legislation including the ABA of 1968, the ABAAS, the Rehabilitation Act of 1973, the Equal Employment Opportunity Act of 1972, and the ADA of 1990. NPS policy actively promotes equal access to all Park resources for people with disabilities.

Accordingly, the circulation paths and transitions between changes in grade within the project area have been designed to ensure compliance with requisite legislation. Access to the project area from adjacent roadways is provided by accessible curb cuts located at various intervals throughout. Within the project area is a combination of concrete and loose gravel walking paths. Due to the intense visitor use, some portions of the paths have been worn down, yielding irregular walking surfaces. In addition, constant gravel migration exacerbates the uneven paths and creates slippery conditions on the paved pathways. The existing gravel paths are neither firm, stable, nor slip resistant and do not meet the standards of accessibility. Currently no curb or steel edging exists between the walkways and turf and tree panels, so accessibility between these elements remains universal. Furthermore, the irregular, gravel surfaces of the pathways make snow and ice removal impossible, resulting in slippery, inaccessible conditions during the winter months.

Park Management and Operations

Park Management

The NAMA is an administrative unit of the national park system. Park management structure is divided into the Office of the Superintendent and several divisions including Administration, Facilities Management, Interpretation and Education, Park Programs, and Resource Management.

Overall management decisions concerning NAMA and the resources within it are the responsibility of the superintendent, while maintenance crew leaders coordinate the daily operations and staff.

PERMITTING FOR PUBLIC USE

One feature unique to this Park is the frequency of special events within the project area such as the 4th of July celebration, the Smithsonian Institution Folklife Festival, the National Cherry Blossom Festival, and presidential inaugural activities. These special events introduce large numbers of visitors, delivery trucks, and staging equipment to the project area, all of which strain Park resources and infrastructure and contribute to natural resource damage such as soil compaction and turf destruction.

Currently, these activities are permitted through the Division of Park Programs, which is located at the NCR Headquarters, pursuant to 36 CFR § 7.96. Permits are required for events of 25 people or more and can be obtained at the Office of Public Affairs, NCR Headquarters, at 1100 Ohio Drive SW, Washington, D.C., 20242. All permits must be received at this office at least 48 hours prior to the proposed event. All applications, unless determined to be a First Amendment activity, require a \$50.00 processing fee. The permitting process seeks to ensure no conflict between special events and general visitor activities (NPS 2010b; CFR 2006). However, the volume of special events and national celebrations, and their related temporary facilities, affects visitor and visual experiences.

NPS has a set of terms for these permits that regulate site access, staging, risk management, comfort facilities, first aid, security, transportation, and cost recovery for the events to minimize impacts to Park resources and to the public. The following resource protection strategies specifically relate to the resources found in the project area:

- Stakes for tents, staging, towers, signs, or other structures cannot be driven more than 18 inches into the ground, and must avoid all underground pipes and fixtures. Water-filled ballast tanks may be used on hardscapes in lieu of stakes.
- Digging and trenching is not permitted.
- No attachments may be made to existing landscape features, nor may they pass through or be affixed to existing trees or other vegetation.
- No set-up of structures or parking or operation of equipment is permitted within any tree canopy (root zone) area, and the permittee may be required to install tree-protection fencing.
- In the project area, set-up is only permitted within the center turf panels, with a few exceptions (Smithsonian Folklife Festival and Black Family Reunion). Some events are also allowed in the tree panels.
- In order to reduce impact to turf area, the permittee may be required to provide and install temporary equipment roadways, pedestrian walkways, and/or tent flooring fabricated from commercially available interlocking plastic composite materials, or other protective material if approved in advance by the NPS (NPS 2007).

Violations to the aforementioned resource protection strategies are common, such as the use of tent stake up to 48 inches, which have resulted in severe irrigation damage.

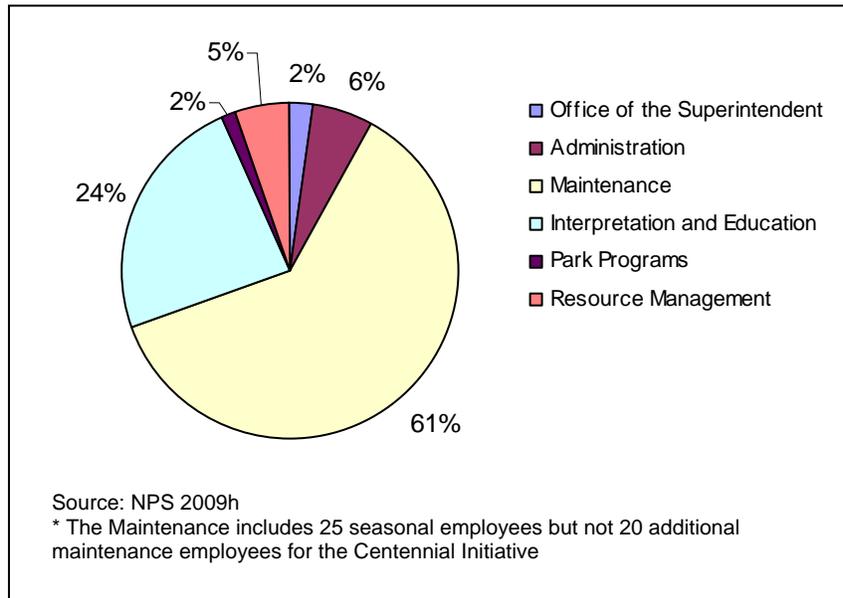
In addition, if the event requires structures, a complete site plan must be submitted to the superintendent at least 30 days prior to the opening day and 45 days prior for large-scale events. All deliveries, unloading, and loading must take place on hardscapes, and vehicles are only allowed on turf with the permission of an authorized NPS official. NPS regulations specify that all costs—including utilities, event equipment and structures, and damage costs—must be borne by the permittee and paid in full to the NPS prior to the event (NPS 2007).

Events of a certain size must prepare a risk management plan to ensure the safety and comfort of attendees including providing additional first aid stations, portable restrooms, site security, and coordination with the Washington Metropolitan Area Transit Authority for transportation (NPS 2007).

STAFFING

The NAMA has a staff of approximately 330, who have responsibility for the National Mall’s historic landscape and commemorative works, as well as the additional 156 reservations, parks, circles, and triangles within the NAMA. These areas include the Law Enforcement Officers Memorial, Dupont Circle, McPherson Square, and Columbus Circle, as well as Pennsylvania Avenue National Historic Site and East Potomac Park. Ford’s Theatre National Historic Site and President’s Park are two adjacent NPS units within Washington, D.C., that rely on NAMA staff for some tasks and during special events. The NAMA staffing distribution per Park structure is shown in Figure 3.5.

Figure 3.5 – NAMA Staff Distribution



DIVISION OF FACILITY MANAGEMENT

The maintenance division is responsible for Park maintenance of facilities, grounds and trees, roads and trails, and transportation. The maintenance division staff has expertise in trades and specialties such as carpentry, electrical, masonry, metal craft, painting and signs, plumbing, and special events and provides this expertise to other NPS units (NPS 2009b).

PROJECT AREA MAINTENANCE

In addition, project-wide litter pickup occurs regularly; trash is removed twice daily and three times daily during special events (NPS 2009c). The irrigation system, benches, trash receptacles, and street lights are regularly repaired and parts replaced as needed (NPS 2009c).

TURF PANEL MAINTENANCE

Under the current turf management program for the Mall, the turf panels are closed in two sections, from the Capitol Reflecting Pool to 7th Street NW and from 7th to 14th Streets NW, alternating every other year from mid-September to the end of March (NPS 2009c). The rest period end date is planned to

coincide with the start of increased spring tourism. This rest period results in visibly healthy turf stands in the spring. However, after the first large special event, the turf continues to decline until the winter rest period. During the closure, the areas are fenced off and the NPS conducts soil aeration, grading, soil replacement and amendment (filling areas with uneven grade), fertilization, reseeding, and irrigation. Turf maintenance consists of complete restoration when more than 50% of the turf is either destroyed or displaced by weeds or turf recovery when damage is below this threshold.

Maintenance during peak use periods (April – October) only involves cutting the grass to a 3-inch height every five to seven days, performed by NPS staff (HOK 2010). Core aeration is typically conducted on two to six panels, depending on the severity of soil compaction, which can be extreme (HOK 2010). Slice aeration is performed, but is not a typical practice. Power slit seeding is performed in the fall and in mid-March (HOK 2010).

WALKWAY MAINTENANCE

The gravel walkways on the Mall are approximately 775,000 square feet in length and require extensive operational and preventative maintenance (NPS 2010e). Maintenance includes gravel installation a necessary to fill low spots, re-grading existing gravel, grading of new gravel, and compacting gravel through rolling and vibration (NPS 2010e). Most of these activities must be done on a daily basis to prevent trip hazards, pot-holing, and water ponding and require a dedicated staff team to perform. The total cost to perform walkway maintenance is \$1,485,100 per year, including labor costs, material costs, and equipment costs (NPS 2010e).

Utilities and Infrastructure

Several subsurface utility and infrastructure systems occur within the project area and could potentially be affected by the proposed actions.

POTABLE WATER

The project area is serviced by DC Water for its potable water. DC Water is a multi-jurisdictional regional utility that provides drinking water and wastewater treatment to residential, commercial, and governmental customers (NPS 2009a). DC Water purchases treated water from the U.S. Army Corps of Engineers' (USACE) Washington Aqueduct. Several major water utility lines serve the National Mall area and are depicted in Figure 3.6. For all special events except the Smithsonian Institution Folklife Festival, the NPS stipulates that all water used must be brought in from offsite (HOK 2010).

SEWER

DC Water provides sanitary and stormwater service for the project area. There are two types of sewer systems in Washington, D.C.: a system with separate pipes for sanitary wastewater and stormwater, and a combined sewer system that conveys both wastewater and stormwater. The project area is served mostly by combined service lines except for a short extension of separate lines at 13th Street and Madison Drive (NPS 2009a). Figure 3.6 illustrates the sewer lines serving the project area.

IRRIGATION

Average rainfall in the project area is approximately 38.6 inches annually with monthly averages ranging from 2.7 to 3.9 inches per month, the lowest amounts occurring in the summer months (NPS 2009c). Estimates of the water quantity required to maintain the turf in the project area are approximately 12 MG per month or approximately 1.5 inches of water per week (NPS 2009c).

The current system consists of gear-driven sprinklers that draw water from potable water sources located at 3rd, 4th, 7th, and 14th Streets (NPS 2009c) via subsurface water supply lines buried at a depth between 12 – 18 inches for lateral pipes and 36 – 48 inches for the mainlines. Despite their depth, many of the pipes have been compromised by the weight of vehicles and equipment and puncturing by tent stakes used during special events. As a result of this damage, the irrigation system cannot be pressurized and the system remains relatively ineffectual. To supplement the irrigation system, the NPS uses automated sprinklers with a quick-coupler system using potable water.

STORMWATER MANAGEMENT

Currently, the NPS allows a site's stormwater to drain directly into nearby storm sewers without treatment and does not recapture the water for on-site use. The project area is largely within the combined service area in which stormwater and wastewater are conveyed together to the Blue Plains Plant for treatment. Because of the volume of stormwater generated during large rain events, the District's collection system can become overwhelmed, and overflow events can occur, discharging a mixture of stormwater and wastewater into the Potomac and the Anacostia Rivers. To reduce and even eliminate the number of overflow events, the District has a plan in place to better capture stormwater before it enters the combined system, and also to construct large underground storage facilities (DC Water 2002).

Options for capturing the stormwater before it can enter the combined system include capturing water from large federal buildings, and increasing the amount of pervious surface within the combined sewer system so more water is recharged (DC Water 2002).

The project area includes several large buildings and associated hardscaping, including the Department of Agriculture Building, the National Gallery of Art East Building and West Building, and Smithsonian Institution museums, as well as roads and sidewalks, all of which can be considered as impervious

surfaces. Combining the buildings, roads, and hardscaping, an estimated 1,000,000 square feet of impervious surface are in and around the study area (HOK 2010). In addition, the existing turf panels are so compacted as to also be considered impervious, increasing the impacts and volume of stormwater runoff during storm events.

COMMUNICATION

Mass communication and fiber optic lines run near the National Mall boundaries, but none occur within the project area. Temporary telephones and communications are provided as needed for events.

ELECTRICITY

The Potomac Electric Power Company supplies energy to the project area. Two power plants within the District generate high-voltage electricity which is released along transmission lines to substations located throughout the city and then eventually to transformers and ground poles that reduce the voltage to safe levels for consumer use (Smithsonian 2008). Within the project area, electrical power service is available at a number of locations including along 3rd Street, 4th Street, and 9th Street (NPS 2009c). Several of the service lines in the project area are capable of meeting the demands of multiple events (NPS 2009c), but the NPS does not typically provide power for special events. Organizers of special events are required to utilize proprietary generators (HOK 2010a).

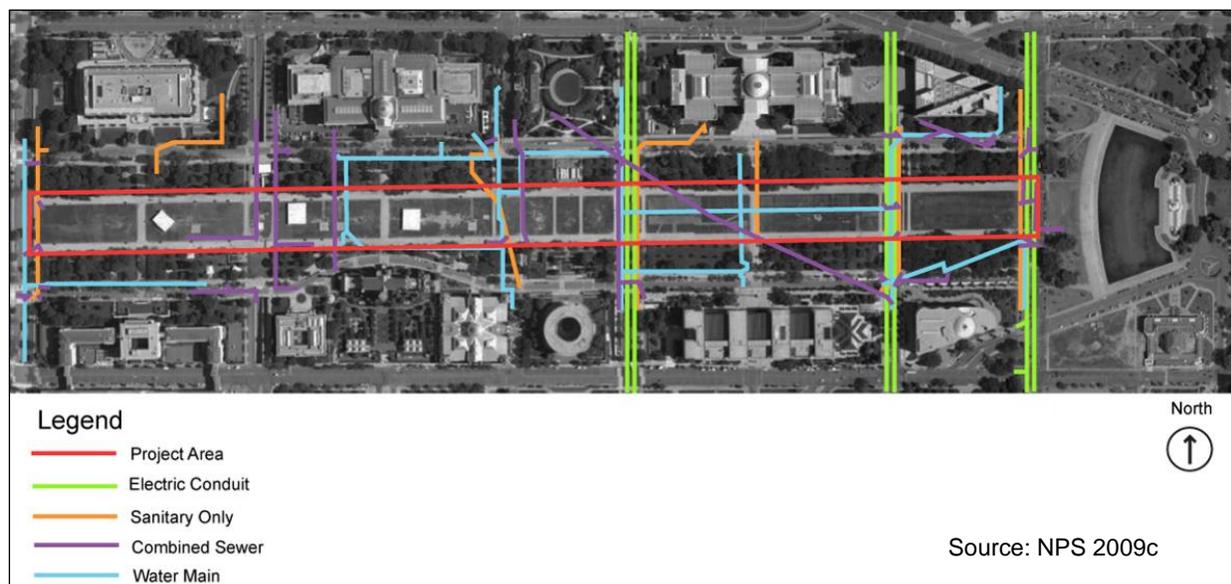
NATURAL GAS

Washington Gas Company delivers natural gas service in the project area at numerous points along Constitution and Independence Avenues. A gas main crosses the project area from the north at 7th Street, runs parallel to Jefferson Drive to 4th Street, and exits the project area toward Independence Avenue (NPS 2009c).

GENERAL SERVICES ADMINISTRATION UTILITIES

The main General Services Administration (GSA) water line serves most of the United States federal government buildings near the National Mall. Several steam and chilled water lines traverse the project area and serve Smithsonian Institution facilities on the south side of the Mall (Smithsonian 2008).

Figure 3.6 – Existing Utilities in the Project Area

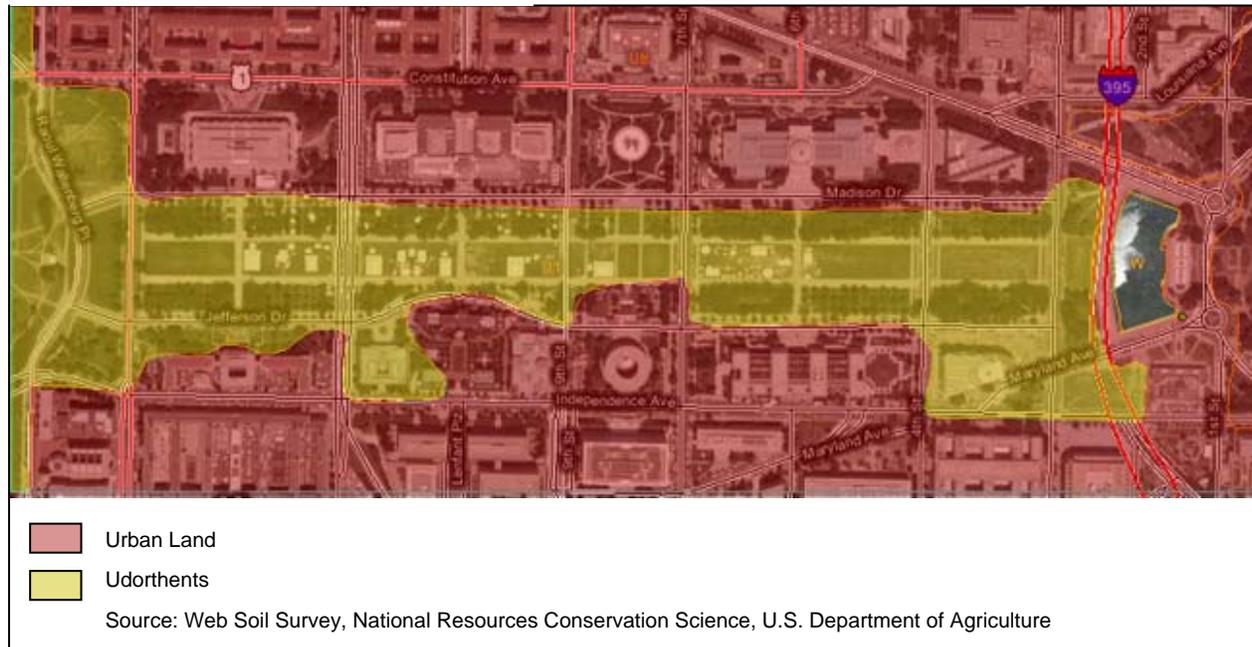


Soils

SOILS

Sections of the National Mall were originally open water at the mouth of Tiber Creek. However, in 1882, dredged material from the river channel was used to fill over 600 acres of marshes and tidal flats where the National Mall is now located (USDA 1976). Figure 3.7 shows the soil map of the project area (USDA 2010).

Figure 3.7 – Soil Map of the Project Area



The soils in the project area are udorthents with surrounding urban land. Udorthents are characterized by nearly level to steep soils that have been heavily influenced by man (USDA 1976). Urban land soils consist of nearly level to moderately sloping areas that are more than 80% covered by impervious surfaces such as asphalt, concrete, and structures (USDA 1976). Soils on the Mall are composed of an assortment of fill materials causing a wide variety of physical and chemical soil properties. In the project area, the topsoil ranges from sandy loam, loam, and silt loam (NPS 2009c). However, subsoils in the project area are much more variable. Soil permeability and runoff appear to be somewhat varied within the project area. However, soil drainage occurs at a rate that is often markedly lower than what is considered acceptable for turf use, especially after rain events (NPS 2009c). Intensive visitor use, particularly where tents or structures are used for extended lengths of time, has resulted in soils that are highly compacted and that function as impervious surfaces. This compaction prevents water from infiltrating into the soils, particularly after heavy rain events, diverting water off the turf panels onto the walkways and streets or causing ponding in depressions.

Vegetation

The analysis of vegetation within this EA is separated into a description of the broader context of the National Mall and the more specific characteristics of the project area.

VEGETATION ON THE NATIONAL MALL

The general vegetative character of the National Mall is that of designed historic landscapes planned to create specific settings such as commemorative spaces, historic vistas, event spaces, recreational areas, and gardens (NPS 2009b). The National Mall is composed of mostly lawns, ornamental and shade trees typical to the NCR, shrubs, hedges, and other types of ground cover. The National Mall includes more than 2,700 elm trees, predominately American elm (*Ulmus americana*), that line the streets and approximately 3,000 Yoshino cherry trees (*Prunus x yedoensis*) that ring the Tidal Basin.

Open lawns are an integral part of the National Mall as they are part of the historic plans for the city and they provide spaces and setting for civic and cultural activities (national celebrations, First Amendment activities and special events), recreation, tourism, and general enjoyment. Lawns are sometimes embedded or bordered by trees that create a diversity of settings and help define important historic viewsheds (NPS 2009b). Many of these lawns, tree groves, and rows are historic character-defining features, fundamental to the aesthetics and visitor experience of the Mall.

Turf panels and grassy areas are a fundamental component of the aesthetics, historic character, visitor experience, and urban ecosystem functioning on the National Mall. Although most turfgrass is not native to the region, NPS has been able to consistently maintain approximately 112 acres of turf designated for general public use and 50 acres of turf and grass area designated specifically for athletics within the National Mall (NPS 2009b). Only the most cold-tolerant warm-season turfgrasses and the most heat-resistant/drought-resistant cool-season turfgrasses are able to survive in the region due to hot, humid summers and cold winters (NPS 2009b). The NPS uses a variety of seed blends on the National Mall in order to best account for the area's variable weather. The seed blend is chosen based on the time of year the seeding occurs, the soil, available sunlight, and other environmental factors (NPS 2009b). Table 3.2 lists the current turfgrass seed blends used by the NPS on the National Mall.

VEGETATION WITHIN THE PROJECT AREA

The turf panels in the project area are defined as the open turf areas in the center of the Mall that extend from 1st Street SW to 14th Street NW. These panels are 180 feet wide (from north to south), vary in length (from east to west), and are bound on the north and south by existing gravel walkways. The turf is planted using varying perennial grass blends of a mixture of species as described in Table 3.2. The condition of the turf varies across the Mall, but generally has been and continues to be worn and damaged by public uses such as special events, recreational activities, demonstrations, and the development of social trails¹ (NPS 2009b). The characterization of the turf panels is described by their current condition and by the physical and natural conditions (stressors) that contribute to their condition.

Current Conditions – The 180-foot-wide central panels are in particularly poor condition and are characterized by large areas of bare earth, minimal turf coverage, and large quantities of non-grass species (NPS 2009c). Variable seeding, resodding, and repairs create a collage of lawn types. Typically, the turf is in the best condition after the winter and spring rests and maintenance period (NPS 2009c). However, this period is short lived as visitor use intensifies with warmer

¹ The NPS defines a social trail as an unofficial trail created by prevailing patterns of human use that diverges from an existing trail as a shortcut to a destination.

weather, resulting in turf wear and decline. Slow drainage and a lack of an operational irrigation system lead to either long periods of oversaturation or severe drought for the turf, often during peak visitor use, resulting in compacted soils. Poor turf conditions and compacted soils often lead to an invasion of undesirable non-turf species (including but not limited to exotic weeds), which outcompetes traditional grasses and leads to even more turf decline (NPS 2009c).

Stressors – The poor turf quality is a result of various factors including maintenance, types and volume of visitor use (including recreation), and drainage. The central turf panels endure the heaviest use from events, demonstrations, passive recreation, and sports use and are traversed by crossing streets and sidewalks. Intense and frequent use has resulted in areas of bare earth, soil compaction, and broken irrigation systems throughout the project area. Constant pedestrian traffic punctuated by frequent special events requiring tents and other structures that cover the lawn for long periods of time diminish turf quality through soil compaction, shading, heat buildup, and physical wear and abrasion (NPS 2009c) and result in large areas of dead turf or areas devoid of turf (NPS 2009c). After these large events, the areas of dead turf are reseeded, usually with little success due to heavy soil compaction, heavy use, and poor irrigation (NPS 2009b).

None of the plant species are identified as threatened or endangered within the areas affected by the proposed National Mall turf and soil reconstruction.

Table 3.2 - Turfgrass Seed Blends used by the NPS on the National Mall

Seed Blend	Mixture	Recommended Seeding Dates
Turf-type Tall Fescue Mixture	<ul style="list-style-type: none"> ▪ 90% mixture of turf-type tall fescue (<i>Festuca arundinacea</i>) consisting of three varieties of which no variety exceeds 40% or less than 20% ▪ 10% Kentucky bluegrass (<i>Poa pratensis</i>) 	April 1 to May 15, September 1 to November 1
Bermuda Grass Blend	<ul style="list-style-type: none"> ▪ Blend of three hybrid Bermuda grasses (<i>Cynodon dactylon</i>), of which no variety exceeds 40% or is less than 20% 	March 15 to August 15
Perennial Ryegrass Blend	<ul style="list-style-type: none"> ▪ Blend of perennial ryegrass (<i>Lolium perenne</i>), consisting of three varieties, of which no one variety exceeds 40% or is less than 20% 	April 1 to December 15
Perennial Ryegrass/Kentucky Bluegrass Mixture	<ul style="list-style-type: none"> ▪ Mixture containing 60% Kentucky bluegrass, which consists of three varieties with no one variety exceeding 25% of the total mixture ▪ 40% perennial ryegrass, which consists of two varieties with no one variety exceeding 25% of the total mixture 	April 1 through 30, August 16 to October 15

Visual Resources

Impacts to visual resources would be project-wide; therefore the affected environment would encompass the conditions of the entire project area.

The visual and aesthetic quality of a certain place is affected by its overall visual character as well as the associated views and vistas within and around the area. The visual character of a site embodies the defining and memorable site features such as salient landscape elements and built features that contribute to overall perception and visitor experience. Views and vistas capture the range of the eye and frame the visual character of the site. Views and vistas are composed of foreground and background elements and are taken from a certain point of view. For this analysis, the term “vista” defines views of primary importance that were specifically planned, designed, and implemented. The term “view” describes those unplanned views that resulted from the construction of other features.

VISUAL CHARACTER

The visual character of the site is defined by an open lawn flanked by formal rows of trees and buildings, aligned along an axis that terminates at the U.S. Capitol Building to the east and the Washington Monument to the west. The open lawn is composed of broad central turf panels bordered by formal rows of American elms in tree panels that extend from 3rd to 14th Streets NW. The turf and tree panels are separated by a network of four parallel walkways that run east to west along the project area and shorter walkways and two roadways that run north to south across the project area.

As the “Nation’s Front Yard,” it is generally agreed that the visual quality of the National Mall must achieve higher standards. This is not a new concern, but one that has been ongoing for decades as the pressures of use continue to overwhelm the capacity of the site and compromise the best efforts to maintain a high standard of visual quality.

Several of the events that take place on the Mall occur over extended periods of time. These events—coupled with their tents, structures, and vehicles—contribute to soil compaction and the mechanical wear and damage of the turf. The issue has long been discussed for the detrimental effect these events have on the visual quality of the Mall and the challenges they present to maintaining high standards of care.

Turf panels – Seven large turf panels and five smaller turf panels are centered along the east-west axis of the project area. The large panels are approximately 475 feet by 180 feet, and the small panels are approximately 120 feet by 180 feet. Turf panels also flank the north and south of the project area and border Madison and Jefferson Drives. As a result of intense visitor use and soil compaction, the turf panels are worn and distressed. At the edges, although there is steel edging between the walkways and the turf panels, there is no formal transition between the turf and gravel walkways. This edging is often buried, and much of the gravel has been dispersed into the turf panels, creating an unclear visual edge between these two disparate elements (see Figure 3.8).

Figure 3.8 – Typical Edge Between Turf Panel and Walkway



Tree panels – Between 3rd and 14th

Streets NW, along the north and south edges of the project area, nearly 600 American elms stand on either side of center turf panels. These trees are planted in four rows within tree panels in turf lawn. The trees in the project area also suffer from the effects of intense visitor use and the resultant soil compaction and show visible signs of stress.

Street trees – The American elm trees located along the curb lines of Madison and Jefferson Drives define the street tree panel. The trees are located between the back of the curb and an existing walkway approximately 12 feet wide. These trees were originally encircled with brick pavers to define the immediate tree locations. However, adjacent gravel surfacing migrates and frequently covers the brick edging as well as contributing to compacting the soil. These lines of trees adjacent to Madison and Jefferson Drives were originally a continuation of the tree panels; however, changes in use have resulted in changes in the character of this tree zone. The pathways within the zone are constructed of exposed aggregate concrete with the surface between the sidewalk and curb covered with compacted gravel. Some of the poorest tree conditions on the Mall can be found here because of heavy pedestrian use, inadequate drainage, and compacted gravel and soil, and the trees are noticeably smaller and less robust than those within the tree panels.

Walkways – The turf panels in the center of the site are separated by a network of gravel and concrete walkways. There is no visible differentiation between the two types of walkways since the concrete contains a large proportion of gravel aggregate that was selected to match the existing gravel onsite. The walkways vary between 20 feet and 40 feet wide, and the peripheral east-to-west walkways that flank the tree panels are lined with benches and trash receptacles. Due to intense visitor use, some portions of the gravel walkways have been disproportionately worn, resulting in some irregular and uneven spots. The walkways were designed with 90 degree corners, which are not consistent with normal circulation patterns and whose edge definition has been lost from intensive visitor use creating social paths at the corners. In combination with the 90 degree corners, the existing steel edging provides no visual cues to the public and is especially ineffective at dissuading the creation of social trails.

VIEWS AND VISTAS

Vistas in the project area have been present since the earliest plans for Washington, D.C., and have been maintained throughout the city's development. In the project area, the patterns of circulation, walkways, and open spaces enable views to and from key cultural resources, such as between the U.S. Capitol Building, Washington Monument, and the Smithsonian Institution Castle. The project area also fits into a larger visual axis that extends west and includes the World War II Memorial, Lincoln Memorial Reflecting Pool, and Lincoln Memorial.

The Mall is defined by its primary grand vista between the U.S. Capitol Building and the Washington Monument. This vista was integral to L'Enfant's plan for a Grand Avenue or promenade extending west from the U.S. Capitol Building to the proposed equestrian monument to George Washington, which would have been placed near the Potomac River, at the point where the east-west Capitol axis intersected the

Figure 3.9 – View of the Project Area from the Top of the Washington Monument



Source: Berger, June 2010

north-south White House axis (NPS 2009b).

There is a secondary planned north-to-south vista adjacent to the project area between the Washington Monument, the White House, and the Thomas Jefferson Memorial.

There are multiple views from the project area that are highly symbolic and sentimental.

The View from the Top of the Washington Monument – This is perhaps the best publicly accessible vantage point from which to view the primary grand vista as described above. The project area is an integral part of this view as a formal landscape element within the vista.

Views to and from Museums - There are numerous oblique views that focus on formal elements to the north and south of the project area such as the Smithsonian Institution Castle and the many museums in the area. The turf and tree panels provide strong background elements to these views.

Cultural Resources

Cultural resources for federal agency planning and environmental review purposes are primarily those resources that qualify for the NRHP as well as those addressed by certain other laws protecting archeological sites and Native American properties. The NHPA of 1966, as amended, is the principal legislative authority for managing cultural resources associated with NPS projects. Generally, Section 106 of the NHPA requires all federal agencies to consider the effects of their actions on cultural resources listed and/or determined eligible for listing in the NRHP. Such resources are also termed “historic properties.”

Moreover, the federal agency must afford the ACHP the opportunity to comment in the event that an undertaking will have an adverse effect on a cultural resource that is eligible for or listed in the NRHP, and must consult with the State Historic Preservation Officer (SHPO) and other interested parties in an effort to avoid, minimize, or mitigate adverse effects.

Eligibility for the NRHP is established according to the official Criteria of Evaluation (36 CFR 60.4) issued by the Department of the Interior (CFR 2005a). The criteria relate to the following:

The quality of significance in American history, architecture, archeology, engineering, and culture present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. that are associated with the lives of persons significant in our past; or
- C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. that have yielded, or may be likely to yield, information important in prehistory or history.

Other important laws and regulations designed to protect cultural resources are:

- Native American Graves Protection and Repatriation Act, 1990
- American Indian Religious Freedom Act, 1978
- NEPA, 1969
- Archeological Resources Protection Act, 1979
- Executive Order 11593: Protection and Enhancement of the Cultural Environment, 1971

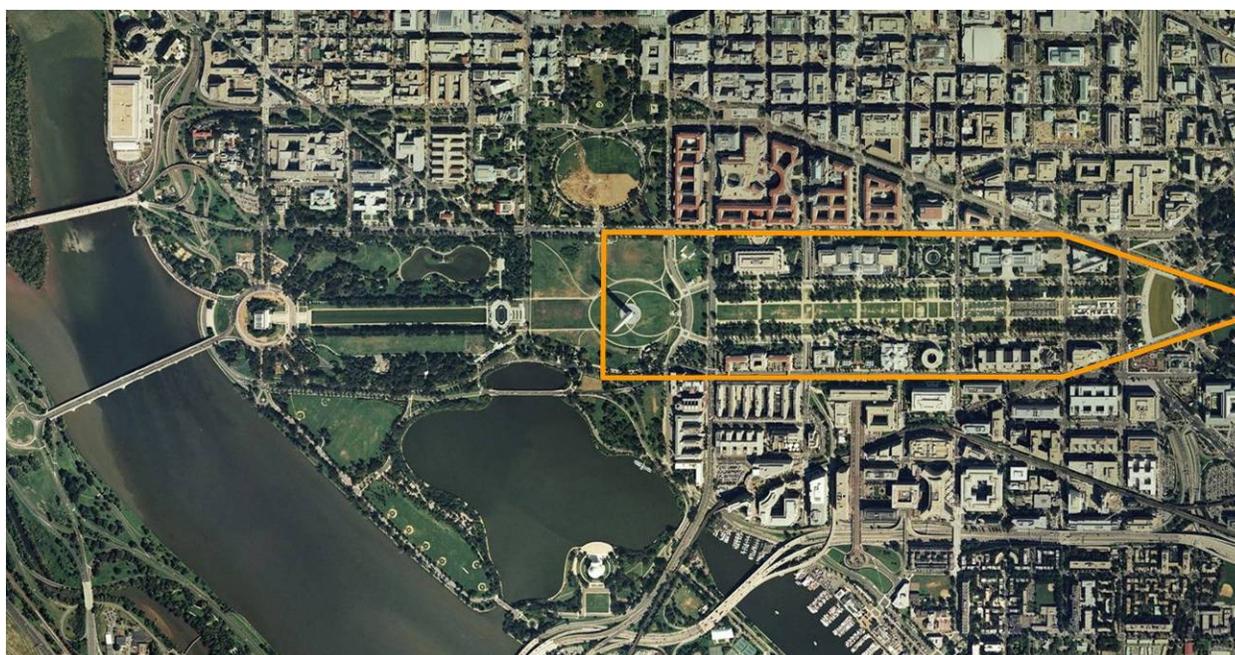
Lastly, the NPS has a unique stewardship role in the management of its cultural properties, reflected in its own regulations and policies. In these policies, the NPS categorizes cultural resources this way: archeological resources, cultural landscapes, historic districts and structures, museum objects, and ethnographic resources.

As indicated in “Chapter 1: Purpose and Need,” the project to reconstruct the turf and soil on the National Mall has been evaluated as having no potential impact upon museum objects or ethnographic resources. Therefore, these impact topics have been dismissed leaving only archeological resources, historic districts and structures, and cultural landscapes to be evaluated. Although not all memorials on the National Mall have been listed in the National Register either individually or as contributing resources to historic

districts, the NPS treats them as eligible. The consideration of cultural resources by the NPS meets pertinent requirements of the NHPA and related legislation and implementing requirements.

Under the regulations implementing Section 106 of the NHPA, the NPS first determined that the soil and turf reconstruction would constitute an “undertaking” having a potential effect on National Register resources, and then the NPS assessed its area of potential effect (APE). The APE that has been proposed is larger than the limits of construction, i.e. the turf panels of the Mall. It corresponds to the Mall, which is defined as an open space surrounded and defined by adjacent buildings and associated views and vistas. The boundaries have been drawn at the line of 16th Street NW across the Washington Monument grounds on the west, the western terrace of the U.S. Capitol on the east, Independence Avenue SW and Maryland Avenue SW plus the line of its continuation northeast toward the Capitol on the south, and Constitution Avenue NW and Pennsylvania Avenue NW plus the line of its continuation to the southeast toward the Capitol on the north. Figure 3.10 shows the APE.

Figure 3.10 – Area of Potential Effect



A vertical dimension of the APE would include the depth of any areas of ground disturbance undertaken to alter the soils and surf as well as subsurface water management features (archeology). The vertical dimension also includes the envelope of space above the Mall that includes the trees, street furniture, and memorials as well as the reciprocal views and vistas, particularly between the Capitol and the Washington Monument.

The APE includes resources listed in or determined eligible for the National Register as a historic site, a contributing feature of a historic structure, and as cultural landscapes. However, the archeological potential of the turf and soil reconstruction project site must be regarded as speculative, i.e. based upon the documentary record. There are no recognized NRHP-eligible or NRHP-listed archeological sites in the project area.

Historic Structures and Districts

This section addresses historic properties present that have been included in or have been determined eligible for the NRHP as buildings, structures, sites, objects, or historic districts. Because the Monumental Core of Washington, D.C., has been the focus of preservation activity from the initial passage of the NHPA in 1966 and earlier, the official documentation of its historic resources has been accomplished in a series of surveys that sometimes overlap and vary in approach with changing technical standards. There have been two successive official listings of the Mall in the National Register under the category of Historic Structures and Districts.

The National Mall was first listed in 1966, the year the NHPA was enacted, but the documentation accompanying the nomination was not completed until 1981. This nomination, focused on architecture and planning, defined the Mall as “Constitution and Pennsylvania Avenues on the north, 1st Street NW on the east, Independence and Maryland Avenues on the south, and 14th Street NW on the west” but excluded the section between 12th and 14th Streets and Jefferson Drive and Constitution Avenue housing the Department of Agriculture.

The Mall was also identified as a contributing feature in the detailed nomination of the “L’Enfant Plan of the City of Washington,” which was listed on the NRHP in 1997. In this nomination the L’Enfant Plan was listed as a “structure,” the designated property type that was deemed most appropriate for the novelty of listing an actual city plan, as it was (partially) realized over history. The exclusion of the Department of Agriculture does not appear to have been maintained in this documentation.

Though of obvious national importance and high integrity, the Mall is not yet an official National Historic Landmark (NHL) or part of one.

A “National Mall Plan Area” has also been recently defined as an area stretching from and including Union Square on the east, the Mall proper, the Washington Monument Grounds, West Potomac Park all the way to the Lincoln Memorial and the Potomac shoreline on the west including other adjacent planning areas such as the Capitol Complex, the White House and President’s Park, and the Monumental Core. This is primarily to facilitate the National Mall Plan, which has been released, and its Record of Decision, which is expected to be released in Fall 2010. .

Much has been written about the Mall as an iconic civic space of the American government; nonetheless, this section of the EA is only concerned with identifying the qualities and attributes that have been accorded significance in the official National Register documentation.

THE NATIONAL MALL, 1981 NRHP NOMINATION AS A SITE

The 1981 nomination of the National Mall indicated that “the Mall is significant as the central axis of the District’s Monumental Core as designed by Pierre Charles L’Enfant in 1791” (NPS 1981). It classified the Mall as a site, but one that had undergone alteration. The nomination form indicated that the Mall was under public ownership, with unrestricted access, and its current use is that of a museum and Park. Dates for the site’s significance were given as 1791 – 1976, and the architect/builder indicated as Pierre Charles L’Enfant and the McMillan Commission. Only the category of Landscape Architecture was checked to indicate the Area of Significance. As noted above, the boundaries were described as Constitution Avenue/Pennsylvania Avenue on the north; Independence Avenue/Maryland Avenue on the south; 14th Street on the west; and 1st Street on the east, with the Department of Agriculture property up to Jefferson Drive carved out. The extension to 1st Street, beyond the rectangle of the inner open Mall ending at 3rd Street, included Union Square.

The 1981 NRHP nomination's "Description" (Section 7) indicated that "the Mall is a large greensward slightly over one mile in length with a standard width of 1500 feet, but narrowing to approximately 500 feet at its eastern terminus." It then described the Mall's internal streets, noting that of the four aligned east and west, Madison and Jefferson Drives are open to motorized traffic while the two innermost ones, Washington and Adams Drives, were converted to gravel pedestrian walkways in the 1970s. The "Description" notes the presence of all the existing major structures within the boundaries including the various museums, five statues, two sculpture gardens, an ice skating rink, and even the Smithsonian Metro station. However, no classification of any feature as "contributing" or "non-contributing" was given other than to note that the Smithsonian Castle, the Arts and Industries Building, the Peace Monument, and the Grant Memorial were listed on the NRHP.

The "Statement of Significance" of the nomination (Section 8) emphasized its role as the central axis of L'Enfant's Monumental Core, stating the " 'Grand Avenue'...run(ing) west from the Capitol to a point directly south of the President's House where its terminus would be crowned by an equestrian statue of General George Washington. According to L'Enfant's Plan, the Mall was to be 'four hundred feet in breadth, about a mile in length, bordered by gardens, ending in a slope from the houses on each side' " (NPS 1981b).

However, the Mall—as a planned open space linking one of the most important buildings and the most towering monument of the American government—has greatly evolved from its conception by Pierre L'Enfant up to the present day. The 185 years of development on the grounds of L'Enfant's concept until the Bicentennial year referenced by the nomination saw many periods in which the plan was ignored, contradicted by incompatible construction, and superseded by planning initiatives that were either at odds with L'Enfant's French-inspired Baroque principles (e.g. the looping carriage roads of Alexander Jackson Downing emanating from the Smithsonian) or somewhat consistent in a later idiom (the Beaux Arts sweep of the McMillan Plan with a late assist from the formal modernism of Skidmore, Owings, & Merrill).

The practical implementation of the plan began in 1797, when President George Washington requested that the lots, streets, squares, and parcels shown on surveyor Andrew Ellicott's map be transferred to the three city commissioners for federal use. Despite later violations, this action was a major initial legal step to implement the concept and reserved the outlines of the Mall as well as other plan features for the future. However, for most of the 19th century and afterwards, the Mall was characterized by the intrusion of buildings meeting the practical needs of the day, such as an armory complex, a train station, a power plant, and, later, the "tempo" (temporary buildings) for the office space needs of two world wars. Land was disposed of or leased by the federal government with no consideration for the implementation of L'Enfant's Plan.

Much of the historic development of the Mall territory during the 19th and early 20th century has had to be effaced to realize the concept of dignity and spaciousness first formulated by L'Enfant. Nonetheless, two 19th century developments were to have major impacts on the Mall. In 1846, Congress donated a portion of the Mall above B Street SW (Independence Avenue) between 9th and 12th Streets to the Smithsonian Institution, allowing James Renwick's "Castle" to be built within 300 feet of the Mall's center line. The subsequent English-style landscape plan for the Smithsonian grounds, developed by Andrew Jackson Downing, was intended to be a model for the entire Mall, but its implementation was limited to the Smithsonian campus and proved to be a dead end for the overall concept of the Mall. However, the attention to landscape design, the need for public gardens, and the precedent of a museum as a characteristic land use on the Mall all had lasting consequences. Another land donation by Congress, this time of a 37-acre site to the Washington Monument Society in 1846, led to the construction of an obelisk honoring George Washington rather than L'Enfant's intended equestrian statue at a point on the (off center) crossing of axes south from the White House and west from the Capitol.

The 1901 McMillan Plan, popularly named after Senator James McMillan, has had the greatest influence after that of L'Enfant's, although its effective implementation did not occur until the New Deal of the 1930s. Section 8 (Significance) of the 1981 NRHP nomination describes the Mall at the turn of the 20th century as “a hodgepodge of public, private, and commercial structures connected by a patchwork of naturalistic landscaping...” The McMillan Commission, established under the aegis of Senator McMillan as chairman of the Senate Committee on the District of Columbia, brought together the talents of architect Daniel H. Burnham; landscape architect Frederick Law Olmstead, Jr.; architect Charles McKim; and sculptor Augustus Saint-Gaudens. Its writ included not only the Mall but also a comprehensive plan for a now-enlarged City of Washington, a city also being physically enlarged by landfill into the Potomac River to the west. The nomination continues “their plan called for the restoration, development, and supplementation of the ‘Grand Avenue’ ideal proposed by L'Enfant in 1791. The core of the Mall was to be a broad grass carpet, typical of those in Europe, 300 feet in breadth and running the entire length of the Mall grounds, bordered on each side by four rows of American elm trees. Public buildings were to border the whole, separated from the elms by narrow roadways.” The McMillan planners produced a parti—a basic concept of an architectural design—which owed a greater degree of detail and specificity to the more than one hundred years of the city's actual development. Its rows of flanking elms and other landscape and hardscape features were heavily influenced by the Ecole de Beaux Arts style of the period. Also, the growth of Washington now dictated that the buildings bordering the Mall would be public edifices, not private houses.

The 20th century saw a back-and-forth series of actions to either implement or thwart the plan. Activities related to plan implementation included the relocation of the Botanical Gardens and railroad infrastructure, the demolition of many inappropriate buildings, and the construction of an American History Museum and a new Department of Agriculture Building in a location which did not violate desired setbacks. Actions that thwarted plan implementation were temporary structures from World War I and II that proved far from temporary and certain highway improvements, although none violated the Mall itself at the surface level. Demolition of the non-conforming Smithsonian Castle and realignment of the Mall axis to its “correct” location proved impractical. Improvements to the Mall—including regrading, planting, and constructing memorials—continued throughout the century but picked up pace during the relief projects of the 1930s, the Bicentennial of the 1970s, and, most recently, with the construction of new museums in nearly all the remaining enframing parcels. The two inner east-west drives, Washington and Adams, were closed to vehicular traffic and made into gravel walkways in the 1970s.

Although the 1981 nomination of the Mall to the National Register gave its property type as a site, it drew boundaries similar to those typical of a historic district. The exclusion of the Department of Agriculture Building appears to have been due to its jurisdictional status as the only land not controlled by the NPS rather than its nonconformity with the plan concept. Again, no list of contributing features was given; however, the period of significance of 1791 – 1976 and the narratives for both Sections 7 and 8 imply that the Mall has been a historic property of evolving significance, not bound to the “original intent” of Pierre L'Enfant.

OTHER STRUCTURES ON THE MALL INDIVIDUALLY LISTED ON THE NRHP

Due to being less than 50 years old, many—though not all—of the monumental buildings and structures at the edge of or enframing the Mall have been individually listed on the National Register. Not to be confused with NRHP qualifying buildings or structures on the Mall proper (of which there are none), they are:

- The Department of Agriculture Building
- The Freer Gallery of Art
- The Smithsonian Castle
- The National Gallery of Art West Building

- The National Museum of Natural History

THE L'ENFANT PLAN OF THE CITY OF WASHINGTON, 1997 NRHP NOMINATION AS A STRUCTURE

The L'Enfant Plan of the City of Washington was nominated and listed on the National Register in 1997. Its Areas of Significance (Section 8) were given as community planning and development, landscape architecture, politics and government, and transportation. This unusual type of historic resource, a city plan nominated as a "structure", was not defined as the plan of L'Enfant and Ellicott, mapped and frozen in time in 1791. The Section 7 (Description) summary indicates that "for nearly a century, the realization of physical changes to the original plan were gradual, until the second important benchmark in the development of Washington's urban plan: the McMillan Commission and its 1901 – 1902 recommendations" (Leach and Barthold 1997). The period of significance is designated as 1790 – 1942. The actual items that were considered to constitute the "structure" listed on the NRHP were listed in the Boundary Justification of Section 10 (Geographical Data): "The nominated area includes all parks and reservations; streets and avenues; buildings, structures, and objects; and corridor of open space that extends from original building line to building line and forms the right-of-way; though they may not be nominated, specific scenic vistas along major axes and among major monuments are important features to the character of the plan." Essentially, the L'Enfant Plan NRHP nomination recognizes the urban spaces and vistas within the original boundaries of the City of Washington (below Florida Avenue) that were created over a century and half that generally conformed with L'Enfant's monumental Baroque-inspired vision. In addition to the McMillan Plan, recognition is given to another latter-day measure, the Height of Buildings Act of 1910, which ensured that the parks, wide boulevards, and vistas envisioned would not be overwhelmed by tall buildings, a possibility of 20th century technology that L'Enfant could not have anticipated.

The significance of the National Mall to the L'Enfant Plan is noted primarily in the inclusion of "Reservations 2-6: National Mall and Monument Grounds" in the Inventory of Contributing Features and secondarily in the inclusion and exclusion of certain avenues and streets framing the Mall in the Inventory of Contributing Features. (It should be noted that the "origin" of many features deemed contributing is often given as one or more of the "L'Enfant Plan, Ellicott Map, and McMillan Plan," thus confirming that the 1901 McMillan Plan is also seen as a source of historic significance.)

RESERVATION NOS. 2-6: NATIONAL MALL AND MONUMENT GROUNDS (NW AND SW, 189 ACRES)

Origin: L'Enfant Plan (no.3), Ellicott Map, McMillan Plan. These five contiguous reservations comprise more than half the National Mall, from 17th Street to 3rd Street, and between Independence Avenue/Tidal Basin. 3rd, 4th, 7th, and 14th Streets cut through it; 9th, 10th, and 12th Streets tunnel below, and it blocks 6th Street. Two vehicular routes, Madison Drive (on the north) and Jefferson Drive (on the south), allow parking and access to the Mall. Reservation No.2 comprises the area from 17th Street to 14th Street; Reservation No. 3 comprises 14th to 7th Streets; Reservation No. 4-5 comprises 7th to 4th Streets; Reservation No. 6 comprises 4th to 3rd Streets; and Reservation 6A comprises 3rd to 1st Streets (Union Square).

More than a dozen museums flank the Mall. On the north side are the National Museum of American History (1964), National Museum of Natural History (1911), National Sculpture Garden [planned], and Ice Rink (ca. 1986), National Gallery of Art – West Building (1941), National Gallery of Art – East Building (1978); on the south side are the Freer Gallery of Art (1923), Smithsonian Castle (1855, NHL), National Museum of African Art/Arthur M. Sackler Gallery (1987), Enid A. Haupt Garden (1987), Arts and Industries Building (1881, NHL), Hirshhorn Museum and Sculpture Garden (1974), and National Air and Space Museum (1976).

Gravel walks, double rows of elm trees, and occasional sculptures are found on the Mall including the Andrew Jackson Downing Statue (1856), Joseph Henry Statue (1882), and National Grange Marker

(1951). At the eastern terminus are the Ulysses S. Grant Memorial (1922) and Capitol Reflecting Pool (1971). At the western terminus is the Lincoln Memorial (1922).

The Monument Grounds contain the Washington Monument (1848 – 84; located slightly off axis of the Capitol and White House), Sylvan Theater (1917 – 61), Boiler Room/Survey Lodge (1886), Memorial Lodge (1888), Jefferson Pier Marker (1889), and German-American Friendship Garden (1988).

The vistas along this greensward are some of the oldest, most symbolic, and most majestic in the city.

The following features associated with the Mall are listed under the subheadings of “Contributing to the Structure”: for “Avenues”—Maryland and Pennsylvania Avenues; for “Major Streets”—Constitution Avenue (City Canal, B Street North) and Independence Avenue (B Street South); for “North-South Streets”—3rd Street SW, 4th Street SW, 7th Street NW and SW, 9th Street SW, 12th Street NW and SW, and 14th Street NW and SW. There are no “East-West Streets,” “Bridges,” or “Other Streets” associated with the Mall that are identified as “Contributing to the Structure”. It should be noted that this omits Madison and Jefferson Drives as well as the former Adams and Washington Drives.

Under the subheading “Contributing Associated Vistas,” the U. S. Capitol along the Mall to the Lincoln Memorial and the western horizon is identified as one of the two “Primary Vistas.”

The nomination of the L’Enfant Plan of the City of Washington also contains a list of specific non-contributing features including “Buildings,” “Parks (Reservations),” “Roadways,” “Bridges,” and “Interruptions and Obstructions of Associated Vistas.” None are directly associated with the Mall. It also notes that “incidental components of the public space such as street and sidewalk paving, manholes, utilities, and other like elements are considered non-contributing.”

Cultural Landscapes

Cultural landscapes, as defined in the NPS's Preservation Brief 36—Protecting Cultural Landscapes: Planning, Treatment, and Management of Historic Landscapes (Birnbaum 1996) consist of “a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein) associated with a historic event, activity, or person exhibiting other cultural or aesthetic values.” The proposed alternatives have the potential to directly affect one cultural landscape: the Mall proper or central portion as defined in the NPS's Cultural Landscape Inventory (CLI). Adjacent to the territory covered by the Mall CLI is the Union Square cultural landscape to the east, as defined in its separate CLI, and the Washington Monument Grounds cultural landscape, for which the NPS has also prepared an individual CLI. Due to the limitation of the alternatives evaluated in this EA to turf and soil renovation in the turf panels which occupy the interior of the landscape, it has been determined that the potential effect upon the Union Square and Washington Monument Grounds landscapes is negligible. Therefore, these adjacent CLI landscapes will not be summarized for the affected environment.

THE MALL CULTURAL RESOURCES LANDSCAPE INVENTORY

In 2006, the Cultural Resources Landscape Inventory was completed by the NPS for the Mall, jurisdictionally a component of the National Mall and Memorial Parks. The Mall CLI embraces the 135 acres bounded by the outer curbs of Madison Drive on the north, Jefferson Drive on the south, 14th Street on the west, and 3rd Street on the east. It is a rectangle except for the section of Jefferson Drive that curves northward into the Mall in front of the Smithsonian Castle. The enframing buildings, ice rink, sculpture garden, and other structures that occupy the space between Madison Drive and Constitution and Pennsylvania Avenues on the north and the space between Independence and Maryland Avenues on the south as well as Union Square are considered an important part of the physical context of the Mall CLI; however, only the internal 135-acre rectangle of open space is directly analyzed.

The CLI, in its Park Information and Inventory Summary, recognizes the previous documentation work accomplished, particularly in the 1981 NRHP nomination of the Mall and the 1997 NRHP nomination of the L'Enfant Plan (NPS 2006c). However, it notes that “neither provides sufficient information on the development, integrity, or current condition of the landscape.” The CLI is also able to provide, due to its more recent date, a description and narrative history of the Mall in its presumably “built-out” state. (The National Museum of the American Indian now occupies the last major site within the semi-rectangle formed by Constitution and Pennsylvania Avenues, 3rd Street, Independence and Maryland Avenues, and 14th Street.) The CLI contains an expanded and more detailed Statement of Significance, Chronology (including all land transfers), and Physical History of the Mall than the preceding documents. The initial paragraph of the CLI Statement of Significance indicates:

The national significance of the Mall cannot be overstated. The central landscape itself, as defined for this inventory, constitutes the fundamental feature of the Mall, clarifying the vista and thus the symbolic relation between the Capitol and the Washington Monument, representing the legislative and executive branches of Government (since the Washington Monument stands on axis with the White House) – the primary design intent of both the L'Enfant and McMillan Plans....The Period of Significance for the Mall includes two separate periods: 1791 – 1792, encompassing the year the L'Enfant Plan was created, and the subsequent year, when changes to the plan were made by L'Enfant's successor, Andrew Ellicott; and 1902 – 1975, extending from the publication of the McMillan Plan, encompassing the years 1932 – 1936 when the plan was revised and largely implemented, to the year when the final tree panel with elm trees following the removal of the last of the temporary war building a few years earlier (NPS 2006c).

The CLI contains a further review of the prior National Register documentation of the Mall which it notes as “Entered – Inadequately Documented.” Table 3.3 summarizes the CLI significance data according to current NRHP technical standards. A more contemporary emphasis is placed upon landscape:

Table 3.3- CLI Significance Data

Significance Criteria	(Cites NRHP Criteria A, B, and C.)
Time Period:	1791 – 1792
Historic Context Theme	Expressing Cultural Values
Historic Context Subtheme	Landscape Architecture
Historic Context Facet	The Early National Period
Time Period:	1901 – 1936
Historic Context Theme	Expressing Cultural Values
Historic Context Subtheme	Landscape Architecture
Historic Context Facet	The City Beautiful Movement
Time Period:	1933 – 1936
Historic Context Theme	Expressing Cultural Values
Historic Context Subtheme	Landscape Architecture
Historic Context Facet	The 1930s: Era of Public Works
Time Period:	1901 – 1975
Historic Context Theme	Expressing Cultural Values
Historic Context Subtheme	Landscape Architecture
Historic Context Facet	Urban Planning in the 20th Century
Areas of Significance	
Category:	Community Planning and Development
Priority:	1
Category:	Landscape Architecture
Priority:	2

The “Analysis and Evaluation” section of the CLI presents a general summary of the features and values of the Mall as a cultural landscape. It evaluates the Mall as retaining its integrity according to the characteristics used by the National Register: Location, Setting, Design, Materials, Workmanship (deemed non-applicable), Feeling, and Association. Of note is the recognition under Materials that “the original concrete paving of the walks has been replaced with a combination of gravel and exposed aggregate concrete, and certain modifications have been made to the mix of elm varieties.”

CONTRIBUTING AND NON-CONTRIBUTING FEATURES are identified in the CLI for Vegetation, Views and Vistas, Circulation, Buildings and Structures, and Small-scale Features while Topography, Archeology, Land Use, and Spatial Organization receive only a general discussion.

TOPOGRAPHY -The basic perception is that the Mall is generally level, although some significant regrading was done at its western end to achieve this appearance.

ARCHEOLOGICAL SITES - No archeological surveys have been done for the CLI territory, but there is potential for archeological resources.

LAND USE - The Mall is intensively used for recreation, demonstrations, tourism, museum access, concerts, and public ceremonies. Pedestrians do not limit themselves to the walkways; they walk or run over the turf panels as well.

VEGETATION - Most of the discussion regarding vegetation concerns the elm trees. However, the CLI notes that the central turf panels are planted with tall fescue while areas under the elms are seeded in a bluegrass mixture.

Contributing features include: turf panels; tree panels; American elm trees planted in 1920s – 1975, and American elm tree cultivars such as ‘Jefferson’ and ‘Princeton,’ planted to replace the original elms

Non-contributing include: American elm tree ‘Augustine Ascending’ cultivar; European elms along 12th Street axis; bald cypresses (*Taxodium distichum*); two oak trees (*Quercus rubra*) along 14th Street; other street trees under D.C. jurisdiction; and landscaping of the Hirshhorn Sculpture Garden

SPATIAL ORGANIZATION - A distinction is drawn between the unfiltered aspect of the great channel of space from the Capitol to the Washington Monument along the central axis of the Mall and the filtered view trough and under the elm canopy from the center of the Mall to the enframing buildings.

VIEWS AND VISTAS - The 1930’s interpretation of the McMillan Plan emphasized the turf panels or *tapis vert*, the eight rows of elms, and the orthogonal walks as devices to reinforce the main reciprocal vista of the Capitol to Washington Monument.

Contributing features include: vista, Capitol to Washington Monument; views to elms from walks and turf panels; views to building façades from the Mall; views up cross streets; views from the Mall to Union Square

CIRCULATION - Under a subheading “Contribution of the Mall Walk System” in the CLI is the following statement:

The pattern of the Mall circulation is contributing. The materials of roads and walks are not contributing; this includes the gravel and concrete of the walkways and sidewalks, which replaced the original concrete walks in 1975 and later. Little information has been found about the historic width of roads and walks. Since the gravel was laid directly on top of the asphalt of the Inner Drives when they were converted into walks, it seems likely that the width did not change substantially.

Contributing features include: Roads and sidewalks – Jefferson Drive, Madison Drive, 3rd Street, 4th Street, 7th Street, 14th Street; east-west walks – North Vista Walk (formerly Washington Drive); South Vista Walk (formerly Adams Drive); sidewalks along Madison and Jefferson Drives (Mall sides of drives – south side of Madison and north side of Jefferson); cross axial walks – 5th, 6th, 8th, 9th, 10th 12th, and 13th Streets axes

Non-contributing features include: social trails; curving walks in front of the Smithsonian Castle; polychrome paving and steps, the Joseph Henry Statue

BUILDINGS AND STRUCTURES - None of the few buildings or structures on the Mall proper are contributing.

Contributing features include: None

Non-contributing features include: the Metro entrance; four food service buildings; Tourmobile kiosks; the Smithsonian carousel and its ticket booth; the Hirshhorn Sculpture Garden

SMALL-SCALE FEATURES - All of the small-scale features found on the Mall—except the benches and streetlights of 1930’s design—are non-contributing. It should be noted that the text of the CLI mentions small-scale features such as tan-colored brick edging around some elms and black steel edging around turf panels in a way that suggests they are non-contributing.

Contributing features include: benches (1930’s design); street lights (1930’s design)

Non-contributing features include: trash receptacles; signs; utility boxes; post-and-chain barriers; chain-link fence around Metro entrance; grates and manholes; parking meters; traffic lights; bicycle racks; National Grange plaque; pay phones; fire hydrants

CONCLUSION

The history of the Mall's documentation as a historic property, and particularly its recordation on the NRHP, indicates that the official recognition given this premier national urban space with multiple urban design, architectural, landscape architectural, and symbolic aspects has evolved since 1966 as the Mall itself has since the late 18th century. Vistas and views, the structure of the street pattern whether represented by pavement or gravel, the framework of monumental buildings and structures at its edges, and the overall impression of a greensward have been the universally accepted primary attributes of the National Mall. Few other more detailed features have been accepted as significant to its historic integrity.

Archeology

Efforts to identify archeological resources included a review of existing databases maintained by the NPS, the DC HPO, a literature review, and research into primary historical documents. A formal Archeological Overview and Assessment Study has not been completed for NAMA, so information concerning archeological resources in the APE must be extrapolated from previous studies in the surrounding area and other sources. The Archeological Overview and Survey Plan for the National Capital Area (Little 1995) established priorities for the system-wide archeological inventory project. In that document, one of the Priority 1 projects was a shoreline study of the Potomac and Anacostia Rivers, which would be relevant to four Parks, including NAMA. To date, the recommended shoreline study has not been completed. Lacking detailed information on archeological resources for the APE, it is possible only to develop speculative statements regarding existing archeological resources.

The recommendation for a shoreline study as an element of the system-wide archeological inventory project stems from the fact that much of the downtown Monumental Core area, including the National Mall, was originally situated on the shoreline of Tiber Creek, one of the District's natural inland waterways. Before the City of Washington was laid out in 1791, the south bank of Tiber Creek cut across what is now the National Mall (Figure 3.11). As a natural shoreline area, areas immediately adjacent to Tiber Creek are of archeological interest primarily because such areas were attractive to Native American groups and because the city's early development was concentrated along its waterfront areas. The modern landscape associated with the APE reflects the filling of Tiber Creek and the creation of formal landscapes of the National Mall. Because most of the land in the APE consists of fill deposits and formal landscapes, the potential for archeological sites is limited, but not non-existent. Archeological resources associated with earlier, historical landscapes, if present, may be found in buried contexts.

It is important to emphasize that the existence of archeological resources within the study area is speculative at this time, as comprehensive archival studies and field surveys have not been completed. It is assumed that any archeological resources within the study area are buried beneath varying amounts of fill, but the depths of modern fill deposits across the study area have not been systematically determined by geoaicheological investigation.

Some information on the depths of fill and disturbed areas is available that is broadly useful for the assessment of possible impacts on archeological resources; these studies include a soil survey (Short et al. 1986) of the Mall, a disturbance study (Heritage Landscapes, LLC 2010), and a geoaicheological study (LeeDecker and Wagner 2010).. These studies provide general information on the character of the landscape as it pertains to potential archeological resources, but they cannot support a rigorous impact analysis for archeological resources, as the presence of archeological resources and their depths below current grade is unknown.

A series of soil cores sampled the near-surface soils in the Mall in the 1980s (Short et al. 1986). These cores were distributed along five east-west transects, with 20 core samples on each transect. The goal of this study was to characterize the physical and chemical properties of the Mall soils, and the cores were limited to the upper 0.7 meter (2.46 feet) of soil. The study noted some of the land use patterns that have influenced the Mall landscape including filling, construction of temporary buildings, and formal landscaping. Overall, 95% of the cores showed evidence of filling – some with multiple discontinuities that reflected multiple filling or grading episodes. More than four in ten (42%) of the soil cores showed evidence of a buried surface soil (A-horizon). It is assumed that archeological resources may be present in surface soils; these surfaces could represent the natural landscape of the city as it existed before the city was laid out in 1790 or intermediate surfaces formed by the addition of fill soils onto the underlying landscape surface. But the fact that 42% of the soil cores identified a buried surface within 2.46 feet of the current surface does suggest that relatively shallow ground-disturbing activities might have an effect on

archeological resources. However, the investigators note that some areas of the Mall may have fills that reach a depth of 20 feet (Short et al. 1986).

In conjunction with the present EA, a mapping project was completed that illustrates the sequence of land use changes that have occurred on the Mall since the city was laid out in 1791 (Heritage Landscapes, LLC 2010). This mapping study focuses on the changing appearance of the Mall and outlines some of the historical processes and events that might be considered as disturbances to the archeological record. Some of the major disturbances that were noted in this study include the complex of World War I temporary buildings at the eastern end of the Mall and the tunnels for 9th Street, 12th Street, and the Metro rail system.

An additional study that was completed in support of the present EA was a geoarcheological investigation that focused on the proposed locations of the cisterns and pump station (LeeDecker and Wagner 2010). These features are elements of the water distribution and supply system that will require relatively large areas of ground disturbance, hence the greatest possible impact to archeological resources.

The study demonstrated that most areas of the Mall are characterized by soil columns that have varying amounts of fill over truncated natural soils, a finding that is consistent with previous studies and the Mall's well-documented landscape history. However, despite the Mall's complex urban developmental sequence, there are some intriguing findings. Recognizable tidal flat soils associated with the south bank of Tiber Creek were identified at the 4th Street cistern location, and these represent the best preserved remnants of the natural environment that existed in the downtown area prior to urban development. These soils would have been part of the landscape associated with the prehistoric and early historic periods, and they may have been exploited for aquatic resources.

Two borings -- at the 10th Street and 7th Street cistern locations -- contain soils that are characteristic of moderately well preserved upland natural landscapes. These columns contained a possible loess deposit (wind-deposited silt), raising the possibility that a more ancient landscape surface may be buried beneath the loess. Mapping and characterization of this loess deposit has become a primary research interest for the archeology of the District of Columbia, as the underlying landscape may have been used by very early prehistoric populations. The presence of a possible prehistoric site on a landscape beneath the loess deposit is highly unlikely, given the small population levels at that time, but the findings do indicate that some ancient landscape surfaces may be present in the highly urbanized environment that is now the National Mall.

Native American occupation in the downtown area around Tiber Creek has been well established despite the urban character of the modern environment. There are many artifact collections from sites in the District of Columbia that were amassed prior to the advent of modern archeology, and as such they typically lack specific information about their origin. Among the prehistoric artifact collections from the District of Columbia is an assemblage of 147 specimens from the Washington Monument grounds as recently described by Krakker (2005). This collection is apparently from a site on the south bank of Tiber Creek, although the exact origin is unknown. The collection was obtained in the 1880s and includes artifacts that indicate episodic use of the area for at least 7,000 years. The collection has been cataloged as archeological site 51NW35-Monument Grounds. It was widely assumed that the Washington Monument Grounds have been so severely disturbed that no possibility existed for archeological resources to have survived. However, recent archeological investigations for the National Museum of African American History and Culture (NMAAHC) have demonstrated that some remnants of the natural landscape along Tiber Creek may be preserved beneath deep fill deposits (LeeDecker , Fiedel, and Bedell 2007; LeeDecker , Kraus, and Kuhn 2008).

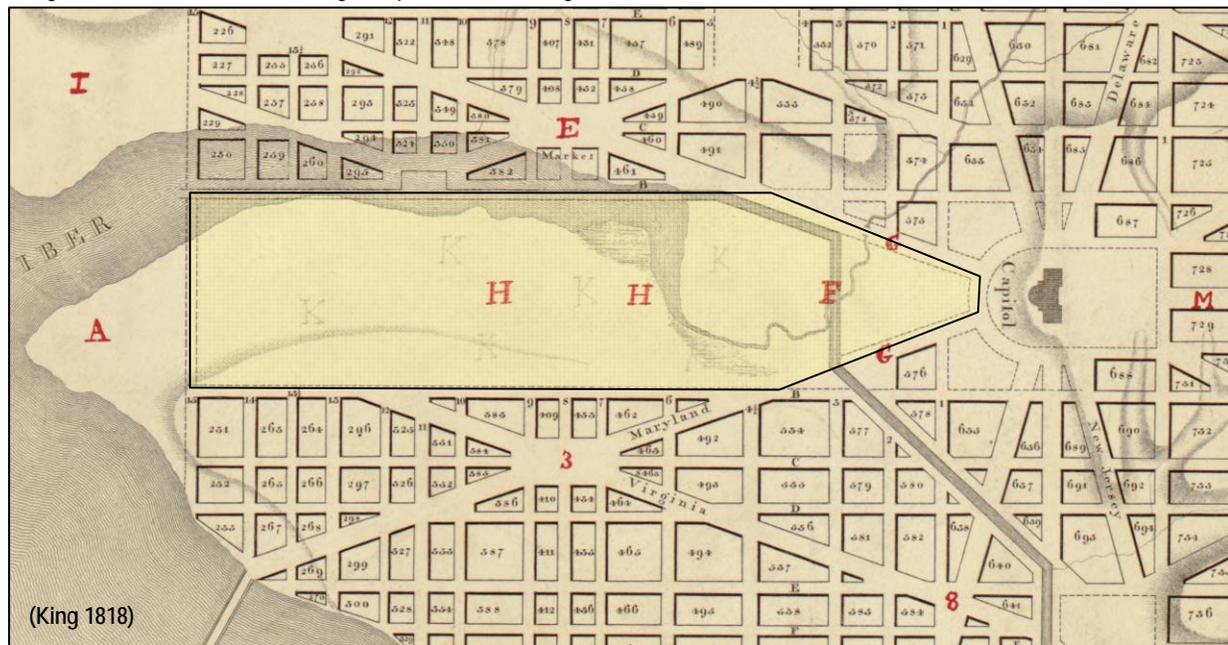
Figure 3.11 – Detail of Pierre L'Enfant's "Dotted Line Map," Showing Area around Tiber Creek



Ever since the City of Washington was laid out in 1791, the National Mall area has been reserved for public use, so its history is closely linked to the development of the city's Monumental Core area. As the city developed in the 19th century, Tiber Creek was transformed first into the Washington City Canal, then into the B Street Sewer. In the 1870s, the sewer was paved over and B Street became Constitution Avenue. The Washington City Canal was an important part of Pierre L'Enfant's Plan for the City of Washington. L'Enfant envisioned a canal that would allow goods to easily reach the interior of the city and connect the Potomac and Anacostia Rivers via Tiber and James Creeks, thereby facilitating traffic between Georgetown and the deepwater ports on the Anacostia. The Washington Canal was the first public works project that had a significant impact on the physical geography of the territory south of the White House. Advocates and promoters of the canal hoped it would also alter the political and economic landscape, easing the path of commerce in the city. Intended to enhance the newly established capital city both in commerce and in beauty, the canal was plagued with obstacles from its beginnings in the 1790s and continued to be plagued by difficulties until its final demise in the 1870s.

The first phase of canal construction, completed by 1815, did not fully realize L'Enfant's plan; at that time the canal route simply followed the existing channel of Tiber Creek as far upstream as 6th Street, where a lock raised the water level. By 1822 the canal channel had been extended across the northern margin of the National Mall, which required a major effort to reshape the stream channel and build a towpath (Figure 3.12). The canal channel, or prism, was simply a flat-bottomed ditch with sloping banks. Typical canals of that period were only 22 feet wide, but the Washington City Canal was much larger. In the downtown area, the canal was 80 feet wide and was flanked on both sides by two 80-foot-wide streets. Instead of digging a ditch across dry land, building the canal through lower Tiber Creek would have involved filling the broad stream channel and forming an appropriately sloped bank to support a towpath. By the 1850s, the canal channel extended as far as 17th Street. The towpath would have been on the inland side of the canal channel, so much of the landfilling would have been on the northern bank of Tiber Creek, which was documented by a previous archeological investigation of the Ellipse (LeeDecker 2006). Part of the section of the canal between the White House and the Capitol, the canal was wharfed with stone walls. The Boschke map of 1861 (Figure 3.14) shows the status of land development at the beginning of the Civil War.

Figure 3.12 – Detail of Robert King's Map of 1818, Showing First Phase of Canal Construction



During Washington's brief period of local government in the early 1870s, the Board of Public Works, under Alexander "Boss" Shepherd, completely transformed the city's landscape. During Shepherd's tenure (1871 – 1873), water and sewer service was extended, streets and sidewalks were improved, trees were planted, street lights were installed, and a trolley system was built. Where others had advocated dredging or covering the canal, Shepherd, a plumber by trade, converted it to a sewer so it could be paved over and reborn as Constitution Avenue. The location of the Washington City Canal is well known and some parts of the canal have been documented in previous archeological studies at the Southeast Federal Center as site 51SE47 (Parsons Engineering-Science, Inc. 1996; Patton and Boyd 2004). Elements of the canal at the Southeast Federal Center have been determined as eligible for the NRHP.

Previous archeological studies within the National Mall have demonstrated that the archeological record associated with the National Mall can be quite complex, with physical remains of a great variety of events that vary widely in their historical and archeological significance.

At the Smithsonian Castle, a documentary study was completed for the South Quadrangle (or South Yard), a 4.2-acre area that was planned for a 460,000-square-foot underground building complex (Smith 1981). That research found documentary evidence that some 22 archeological features may have existed in the study area; for the most part these were architectural remains associated with the Smithsonian Castle building and its associated dependencies along with temporary structures such as window wells, grading deposits, and utility lines. Some of the more notable and unique resources were large cisterns, cess-pools [sic], and scientific buildings, the latter of which included a subterranean magnetic observatory and an astrophysical observatory. This study concluded that evidence of Native American occupation would have been obliterated, but that there was some chance for “survival of four historic features: the Inground Cisterns, the Castle Well, the Astrophysical Observatory, and Subsurface Linear Disturbance Features” (utility lines). The report concluded that construction of the new building would have no adverse effect on archeological resources, with the stipulation that construction would be monitored on a daily basis by an archeologist who would document exposed archeological features. Whether these features had actually survived in archeological context is unknown, as there is no known report of monitoring during construction (Smith 2010).

The Smithsonian Institution sponsored a series of archeological studies prior to construction of the National Museum of the American Indian, located on Reservation C, a parcel bounded by 3rd Street, 4th Street, Maine Avenue, and Maryland Avenue. Reservations A, B, C, and D were originally set aside as public land under the L’Enfant Plan, but they were given over to private interests for development in the 1820s. Development of these parcels began in the 1840s, and these areas were characterized by a mixture of low-income housing and industrial uses. Archeological investigations for the museum site ultimately focused on deposits associated with an upper-class brothel owned by Mary Ann Hall, which was designated as Site 51SW14 (Smithsonian 1997). Based on the archival research for the National Museum of the American Indian, the archeological record in Reservations A, B, C, and D may contain evidence of many other residential and industrial properties. Subsequent construction of the museum presumably destroyed many of these archeological properties.

Other potential archeological resources in the study area can be identified on the basis of archival sources, most notably the Washington Armory which stood at the site now occupied by the National Air and Space Museum. The area between 6th and 7th Streets SW was then locally known as Armory Square. During the Civil War, the Armory (also known as the Columbian Armory) was surrounded by barracks and hospitals, extending across the width of the Mall, with a morgue, a church, quarters for nurses and a chaplain, and 50 barracks (NPS 2006c). Another potential complex of archeological features on Armory Square is represented by the “Pennsylvania” Baltimore and Potomac Railroad station along the east side of 6th Street. As shown on the 1903 Baist atlas, the railroad complex includes a large station, track sidings, and a group of smaller structures (Figure 3.13).

Figure 3.13 – Detail of Baist Atlas of 1903, Showing Development of Armory Square

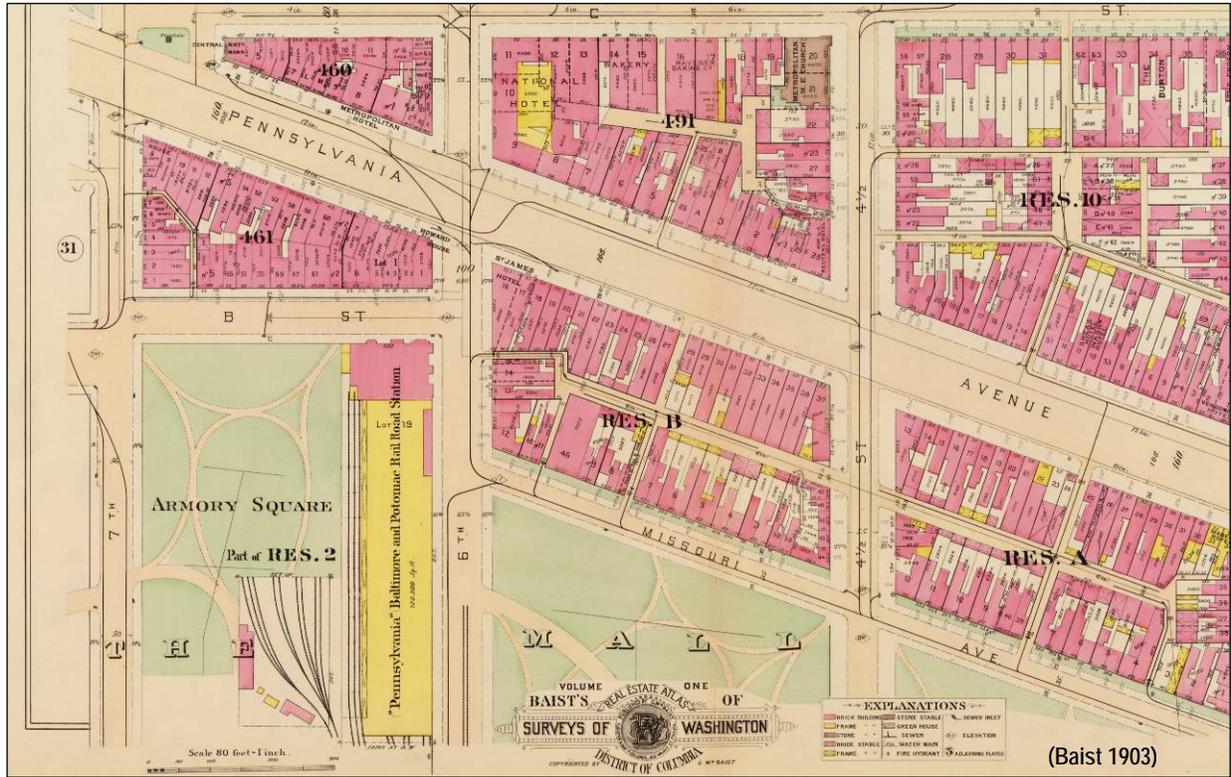
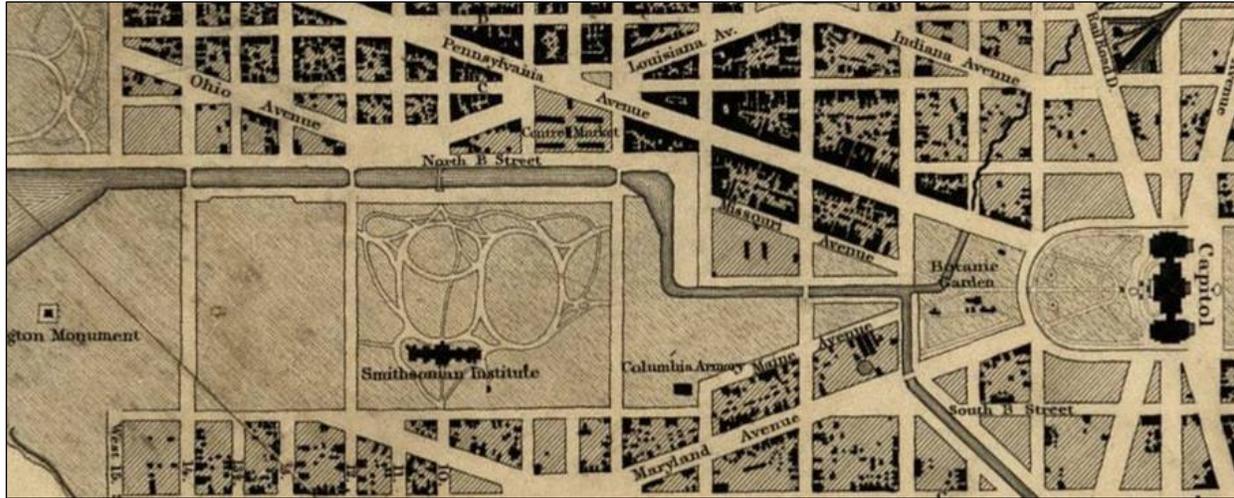


Table 3.4 summarizes the potential archeological resources that can be identified on the basis of available sources. The presence of archeological resources within the study area can be specified only on the basis of speculative or predictive statements, as field surveys have not been completed. Formal identification and evaluation of such resources would require detailed study, including field surveys that involve subsurface investigations. With the filling of Tiber Creek, the conversion of B Street into Constitution Avenue and the subsequent development of the Mall following the MacMillan Plan, it should be expected that archeological sites in the study area would be buried beneath fill deposits, given the complex land use history of this urban area.

Table 3.4 – Potential Archeological Resources

Resource Type	Location and Description
Native American Sites	Short-term camp sites or resource extraction areas along the (former) shoreline of Tiber Creek; most likely locations would be elevated, well-drained areas of the original landscape; sites may be buried beneath deep fill deposits
Washington City Canal (circa 1815 to 1870s)	Features such as canal prism, wharfing, towpath and western tidelock; most likely locations for survival of the canal is between 7th and 3rd Streets
Washington Armory	Remains of Civil War era barracks, hospitals, a morgue, a church, and quarters for nurses and a chaplain; between 6th and 7th Streets
Baltimore and Potomac Railroad station/terminal (circa 1900 to 1910)	Remains of train station, rail yard and support buildings along east side of 6th Street
Residential and industrial sites (circa 1840s to 1930s)	Mixed neighborhood of working-class residences, brothels, and industrial sites; Reservations A and B (3rd to 6th Streets between Pennsylvania and Missouri Avenues); Reservations C and D (3rd to 6th Streets between Maine and Maryland Avenues)

Figure 3.14 – Detail of Boschke's Map of 1861, Showing the Mall Area at the Beginning of the Civil War



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CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

This “Environmental Consequences” chapter analyzes both beneficial and adverse impacts that would result from implementing any of the alternatives considered in this EA. This chapter also includes definitions of impact thresholds (e.g., negligible, minor, moderate, and major), methods used to analyze impacts, and the analysis methods used for determining cumulative impacts. As required by the CEQ regulations implementing NEPA, a summary of the environmental consequences for each alternative is provided in Table 2.3 which can be found in “Chapter 2: Alternatives.” The resource topics presented in this chapter and the organization of the topics correspond to the resource discussions contained in “Chapter 3: Affected Environment.”

General Methodology for Establishing Impact Thresholds and Measuring Effects by Resource

The following elements were used in the general approach for establishing impact thresholds and measuring the effects of the alternatives on each resource category:

- general analysis methods as described in guiding regulations, including the context and duration of environmental effects
- basic assumptions used to formulate the specific methods used in this analysis
- thresholds used to define the level of impact resulting from each alternative
- methods used to evaluate the cumulative impacts of each alternative in combination with unrelated factors or actions affecting Park resources

These elements are described in the following sections.

General Analysis Methods

The analysis of impacts follows CEQ guidelines and DO-12 procedures (NPS 2001) and incorporates the best available information applicable to the setting and the actions being considered in the alternatives. For each resource topic addressed in this chapter, the applicable analysis methods are discussed, including assumptions and impact intensity thresholds.

Impact Thresholds

Determining impact thresholds is a key component in applying NPS Management Policies and DO-12. These thresholds provide the reader with an idea of the intensity of a given impact on a specific topic. The impact threshold is determined primarily by comparing the effect to a relevant standard based on applicable or relevant/appropriate regulations or guidance, relevant literature and research, or best professional judgment. Because definitions of intensity vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this document. Intensity definitions are provided throughout the analysis for negligible, minor, moderate, and major impacts. In all cases, the impact thresholds are defined for adverse impacts. Beneficial impacts are addressed qualitatively.

Potential impacts of all alternatives are described in terms of type (beneficial or adverse); context; duration (short- or long-term); and intensity (negligible, minor, moderate, major). Definitions of these descriptors include:

Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse: A change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition.

Context: The affected environment within which an impact would occur, such as local, park-wide, regional, global, affected interests, society as whole, or any combination of these. Context is variable and depends on the circumstances involved with each impact topic. As such, the impact analysis determines the context, not vice versa.

Duration: The duration of the impact is described as short-term or long-term. Duration is variable with each impact topic; therefore, definitions related to each impact topic are provided in the specific impact analysis narrative.

Intensity: Because definitions of impact intensity (negligible, minor, moderate, and major) vary by impact topic, intensity definitions are provided separately for each impact topic analyzed. Thresholds are provided only for adverse impacts. (An EA typically does not include major adverse impacts).

Cumulative Impacts Analysis Method

NEPA regulations require an assessment of cumulative effects in the decision-making process for federal projects. Cumulative effects are defined as “the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions” (CFR 2005b). Cumulative effects are considered for all alternatives, including the no action alternative.

The methodology for determining cumulative effects is derived from using an “ $X+Y=Z$ ” analysis where “ X ” represents the impacts of the alternative and “ Y ” is other past, present, and reasonably foreseeable future actions. When considered relative to each other, their combined contribution to the overall cumulative effect is “ Z .” It is important to note that due to the disparate scale and location of the proposed actions, effects from certain proposed actions could be moderate, but when considered in the overall context, could constitute a relatively small incremental portion of the project area and contribute to a collective minor effect.

Table 4.1 summarizes the cumulative impacts projects and describes the various resource areas that could be affected by these projects. In addition to those actions identified below, other current and future plans, including the National Mall Plan, are described in “Chapter 1: Purpose and Need.” Figure 4.1 delineates the location of the cumulative impacts projects. The analysis of cumulative effects was accomplished using four steps:

1. Identify Resources Affected - Fully identify resources affected by any of the alternatives. These include the resources addressed as impact topics in “Chapter 3: Affected Environment” and “Chapter 4: Environmental Consequences” of the document.
2. Set Boundaries - Identify an appropriate spatial boundary for each resource. The spatial boundary for each resource topic is listed under each topic.
3. Identify Cumulative Action Scenario - Determine which past, present, and reasonably foreseeable future actions to include with each resource. These are listed in Table 4.1 and are described below.
4. Cumulative Impact Analysis - Summarize impacts of these other actions (X) plus impacts of the proposed action (Y), to arrive at the total cumulative impact (Z). This analysis is included for each resource in “Chapter 4: Environmental Consequences.”

Figure 4.1 – Cumulative Impacts Projects or Actions



Table 4.1 – Cumulative Impacts Projects or Actions

Type of Action	Cumulative Impacts Project	Description	Status
Perimeter Security	N/A	<p>Since the 1995 Oklahoma City federal building bombing and 9/11, security improvements have been implemented or would likely be implemented in the future throughout the Washington, D.C., area, including the project area. The Smithsonian Institution and National Gallery of Art have recently completed perimeter security projects.</p> <p>Affected Resources Areas: The security measures, although important for public safety, have resulted in impacts on the visual and cultural resources of the area. The presence of law enforcement has also been increased, causing impacts on Park management and operations.</p>	PAST/ PRESENT
Plans	National Mall Plan	<p>The goal of the National Mall Plan is to establish a sense of place and an overall identity for the National Mall, creating a coherent pedestrian environment that would complement and balance the natural environment, formal and informal features, and national commemorative works.</p>	PRESENT/ Fall 2010
New Museums and Memorials	National Museum for African American History and Culture (NMAAHC)	<p>This building would be constructed on a 5-acre parcel on the Washington Monument Grounds between 14th and 15th Streets and Constitution Avenue NW.</p> <p>Affected Resources Areas: This new museum would affect visitor use and transportation since it would be a highly visible draw for tourists upon completion of construction. It would affect visual and cultural resources since it would be the first new structure to be built on the National Mall in the 21st century.</p>	FUTURE 2012-2016
	Martin Luther King, Jr., Memorial (MLK)	<p>This project would establish a memorial to Dr. King on a 3-acre site within the triangular area bounded by Independence Avenue, relocated West Basin Drive, and the western edge of the Tidal Basin walkway. The memorial would conceptually be a landscape experience, using stone, water, and trees to convey the main themes of Dr. King's legacy: justice, democracy, and hope.</p> <p>Affected Resources Areas: This new memorial would affect visitor use since it would be a highly visible draw for tourists upon completion of construction.</p>	PRESENT 2010
	Dwight D. Eisenhower Memorial	<p>This new memorial is proposed to be built across Independence Avenue from the National Air and Space Museum and north of the Department of Education. The design concept includes a cohesive and important civic space and urban monument in the heart of the capital region that provides a quiet and contemplative space.</p> <p>Affected Resources Areas: This new memorial would affect visitor use and Park management and operations since it would be a highly visible draw for tourists upon completion of construction.</p>	FUTURE 2011/2012
	American Veterans Disabled for Life Memorial (AVDLM)	<p>The AVDLM will occupy a 2-acre site south of Independence Avenue SW at 2nd Street SW and Canal Street SW. The Memorial will honor all those veterans who were permanently disabled while serving in the United States Armed Forces.</p> <p>Affected Resources Areas: This new memorial would affect visitor use and Park management and operations since it would be a highly visible draw for tourists upon completion of construction.</p>	FUTURE 2011/2012

Table 4.1 – Cumulative Impact Projects or Actions (continued)

Civil Works Projects	Potomac Park Levee Project	<p>This project would introduce an improved levee system in the area between 23rd Street and 17th Street and along the north side of the Reflecting Pool. At 17th Street, just south of Constitution Avenue, a closure structure would be built with abutments that support posts and panels that would be erected during a flood emergency. At 23rd Street and along the Reflecting Pool, existing low spots in the levee would be filled and brought to an elevation that complies with USACE standards.</p> <p>Affected Resource Areas: The new structures and landscape modifications would potentially impact Park management and operations and cultural and visual resources. During construction, it would potentially impact public safety, visitor use, soils, and vegetation.</p>	PRESENT/ ongoing 2008-2010
	Lincoln Memorial Reflecting Pool Rehabilitation	<p>This project would rehabilitate and enhance the infrastructure, circulation, and accessibility around the Lincoln Memorial east plaza. At the Reflecting Pool, upgrades to the structural and water systems would improve its functionality and sustainability and formalize walkways along the north and south edges of the pool. Site furnishings throughout the project area would be refurbished and reconfigured.</p> <p>Affected Resource Areas: During construction, these improvements would potentially impact visitor use due to the disruption to the Reflecting Pool for approximately 18 months. Following completion, there would be potential impacts to Park management and operations due to the new water system and visitor use.</p>	FUTURE 2011/2012
	Constitution Avenue Street Improvements	<p>Constitution Avenue NW between 23rd Street NW and 16th Street NW would be rehabilitated; streetscape improvements would introduce new street lighting and storm sewer upgrades.</p> <p>Affected Resource Areas: During construction, these improvements would potentially impact visitor use and public safety.</p>	FUTURE 2011
	Madison Drive Streetscape Improvements	<p>Madison Drive would be rehabilitated with enhancements to streetscape elements.</p> <p>Affected Resource Areas: During construction, these improvements would potentially impact visitor use and visual resources in the project area.</p>	FUTURE 2011
	Jefferson Seawall Rehabilitation	<p>This project would rehabilitate the Thomas Jefferson Memorial plaza, seawall, and staircases in a manner that improves pedestrian circulation and visitor safety.</p> <p>Affected Resources Areas: These improvements would potentially impact Park management and operations and cultural and visual resources. During construction, it would potentially impact public safety and visitor use.</p>	ongoing 2009-2010

Visitor Use and Experience

METHODOLOGY AND ASSUMPTIONS

The purpose of this impact analysis is to assess the effects of the alternatives on the visitor use and experience in the areas that would be affected by the turf and soil reconstruction in and around the project area. To determine impacts, the current uses of the area were considered and the potential effects of the construction and implementation of the rehabilitation on visitor experience and use were analyzed. Activities and the type of visitor experience and use/visitation that occur in the Park and which might be affected by the proposed actions, as well as the visual character of the area and noises experienced by the visitors, were considered.

STUDY AREA

The proposed actions would be located on the Mall between 3rd and 14th Streets NW and Madison and Jefferson Drives. For the impact analysis, the study area for visitor use and experience includes the larger area of the National Mall as well as the attractions and museums in the surrounding areas. Projects and plans in the immediate vicinity of the National Mall, particularly those that result in new visitor use opportunities or temporary closures, are considered in the cumulative impact analysis.

IMPACT THRESHOLDS

Negligible: The impact would not be detectable or would be barely detectable to most visitors and would not affect their experiences or opportunities in a perceptible manner.

Minor: The impact would be detectable to some visitors and might result in some effect on their experiences or opportunities.

Moderate: The impact would be readily apparent to many visitors and would likely affect the experiences or opportunities of many visitors.

Major: The impact would be obvious to most visitors and would affect the experiences or opportunities of most or all visitors.

Duration: Short-term impacts would occur throughout the course of a year. Long-term impacts would last more than one year.

Impacts of Alternative 1: the No Action Alternative

The no action alternative represents a continuation of the existing conditions, operations, and maintenance of the turf and soil and of current practices regulating visitor use and special events within the project area. Visitation in the project area, including recreation and special events, would continue to degrade and compact the turf and soil resources on the National Mall.

TURF AND SOIL MAINTENANCE

Along the edges of the turf panels, there would continue to be steel edging that provides ineffective separation between the turf and walkways. An unclear visual distinction between the walkways and turf panels would persist resulting from the large amount of gravel that migrates onto the turf panels. The corners of the turf panels would continue to be subject to substantial wear from intense visitor use.

Seasonal maintenance would continue including a winter rest period from mid-September to the end of March, during which half of the project area each year would be closed to visitor use. Smaller rest periods would continue to occur throughout the year following large-scale special events.

Under the no action alternative, visitors would continue to enjoy the same level and intensity of use in the project area. However, there would continue to be temporary closures of portions of the project area for

scheduled winter rest periods; noticeable wear on the turf panels, particularly along the edges of the walkways, would persist. These impacts would be readily apparent to many visitors because of slight limitations to access during seasonal closures and the visual impact of the worn turf panels on visitor experience; therefore, there would be long-term moderate adverse effects to visitor use and experience.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

There would be no changes to strategies to protect the integrity of the turf and soil by managing elements of the use of the project area for special events. The special events within the project area would continue to be permitted through the Division of Park Programs at the NCR Headquarters and would be subject to current regulations for site access, staging, risk management, comfort facilities, first aid, security, transportation, and cost recovery for the events in a manner that minimizes impacts to Park resources and the public. Under the no action alternative, there would be no changes to the issuance or conditions of permits for special events, including duration or use and siting of temporary structures, so there would be no effect on visitor use. However, due to the continued degradation and worn appearance of the turf panels as a result of special events, there would be long-term moderate adverse impacts to visitor experience.

CUMULATIVE IMPACTS

Present and future construction on the National Mall and surrounding areas, including the MLK Memorial, Dwight D. Eisenhower Memorial, AVDLM, Potomac Park Levee Project, Jefferson Seawall Rehabilitation, Lincoln Memorial Reflecting Pool Rehabilitation, and NMAAHC would contribute cumulatively to visitor experience by enhancing existing Park resources and adding new visitor destinations. However, additional visitation to the project area would result in more intensive use within the project area.

Roadway enhancements along Constitution Avenue and Madison Drive would introduce uniform street furnishings (such as lighting fixtures and trash receptacles) and visual enhancement to streetscapes around the project area.

The implementation of the National Mall Plan would result in a more sustainable National Mall with improved visitor experiences (education, venues for civic and recreational activities, visitor facilities, improved visual quality); and improved access for pedestrians, people with disabilities, bicycles, and multi-modal transportation; and more sustainable approaches to resource management, stormwater management, Park management/event management, and utilities. Smaller turf areas would be renovated or restored more frequently improving visitor access and more equitably scheduling multiple uses. Additional paved spaces would be created providing more venues that can accommodate repeated use with minimal resources damage.

Construction activity resulting from these projects would result in temporary disruptions to certain areas of the Park which could inconvenience visitors and detract from visitor experience. Depending on the duration and extent of construction, the number of affected visitors would vary.

These past, present, and reasonably foreseeable future actions would enhance the condition and visual quality of existing Park features and create new attractions and destinations for visitors. Despite the increased visitation and more intensive use of the Park resources resulting from these projects, there would be beneficial impacts to visitor use and experience.

As described above, the implementation of the no action alternative would result in long-term minor adverse impacts to visitor use and experience. The long-term minor adverse impacts of this alternative, in combination with the beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term beneficial cumulative effect. Construction activity resulting from these

projects would result in a short-term minor to moderate adverse cumulative effect on visitor use and experience depending on the duration and extent of construction.

CONCLUSION

Under the no action alternative, long-term minor adverse impacts to visitor use and experience would result from annual temporary closures of portions of the project area and the worn appearance of the turf panels caused by intense visitor use. There would be no effect on visitor use resulting from continuance of current turf management policies related to special events. However, there would be long-term moderate adverse impacts to visitor experience as a result of the continued degradation of turf from special events. The long-term minor adverse impacts of this alternative, in combination with the beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term beneficial cumulative effect. There would be a short-term minor to moderate adverse cumulative effect on visitor use and experience resulting from construction activity depending on the duration and extent of construction.

Impacts of Alternative 2: the Action Alternative

The action alternative describes proposed improvements to rehabilitate the turf, alleviate soil compaction, and provide a comprehensive irrigation system in the project area. The action alternative explores different options for new curb and gutter profiles around the turf panels, new soil profiles, and a new irrigation system.

CURB AND GUTTER OPTIONS

Options A1, A2, and A3 present three curb and gutter options that would serve as a separation elements between the walkways and turf.

Option A1: This option would introduce a 90-degree corner to the turf panels and a new “block” profile granite curb and gutter system. The turf panels would be raised by 6 inches. The new corner and curb profile would deter visitors from walking on the turf panels, thereby helping to reestablish and maintain the quality of the lawn. The curb system would also enhance the visual distinction between turf and walkway. Several 6-foot-long ramps would be required around the turf panels at 50 to 100 foot intervals to accommodate accessibility and maintenance access throughout the project area. Option A1 would restrict visitor use of the turf panels relative to current conditions, but ramps would ensure ADA/ABAAS compliance. However, the presence of numerous ramps throughout the project area would have adverse effects on visual resources by compromising views and vistas within the project area. The addition of numerous ramps at each turf panel throughout the Mall would result in noticeable changes to the visual character of the project area to most visitors, resulting in a long-term moderate adverse impact on visitor use and experience.

Option A2 (Preferred): This option would introduce 15-foot-radius corners at each turf panel and a new 18-inch-wide sloped granite curb and gutter. The turf panels would be raised by 2 to 3 inches. Similar to Option A1, the new corner condition and curb profile would enhance the overall appearance of the lawn in the project area and would create a clear visual edge around the turf panels resulting in long-term beneficial impacts to visitor experience. Flush granite curb cuts at regular intervals would ensure compliance with ADA accessibility standards. In contrast to Option A1, the corner radius would reduce the likelihood of visitors cutting the corners across the panels and the 15-foot radius would reduce the tendency of visitors to cut across the corners of the panels and form new social trails, resulting in long-term beneficial impacts to visitor use.

Options A3: This option would introduce 25-foot-radius corners at each turf panel corner and a new “V”-shaped granite curb and gutter. Similar to Options A1 and A2, the new corner condition and curb profile would enhance the overall appearance of the lawn in the project area and create a clear visual edge at the turf panels, resulting in long-term beneficial impacts to visitor experience.

Since this option does not raise the turf panels and maintains relatively flush around the curb system, universal accessibility in the project area would be maintained.

SOIL RECONSTRUCTION PROFILES

All three soil reconstruction profiles (Options B1, B2, and B3) would improve the soils in the project area, alleviating compaction and contributing to the health of the turf. Implementation of any option would result in long-term beneficial impacts on visitor experience because of the enhanced visual quality of the turf panels.

IRRIGATION OPTIONS

The proposed irrigation systems and components (including water distribution Options C1 – C4, water supply Options D1 and D2, and water storage Options E1 and E2) would contribute to healthier, more visually appealing turf panels. All corresponding infrastructure and equipment would either be located underground or would not be visually conspicuous, and all watering activity would occur at night. Due to the overall enhancement of the visual character of the project area, the implementation of any irrigation system would have long-term beneficial impacts to visitor use and experience.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

Strategies to protect the integrity of the turf and soil by managing elements of the use of the project area for special events would allow special events to occur, while providing a mechanism for the NPS to manage the high intensity and duration of multiple events together and ensure that there is adequate recovery time between events for the turf to be restored. Event management modifications may reduce the number of large permitted events and the size and number of structures allowed during these events. Potential new management policies to protect the turf during special events would inherently restrict use of the project area, in terms of timing and duration of special events, and would require applicants to plan accordingly. In addition, due to the ubiquity of open space within the National Mall and in areas immediately adjacent to the project area, there would not be a noticeable effect on visitor use or the ability to use the project area for First Amendment rights. Event management modifications would reduce the number of permits issued for special events in the project area, but these changes would not appreciably limit critical characteristics of the visitor use or experience for most visitors, so resultant impacts would be long-term minor and adverse.

SHORT-TERM IMPACTS

Implementation of any curb, soil, or irrigation option would have the same scope of construction activity and duration. During construction, most visitors would be affected by the closure of approximately half of the turf panels, the noticeable presence of construction equipment, and the disruption of circulation within the project area. As a result, there would be short-term moderate adverse impacts to visitor use and experience.

CUMULATIVE IMPACTS

Impacts to visitor use and experience from past, present, and reasonably foreseeable future actions would be similar to those under the no action alternative. When combined with the long-term beneficial impacts to visitor use and experience resulting from implementation of the action alternative, there would be a long-term beneficial cumulative effect.

Short-term impacts would vary based on the location and duration of construction. The streetscape improvements along Constitution Avenue and Madison Drive would result in the presence of construction equipment and the disruption of access and circulation around the project area. The construction of the Potomac Park Levee and the rehabilitation of the Lincoln Memorial Reflecting Pool and surrounding area could coincide with the reconstruction of the turf and soil in the project area which would adversely affect

visitor use and experience within the Park. Any adverse impacts would be mitigated by the relatively short construction period for the turf and soil reconstruction (approximately 18 months) and extensive NPS notification of Park area closures. When combined with the short-term moderate adverse impacts to visitor use and experience resulting from construction activity of the action alternative, there would be a short-term moderate adverse cumulative effect.

CONCLUSION

Curb Options A2 and A3 would all enhance the overall appearance of the lawn in the project area by creating a clear visual edge between the walkways and turf panels, deterring visitors from walking on the lawn, and protecting the health and visual quality of the grass. Each option would result in long-term beneficial impacts to visitor use and experience. Option A1 would require numerous ramps throughout the project area for accessibility, which would result in a long-term moderate adverse impact on visitor use and experience primarily due to the change in visual character of the Mall.

Implementation of any soil profile would improve the soils in the project area, alleviating compaction and contributing to the health of the turf, resulting in long-term beneficial impacts on visitor experience. The proposed irrigation systems and components also would contribute to healthier, more visually appealing turf panels. Since corresponding infrastructure would not be visible, implementation of any irrigation system would have long-term beneficial impacts to visitor use and experience.

Implementation of any curb, soil, or irrigation option would have the same scope of construction activity and duration. During construction, there would be short-term moderate adverse impacts to visitor use and experience due to the closure of approximately half of the turf panels, the noticeable presence of construction equipment, and the disruption of circulation within the project area.

The overall long-term beneficial impacts of this alternative, in combination with the beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term beneficial cumulative effect. The short-term moderate adverse impacts to visitor use and experience resulting from construction activity of the action alternative, in combination with the short-term moderate adverse effects of other past, present, and reasonably foreseeable future actions, would result in long term beneficial impacts interspersed with short-term moderate adverse cumulative effects during construction periods.

Public Safety

METHODOLOGY AND ASSUMPTIONS

The analysis of public safety considers risks to Park employees and the general public that are associated with hazards in the project area as well as the proposed reconstruction of turf and soils on the National Mall and surrounding area. Impacts for this resource area were analyzed qualitatively, using information provided by the project engineers and Park service staff familiar with the current operations and maintenance within the project area.

STUDY AREA

The proposed actions would be located on the Mall between 3rd and 14th Streets NW and Madison and Jefferson Drives. The study area for the public safety impact analysis includes the project area as well as the surrounding pathways and attractions. Projects and plans in the immediate vicinity of the project area, particularly those that would introduce construction equipment and temporary closures, are considered in the cumulative impact analysis.

IMPACT THRESHOLDS

The impact intensities for the assessment of impacts on public safety follow. Where impacts on public safety become moderate, it is assumed that current visitor satisfaction and safety levels would begin to decline, and some of the Park's long-term visitor goals would not be achieved.

Negligible: The impact on public safety would not be measurable or perceptible.

Minor: The impact on public safety would be measurable or perceptible, but it would be limited to a relatively small number of visitors or employees at localized areas.

Moderate: The impact on public safety would be sufficient to cause a change in accident rates at existing low-accident locations or in areas that currently do not exhibit noticeable accident trends.

Major: The impact on public safety would be substantial. Accident rates in areas usually limited to low-accident potential are expected to substantially increase in the short term and long term.

Duration: Short-term impacts are those lasting less than one year; long-term impacts are those lasting longer than one year.

Impacts of Alternative 1: the No Action Alternative

The no action alternative represents a continuation of the existing management, operations, and maintenance of the National Mall turf panels and surrounding walkways.

TURF AND SOIL MAINTENANCE

Under the no action alternative, there would be no changes to the turf panels or soil and there would be no impacts to public safety relative to current conditions. The existing lack of separation between the turf and walkways in some areas, combined with the ineffective, uneven steel edging in other areas, represents a minor adverse long-term impact to public safety due to the irregular walking surface, migration of gravel into the turf panels, and tripping hazard.. The project area would continue to be mostly accessible, with no barriers between the turf panels and walkways except in the areas where the existing steel edging has been exposed and height exceeds accessibility standards. However, accessibility during snow periods would be limited because snow removal is not possible due to the gravel surfacing, resulting in long-term minor adverse impacts during these periods.

The continued use of the current irrigation and water distribution system would continue to have no effect on public safety.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

Under the no action alternative, current policies related to intensity and duration of use of the turf panels would continue and staff and visitors would be subject to the current regulations for site access, staging, risk management, comfort facilities, first aid, security, transportation, and cost recovery. There would be no effect on public safety relative to current conditions.

CUMULATIVE IMPACTS

Construction activity resulting from present and future construction (including the MLK Memorial, Dwight D. Eisenhower Memorial, AVDLM, Potomac Park Levee Project, Jefferson Seawall Rehabilitation, Lincoln Memorial Reflecting Pool Rehabilitation, NMAAHC, and roadway projects) would result in temporary disruptions to certain areas of the Park with potential for injury and risk to Park staff and the public. However, construction contractors would follow approved NPS health and safety plans, so risks to Park staff and members of the public would be minimized. Following construction, the operations and maintenance of these projects would not pose any risk to public safety.

Perimeter security projects would enhance public safety at attractions on the National Mall that are adjacent to the project area.

The implementation of the National Mall Plan would enhance pedestrian movement, lighting, and accessibility across the National Mall, minimizing risks to public safety.

These past, present, and reasonably foreseeable future actions would enhance pedestrian movement, lighting, and accessibility and would result in beneficial impacts to public safety.

As described above, the implementation of the no action alternative would result in long-term negligible adverse impacts to public safety. The long-term negligible adverse impacts of this alternative, when combined with the beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in long-term negligible adverse cumulative impacts to public safety.

CONCLUSION

Under the no action alternative, there would be long-term minor adverse impacts to public safety due to the current lack of separation between the turf and walkways and migration of gravel into the turf panels that creates an irregular walking surface. There would also be long-term minor adverse impacts to public safety because of diminished accessibility during snow periods caused by the impossibility of snow removal. The long-term minor adverse impacts of this alternative, when combined with the beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in long-term negligible adverse cumulative impacts to public safety.

Impacts of Alternative 2: the Action Alternative

The action alternative proposes several improvements to rehabilitate the turf, alleviate soil compaction, and provide a comprehensive irrigation system for the turf panels in the project area.

CURB AND GUTTER OPTIONS

Options A1, A2, and A3 present different edge conditions around the turf panels and vary in their respective overall effect to public safety within the project area.

Options A1: Option A1 would introduce a raised profile curb and gutter system and would elevate the turf panels by several inches. Option A1 would reduce accessibility into the turf

panels, but regularly spaced ramps would ensure compliance with ADA/ABAAS. The raised curbs would present a potential tripping hazard to visitors in the project area. The change to public safety would be noticeable and sufficient to cause a change in accident rates as the single step curb would be added to areas with daily recreational use (such as toddlers in day care groups and pick up games of softball, kickball, Frisbee and soccer). As a result, long-term adverse impacts would be moderate.

Option A2 (preferred) and A3: Options A2 and A3 would introduce a new curb and gutter system that would be universally accessible around the entire perimeter of the turf panels with a small beveled grade change. As a result these options would have negligible to minor impacts on public safety.

SOIL RECONSTRUCTION PROFILES

Option B1 (Preferred), B2, and B3 would have no effect on public safety following construction because none of the options would result in any above-ground modifications.

IRRIGATION OPTIONS

The irrigation system components would be installed primarily underground, so there would be no effect on public safety resulting from implementation of any water source (Option D1 or D2) or water storage option (E1 or E2).

The water distribution system options (C1 – C4) vary in the number and type of sprinkler or quick-coupler valves required. In all options, the sprinklers and valves would be recessed and activated mainly at night during the watering of the turf panels. While the project area is open to the public 24 hours a day, and the sprinklers and valves could potentially pose a tripping hazard, it is unlikely that their presence would result in a measurable risk to public safety because relatively few people occupy the turf panels at night, and even fewer would be present while they are being watered. Impacts resulting from the implementation of options C1 and C3 and option C4 (preferred) would be comparable with negligible effects to public safety. Option C2 poses an additional risk to the public and Park staff because the system utilizes high-pressure sprinklers which could cause injury to people who come in contact with the water streams. Therefore, implementation of option C2 would result in long-term minor adverse impacts to public safety.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

The proposed modifications to turf management related to special events would have no effect on public safety because the operational policies would ensure that the condition of permits allow for the NPS to impose “reasonable restrictions on the use of temporary structures in the interest of protecting Park areas, traffic, and public safety” (NPS 2010c). In addition, NPS NCR requirements for special events would have a provision for on-site supervision and security to enhance public safety utilizing NPS and U.S. Park Police staff, as needed (NPS 2010c).

SHORT-TERM IMPACTS

Implementation of the action alternative would result in short-term moderate adverse impacts to public safety during the construction period. However, construction workers and employees would follow an approved health and safety plan which would incorporate all applicable regulations. Barriers and signs would be used around the construction sites to divert the public from potentially dangerous situations. In addition, public announcements would be made on the Park website and in the media to alert the public to the construction schedule and locations. Therefore, short-term impacts would be mitigated to minor adverse.

CUMULATIVE IMPACTS

Impacts to public safety resulting from past, present, and reasonably foreseeable future actions would be similar to those under the no action alternative and would have beneficial impacts. When combined with the negligible impacts resulting from the implementation of curb Options A2 or A3, water distribution Options C1, C3, and C4, and any soil profile, water source, or water supply options, there would be a long-term beneficial cumulative impact to public safety.

When combined with the long-term minor adverse impacts resulting from the implementation of curb Option A1 or water distribution Option C2, there would be a long-term minor adverse cumulative impact to public safety.

Construction activity resulting from present and future construction would result in temporary disruptions to certain areas of the Park, but risks to Park staff and members of the public would be negligible. When combined with the short-term negligible impacts to public health and safety resulting from construction activity of the action alternative, there would be a short-term negligible cumulative effect.

CONCLUSION

Under the action alternative, there would be long-term minor adverse impacts on public safety resulting from the implementation of the raised curb and gutter profile in Option A1. However, implementation of Option A2 or A3 or any of the soil profile or irrigation options would result in negligible impacts to public safety. Since soil profile options and irrigation system components are located mainly underground, implementation of any soil profile option (Options B1 – B3), water source (Option D1 or D2) or water storage option (E1 or E2) would have no effect on public safety. Impacts resulting from the implementation of Options C1, C3, and C4 would also have no effect on public safety, but Option C2 would utilize high-pressure sprinklers which would result in long-term minor adverse impacts to public safety.

Implementation of any of the soil reconstruction options (B1, B2, or B3), water source options (D1 or D2), and water storage options (E1 or E2) would have no effect on public safety because none of these proposed actions would have any above-ground components that would pose a threat to public safety. Curb Options A2 or A3, water distribution Options C1, C3, and C4, would result in long-term negligible adverse impacts to public safety. Implementation of curb Option A1 would result in a long-term minor adverse impact to public safety due to the raised curbs, which would present a potential tripping hazard to visitors in the project area. Implementation of Option C2 would result in a long-term minor adverse impact to public safety due to the high pressure of the components that could injure staff or visitors. Short-term impacts during construction of any of the proposed actions would be mitigated to minor adverse.

Cumulative impacts resulting from past, present, and reasonably foreseeable future actions analyzed under the no action alternative would have beneficial impacts. When combined with the negligible impacts resulting from the implementation of curb Options A2 or A3, water distribution Options C1, C3, and C4, and any soil profile, water source, or water supply options, there would be a long-term beneficial cumulative impact to public safety. When combined with the long-term minor to moderate adverse impacts resulting from the implementation of curb Option A1 or water distribution Option C2, there would be a long-term minor adverse cumulative impact to public safety. There would be a short-term negligible cumulative effect on public health and safety resulting from construction activity.

Park Management and Operations

METHODOLOGY AND ASSUMPTIONS

Park management and operations, for the purpose of this analysis, refers to the quality and effectiveness of the Park staff to maintain and administer Park resources and facilities and to provide for an effective visitor experience. This includes an analysis of the condition and maintenance of the facilities and concessioners used to support the operations of the Park. Facilities included in this project include the Park itself and the sites within the study area. Park staff who are knowledgeable of these issues were members of the planning team that evaluated the impacts of each alternative. The impact analysis is based on the current description of Park operations presented in “Chapter 3: Affected Environment” of this document.

STUDY AREA

The proposed actions would be located on the Mall between 3rd and 14th Streets NW and Madison and Jefferson Drives. The study area for the Park operations and maintenance impact analysis includes the larger area of the National Mall and other lands managed by the National Mall and Memorial Parks. Park management and operations encompasses staffing, facilities, and budget.

IMPACT THRESHOLDS

Impact thresholds are as follows.

Negligible: Park operations would not be impacted or the impact would not have a noticeable or appreciable impact on Park operations.

Minor: Impacts would be noticeable, but would be of a magnitude that would not result in an appreciable or measurable change to Park operations.

Moderate: Impacts would be readily apparent and would result in a substantial change in Park operations that would be noticeable to staff and the public. Mitigation could be required and may be effective.

Major: Impacts would be readily apparent and would result in a substantial change in Park operations that would be noticeable to staff and the public and would require the Park to readdress its ability to sustain current Park operations.

Duration: Short-term impacts are those lasting less than one year; long-term impacts are those lasting longer than one year.

Impacts of Alternative 1: the No Action Alternative

The no action alternative represents a continuation of the existing management, operations, and maintenance of the National Mall turf panels and surrounding walkways.

TURF AND SOIL MAINTENANCE

Under the no action alternative, the turf panels would continue to be maintained seasonally according to the current schedule for aeration, fertilization, and reseeding. The Park would continue to alternate maintenance of the turf panels by closing the project area in two sections (to the east and west of 7th Street NW) every other year from mid-September to the end of March to allow the turf to rest. During this rest period, NPS would continue to conduct winter maintenance including soil aeration, grading, soil replacement, fertilization, reseeding, and irrigation. Maintenance during peak use periods (April – October), including weekly mowing and edging, would continue. The current irrigation system would

continue to serve the project area, although the deficiencies would persist and the system would continue to function at a low and ineffectual, inadequate level. Potable water would continue to be the primary water source.

Frequent and intensive maintenance of the turf panels would continue to create a noticeable and substantial strain on Park staff and operating costs to mitigate against the effects of intense visitor use, resulting in long-term moderate adverse impacts to Park management and operations.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

Under the no action alternative, turf management related to special events would continue as is. Special events would continue to be permitted through the Division of Park Programs at the NCR Headquarters and would be subject to the current regulations for site access, staging, risk management, comfort facilities, first aid, security, transportation, and cost recovery. There would continue to be no long-term management plan for regulating the timing and corresponding rest periods between events. Current use practices for special events would continue to create a noticeable strain on Park staff and operating costs to repair irrigation system components¹ and to mitigate against the effects of the large number of visitors, delivery trucks, and staging equipment on the turf in the project area.

The no action alternative would result in long-term moderate adverse impacts to Park management and operations.

Policies and rules concerning special events and the use and placement of equipment and structures would likely continue to be inconsistently enforced, exacerbating the stress on the project area, and requiring more attention by staff. Although permit holders frequently use tent stakes greater than 18 inches, they are often required to install tree protection fencing to protect the tree root zone area; however, this permit requirement is not uniformly enforced.

CUMULATIVE IMPACTS

Implementation of the National Mall Plan and new projects (including the MLK Memorial, Dwight D. Eisenhower Memorial, AVDLM, Potomac Park Levee Project, Jefferson Seawall Rehabilitation, Lincoln Memorial Reflecting Pool Rehabilitation, and NMAAHC) would result in increases in Park staff and operating costs to support new structures and facilities, but the impacts would be offset by the implementation of energy-efficient components and sustainable systems.

Constitution Avenue and Madison Drive street improvements would enhance roadway conditions and introduce energy efficient features, which would reduce Park maintenance and operating costs.

Construction activity resulting from these projects would result in a short-term increase in responsibilities for NPS staff for supervision and oversight of contractors and construction crews.

These past, present, and reasonably foreseeable future projects would result in short-term increases in Park staff responsibilities and operating costs. However, in the long term, the Park systems and facilities would be improved with greater efficiency, sustainability, and reliability.

As described above, continuation of the no action alternative would result in long-term moderate adverse impacts to Park management and operations. When combined with the long-term beneficial impacts of other past, present, and reasonably foreseeable future actions, the no action alternative would result in a long-term minor adverse cumulative effect. Construction activity resulting from these actions would result in a short-term minor adverse cumulative effect on Park management and operations.

¹ While event management guidelines stipulate that stakes are only permitted to a depth of 18 inches, stakes up to 48 inches are used regularly and have damaged underground irrigation system pipes.

CONCLUSION

The no action alternative represents the continuation of current maintenance efforts and operations for the project area. Frequent and intensive maintenance of the turf panels and soil conditions would continue to create a noticeable and substantial strain on Park staff and operating costs to mitigate against the effects of intense visitor use, resulting in long-term moderate adverse impacts to Park management and operations.

Current use practices for special events would continue to create a noticeable strain on Park staff and operating costs to mitigate against the effects of the large number of visitors, delivery trucks, and staging equipment on the turf in the project area. The no action alternative would result in long-term moderate adverse impacts to Park management and operations.

The long-term moderate adverse impacts resulting from the no action alternative, when combined with the long-term beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term minor adverse cumulative effect. Construction activity resulting from these actions would result in a short-term minor adverse cumulative effect on Park management and operations.

Impacts of Alternative 2: the Action Alternative

The action alternative describes proposed improvements to rehabilitate the turf, alleviate soil compaction, and provide a comprehensive irrigation system in the project area. The action alternative explores different options for new curb and gutter profiles around the turf panels, new soil profiles, a new irrigation system, and special events management modifications.

Under the action alternative, the turf panels would continue to be maintained seasonally according to the current schedule for aeration, fertilization, and reseeding. Peak use period maintenance (April – October) would continue including cutting the grass to a 3-inch height every five to seven days. However, under the action alternative, additional grounds keeping would be required to maintain the edges of the turf panels and the integrity of the curb and gutter systems.

CURB AND GUTTER OPTIONS

Options A1, A2, and A3 present three curb and gutter options, each serving as a separation element between the walkways and turf to mitigate against soil compaction and worn turf. All three options would require additional staff to maintain the edges of the turf panels and the integrity of the curb and gutter system. Options A1, A2, and A3 have minor differences relative to each other.

Option A1: This curb option would prevent the liberal migration of gravel into the turf panels and would reestablish and maintain the quality of the lawn. However, this option would require numerous ramps to be installed around the turf panels for accessibility which would have a noticeable effect on Park maintenance, but not of a magnitude that would not result in an appreciable or measurable change to Park operations. Implementation of this option would result in a long-term minor adverse impact to Park management and operations.

Option A2 (preferred): Similar to Option A1, this curb option would reduce the migration of gravel into the turf panels, but a significant amount of staff time to maintain the gravel walkways would still be required. This option would also reestablish and maintain the quality of the lawn, reduce the overall amount of turf, and soften the corners to reduce the formation of social trails.

Options A3: As with Option A2, this option would also reduce the overall amount of turf and would soften the corners to reduce the formation of social trails. However, this curb option would be the least effective of the three options in preventing gravel migration from the adjacent pathways.

All three options would require additional staff to maintain the edges of the turf panels and the integrity of the curb and gutter system, with Option A2 offering a slight advantage to Park management and operations. The adverse impacts resulting from the implementation of any curb option would not create an appreciable or measurable change to Park operations and would be long-term minor and adverse.

SOIL RECONSTRUCTION PROFILES

Implementation of any of the soil profile reconstruction options (B1, B2, and B3) would result in increased costs, but each varies relative to maintenance responsibilities. Option B1 (preferred) and B2 would require the same operating costs and level of maintenance following construction. Impacts would not create an appreciable or measurable change to Park operations and would be long-term adverse and minor. Option B3 would require the most intensive level of maintenance because the soil profile is comparable to what is used at golf courses and professional athletic fields. The resultant effect on the Park would be noticeable and would create an appreciable and measurable change to Park operations, yielding a long-term moderate adverse effect on Park management and operations.

IRRIGATION SYSTEM OPTIONS

Each option would require the installation and operation of one or two pump stations (either a single pump station in the center of the project area or two pump stations, one at each end of the project area), which would result in long-term minor adverse impacts due to the associated maintenance, inspection, and repair required for the equipment.

WATER DISTRIBUTION

All four water distribution options (C1 – C4) would vary slightly in their effects.

Option C1: Option C1 would utilize a manual irrigation system with a single row of quick couplers installed down the center of the turf panels. This option would provide maintenance staff more flexibility and efficiency in controlling where they water. This distribution system would require the least amount of piping and lowest amount of long-term maintenance and repair. However, Option C1 is a manual system and would have the largest Park maintenance requirement.

Option C2: This option would utilize an automatic high-pressure sprinkler system installed at the edges of the turf panels. Option C2 would not require staff for manual application and the automatic system would allow for more efficient watering and coverage of the turf panels. The valves would require inspection to maintain their operability.

Option C3: This option would combine a manual and automatic irrigation system that would include automatic sprinklers down the edges of the turf panels and a manual arrangement of quick couplers down the center. This option would combine the benefits and costs of both Options C1 and C2. However, this option would require the greatest amount of piping and higher costs for maintenance and repairs.

Option C4 (preferred): This option would utilize an automatic sprinkler system installed in three rows along the turf panels. This option would not require staff for manual application and the automatic system would allow for more efficient watering and coverage of the turf panels. The valves would require inspection to maintain their operability.

Each option varies in its impact to Park staff and maintenance. However, none of the water distribution options would result in an appreciable or measurable change to Park maintenance or operations so the resultant effect of implementing Options C1 – C4 would be long-term minor and adverse.

WATER SUPPLY

Options D1 and D2 provide alternative water supply options to potable city water, which would create a long-term beneficial impact to Park management and operations. Both options would provide further beneficial impacts by removing water from the stormwater system during times of excess runoff. However, to channel stormwater drainage into the project area from adjacent properties, the NPS would need to negotiate administrative agreements with other property owners, creating short-term adverse impacts to Park management.

WATER STORAGE

The addition of an on-site water storage system would result in increased costs and maintenance responsibilities. However, all water storage options would result in increased irrigation system efficiency and would reduce the reliance on potable city water. Any adverse impacts to Park maintenance and operations would be offset by long-term beneficial impacts resulting from increased system efficiency. Both concrete box culverts (Option E1) and concrete cisterns (Option E2, preferred) would provide flexibility for maintenance and expansion in the future. The cisterns are generally located under walks, but collection and distribution system lines would need to be identified as no-stake areas.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

Turf management modifications related to special events, including the reduction of large permitted events and the size and number of structures allowed during these events, as well as a carefully considered range of recovery times for the turf between events, would result in long-term beneficial impacts to Park management and operations. A reduction of large permitted events would reduce the costs and administrative effort involved in permitting and would reduce the intensity of Park maintenance required following special events for the restoration of the project area.

SHORT-TERM IMPACTS

Implementation of any curb, soil, or irrigation option would have the same scope of construction activity and duration and the same noticeable, but slight short-term minor adverse effects to Park management and operations due to disruption of the Park and requirements for construction activity coordination and supervision.

CUMULATIVE IMPACTS

Impacts to Park management and operations from past, present, and reasonably foreseeable future actions would be similar to those under the no action alternative and would be beneficial in the long-term but would have short-term minor adverse impacts to Park management and operations. When combined with the long-term minor adverse impacts of implementing any curb option (A1 – A3), soil profile Option B1 or B2, any water distribution option (C1 – C4), and the long-term beneficial impacts of implementing any water supply or water storage option (D1 or D2, E1 or E2), there would be a long-term minor adverse cumulative effect on Park management and operations.

The beneficial impacts of past, present, and reasonably foreseeable future actions, when combined with the implementation of soil Option B3 and any of the other options, would result in a long-term moderate adverse cumulative effect on Park management and operations.

Construction activity resulting from these actions would result in a short-term minor adverse cumulative effect on Park management and operations.

CONCLUSION

The action alternative would introduce new curbs, soil profiles, and a new irrigation system resulting in increases in Park maintenance responsibilities and operating costs to maintain the new components. However, increases in Park maintenance responsibilities and operating costs would be offset by the

reliance on captured water instead of potable water for site irrigation. Implementation of any water supply or water storage option (D1 or D2, E1 or E2) would have beneficial impacts on Park management and operations. Implementation of any curb option (A1 – A3), soil profile Option B1 or B2, or any water distribution option (C1 – C4) would have a long-term minor adverse impact. Implementation of Option B3 would have a long-term moderate adverse impact. Modifications to turf management related to special events would result in long-term beneficial impacts to Park management and operations because new policies would reduce the costs and administrative effort involved in permitting and would reduce the intensity of Park maintenance required following special events for the restoration of the project area.

Implementation of any curb, soil, or irrigation option would have the same scope of construction activity and duration and the same noticeable, but slight short-term minor adverse effects to Park management and operations.

The long-term adverse impacts ranging from minor to moderate resulting from implementation of the action alternative, when combined with the long-term beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term minor adverse cumulative effect. Construction activity resulting from these actions would result in a short-term minor adverse cumulative effect on Park management and operations.

Utilities and Infrastructure

METHODOLOGY AND ASSUMPTIONS

STUDY AREA

The proposed actions would be located on the Mall between 3rd and 14th Streets NW and Madison and Jefferson Drives. The study area for the utilities and infrastructure impact analysis includes the larger utility network that services the project area as well as the B Street and New Jersey Avenue drainage area for the combined sewer system, which is the receiving area for the turf panel stormwater runoff. Projects in the immediate vicinity of the turf panels, particularly those that lie within this drainage area, are considered in the cumulative impact analysis.

IMPACT THRESHOLDS

Impact thresholds are as follows.

Negligible: There would be no noticeable temporary or permanent disruption to utilities and the serviced community.

Minor: The impact on the utility lines and the serviced community would not be substantial; utility lines would be relocated or there would be increased loads on the utility (such as increased stormwater runoff or demand of utility service), but there would be no noticeable disruption to the serviced community during construction.

Moderate: The impact on the utility lines and the serviced community would be substantial; utility lines would be relocated, or there would be noticeable increased loads on the utility and there would be a noticeable disruption to the serviced community during construction. However, following the construction phase, service to the community would be restored to its former state.

Major: The impact on the utility lines and the serviced community would be substantial, resulting in permanent changes and diminished service experienced by the system and the community, and markedly noticeable increased loads on the utility.

Duration: Short-term impacts are those lasting less than one year; long-term impacts are those lasting longer than one year.

Impacts of Alternative 1: the No Action Alternative

The no action alternative represents a continuation of the existing utilities within the National Mall turf panels and surrounding areas.

Under the no action alternative, all utilities within the project area would continue to function at adequate levels except for the irrigation system. The irrigation system would continue to provide relatively ineffectual water service to the turf panels due to the poor condition of the existing subsurface water supply lines which cannot support adequate pressurization and which have been damaged by the weight of vehicles and by special events tent stakes. The city potable water supply would continue to be used as the primary water supply for the irrigation system.

In addition, due to compacted soils, the project area would continue to function as an impervious surface and would continue to drain stormwater to the combined sewer system in amounts similar to what would run off the site if it were completely paved, contributing to the potential for overflow events. However, the volume of water the surface of the project area contributes to the combined sewer overflow during storm events would be relatively small when compared to the context of impervious surface in the entire District of Columbia. Therefore, the effects of the current conveyance of stormwater drainage to the combined sewer system would continue to have a long-term minor adverse impact.

Due to the compromised state of the irrigation system, there would continue to be substantial disruptions to the condition and capacity of the components which prevent the system from effectively watering the turf panels, resulting in long-term moderate adverse impact to the irrigation system.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

Under the no action alternative, there would be no modifications to turf management related to special events. There would be a similar number of large permitted events and continuation of the size and number of structures allowed during these events, along with the continued unauthorized use of long stakes that can and often do damage the irrigation system, and there would be no change in recovery time for the turf or soil, so the soil would remain compact and essentially impervious. Continuation of these practices would result in continued long term, minor adverse impacts to the irrigation system, since although the effects on a functioning system would be noticeable, further damage to an already damaged system and difficult to repair system would not be noticeable. The impacts on the stormwater utility from the continued compaction related to no change in recovery are discussed in the previous paragraph. There would be no impacts to other utilities.

CUMULATIVE IMPACTS

Present and future construction on the National Mall and surrounding areas would introduce new facilities and systems that would contribute cumulatively to utilities and infrastructure by creating additional demand on the power, water, and sewer systems. However, none of the projects would introduce a demand that would diminish the overall system capacity or service.

New construction and the addition of new paved surfaces would contribute cumulatively by adding additional volume to the stormwater management system, although if new construction activities utilize LEED techniques (i.e., green roofs) and if stormwater is harvested for reuse, there could be compounded long-term beneficial impacts on both the stormwater and combined sewer systems by reducing the amount of stormwater delivered to the combined sewer system.

These past, present, and reasonably foreseeable future actions would have no effect on water and power systems and a minor adverse effect on stormwater and the combined sewer system.

As described above, the no action alternative would result in long-term minor adverse impacts to all utilities and infrastructure in the project area except the irrigation system, which would result in a long-term moderate adverse impact. The long-term minor to moderate adverse impacts of this alternative, in combination with the beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term beneficial cumulative effect. Construction activity resulting from these projects would result in a short-term minor to moderate adverse cumulative effect on utilities and infrastructure depending on the duration and extent of construction and level of disruption to utility service.

CONCLUSION

Under the no action alternative, due to the compromised state of the irrigation system, there would continue to be substantial disruptions in irrigation service to the turf panels resulting in long-term moderate adverse impacts. The current conveyance of stormwater drainage to the combined sewer system would continue to contribute adversely to the stormwater management infrastructure system, resulting in long-term minor adverse effects. New construction projects within the project area and surrounding area would introduce new facilities and systems that have a cumulative negligible long-term adverse effect on most utilities and infrastructure in the project area. The long-term minor to moderate adverse impacts of the no action alternative, in combination with the beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term beneficial cumulative effect. Construction activity resulting from these projects would result in a short-term minor to moderate adverse cumulative effect.

Impacts of Alternative 2: the Action Alternative

The action alternative proposes multiple options for a new system that would reduce overall wear on the turf and increase permeability of the soil, with a comprehensive drainage system to harvest stormwater for reuse onsite. Due to increased soil permeability and groundwater capture, implementation of the action alternative would result in a reduction of stormwater runoff to the combined sewer system.

Implementation of the action alternative would have no effect on the power or telecommunication infrastructure in and around the project area.

CURB AND GUTTER OPTIONS

Options A1, A2 (preferred), and A3 would capture stormwater runoff for reuse in irrigation of the turf panels and result in similar long-term beneficial impacts.

SOIL RECONSTRUCTION PROFILES

Implementation of any soil profile option (B1, B2, or B3) would introduce enhancements to the soils in the project area to alleviate and reverse the effects of compaction. Reconstruction of the soil profiles would result in more pervious turf panels, would increase stormwater filtration into the soil, and would reduce stormwater runoff from the turf panels. All options would result in a long-term beneficial effect on the city's stormwater/combined sewer system.

Although any of the proposed soil profile options would percolate water more quickly and would have increased storage capacity, any water collected into cisterns would have a second opportunity to be "filtered" by plants.

There are minor differences in the soil profile options resulting from the depth and spacing of the drainage and irrigation pipes, with Option B1 having drainage and irrigation lines spaced at 5-foot intervals and 2.5 feet deep; B2 having drainage and irrigation lines at a 4-foot depth, but spaced at 10-foot intervals; and Option B3 having very shallow drainage lines that could easily be damaged by tent stakes, even if they are widely spaced. Although only tent stakes less than 18 inches long are allowed, often tent stakes up to 48 inches are used resulting in the possibility for the drainage system to be compromised if the system were punctured by these stakes. Event management policies would regulate usage of the site, site structures, and equipment, however, so effects to the irrigation system would be negligible.

IRRIGATION SYSTEM OPTIONS

The implementation of any irrigation system would result in long-term beneficial impacts to the city water supply system since the new system would not rely on the municipal system for primary service, and would help address NPS requirement to reduce the use of potable water. In addition, the recapture of stormwater and infiltration water in drain pipes below the turf would reduce/prevent water from being directed to DC Water's Blue Plains Water Treatment Plant and reduce the contribution of stormwater to the combined sewer system. All options would result in a long-term beneficial effect on the city's stormwater/combined sewer system and would be sympathetic with the long-term control plan for reducing overflows of the combined sewer system. These options would help meet the criteria for the NPS sustainable sites initiative and LEED criteria, which is also a goal for the NPS. Each option would require the installation and operation of one or two new subsurface pump houses, but the equipment would create a negligible demand on the power supply. There are subtle differences between water distribution options (manual versus automatic) that affect the efficiency of the water usage, but differences between options are negligible and would not affect the larger municipal system.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

Modifications to turf management related to special events, which includes the reduction of the number of large permitted events and the size and number of structures allowed during these events, would greatly

reduce the likelihood that existing or new irrigation and drain lines would be damaged. These modifications would also help prevent soil compaction and maintain soil permeability, which is a critical element of managing stormwater quantity and implementing an effective irrigation system and which would result in a slight but long-term beneficial impact to the irrigation system and to the District of Columbia's stormwater and combined sewer systems. There would be no impacts to other utilities.

SHORT-TERM IMPACTS

There would be short-term adverse impacts to utilities during construction due to potential temporary disruption of service. However, ground-disturbing activity would be conducted in accordance with construction sequencing plans to be approved by the NPS to reduce impacts to utilities. Short-term impacts would be minor.

CUMULATIVE IMPACTS

Cumulative impacts projects are the same as described for the no action alternative with new construction projects having negligible effect on the capacity and service of utilities and infrastructure in the project area and a long-term minor adverse impacts on the both the stormwater and combined sewer systems. When combined with the long-term beneficial impacts to utilities and infrastructure resulting from implementation of the action alternative if new construction activities utilize LEED techniques and if stormwater from these projects is harvested for reuse, there would be a long-term beneficial cumulative effect. Construction activity resulting from past, present, and reasonably foreseeable actions would result in a short-term minor to moderate adverse cumulative effect.

CONCLUSION

Implementation of the action alternative would introduce new curbs and gutters, a reconstructed soil profile, and an irrigation system that would enhance the turf and soils in the project area to alleviate and reverse the effects of compaction and reduce stormwater runoff. All options would result in a long-term beneficial impact on the city's stormwater/combined sewer system and would be sympathetic with the long-term control plan for reducing overflows of the combined sewer system.

The implementation of any irrigation system would result in long-term beneficial impacts to the city water supply system since the new system would not rely on the municipal system for primary service. There are subtle differences between water distribution options (manual versus automatic) that affect the efficiency of water usage, but differences between options are negligible and would not affect the larger municipal system. Modification to turf management related to special events would greatly reduce the likelihood that existing or new irrigation and drain lines would be damaged and would result in a slight, but long-term beneficial impact to the irrigation system and to the city's stormwater and combined sewer system.

There would be short-term adverse impacts to utilities during construction due to potential temporary disruption of service. However, ground-disturbing activity would be conducted in accordance with construction sequencing plans to be approved by the NPS to reduce impacts to utilities. Short-term impacts would be minor.

When combined with the long-term beneficial impacts to utilities and infrastructure resulting from implementation of the action alternative if new construction activities utilize LEED techniques and if stormwater from these projects is harvested for reuse, there would be a long-term beneficial cumulative effect. Construction activity resulting from past, present, and reasonably foreseeable actions would result in a short-term minor to moderate adverse cumulative effect.

Soils

METHODOLOGY AND ASSUMPTIONS

For soil resources, potential impacts were assessed based on limitations associated with the soils and the extent of possible disturbance. Impact analysis and the conclusions for possible impacts to the resources were based on a geotechnical analysis of the project area, review of existing literature and soil and topography maps, and information provided by the NPS and other agencies. This section assesses the potential effects of the turf and soil reconstruction in the project area.

STUDY AREA

The proposed actions would be located on the Mall between 3rd and 14th Streets NW and Madison and Jefferson Drives and represents the area of analysis. Cumulative projects for this topic include those projects immediately adjacent to the Mall.

IMPACT THRESHOLDS

The following thresholds were used to determine the magnitude of impacts on soil resources:

Negligible: Impacts on soils would be slight and largely unnoticeable compared to healthy native soils typical of the soil type and profile. Any effects on productivity, compaction, infiltration, subsidence, or erosion potential would not be measurable.

Minor: Impacts on soils would be noticeable compared to healthy native soils typical for the soil type and profile. Any effects on productivity, compaction, infiltration, subsidence, or erosion potential would be measurable but localized to a small area.

Moderate: Impacts on soils would be readily apparent compared to healthy native soils typical for the soil type and profile. Any effects on productivity, compaction, infiltration, subsidence, or erosion potential would be measurable and would cover several acres.

Major: Impacts on soils would substantially alter healthy native soils typical for the soil type and profile. Any effects on productivity, compaction, infiltration, subsidence, or erosion potential would be measurable and would affect a relatively large area (more than 5 acres).

Duration: Short-term impact to soils would occur during the construction activities. Long-term impacts to soils would extend after completion of the project.

Impacts of Alternative 1: the No Action Alternative

The no action alternative represents a continuation of the existing operations and maintenance of the turf panels on the National Mall.

As a result of the no action alternative, intense visitor use on the National Mall, including recreational activities, special events, demonstrations, and general visitor use, would continue to degrade the turf and compact the soil on the turf panels in the project area. The ineffective steel edging and lack of curbs and gutters would allow existing social trails to continue to be used by visitors. Soil under these social trails is compacted and exposed to erosion from stormwater and result in long-term moderate adverse impacts.

Soil permeability and runoff would continue to be varied, but generally poor within the project area, due to both compaction and generally poor quality of the nonnative soil throughout the area. Soil drainage would continue to occur at a low rate throughout the project area, resulting in flooding of portions of the turf panels during rain events, and areas that would remain extremely dry during droughts. There would be long-term minor to moderate adverse impacts to soils resulting from the variable soil permeability and runoff and from poor soil drainage in the project area. Lack of permeability in the soil would continue to

make it difficult to attain desired turf conditions. Winter maintenance would continue, including soil aeration, grading, soil replacement, and irrigation. However, the beneficial impacts resulting from winter maintenance would continue only until the start of peak visitor season. Continuing to rely on the poorly functioning irrigation systems would also result in long-term minor to moderate adverse effects, since the soil would not receive adequate moisture and would be further prone to compaction.

Continuation of the no action alternative would result in the further degradation of soils and compaction in the project area of measurable consequence; there would be long-term moderate adverse impacts resulting from intense visitor use in the project area.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

Turf management strategies related to special events, during which tents and structures are constructed on the turf panels, would continue to occur with long durations and high visitation causing severe soil compaction. Special events permitting would continue to allow the use of tents and other structures that cause physical wear and abrasion of the turf and soil and soil compaction, often resulting in areas of bare earth, minimal turf coverage, and impermeable soil.

CUMULATIVE IMPACTS

Past, present, and reasonably foreseeable future actions, such as construction of the NMAAHC, would remove soil from the project areas and could increase the number of visitors using the turf panels. However, the soil removal does not impact the turf panel soil resources, and the number of additional visitors congregating on the turf panels would not be noticeable. Impact to soil resources from cumulative projects would be long-term negligible to minor and adverse due to the permanent removal of soils to allow for construction.

The implementation of the National Mall Plan would provide in increased paved space for special events to occur resulting in long-term beneficial impacts to soils because heavy equipment and structures from these events would more likely be placed on pavement, which can accommodate repeat use without resource damage.

As described above, the implementation of the no action alternative would result in long-term moderate adverse impacts to soils. The long-term moderate adverse impacts of this alternative, in combination with the long-term negligible to minor adverse and beneficial impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term moderate adverse cumulative effect.

CONCLUSION

Implementation of the no action alternative would result in long-term moderate adverse impacts to soil resources due to continued compaction and erosion of soils from intense visitor use, causing further erosion and exposure.

The long-term moderate adverse impacts of this alternative, in combination with the long-term negligible adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term moderate adverse cumulative effect.

Impacts of Alternative 2: the Action Alternative

The action alternative describes proposed improvements to rehabilitate the turf, alleviate soil compaction, and provide a comprehensive irrigation system for the turf panels in the project area. Options within the action alternative explore different edge conditions (curb and gutters) at the turf panels, soil profiles, and irrigation systems.

Although the project involves disturbance to soil resources and either removal or amendments to soil resources and some fine grading of topography, the final outcome of the project would result in long-term beneficial impacts to soils since compaction would be reduced, social trails that exacerbate erosion and compaction would be minimized or eliminated, and the soil under the turf panels would be better able to resist compaction forces resulting from high amounts of visitor use and large public events and attendant processes.

CURB AND GUTTER OPTIONS

All three curb and gutter options would result in some degree of overall long-term beneficial impacts, although there would be negligible adverse impacts on soil immediately under the curbs and gutters, as that soil would be permanently disturbed in those areas and the placement of the granite would require compaction of the soil to install it.

Option A1 would maintain the right angles at the corners of the turf panels, making it more likely that visitors would continue to wear social paths across the turf panels at these locations, even with the introduced difference in elevation between the turf panels and the walks. Social paths tend to wear away vegetation and expose and compact the soil underneath. The long-term impacts would be negligible to minor and adverse.

The other curb configurations use gentler angles in the cross section and introduce arcs at the corners of the turf panels. These angles and arcs would mimic those of the existing social paths, pulling the curb back even further. The configurations would discourage the formation of social paths at the corners of the panels and would create a long-term beneficial impact.

SOIL RECONSTRUCTION PROFILES

All of the soil reconstruction profiles would significantly alter the existing soils by reducing existing compaction and by adding amendments and products to resist compacting forces and to aid in holding moisture. Since the area was originally wetlands and was filled to create the land that is now the National Mall, the existing soil is not original to the area. All options would remove soil from the panels, at least temporarily, and artificially alter the soil profiles to create soils in which heavily used areas of turf grass can be sustained. The impacts to soil resources would ultimately be long-term and beneficial for all of the options, with improved perviousness, resistance to compaction, soil amendments to better support the turf, and grading improvements to create positive drainage to capture and reuse stormwater. There are minor differences in the soil profile options, however, and corresponding variations to the impacts.

Option B1 (preferred): This option would create the least alteration to the existing (mostly anthropic) soil resources overall, making use of deep fractioning of the existing soil and amending the top layer of soil in such a way that would result in improvements and long-term beneficial impacts. The existing soil would be stockpiled and reused after amendment with compost; deeper soil would be fractured in place to improve soil perviousness and to decrease compaction. The final result would be a less-compacted soil that most closely resembles the original soil, with a soil stabilizing product providing resistance to future compaction. However, of the three soil reconstruction options, Option B1 would be the most susceptible to re-compaction.

Option B2: This option also includes reuse and stockpiling of existing soil, which would be amended with sand to improve growing conditions for the turf grass. A layer of crushed aggregate stone would also be added, in which the drainage lines would be placed. As with Option B1, the top layers of soil would be reinforced by a soil stabilizing product to improved resistance to compaction forces. The end result would be long-term beneficial impacts to the soil resources, preserving much of the existing soils, although with an introduced layer of aggregate.

Option B3: This option is the most engineered option for soil profile reconstruction and would completely alter the existing soil profile beneath the turf panels. As with Options B1 and B2, Option B3 would also use a soil stabilizing product to reinforce the soil. In addition, however, Option B3 also calls for replacing 20 to 26 inches of existing soil below the turf panels with the same sand soil used for professional sports fields. An impervious tray of bentonite clay topped with aggregate that houses the drain lines would facilitate moisture retention, distribute water storage, and create soil that would support turf panels most similar to professional sports fields or golf course greens. The end result would be a long-term and beneficial impact to the soil, as it would create a pervious soil profile that resists compaction, is most appropriate for supporting turf growth, and stores harvested stormwater. With this option, however, the level of engineering required and the complete replacement of the soil would permanently and adversely alter the existing soils in a way the other options would not.

IRRIGATION OPTIONS

Each of the four irrigation options would use either two or three parallel rows of sprinkler heads or couplers and associated piping down the lengths of the turf panels and also drainage pipes to capture stormwater once it has filtrated through the upper layers of turf and soil. These drainage and irrigation pipes would require installation. If they were installed independently of other project components such as the soil profile reconstruction, they would cause significant disturbance to the soil resources and result in short-term moderate adverse impacts that would be mitigated to negligible with soil and erosion control measures. All irrigation options would help maintain moisture in the soil and would result in minor long-term benefits to soils throughout the project area.

WATER SUPPLY

The options would impact soil resources only in the short term as the systems are put in place and roof drainage rerouted or storm drains installed along with the curb and gutter systems. These construction impacts would be short-term minor and adverse, and could be mitigated to negligible short-term impacts by following sediment and erosion control guidelines consistent with those required by the District of Columbia and by creating a sediment and erosion control plan. This plan would use sediment traps and silt fencing to prevent soil erosion and sediment runoff caused by rain events during construction.

WATER STORAGE

There are two options for storing harvested stormwater—the use of pipes or cisterns. Both would result in the disturbance and excavation of large amounts of soil to make room for the storage systems.

Beyond the excavation required to fine grade the walkways for positive drainage and to install curbs and drains, installation of the storage pipes and cisterns would also require excavation of the walkways. Soil would either need to be reused in the project or removed from the site. As a result of the need to excavate and likely remove soil for both options, the impacts to soils would be long-term minor and adverse immediately around the pipes and cisterns. Because of the need for the cisterns and the benefits they would provide, however, their installation would result in overall benefits to the project area and its soil resources by providing an efficient source for water and irrigation.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

Modifications to turf management strategies—which include reducing the number of large permitted events (particularly those events requiring erection of structures on the turf panels) and reducing the size and number of the structures allowed during these events—would reduce the frequency of compacting forces on turf panel soils and encourage continued soil permeability.

SHORT-TERM IMPACTS

All activities that comprise the action alternative would result in short-term minor adverse impacts to soil resources during construction as soil would be disturbed and in some instances stockpiled onsite, and the potential for erosion and soil loss would be greater. Impacts from construction would be mitigated to negligible adverse, however, by following a sediment and erosion control plan. Such a plan includes measures such as using silt fencing around the construction zone and hay bale sediment traps to prevent sediment runoff during storm events.

CUMULATIVE IMPACTS

Cumulative project impacts would be the same as for the no action alternative. When combined with the long-term beneficial impacts of the action alternative on soil resources, the long-term negligible adverse impacts of other past, present, and reasonably foreseeable future actions would result in a long-term beneficial cumulative effect.

CONCLUSION

The action alternative and its options would have a range of impacts on soil resources. All options require construction and excavation of soil, which would cause a short-term minor adverse impact that can be mitigated to negligible with appropriate site management and monitoring.

The curb and gutter options would not affect soil resources except for some compaction of soil underneath the gutters, which is a long-term, but negligible, impact. The other two options would discourage the need for the social paths, resulting in a long-term beneficial impact on soils.

All the new soil profiles would ultimately result in long-term benefits to soil resources by reversing compaction, amending the soils to better support the turf grass and infiltrate stormwater, and adding products that would help the soil resist future compaction. Of the three soil profile options, the third option calls for replacement and use of clay trays and aggregate layers. It is therefore the most engineered option, yielding the fewest benefits to the soil resources, and the replacement of the soils could be considered an adverse impact to the existing soils.

The irrigation options would all provide minor benefits to the soil by providing moisture.

The water supply and storage options would result in minor short-term adverse impacts to soil resources during construction. Changes in turf management related to special events would have a long-term beneficial impact on soil resources, as the changes would result in fewer compacting forces on the soil.

All activities that comprise the action alternative would result in short-term minor adverse impacts to soil resources during construction as soil would be disturbed and in some instances stockpiled onsite, and the potential for erosion and soil loss would be greater. However, impacts from construction would be mitigated to short-term negligible adverse.

When combined with the long-term beneficial impacts of the action alternative on soil resources, the long-term negligible adverse impacts of other past, present, and reasonably foreseeable future actions would result in a long-term beneficial cumulative effect.

Vegetation

METHODOLOGY AND ASSUMPTIONS

Available information on the vegetation was compiled and reviewed. Impacts on vegetation were based on general characteristics of the site and vicinity, available aerial photos, site observations, and proposed encroachment into vegetated areas associated with the reconstruction of turf and soils.

STUDY AREA

The proposed actions would be located on the center turf panels of the Mall between 3rd and 14th Streets NW and Madison and Jefferson Drives. The study area for vegetation includes the aforementioned project area. Cumulative projects for this topic include those projects immediately adjacent to the Mall.

IMPACT THRESHOLDS

The following thresholds were used to determine the magnitude of impacts on vegetation:

Negligible: Impact on vegetation would not be measurable. The abundance or distribution of individual trees, mature landscape plantings, or turf would be only slightly affected. Ecological processes, biological productivity, or sustainability would not be affected.

Minor: Impacts on vegetation would be measurable. The abundance or distribution of individual trees, mature landscape plantings, or turf would affect small areas. Ecological processes, biological productivity, or sustainability would be affected slightly.

Moderate: Impacts on vegetation would be measurable. The abundance or distribution of individual trees, mature landscape plantings, or turf would be affected. Ecological processes, biological productivity, or sustainability would be affected.

Major: Impacts on vegetation would be measurable and clearly evident in areas that are prominent and highly visible. The abundance or distribution of individual trees, mature landscape plantings, or turf would be greatly affected. Ecological processes, biological productivity, or sustainability would be affected.

Duration: Short-term impacts last less than one year; long-term impacts last longer than one year.

Impacts of Alternative 1: the No Action Alternative

The no action alternative represents a continuation of the existing operations and maintenance of the turf panels on the National Mall.

Under the no action alternative, intense visitor use on the National Mall, including recreational activities, special events, demonstrations, and general visitor use, would continue to degrade the turf and compact the soil beneath the turf panels in the project area. The existing social trails throughout the project area, and especially near the corners of the turf panels, would continue to be used by visitors; their continued use would further compact the soils and prevent turf growth in those area resulting in long-term moderate adverse impacts to vegetation.

Although winter maintenance practices and rest periods would continue, their mitigating beneficial effects on the turf panels would only last until the start of the next peak visitor season. Soil aeration, grading, soil replacement, fertilization, reseeding, and irrigation performed during the winter rest periods would continue to result in short-term annual improvements to soil conditions and turf health. However, turf conditions would continue to deteriorate rapidly with increased visitor use during spring and summer. As a result, there would continue to be recurring long-term moderate adverse impacts on turf condition during peak visitor periods.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

Special events, particularly those making use of tents, stages, other structures, and heavy equipment on top of the turf panels, and those with long durations and high volumes of visitors, would continue to occur, causing severe turf damage. Management and regulation of special events would remain the same and would continue to allow the same intensive use of tents and other structures that cause soil compaction, shading, heat buildup, and physical wear and abrasion of the turf. Consequently, there would be long-term moderate adverse impacts to vegetation in the project area because of the continued wear on the turf that has resulted in large areas of bare earth, minimal turf coverage, and areas of weeds and undesirable non-turf species.

CUMULATIVE IMPACTS

Present and future construction on the National Mall and surrounding areas, including the MLK Memorial, Dwight D. Eisenhower Memorial, AVDLM, Potomac Park Levee Project, Jefferson Seawall Rehabilitation, and the NMAAHC, would contribute cumulatively to impacts on vegetation in the project area. Construction activity from these projects would potentially result in the removal of some vegetation in the project area. However, each project would be subject to mitigation requirements which would result in no overall net change in the number of trees on the National Mall.

Implementation of the Lincoln Memorial Reflecting Pool Rehabilitation and National Mall Plan would introduce new walkways and features which would discourage visitors from forming social trails, thereby reducing overall soil compaction and improving vegetation.

These past, present, and reasonably foreseeable future actions would result in the removal of some vegetation in the project area. However, mitigation measures would result in no net change in the number of trees within the project area. In addition, proposed projects would reduce the formation of new social trails and would alleviate soil compaction and enhance vegetation within portions of the National Mall. Although there would be short-term moderate adverse impacts to vegetation during construction due to the disruption of turf, there would be beneficial long-term impacts to vegetation.

As described above, the implementation of the no action alternative would result in long-term moderate adverse impacts to vegetation in the project area. The long-term moderate adverse impacts from this alternative, in combination with the long-term beneficial impacts from other past, present, and future projects, would never-the-less, result in a long-term moderate adverse cumulative effect on vegetation.

CONCLUSION

The implementation of the no action alternative would result in long-term moderate adverse impacts to vegetation in the project area because of severe turf damage caused by continued heavy visitor use. The long-term moderate adverse impacts from this alternative, in combination with the long-term beneficial impacts from other past, present, and future projects, would result in a long-term moderate adverse cumulative effect on vegetation.

Impacts of Alternative 2: the Action Alternative

The action alternative describes proposed improvements to rehabilitate the turf, alleviate soil compaction, and provide a comprehensive irrigation system for the turf panels in the project area. Options within the action alternative explore different edge conditions (curb and gutters) at the turf panels, soil profiles, and irrigation systems.

The turf panels would continue to be maintained seasonally according to the current schedule for aeration, fertilization, and reseeding. Peak use period maintenance (April – October), including cutting the grass to a 3-inch height every five to seven days, would continue. In addition, under the action alternative, the

grass at the outside of the turf panels would be edged regularly to maintain the integrity of the curb and gutter systems.

CURB AND GUTTER OPTIONS

Three curb and gutter options are presented that explore the edge conditions of the turf panels and the transition between the walkways and turf. Option A1 would have a long-term beneficial impact on vegetation as it would restore the worn corners of the turf panels to the original 90 degrees, and provide an elevation difference that would help deter the continuation of social path shortcuts to some extent in the future. Options A2 (preferred) and A3 would introduce 15-foot and 25-foot radius corners, respectively, on each of the turf panel corners. These new radii would reduce the potential overall amount of turf, and would therefore result in long-term negligible to minor adverse impacts, although the turf is currently worn away or in poor condition in these areas. There would be a long-term beneficial impact to the vegetation by defining the edges of the panels and discouraging the continuation of the social paths. All three options would have long-term minor adverse impacts resulting from turf removal around the edges of the turf panels where the new curbing would be placed.

SOIL RECONSTRUCTION PROFILES

All three soil profile reconstruction options would have comparable long-term beneficial impacts on vegetation in the project area by reducing existing compaction, helping the turf and soil resist compaction forces, and more effectively retaining water. All options would have short-term moderate adverse impacts to vegetation because all turf in the project area would be removed during construction. After soils construction, however, the turf would be established.

IRRIGATION OPTIONS

All irrigation options, including water distribution, supply, and storage would help maintain healthier, more visually appealing turf stands and would result in comparable long-term beneficial impacts to vegetation by providing an efficient and consistent method for watering the project area.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

Modifications of turf management related to special events would decrease the frequency and duration of compacting forces on the soil panels by reducing the frequency and duration of large permitted events as well as the placement, size, and number of structures allowed on the turf panels during these events. This reduction in event frequency and duration would result in decreased wear and tear on the turf panels and would provide increased rest periods, ranging in duration based on event size, enabling turf to better regenerate. Overall, the turf management modifications would result in long-term beneficial impacts to vegetation in the project area.

SHORT-TERM IMPACTS

All proposed actions under the action alternative would result in short-term moderate adverse impacts to vegetation during construction, as the turf would be completely removed. However, the final outcome of the proposed actions would result in long-term beneficial impacts to vegetation since soil compaction would be reduced, irrigation would be improved, and special events practices would be altered to provide increased rest periods from the high amounts of visitor use.

CUMULATIVE IMPACTS

Impacts to vegetation from past, present, and reasonably foreseeable future actions would be similar to those under the no action alternative. When combined with the long-term beneficial impacts to vegetation resulting from the implementation of the action alternative, there would be a long-term beneficial cumulative effect.

CONCLUSION

Throughout the project area, long-term beneficial impacts to vegetation would be expected as a result of the improved soil conditions and irrigation system. Short-term moderate adverse impacts to vegetation would result from construction. However, these adverse impacts would be mitigated by turf replacement after construction completion. The long-term beneficial impacts to vegetation resulting from the implementation of the action alternative, when combined with the long-term beneficial impacts from other past, present, and future projects, would result in long-term beneficial cumulative impacts to vegetation.

Visual Resources

METHODOLOGY AND ASSUMPTIONS

This visual impact assessment addresses potential changes to the project area's visual character, views, and vistas that would result from implementation of the proposed actions.

STUDY AREA

The proposed actions would be located on the National Mall between 3rd and 14th Streets NW and between Madison and Jefferson Drives.

IMPACT THRESHOLDS

The following thresholds were used to determine the degree of impacts on visual resources in the project area:

Negligible: The proposed action would not impact the aesthetics or visual viewshed of the proposed project area during construction or operations.

Minor: The proposed action would not substantially change the scenic vista, would not substantially change scenic resources, and would not substantially change the existing visual character or quality of the site and its surroundings. The effect would be detectable, but slight, and would minimally diminish overall integrity or affect the character-defining feature(s) of the visual resources and aesthetic environment.

Moderate: The proposed action would result in a noticeable effect on a scenic vista; alter scenic resources including, but not limited to, trees and historic buildings; or alter the existing visual character or quality of the site and its surroundings. The effect would diminish overall integrity or would alter a character-defining feature(s) of the visual resources and aesthetic environment.

Major: The proposed action would result in a substantial effect on a scenic vista; substantially alter scenic resources including, but not limited to, trees and historic buildings; or substantially alter the existing visual character or quality of the site and its surroundings. The effect would significantly diminish overall integrity or would significantly alter a character-defining feature(s) of the visual resources and aesthetic environment.

Duration: In the short term, the most negative visual impacts would be related to the activity and disruption associated with construction. The long-term impacts would be related to compromised, obscured, or disrupted views in the areas where the proposed actions would occur.

Impacts of Alternative 1: the No Action Alternative

The no action alternative represents a continuation of the existing operations and maintenance of the turf panels and irrigation system. There would be no changes to the turf panels or the separation between the lawn and walkways.

Visual Character: As a result of intense visitor use and soil compaction, the turf panels would continue to appear worn and distressed. There would continue to be no formal separation at the edges between the turf and gravel walkways, and the gravel would continue to migrate into the turf panels, creating an unclear visual distinction between these two disparate elements. The worn appearance of the turf and lack of visual distinction between the turf and walkways would continue to have a long-term moderate adverse effect since the visual appearance of the turf panels diminishes the overall integrity of the aesthetic environment of this cultural landscape.

Views and Vistas: The visual quality of the turf panels creates a negligible visual effect on the primary grand vista between the U.S. Capitol and the Washington Monument since the two landmark structures serve as the visual anchors and the turf panels form the backdrop to the vista and from the ground level, the presence of vegetation, regardless of the quality, appears to be continuous.

The visual quality of the turf panels creates a long-term moderate adverse effect on the view from the top of the Washington Monument. This effect is due to the deteriorating patches of turf and worn edges and corners of the turf panels which diminish overall integrity of the central elements along the primary axis of the view.

CUMULATIVE IMPACTS

Present and future construction on the National Mall along the larger visual east-west axis (Lincoln Memorial Reflecting Pool Rehabilitation, Potomac Park Levee, and NMAAHC) and the secondary planned north-south axis adjacent to the project area (Jefferson Seawall Rehabilitation) would contribute cumulatively to visual resources by creating new visual elements that affect key views in the project area.

The NMAAHC would affect the grand vista between the U.S. Capitol Building and Washington Monument. The degree of impact on visual resources will depend on the design (which is currently in progress with the Smithsonian Institution) and its relationship to the intervening tree canopies in the project area.

Construction of improvements to the Lincoln Memorial Reflecting Pool and surrounding area would introduce enhancements to the visual character of the National Mall and the vista between the U.S. Capitol Building, Washington Monument, World War II Memorial, and the Lincoln Memorial.

Roadway enhancements along Constitution Avenue and Madison Drive would introduce uniform street furnishings (such as lighting fixtures and trash receptacles) and would enhance the overall visual character of these streets.

The implementation of the National Mall Plan would improve overall visual resources by establishing a sense of place and an overall identity for the National Mall, creating a coherent pedestrian environment that would complement and balance the natural environment, formal and informal features, and national commemorative works.

These past, present, and reasonably foreseeable future actions would enhance the condition and visual quality of the National Mall, but would also introduce new visual elements that affect key views in the project area.

As described above, the implementation of the no action alternative would result in long-term moderate adverse impacts to visual resources in the project area. The long-term moderate adverse impacts of this alternative, in combination with the beneficial impacts of other past, present, and reasonably foreseeable future actions (except the NMAAHC), would result in a long-term minor adverse cumulative effect. Construction activity resulting from these projects would result in a short-term minor to moderate adverse cumulative effect on visual resources depending on the duration, extent of construction, and whether or not construction from other projects was occurring simultaneously.

CONCLUSION

Under the no action alternative, there would be long-term moderate adverse impacts on visual resources due to the worn and distressed appearance of the turf panels and the lack of visual distinction between the turf and gravel walkways, which diminishes the overall integrity of the aesthetic environment of this cultural landscape.

The past, present, and reasonably foreseeable future actions on or around the National Mall generate visual impacts that are primarily long-term and beneficial, with the exception of the NMAAHC, which would introduce a long-term adverse impact on visual resources ranging from minor to moderate, depending on the design. When combined with the long-term moderate adverse impacts associated with the no action alternative, there is a long-term minor adverse cumulative effect. Construction activity resulting from these projects would result in a short-term minor to moderate adverse cumulative effect on visual resources depending on the duration and extent of construction.

Impacts of Alternative 2: the Action Alternative

The action alternative describes proposed improvements to rehabilitate the turf, alleviate soil compaction, and provide a comprehensive irrigation system for the turf panels in the project area. Options within the action alternative explore different edge conditions (curb and gutters) at the turf panels, soil profiles, irrigation systems, and turf management modifications related to special events.

CURB AND GUTTER OPTIONS

Three curb and gutter options are presented that explore the edge conditions of the turf panels and the separation between the walkways and turf. Each of the three options (Options A1, A2, and A3) would improve the quality of the separation between the turf and walkways and would enhance the visual character and views in the project area.

Option A1 - This option would restore the current condition of a 90-degree corner to the turf panels which was first introduced in the 1970 Skidmore, Owings, & Merrill Plan for the National Mall. A “block” profile granite curb and gutter system would be installed around each turf panel and they would be raised 6 inches. Granite is proposed because it would most optimally channel water with a minimal slope and is consistent with the existing materials on the Mall. Accessibility and maintenance points would be provided with new 6-foot-long ramps spaced every 50 to 100 feet. The visual appearance of the block curb and gutter system would introduce a long-term beneficial impact in the project area by creating a clear visual distinction between the turf and walkways. However, the numerous ramps required throughout the project area would diminish the project area’s overall integrity of the aesthetic environment and would compromise the views and vistas in the project area, resulting in a long-term moderate adverse impact to visual resources.

Option A2 (preferred) - This option would introduce 15-foot-radius corners on each of the turf panel corners to reduce the heavily worn edges. An 18-inch-wide sloped granite curb and gutter system would be installed around each turf panel, and they would be raised by 2 inches. The curb and gutter system would be sloped away from the walkway to control the flow of water. The radius introduced by this option would help reduce the heavily worn edges present at nearly every corner of the turf panels. The curb and gutter system would be a unified and angled piece of granite that would have a visually strong presence and would most clearly define the edge of the turf panels, resulting in a long-term beneficial impact on view and visual resources in the project area.

Option A3 - This option would introduce 25-foot-radius corners on each of the turf panel corners to reduce the wear and protect the edges of the panels. A “V”-shaped granite curb and gutter system would be installed around each turf panel, but they would not be raised. The “V”-shaped curb would function more like a gutter system (collecting and conducting water to drain inlets) than a traditional curb. Since the curb does not incorporate a grade change, accessibility and maintenance access would be continual around the turf panels. The relatively larger radius would introduce a more noticeable, but still beneficial, visual effect. The “V” curb and gutter system would have a visually strong presence and would define the edge of the turf panels, although not

as prominently as the sloped granite curb in Option A2. Nevertheless, implementation of Option A3 would still result in a long-term beneficial impact on the views and visual resources in the project area.

SOIL RECONSTRUCTION PROFILES

There would be a beneficial long-term effect on the visual resources within the project area resulting from the implementation of any of the soil profile reconstruction options. Each option would introduce enhancements to the soils in the project area to alleviate the effects of compaction and to support a healthier and more visually appealing turf.

IRRIGATION OPTIONS

There would be a negligible effect resulting from the installation of water irrigation valves at numerous points along the turf panels because they would not substantially contribute to the overall aesthetic environment of the area. They would be recessed into the turf and would only be activated at night. From any views or vistas within the project area, the irrigation valves would be too small to be visually detected.

The negligible long-term effects would result from the implementation of any of the options for water supply for the irrigation system. The design of the on-site drainage collection system would be integrated into the comprehensive curb and gutter system for each turf panel and would not be visually conspicuous. Options for stormwater runoff would have no visual effect since the conveyance infrastructure would be located underground.

Each option would require the installation and operation of one or two pump stations (either a single pump station in the center of the project area or two pump stations, one at each end of the project area) which would require an access hatch that would be visible from points within the project area. Ongoing review and design refinement within the design phase and Section 106 process will ensure that the proposed actions blend as harmoniously as possible with the existing scale, context, and landscape in the project area. The one or two access hatches would not substantially change the scenic vistas, nor would they substantially change the existing visual character or quality of the site and its surroundings. The effect would be detectable, but slight, and would result in a long-term minor adverse impact to visual resources.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

There would be a beneficial long-term effect on the visual resources within the project area resulting from the implementation of turf management strategies related to special events that address the number of events, the duration of events, and the intensity of use within the project area. Such management changes would allow for turf recovery, alleviate the effects of prolonged soil compaction, and would enable consistently healthier and more visually appealing turf panels.

SHORT-TERM IMPACTS

Implementation of each option would cause short-term moderate adverse effects during construction due to the visual disturbance of the project area and compromised views along the grand axis of the Mall, diminishing the overall integrity of the aesthetic environment.

CUMULATIVE IMPACTS

Impacts to visual resources from cumulative actions would be similar to those under the no action alternative, resulting in primarily long-term beneficial impacts, with the exception of the NMAAHC, which would introduce an adverse long-term impact, ranging from minor to moderate, depending on the design. When combined with the overall long-term beneficial impacts associated with the action alternative, there would be a beneficial cumulative effect on visual resources. Construction activity

resulting from these projects would result in a short-term moderate adverse cumulative effect on visual resources depending on the duration and extent of construction.

CONCLUSION

The proposed actions would introduce curb and gutter profiles that would more clearly differentiate the turf panels and walkways. This visual distinction in Options A2 and A3 would create a long-term beneficial impact on visual resources in the project area since they would improve the overall visual quality of the project area. Option A1 would result in a long-term moderate adverse effect due to the numerous ramps that would be required throughout.

There would be a beneficial long-term effect on the visual resources within the project area resulting from the implementation of any soil profile reconstruction option since each option would alleviate the effects of compaction to support healthier and more visually appealing turf panels.

The installation of any of the options for the water distribution, water supply, and storage options of the irrigation system would result in long-term minor adverse impacts resulting from the presence of an access hatch for the subsurface pump house. The remaining elements associated with the irrigation system would be installed underground and would not be visible. There would be a beneficial long-term effect resulting from the implementation of turf management strategies to restrict the intensity of use of the turf panels within the project area since a comprehensive management plan would alleviate the effects of prolonged soil compaction and would enable consistently healthier and more visually appealing turf panels.

Implementation of each option would result in short-term moderate adverse effects during construction due to the visual disturbance of the project area and compromised views along the grand axis and from the Washington Monument, diminishing the overall integrity of the aesthetic environment.

The impacts of past, present, and reasonably foreseeable future actions on or around the National Mall, when combined with the overall long-term beneficial impacts associated with the action alternative, would result in long-term beneficial cumulative effects on visual resources. Construction activity resulting from these projects would result in a short-term moderate adverse cumulative effect on visual resources depending on the duration and extent of construction.

Cultural Resources

METHODOLOGY AND ASSUMPTIONS

The NPS categorizes cultural resources by the following categories: archeological resources, cultural landscapes, historic districts and structures, museum objects, and ethnographic resources. As noted in the “Issues and Impact Topics” section of “Chapter 1: Purpose and Need,” impacts to cultural landscapes, historic districts and structures, and archeological resources are of potential concern for this project. There would be no impacts to ethnographic resources or museum objects, so these topics were dismissed from consideration.

The analyses of effects on cultural resources that are presented in this section respond to the requirements of both NEPA and Section 106 of the NHPA. In accordance with the ACHP’s regulations implementing Section 106 (36 CFR Part 800, *Protection of Historic Properties*; CFR 2004), impacts on cultural resources were identified and evaluated by (1) determining the APE; (2) identifying cultural resources present in the APE that are either listed in or eligible to be listed in the NRHP (i.e., historic properties); (3) applying the criteria of adverse effect to affected historic properties; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the implementing regulations for Section 106, a determination of either adverse effect or no adverse effect must also be made for affected historic properties. An adverse effect occurs whenever an impact alters any characteristic of a cultural resource that qualifies it for inclusion in the NRHP (for example, diminishing the integrity of the resource’s location, design, setting, materials, workmanship, feeling, or association). Adverse effects also include reasonably foreseeable effects caused by the proposal that would occur later in time, be farther removed in distance, or be cumulative (CFR 2004). A determination of no adverse effect means there is either no effect or that the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the NRHP.

CEQ regulations DO-12: *Conservation Planning, Environmental Impact Analysis and Decision-making* (NPS 2001) also call for a discussion of the appropriateness of mitigation as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact (e.g., reducing the intensity of an impact from major to moderate or minor). Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. Cultural resources are non-renewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under Section 106 may be mitigated, the effect remains adverse.

The NPS guidance for evaluating impacts (DO-12: *Conservation Planning, Environmental Impact Analysis, and Decision Making*; NPS 2001) requires that impact assessment be scientific, accurate, and quantified to the extent possible. For cultural resources, it is seldom possible to measure impacts in quantifiable terms; therefore, impact thresholds must rely heavily on the professional judgment of resource experts.

Historic Districts and Structures

STUDY AREA

The study area for cultural resources is the APE as defined by the NPS under Section 106 regulations (see the “Cultural Resources” section in “Chapter 3: Affected Environment”). It is not the same as that used to evaluate visual and aesthetic resources even though some of the topics such as views and vistas appear the same. Of the many types of historic properties, the project has the potential to directly or indirectly impact numerous historic resources within the APE that are individually listed in the National Register: the National Mall², the L’Enfant Plan of the City of Washington, the Washington Monument and Grounds, the Smithsonian Castle, the USDA Whitten Building, the Freer Gallery of Art, the Arts and Industries Building, the National Gallery of Art – West Building, and the National Museum of Natural History. It should be noted that although the National Mall has many of the characteristics of a historic district, including defined boundaries enclosing multiple resources, it was nominated as a “site,” as was the Washington Monument and Grounds. The L’Enfant Plan of the City of Washington was nominated as a “structure.” There are no historic districts per se within the APE. However, both the National Mall and the Washington Monument and Grounds have also been documented as cultural landscapes (discussed further below).

For a historic district or structure to be listed on the NRHP, it must possess significance (the meaning or value ascribed to the historic district or structure), and the features necessary to convey its significance must have integrity. For purposes of analyzing potential impacts on historic districts and structures, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: The impact is at the lowest level of detection with neither adverse nor beneficial consequences. For purposes of Section 106, the determination of effect would be no adverse effect.

Minor: **Adverse impact**—Alteration of a pattern(s) or feature(s) of a historic district or structure listed on or eligible for the NRHP would not diminish the integrity of a character-defining feature(s) or the overall integrity of the historic property. For purposes of Section 106, the determination of effect would be no adverse effect.

Beneficial impact—The character-defining features of the historic district or structure would be stabilized/preserved in accordance with the *Secretary of the Interior’s Standards for the Treatment of Historic Properties* (NPS 1992) to maintain its existing integrity. For purposes of Section 106, the determination of effect would be no adverse effect.

Moderate: **Adverse impact**—The impact would alter a character-defining feature(s) of a historic district or structure and diminish the integrity of that feature(s) of the historic property. For purposes of Section 106, the determination of effect would be *adverse effect* but one which could be fairly easily avoided, minimized, or mitigated through an Agreement Document.

Beneficial impact—The historic district or structure would be rehabilitated in accordance with the *Secretary of the Interior’s Standards for the Treatment of Historic Properties* (NPS 1992) to make possible a compatible use of the property while preserving its character-defining features. For purposes of Section 106, the determination of effect would be no adverse effect.

² The “National Mall” that is documented for the NRHP in 1981 refers to the traditional Mall, not the far larger National Mall Area which is the subject of the current National Mall Plan.

Major: Adverse impact—The impact would alter a character-defining feature(s) of the historic district or structure and would severely diminish the integrity of that feature(s) and the overall integrity of the historic property. For purposes of Section 106, the determination of effect would be adverse effect and would present serious difficulty in avoiding, minimizing, or mitigating through an Agreement Document.

Beneficial impact—The historic district or structure would be restored in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* to accurately depict its form, features, and character as it appeared during its period of significance. For purposes of Section 106, the determination of effect would be no adverse effect (NPS 1992).

Duration: Short-term impacts are those lasting less than one year; long-term impacts are those lasting longer than one year.

Impacts of Alternative 1: the No Action Alternative

The no action alternative represents a continuation of the existing condition, operation, and maintenance of the turf within the project area. The turf panels would continue to have no separation between the turf and walkways and would continue to be subject to substantial wear at the corners from visitor use. Loose gravel would continue to migrate into the turf as would the impact of many footsteps that a barrier between turf and walkway would partially prevent. The current procedures with their inherent difficulties in regenerating turf after major Mall events and adverse weather conditions would continue. The visual blurring of the lines between the inner gravel walkways and the turf panels would persist, thereby degrading the visibility of the street and walkway pattern through the Mall, which is an important feature of the L'Enfant Plan of the City of Washington³.

The periods in which the turf suffers from a patchy, beaten down, or bald appearance in numerous locations would continue and worsen if the high public use and assembly demands upon the Mall of recent years continue. Large patchy or damaged areas of turf would be periodically visible from the Washington Monument base of the Capitol terrace, degrading the major axial vista of the Mall. As stated earlier, the regulations for Section 106 of the NHPA indicate that an adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic that qualifies it for inclusion in the National Register (e.g., diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association). The existing condition constitutes a gradual degradation since the 1970s of the overall impression of the visitor passing through the Mall of a "vast greensward" (the Mall as an NRHP site) and blurs the internal circulation structure of gravel paths (the Mall as a series of reservations and designated avenues and streets contributing to the L'Enfant Plan as an NRHP structure). The scale of both the Mall site and L'Enfant Plan structure are large; however, their respective locations, designs, settings, materials, workmanship, and associations would suffer from a moderate, long-term adverse impact due to the no action alternative. The setting of five monumental buildings enframing the Mall that have been listed on the NRHP would be degraded. This would constitute a minor long-term adverse impact.

CUMULATIVE IMPACTS

Construction of the new memorials, civil works projects, and security upgrades described at the beginning of this chapter and in Table 4.1 has the potential to impact the historic districts and structures within the project area.

³ The internal streets of the Mall were, of course, a feature of the McMillan Plan component.

Construction of the MLK Memorial, Lincoln Memorial Reflecting Pool Rehabilitation, Potomac Park Levee Project, and Jefferson Seawall Rehabilitation would result in a negligible cumulative impact on relevant historic districts and structures due to their distance from the project area.

The Dwight D. Eisenhower Memorial would be constructed by 2015 between 4th and 6th Streets SW and between Independence Avenue SW and the Department of Education Building. The presence of the memorial in this location could affect the L'Enfant Plan vista along Maryland Avenue toward the U.S. Capitol. Its effect upon cultural resources is currently being evaluated under NEPA and Section 106 by the NPS, particularly its relation to Maryland Avenue as a component of the L'Enfant Plan. Construction of the Eisenhower Memorial could create long-term minor to moderate adverse effects to the relevant historic districts and structures but is likely to be mitigated by the design review process.

The NMAAHC would be constructed by 2016 on the National Mall at the southwest corner of 14th Street NW and Constitution Avenue NW, on the Washington Monument Grounds. The presence of a new building in this location would affect the vista between the U.S. Capitol, Washington Monument, World War II Memorial, and the Lincoln Memorial, creating a long-term adverse impact on historic districts and structures such as the National Mall and Washington Monument historic sites that would range from minor to moderate, depending on the design (which is currently in progress with the Smithsonian Institution). Security improvements to Smithsonian museums and the National Gallery of Art would have long-term minor adverse effects to historic districts and structures due to the visual intrusiveness of these measures.

Roadway enhancements along Constitution Avenue and Madison Drive are also planned and would have a beneficial impact on historic districts and structures since the project would utilize uniform street furnishings (such as lighting fixtures and trash receptacles) and would enhance the overall aesthetic character of these streets. The implementation of the National Mall Plan would yield beneficial impacts on historic districts and structures by establishing a sense of place and an overall identity for the National Mall, creating a coherent pedestrian environment that would complement and balance the natural environment, formal and informal features, and national commemorative works.

The recent, planned, and reasonably foreseeable projects on or around the National Mall generate aesthetic impacts that, with the exception of the NMAAHC and possibly the Eisenhower Memorial, are primarily long-term and beneficial to historic districts and structures. The cumulative impact of these projects, when combined with the long-term minor to moderate adverse impact of the no action alternative would still be minor to moderate long-term adverse.

CONCLUSION

Under the no action alternative, there would be a long-term minor to moderate adverse effect due to the worn and distressed appearance of the turf panels and the lack of visual distinction between the turf and gravel walkways, diminishing the overall integrity of the Mall and specifically the visible structure of the street pattern (L'Enfant Plan.) and the planned *tapis vert*. The effects from the projects on or around the National Mall generate aesthetic impacts that are primarily long-term and beneficial, but the overall cumulative long-term impact would be minor to moderate adverse.

Impacts of Alternative 2: the Action Alternative

The action alternative describes proposed improvements to rehabilitate the turf, alleviate soil compaction, and provide a comprehensive irrigation system for the turf panels in the project area. Options within the action alternative explore different edge conditions (curb and gutters) at the turf panels, soil profiles, and irrigation systems.

CURB AND GUTTER OPTIONS

Three curb and gutter options under consideration explore the edge conditions of the turf panels and the separation between the walkways and turf. Nothing in the documentation of the Mall as a site on the National Register or as a major feature of the L'Enfant Plan of the City of Washington, itself a structure on the National Register, indicates that any of the three options are more in keeping with the historic context than any other, as all maintain the spatial organization and dimensional relationships of the 1930's landscape design. The identification of surface materials (gravel or concrete) and curb type or radius configuration were not called out as 'contributing features' because the documentation formats either did not specifically list contributing features (the Mall as a site) or reach that level of detail (the Mall as a feature of the L'Enfant Plan). There is some evidence from the Heritage Landscapes report of 15' radius grass panels in the 1930's, but this is no more a defining precedent than other configurations from other periods.

Certain north-south streets that cross or border the Mall—3rd Street SW, 4th Street SW, 7th Street NW and SW, 9th Street SW, 12th Street NW and SW, and 14th Street NW and SW—are contributing features to the L'Enfant Plan. The visibility and definition of the L'Enfant Plan's street pattern is significant, although the details and paving materials have often changed and are not significant. 9th and 12th Streets cross the mall in the form of blocked or interrupted gravel paths. Although not the same dimensions as an actual street, they form a visual indicator of the alignment of the street. Improving the visitor's ability to "read" the lines of these pathways by maintaining the separation of turf and gravel path is a long-term beneficial impact to the L'Enfant Plan.

Other gravel pathways that cross the Mall in an east-west direction and are bordered by turf panels are not officially considered significant features of the L'Enfant Plan. However, the separation of gravel and turf along these pathways, such as the former Adams and Washington Drives, contributes to the visitor perception of the great axis along the Mall between the Capitol and the Lincoln Memorial and the overall integrity of the Mall. Therefore, the curb and gutter installation would be a long-term beneficial impact to the Mall and the setting of the NRHP-listed buildings within the APE.

SOIL RECONSTRUCTION PROFILES

Effects to the historic districts and structures within the project area, resulting from the implementation of any soil profile reconstruction option, would be beneficial and long-term on the cultural resources within the project area. Each option would introduce enhancements to the soils in the project area, alleviating the effects of compaction to support healthier and more visually appealing turf panels. There is no significance in the National Register documentation of the Mall or the L'Enfant Plan given to the use of any particular soil or grass variety.

IRRIGATION OPTIONS

There would be a long-term beneficial effect on the Mall as a historic site, the L'Enfant Plan, or any of the historic buildings within the APE resulting from the installation of water irrigation valves at numerous points along the turf panels. The valves would be too small to be visually detected and the impact on maintaining the historic impression of a *tapis vert* would be positive.

There would be beneficial long-term effects resulting from the implementation of any of the options for water supply for the irrigation system on the Mall as a historic site, the L'Enfant Plan, or any of the historic buildings within the APE. The design of the on-site drainage collection system would be integrated into the comprehensive curb and gutter system for each turf panel and would not be visually conspicuous. Options for stormwater from areas adjacent to the project area would have no visual effect since the conveyance infrastructure would be located underground. Again, the impact on maintaining the historic impression of a greensward would be positive.

There would be no long-term effect resulting from the implementation of any of the options for subsurface storage structures for the irrigation system since neither the concentrated nor distributed systems would be visible.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

There would be a beneficial long-term effect on historic districts and structures within the project area resulting from the implementation of turf management strategies related to special events that would regulate the intensity of use within the project area. A comprehensive management plan would alleviate the effects of prolonged soil compaction and would enable consistently healthier and more visually appealing turf panels.

SHORT-TERM IMPACTS

There would be short-term minor to moderate adverse effects during construction due to the visual disturbance of the project area and compromised views along the grand axis and from the Washington Monument, diminishing the overall integrity of the aesthetic environment.

CUMULATIVE IMPACTS

Impacts to historic districts and structures from cumulative actions would be similar to those under the no action alternative, resulting in primarily long-term beneficial impacts. An exception to this would be the construction of the NMAAHC and possibly the Eisenhower Memorial, which would introduce an adverse long-term impact ranging from minor to moderate, depending on the design. When combined with the overall long-term beneficial impacts associated with the action alternative, there would be a beneficial cumulative effect on these resources. Construction activity resulting from these projects would result in a short-term moderate adverse cumulative effect on historic districts and structures depending on the duration and extent of construction.

CONCLUSION

Under the action alternative, there would be a long-term beneficial effect due to the improvement of the worn and distressed appearance of the turf panels and the lack of visual distinction between the turf and gravel walkways, which diminishes the overall integrity of the Mall and specifically the visible structure of the street pattern (L'Enfant Plan.). These long-term beneficial effects are created by all curb and gutter options, all soil reconstruction profiles, and changes in turf management strategies for special events. The effects of the irrigation options are negligible in their visual impact but long-term beneficial in that improved water distribution and drainage contributes to the appearance of the Mall as a *tapis vert*.

There would be short-term minor to moderate adverse effects during construction of all physical components of the action alternative due to the visual disturbance of the project area and compromised views along the grand axis and from the Washington Monument, diminishing the overall integrity of the aesthetic environment.

The projects on or around the National Mall generate impacts on historic districts and structures that are primarily long-term and beneficial, with the exception of the NMAAHC and possibly the Eisenhower Memorial, which would introduce a long-term adverse impact on historic districts and structures. The overall cumulative impact is long-term beneficial.

Cultural Landscapes

STUDY AREA

The proposed alternatives have the potential to impact character-defining features of one cultural landscape: the Mall as defined in the NPS's 2006 CLI (e.g., the inner Mall or open space between 14th and 3rd Streets and Jefferson and Madison Drives). It should be noted that the CLI discusses and evaluates many of the same features as the earlier NRHP documentation, but places a greater emphasis upon the Mall as a designed landscape, the condition of its natural components such as trees and grass, and the physical development of the plan in the 20th century after the major impetus of the McMillan Commission revisions and Depression-era and Bicentennial-year implementation. (See "Chapter 3: Affected Environment.")

Consideration was given to including the Washington Monument and Grounds cultural landscape on the west and the Union Square cultural landscape on the east, but the nature and small-scale of the alternatives being evaluated in this EA made that unnecessary.

IMPACT THRESHOLDS

In order for a cultural landscape to be listed in the NRHP, it must possess significance (the meaning or value ascribed to the landscape), and the features that convey its significance must have integrity. Character-defining features of a cultural landscape may include spatial organization and land patterns, topography, vegetation, circulation patterns, water features, structures/buildings, and small-scale objects (see *The Secretary of the Interior's Standards for the Treatment of Historic Properties and the Guidelines for the Treatment of Cultural Landscapes*; NPS 1992). For purposes of analyzing potential impacts on cultural landscapes, the thresholds of change for the intensity of an impact are defined in much the same manner as those for historic districts and structures:

Negligible: The impact is at the lowest level of detection with neither adverse nor beneficial consequences. For purposes of Section 106, the determination of effect would be no adverse effect.

Minor: Adverse impact—Alteration of a pattern(s) or feature(s) of the cultural landscape listed on or eligible for the NRHP would not diminish the integrity of a character-defining feature(s) or the overall integrity of the landscape. For purposes of Section 106, the determination of effect would be no adverse effect.

Beneficial impact—Preservation of landscape patterns and features would be in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*, thereby maintaining the integrity of the cultural landscape. For purposes of Section 106, the determination of effect would be no adverse effect.

Moderate: Adverse impact—The impact would alter a character-defining feature(s) of the cultural landscape and diminish the integrity of that feature(s) of the landscape. For purposes of Section 106, the determination of effect would be adverse effect but one which could be fairly easily avoided, minimized, or mitigated through an Agreement Document.

Beneficial impact—The landscape or its features would be rehabilitated in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*, to make possible a compatible use of the landscape while preserving its character-

defining features. For purposes of Section 106, the determination of effect would be no adverse effect.

Major: **Adverse impact**—The impact would alter a character-defining feature(s) of the cultural landscape and severely diminish the integrity of that feature(s) and the overall integrity of the historic property. For purposes of Section 106, the determination of effect would be adverse effect and would present serious difficulty in avoiding, minimizing, or mitigating through an Agreement Document.

Beneficial impact—The cultural landscape would be restored in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* to accurately depict the features and character of a landscape as it appeared during its period of significance. For purposes of Section 106, the determination of effect would be no adverse effect.

Duration: Short-term impacts are those lasting less than one year; long-term impacts are those lasting longer than one year.

Impacts of Alternative 1: the No Action Alternative

The no action alternative represents a continuation of the existing condition, operation, and maintenance of the turf within the project area. The turf panels would continue to have no separation between the turf and walkways and would continue to be subject to substantial wear at the corners from visitor use. Loose gravel would continue to migrate into the turf as would the impact of many footsteps that even a slight barrier between turf and walkway would partially prevent. The current procedures with their inherent difficulties in regenerating turf after major Mall events and adverse weather conditions would continue. The visual blurring of the lines between the inner gravel walkways and the turf panels would persist, thereby degrading the visibility of the street and walkway pattern through the Mall, which is an important feature of the Mall cultural landscape.

The project area would continue to host numerous special events throughout the year with no special management strategies to direct the recovery time for the turf, and the soils would continue to be highly compacted, exacerbating the poor appearance of the turf panels. The periods in which the turf suffers from a patchy, beaten down, or bald appearance in numerous locations would continue and worsen if the high public use and assembly demands upon the Mall of recent years continue without recovery strategies. Large patchy or damaged areas of turf would be periodically visible from the Washington Monument base of the Capitol terrace, degrading the major axial vista of the Mall. As stated earlier, the regulations for Section 106 of the NHPA indicate that an adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic that qualifies the resource for inclusion in the National Register (e.g., diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association). The existing condition constitutes degradation over time of the overall impression the visitor receives passing through the "vast greensward" of the Mall and blurs the internal circulation structure of crisscrossing gravel paths. Despite the scale of the Mall cultural landscape, its location, design, settings, materials, workmanship, and association would suffer from a moderate long-term adverse impact due to the no action alternative.

CUMULATIVE IMPACTS

Construction of the new memorials, civil works projects, and security upgrades described at the beginning of this chapter and in Table 4.1 has the potential to impact the cultural landscapes within the project area.

Construction of the MLK Memorial, Lincoln Memorial Reflecting Pool Rehabilitation, Dwight D. Eisenhower Memorial, Potomac Park Levee Project, and Jefferson Seawall Rehabilitation would result in a negligible cumulative impact on relevant cultural landscapes due to their distance from the project area.

The NMAAHC would be constructed by 2016 on the National Mall at the southwest corner of 14th Street NW and Constitution Avenue NW, on the Washington Monument Grounds. The presence of a new building in this location would affect the vista between the U.S. Capitol, Washington Monument, World War II Memorial, and the Lincoln Memorial, creating a long-term adverse impact on cultural landscapes that would range from minor to moderate, depending on the design (which is currently in progress with the Smithsonian Institution).

Security improvements to Smithsonian museums, particularly to the Castle and the National Gallery of Art would have long-term minor adverse effects to cultural landscapes due to the visual intrusiveness of these measures.

Roadway enhancements along Constitution Avenue and Madison Drive are also planned and would have a beneficial impact on cultural landscapes since the project would utilize uniform street furnishings (such as lighting fixtures and trash receptacles) and would enhance the overall aesthetic character of these streets. The implementation of the National Mall Plan would yield beneficial impacts to cultural landscapes by establishing a sense of place and an overall identity for the National Mall, creating a coherent pedestrian environment that would complement and balance the natural environment, formal and informal features, and national commemorative works.

The recent, planned, and reasonably foreseeable projects on or around the National Mall generate aesthetic impacts to cultural landscapes that, with the exception of the NMAAHC, are primarily long-term and beneficial. The cumulative impact of these projects, when combined with the long-term minor to moderate adverse impact of the no action alternative would still be minor to moderate long-term adverse.

CONCLUSION

Under the no action alternative, there would be a long-term minor to moderate adverse effect due to the worn and distressed appearance of the turf panels and the lack of visual distinction between the turf and gravel walkways, diminishing the overall integrity of the Mall and specifically the visible structure of the street pattern. The effects from the projects on or around the National Mall generate aesthetic cumulative impacts that are primarily long-term and beneficial, with the exception of the NMAAHC, which would introduce a long-term adverse impact on cultural landscapes that would range from minor to moderate. The overall cumulative impact on cultural landscapes is long-term minor to moderate adverse.

Impacts of Alternative 2: the Action Alternative

The action alternative describes proposed improvements to rehabilitate the turf, alleviate soil compaction, and provide a comprehensive irrigation system for the turf panels in the project area and modifications of turf management strategies related to special events. Options within the action alternative explore different edge conditions (curb and gutters) at the turf panels, soil profiles, and irrigation systems.

As the CLI provides more specific information as to what is considered contributing and non-contributing to the Mall cultural landscape, a short summary is provided of those designations which appear relevant to the action alternative:

Topography: The basic perception is that the Mall is generally level, although some significant regrading was done at its western end to achieve this appearance.

Archeological Sites: No archeological surveys have been conducted for the inner Mall, but the potential exists for archeological resources.

Land Use: The Mall is intensively used for recreation, demonstrations, tourism, museum access, concerts, and public ceremonies. Pedestrians do not limit themselves to the walkways; they walk or run over the turf panels as well.

Vegetation: The central turf panels are planted with tall fescue while areas under the elms are seeded in a bluegrass mixture. However, unlike the elm trees, the CLI makes **no designation** of grass types as contributing.

Views and Vistas: It was the 1930's interpretation of the McMillan Plan that emphasized the turf panels or *tapis vert*, the eight rows of elms, and the orthogonal walks as devices to reinforce the main reciprocal vista of the U.S. Capitol Building to the Washington Monument.

- **Contributing** features include the U.S. Capitol Building to the Washington Monument vista; views to elms from walks and turf panels; views to building façades from the Mall; views up cross streets; and views from the Mall to Union Square.

Circulation: Under a subheading "Contribution of the Mall Walk System" in the CLI is the following statement: "The pattern of the Mall circulation **is** contributing. The materials of roads and walks **are not** contributing; this includes the gravel and concrete of the walkways and sidewalks, which replaced the original concrete walks in 1975 and later. Little information has been found about the historic width of roads and walks. Since the gravel was laid directly on top of the asphalt of the Inner Drives when they were converted into walks, it seems likely that the width did not change substantially (NPS 2006c)."

- **Contributing** features include: Roads and sidewalks – Jefferson Drive, Madison Drive, 3rd Street, 4th Street, 7th Street, and 14th Street; East-west walks – North Vista Walk (formerly Washington Drive); South Vista Walk (formerly Adams Drive); sidewalks along Madison and Jefferson Drives (Mall sides of drives – south side of Madison and north side of Jefferson); and Cross axial walks – 5th, 6th, 8th, 9th, 10th 12th, and 13th Streets axes.

Buildings and Structures: There are few buildings or structures on the Mall proper, and **none** are contributing.

Small-scale Features: All of the small-scale features found on the Mall—except the benches and streetlights of 1930's design—are non-contributing. It should be noted that the text of the CLI mentions small-scale features such as tan-colored brick edging around some elms and black steel edging around turf panels in a way that suggests they are non-contributing.

CURB AND GUTTER OPTIONS

Three curb and gutter options under consideration deal with the edge conditions of the turf panels and the separation between the walkways and turf. Nothing in the documentation of the Mall as a cultural landscape indicates that any of the three options is more in keeping with the historic context than any other. In fact, there is clear indication that the details of the curb and gutter options are not historically sensitive. All curb and gutter options support the spatial organization and dimensional relationships of the 1930's landscape design which is important for views and vistas. (See above excerpt from the CLI).

The CLI designates all of the historic circulation system from the 1930s as contributing roads and sidewalks, east-west walks, and cross axial walks. Therefore, the separation of gravel and turf along all non-social pathways contributes to the visitor perception of the great axis along the Mall between the U.S.

Capitol Building and the Lincoln Memorial and the overall integrity of the Mall. Therefore, the curb and gutter installation would be a long-term beneficial impact to the Mall as a cultural landscape.

SOIL RECONSTRUCTION PROFILES

There would be a beneficial long-term effect on the cultural resources within the project area resulting from the implementation of any soil profile reconstruction option. Each option would introduce enhancements to the soils in the project area, alleviating the effects of compaction to support healthier and more visually appealing turf panels. The CLI notes the past use of tall fescue on the turf panels but does not designate it as contributing. The CLI's General Management Information contains a section of "Condition Assessment and Impacts" which recognizes the Mall's soil compaction, erosion, and drainage issues and provides justification for the action alternative.

IRRIGATION OPTIONS

There would be a beneficial long-term effect on the Mall as a cultural landscape resulting from the installation of water irrigation valves at numerous points along the turf panels. The valves are too small to be visually detected; however, the contribution to maintaining the appropriate appearance of a greensward would be positive.

For similar reasons, there would be beneficial long-term effects on the Mall as a cultural landscape, resulting from the implementation of any of the options for water supply for the irrigation system. The design of the on-site drainage collection system would be integrated into the comprehensive curb and gutter system for each turf panel and would not be visually conspicuous. Options for stormwater runoff from areas adjacent to the project area would have no visual effect since the conveyance infrastructure would be located underground.

There would be no long-term effect resulting from the implementation of any of the options for subsurface storage structures for the irrigation system since neither the concentrated nor distributed systems would be visible.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

There would be a beneficial long-term effect on cultural landscapes within the project area resulting from the implementation of turf management strategies related to special events that would address the intensity of use within the project area and that would incorporate turf recovery periods. A comprehensive management plan would alleviate the effects of prolonged soil compaction and would enable consistently healthier and more visually appealing turf panels.

SHORT-TERM IMPACTS

There would be short-term minor to moderate adverse effects during construction due to the visual disturbance of the project area and compromised views along the grand axis and from the Washington Monument, which would diminish overall integrity of the aesthetic environment.

CUMULATIVE IMPACTS

As indicated above, projects in Table 4.1 have the potential to combine with the alternatives addressed in this EA to create cumulative impacts.

Impacts to cultural landscapes from cumulative actions would be similar to those under the no action alternative, resulting in primarily long-term beneficial impacts, with the exception of the NMAAHC which would introduce an adverse long-term impact, ranging from minor to moderate, depending on the design. When combined with the overall long-term beneficial impacts associated with the action alternative, there would be a beneficial cumulative effect on these resources. Construction activity

resulting from these projects would result in a short-term moderate adverse cumulative effect on historic districts and structures depending on the duration and extent of construction.

CONCLUSION

Under the action alternative, there would be a long-term beneficial effect to cultural landscapes due to the improvement of the worn and distressed appearance of the turf panels and the lack of visual distinction between the turf and gravel walkways, which diminishes the overall integrity of the Mall and specifically the visible structure of the street pattern. These long-term beneficial effects are created by all curb and gutter options, all soil reconstruction profiles, and the turf management modifications related to special events. The effects of the irrigation options are negligible in their visual impact but moderate long-term beneficial in that improved drainage contributes to the appearance of the Mall as a *tapis vert*.

There would be short-term minor to moderate adverse effects during construction of all physical components of the action alternative due to the visual disturbance of the project area and compromised views along the grand axis and from the Washington Monument, diminishing the overall integrity of the aesthetic environment.

The projects on or around the National Mall generate cumulative cultural resource impacts that are primarily long term and beneficial, with the exception of the NMAAHC, which would introduce a long-term adverse impact on cultural landscapes.

Archeological Resources

METHODOLOGY AND ASSUMPTIONS

As archeological resources exist essentially in subsurface contexts, potential impacts to archeological resources are assessed according to the extent to which the proposed alternatives would involve ground-disturbing activities such as excavation or grading. Analysis of possible impacts to archeological resources was based on a review of previous archeological studies, consideration of the proposed design concepts, and other information provided by the NPS.

STUDY AREA

The APE for archeological resources is broadly defined to extend between 14th and 3rd Streets NW and bounded on the north and south by Constitution and Independence Avenues. While much of the proposed work would focus on the turf panels bounded by Madison and Jefferson Drives, some elements of the project – particularly elements of the irrigation system such as water lines, electrical lines, and water storage features – may involve ground-disturbing activities beyond the turf panels.

IMPACT THRESHOLDS

Impacts to archeological resources occur when the proposed alternative results in whole or partial destruction of the resource, which is termed a loss of integrity in the context of Section 106. Impact thresholds for archeological resources consider both the extent to which the proposed alternative results in a loss of integrity and the degree to which these losses can be compensated by mitigating activities, such as preservation or archeological data recovery. The process begins with assessment of a resource according to its eligibility for the NRHP, as only sites considered significant enough for listing on the NRHP are protected by federal regulations.

Under federal guidelines, resources are eligible for the NRHP if they possess integrity and if they meet one or more of the criteria of eligibility for inclusion in the NRHP. Most archeological resources found eligible for the NRHP are significant under criterion D because they have the potential to provide important information about the history or prehistory of a location. However, in some circumstances, archeological resources might be found significant because (1) they are associated with events that have made a significant contribution to the broad patterns of our history (NRHP criterion A), or (2) because they are associated with the lives of persons significant in our past (NRHP criterion B), or (3) because they define the distinctive characteristics of a type, period, or method of construction (NRHP criterion C). In some cases, archeological resources should be considered not only in terms of criterion D, but also with respect to criteria A and B (see *National Register Bulletin #15, How to Apply the National Register Criteria for Evaluation*).

For purposes of analyzing impacts to archeological resources, thresholds of change for the intensity of an impact are based on the foreseeable loss of integrity. All of these discussions consider only the direct impacts of construction because operation of the facilities should have no ground-disturbance activities and no additional effect on archeological resources under any of the alternatives under consideration. All impacts are considered long term (i.e., lasting longer than the period of construction).

IMPACT THRESHOLDS

Negligible: Impact is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for Section 106 would be no adverse effect.

Minor: Disturbance of a site(s) results in little, if any, loss of integrity. For purposes of Section 106, the determination of effect would be no adverse effect.

Moderate: Disturbance of a site(s) results in loss of integrity to the extent that there is a partial loss of the character-defining features and information potential that form the basis of the site's NRHP

eligibility. Mitigation is accomplished by a combination of archeological data recovery and in-place preservation. The determination of effect for Section 106 would be adverse effect.

Major: Disturbance of a site(s) results in loss of integrity to the extent that it is no longer eligible for the NRHP. Its character-defining features and information potential are lost to the extent that archeological data recovery is the primary form of mitigation. The determination of effect for Section 106 would be adverse effect.

Beneficial: No levels of intensity for beneficial impacts are defined. Beneficial impacts can occur under the following scenarios: when an archeological site is stabilized in its current condition to maintain its existing level of integrity or when an archeological site is preserved in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1992), to accurately depict its form, features, and character as it appeared during its period of significance. For purposes of Section 106, a beneficial effect is equivalent to no adverse effect.

Duration: Short-term impacts would last for the duration of construction activities associated with the proposed alternative; long-term impacts would last beyond the construction activities. All impacts to archeological resources are considered long term.

Impacts of Alternative 1: the No Action Alternative

Under the no action alternative, there would be no impacts to archeological resources, as the current practices regarding visitor use and operations and maintenance would continue. The current irrigation system would remain, and the seasonal schedule for aeration, fertilization, and overseeding would continue. New topsoil would be added to low-lying areas as needed to improve drainage. As none of these activities would involve significant ground-disturbing activities, existing archeological resources would remain undisturbed.

CUMULATIVE IMPACTS

Although other past, present, and reasonably foreseeable future actions may affect archeological resources, the no action alternative would have no impacts on archeological resources. Because there is no impact to archeological resources as a result of the no action, it would not contribute to the overall cumulative effect on archeological resources.

CONCLUSION

Implementation of the no action alternative would result in no direct, indirect, beneficial or adverse impacts to archeological resources in the study area. Consequently, the no action alternative would not contribute to the overall cumulative effect on archeological resources.

Impacts of Alternative 2: the Action Alternative

The action alternative includes a variety of options under consideration for turf rehabilitation, alleviation of soil compaction, and comprehensive irrigation of the turf panels. The various options for curbing, soil profile amendment, and irrigation differ in the degree to which they might result in impacts to archeological resources, so their effects are evaluated individually.

CURB AND GUTTER

The various treatments under consideration for curbs and gutters (radii versus 90-degree corners; sloped, block, or check-marked profile) would all be expected to have negligible to minor impacts on archeological resources. All treatments under consideration would involve simple replacement of the existing curb and gutter features, so the expected ground disturbance required would be essentially limited to areas that have been disturbed by the installation, repair, and replacement of earlier curbs and gutters or by previous landscaping. Ground disturbance associated with construction of the new curb and gutter features would be relatively narrow and shallow (less than 3 feet below current grade), so no appreciable loss of integrity to archeological resources that might be present in surface or near-surface contexts is assumed. Therefore, all of the curb and gutter options would result in negligible to minor impacts to archeological resources.

SOIL PROFILE AND RECONSTRUCTION

The options under consideration involve varying degrees of soil removal/replacement or the addition of new material (primarily sand) that would alleviate compaction and improve drainage. Option B1 (preferred) would involve the removal of the uppermost one foot (12 inches) of existing soil and the fracturing of the soil profile to a depth of 18 to 24 inches below the current grade. Impacts to archeological resources in surface or near-surface contexts could result from this process, especially the outright removal of soil. To the extent that archeological features or deposits are present in the upper 12 inches of soil, the impacts could vary widely, ranging from negligible to major. It is assumed that the upper 12 inches of soil has already been disturbed by previous landscaping, so actual impacts to archeological resources are assumed to be negligible or minor since most archeological resources are likely buried beneath at least one foot of fill soil. Option B2 would involve the addition and mixing of sand into the upper 18 inches of the existing profile. This process could result in impacts to archeological features or deposits that are present in the surface or near-surface contexts, but the impacts would be less harmful than outright removal of soil. The mixing of sand would result in relatively minor displacement of features and artifacts associated with archeological resources in the study area; therefore, the impacts might range from negligible to minor. Option B3 would require the removal of the uppermost 20 to 26 inches of existing soil, followed by its replacement by new material. Archeological resources in surface or near-surface contexts might be completely lost, depending on the degree to which their associated features or deposits existing above or below the depth of soil removal. Partial loss of archeological sites under this scenario would range from minor to moderate, and the complete loss of archeological resources would be a moderate impact.

IRRIGATION SYSTEM DISTRIBUTION

Each component of the irrigation system (water distribution, water supply, and water storage) would require some degree of ground disturbance that could result in possible impacts to archeological resources.

The water distribution options would all require a network of water supply lines across the turf panels. Option C1 would require installation of a single row of quick couplers along the central axis of the turf panels; Option C2 would require two rows of automatic high-pressure sprinklers along the edges of the turf panels; and Option C3 and Option C4 (preferred) require three rows of sprinklers or quick couplers, arrayed along the central axis and edges of the turf panel. For all options, the supply lines would be placed at a depth of at least 4 feet below existing grade, the depth necessary to prevent damage from tent spikes. Archeological resources within 4 feet of the ground surface could be impacted by installation of the water supply lines. The largest supply pipes – those nearest the pump station – would be 16 inches in diameter, and smaller pipes would be used in the areas of the network near the sprinkler heads or couplers. The installation trenches necessary to install the supply lines would require excavations on the order of 2 feet wide near the pump station, while the smallest pipes might require a trench of 1 foot wide

or smaller. Among the various options, Option C1, with a single row of quick couplers would require relatively less trenching in comparison to Options C2, C3 and C4, which would require two or three rows of sprinklers or quick couplers. The level of impact from installation of the supply lines might range from negligible to minor, given the narrow width of the trenches necessary to install the water lines.

One or two pump stations would be installed, either a single pump station in the center of the project area or two pump stations, one at each end of the project area. If the single pump station option is chosen, one or more lift pump stations might also be needed to convey water through the distribution system. A pump station would require an excavation on the order of 500 cubic yards of soil to install an underground vault approximately 18 by 20 feet wide by 10 feet high, along with electrical supply lines, which would require excavation of a narrow utility trench. Depending on its location, installation of the pump station vault could have an adverse impact on archeological resources, which could range from negligible to moderate.

The water supply options vary according to the primary water source. All of the options for use of rainwater or stormwater would be supplemented by potable water from the existing city distribution system, so a tie-in to existing water mains would be required. New supply lines from existing water mains would require an excavation trench, which could potentially result in an impact to archeological resources; these impacts could range from negligible to minor, as it is assumed that impacts would be confined to relatively narrow trenches, approximately 8 to 12 feet wide.

Option D1 would require grading of the turf panels to direct rainwater and stormwater toward the curb where it would be conveyed to catchment areas, using a network of underground pipes that would feed the water storage system. Option D2 would capture runoff rainwater from the roofs of adjacent buildings or would capture water from deep basements and tunnels to direct stormwater into new drain lines that would feed the storage system. Each of these systems would require a network of drainage or supply pipes and possibly a lift pump station, which in turn would require electrical power. Archeological resources might be negatively impacted by excavations necessary to install the supply pipes and associated facilities. The impacts could range from negligible to minor, depending on the location of the facilities and based on the assumption that supply line trenches would be no larger than 8 to 12 feet wide and any lift stations would not require excavations larger than 500 cubic yards of soil.

For water storage, each of the options would require a system with a capacity of 1MG. This would be achieved by a concentrated storage system (cisterns) in Options E1 and E2 (preferred). The concentrated storage systems would use either prefabricated concrete pipe culverts (Option E1) or concrete boxes (Option E2) that would be installed beneath the north-south walkways and the turf panels. The distributed storage system would use a system of basins beneath the turf panels that would be lined with impervious geotextile material or clay. Among the various components of the irrigation system, the water storage options have the greatest risk of adverse impacts to archeological resources, based on the large size of the excavations necessary for their installation. Excavations necessary to install the water storage structures would require approximately 15,000 to 20,000 cubic yards of soil, depending on the option chosen. With regard to archeological resources, excavations on this scale could result in impacts that range from negligible to moderate, depending on the siting of the storage structure.

A geoaicheological study (LeeDecker and Wagner 2010) was completed for the four proposed cistern locations and the pump station, and this study found that two of the cistern locations may contain deeply buried, ancient landscape surfaces that could have been used by Native American groups during the paleoindian period. While the presence of a Native American archeological site at either of these locations is extremely unlikely, NPS will conduct additional geoaicheological investigation at the two cistern locations, to more delineate and characterize the possible landscape surface. This study will be carried out immediately prior to construction, because it will require mechanical trenching.

As the presence of NRHP-eligible archeological resources is not known, and because final designs are not yet available, only general plans or strategies for mitigation of adverse effects on archeological resources

can be identified at this time. NPS' preferred mitigation strategy is to avoid any disturbance to archeological sites by the siting of the project components – especially water storage features – in areas that are known to have been previously disturbed to the extent that precludes preservation of NRHP-eligible archeological resources. While there is some degree of latitude in the placement of the water storage features, there is less design latitude in the routing of the various supply lines, drainage lines, and pump stations.

The preliminary results of the geoarcheological study have been shared in consultation with the DC SHPO. The NPS will continue to coordinate with the DC SHPO on any further archeological investigation or mitigation if necessary.

TURF MANAGEMENT RELATED TO SPECIAL EVENTS

There would be no impacts to archeological resources as a result of modification of turf management related to special events.

CUMULATIVE IMPACTS

Few, if any, past, present and future projects in the project area would have any cumulative effect on archeological resources. Several of these projects involve ground-disturbing activities that would be confined to surface and near-surface contexts where there is negligible likelihood that archeological resources exist: Reflecting Pool Rehabilitation, Constitution Avenue street improvements; and Madison Drive street improvements.

The security upgrades to the National Museum of American History, the National Museum of Natural History, and the National Gallery of Art required ground-disturbing activities in areas adjacent to existing buildings, and as these past and present projects have not resulted in any unanticipated archeological discoveries, it is assumed that they were limited to areas that have been previously disturbed to the extent that would preclude preservation of significant archeological resources.

Two of the projects will occur entirely within areas of made land that consist of redeposited river silts from the Potomac River bottom: Jefferson Memorial Seawall Rehabilitation and the MLK Memorial. The NMAAHC site has been studied for possible impacts to archeological resources (LeeDecker, Fiedel, and Bedell 2007; LeeDecker, Kraus, and Kuhn 2008), but these studies concluded that no NRHP-eligible sites are present in that site. Future construction of the Potomac Park Levee could have an adverse effect on archeological remains of the 17th Street Wharf (LeeDecker and Baynard 2009); however, since that potential archeological resource is not present in the APE associated with the action alternative no cumulative impacts are anticipated. Construction of the Dwight D. Eisenhower Memorial will occur in an area that could contain domestic archeological deposits comparable to those expected in the APE for the action alternative; however, the presence of specific archeological resources is speculative at this time, so it is not possible to identify any cumulative impacts on archeological resources.

The National Mall Plan itself would not require any ground-disturbing activities, so it would not have any effect on archeological resources.

These past, present, and reasonably foreseeable future projects would have no cumulative effect on archeological resources within the project area.

CONCLUSION

A range of ground-disturbing activities associated with the action alternative could result in adverse impacts to archeological resources. All impacts to archeological resources would be adverse and long term. However, as the presence of NRHP-eligible archeological resources is speculative at this time, it is not possible to characterize the intensity of these possible impacts. NPS will mitigate any impacts to NRHP-eligible archeological resources by completing a detailed geoarcheological study that will focus on the possible ancient, buried landscape that may be preserved at two of the proposed cistern locations. It is highly unlikely that any NRHP-eligible archeological sites are preserved at either location. Impacts to archeological resources would be non-existent if there are no archeological resources in the APE, or they could range from negligible to minor (no adverse effect under Section 106) or moderate (adverse effect under Section 106), if archeological resources are present. These impacts would be mitigated by a program of archeological documentation that would be developed in consultation with the DC HPO and implemented prior to construction or during construction by means of a construction monitoring program. There are no cumulative impacts to archeological resources associated with the action alternative, nor is the action alternative likely to result in any impacts that would constitute impairment of archeological resources.

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CHAPTER 5: CONSULTATION AND COORDINATION

The NPS places a high priority on public involvement in the NEPA process and on giving the public an opportunity to comment on proposed actions. As part of the NPS NEPA process, issues associated with the proposed action were identified during the internal scoping meeting held with NPS and have been communicated to other affected agencies and stakeholders.

Consultation

Coordination with local and federal agencies and various interest groups was conducted during the NEPA process to identify issues and/or concerns related to the proposed turf and soil reconstruction on the National Mall. In accordance with Section 7 of the Endangered Species Act, consultation letters were sent from the NPS to the USFWS; the District of Columbia Department of the Environment (DDOE), Fisheries and Wildlife Division; and the District Department of Health, Environmental Health Administration, on June 2, 2010. No responses were received, but based on similar projects recently undertaken on the National Mall, no rare, threatened, or endangered species or habitat known or expected to occur in the project area.

Section 106 letters to the DC HPO and ACHP were sent on June 2, 2010. Throughout the Section 106 review process the NPS will consult with the ACHP, the DC HPO, and representatives of state and local governments, agencies, organizations, and the general public. Due to the potential for adverse effects on archeological resources, NPS will conduct an additional geoarcheological study to identify a possible buried ancient landscape surface that may contain archeological resources. Depending on the results of that study, NPS will consult with DC HPO to develop a program for archeological documentation that would be completed prior to or during construction.

Correspondence from the U.S. Commission of Fine Arts (CFA) was received on May 28, 2010 stating the concept submission for this project was reviewed and approved at its meeting on May 20, 2010. The CFA had several comments regarding the proposed actions including a preference for granite curbs over pre-cast concrete, minimizing the width of the curbs, reducing the radius of the corners, only using center and edge waterlines, and considering biodiversity when selecting plant materials for the project.

Correspondence from the National Capital Planning Commission (NCPC) was received on May 27, 2010. In this letter, the NCPC commented favorably on the concept design for the project with the recommendation that the curbs be constructed of granite and that the NPS should continue consultation regarding the dimensions of the curb radius as the design develops further.

Comment Period

To comment on this EA, you may mail comments or submit them online within 30 days of the publication of this EA. Please be aware that your comments and personal identifying information may be made publicly available at any time. While you may request that NPS withhold your personal information, we cannot guarantee that we will be able to do so. Preferred method: Online at <http://parkplanning.nps.gov/NAMA> and follow the appropriate links. Comments may also be submitted via mail addressed to:

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Acronyms

Advisory Council on Historic Preservation	(ACHP)
Americans with Disabilities Act	(ADA)
American Veterans Disabled for Life Memorial	(AVDLM)
Architectural Barriers Act	(ABA)
Architectural Barriers Act Accessibility Standard	(ABAAS)
Area of Potential Effect	(APE)
U. S. Commission of Fine Arts	(CFA)
Code of Federal Regulations	(CFR)
Council on Environmental Quality	(CEQ)
Cultural Landscape Inventory	(CLI)
Director's Order	(DO)
District of Columbia Department of the Environment	(DDOE)
District of Columbia Historic Preservation Office	(DC HPO)
District of Columbia Water and Sewer Authority	(DC Water)
Environmental Assessment	(EA)
Federal Capital Improvements Program	(FCIP)
Finding of No Significant Impact	(FONSI)
General Services Administration	(GSA)
Leadership in Energy and Environmental Design	(LEED)
Martin Luther King, Jr.	(MLK)
Million gallons	(MG)
National Capital Region	(NCR)
National Capital Planning Commission	(NCPC)
National Environmental Policy Act	(NEPA)
National Historic Landmark	(NHL)
National Historic Preservation Act	(NHPA)
National Mall and Memorial Parks	(NAMA)
National Museum of African American History and Culture	(NMAAHC)
National Park Service	(NPS)
National Parks Omnibus Management Act	(NPOMA)
National Register of Historic Places	(NRHP)
Northwest	(NW)
Polyvinyl Chloride	(PVC)
Planning, Environment, and Public Comment website	(PEPC)
Southwest	(SW)
State Historic Preservation Officer	(SHPO)
Traditional Cultural Property	(TCP)
United States Army Corps of Engineers	(USACE)
United States Fish and Wildlife Service	(USFWS)

Key Word Glossary

Affected Environment — The existing environment to be affected by a proposed action and alternatives.

Alignment — The arrangement or relationship of several disparate components along a common vertical or horizontal line or edge.

Anthropic — Of or relating to humans and the era of human life.

Best Management Practices — Methods that have been determined to be the most effective, practical means of preventing or reducing pollution or other adverse environmental impacts.

Cistern – A waterproof receptacle that holds water and is built to catch and store rainwater.

Contributing Resource — A building, site, structure, or object that adds to the historic significance of a property or district.

Council on Environmental Quality — Established by Congress within the Executive Office of the President with passage of the National Environmental Policy Act (NEPA) of 1969. CEQ coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives.

Core Aeration — Method by which air is circulated through soil. Core aeration involves the removal of approximately 1-inch to 2-inch cores of soil from the ground to reduce turf compaction and to improve water and nutrient infiltration.

Cultural Landscape – Environments that include natural and cultural resources associated with a historical context.

Cultural Resources — Prehistoric and historic districts, sites, buildings, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reason.

Culvert – A device used to channel water.

Cumulative Impacts — Under NEPA regulations, the incremental environmental impact or effect of an action together with the effects of past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions (40 CFR Part 1508.7).

Dewatering — A term used to describe the process of removing water from a location where it is not wanted or needed.

Enabling Legislation — Legislation that gives appropriate officials the authority to implement or enforce the law.

Endangered Species — Any species that is in danger of extinction throughout all or a significant portion of its range. The lead federal agency for the listing of a species as endangered is the U.S. Fish and Wildlife Service, and it is responsible for reviewing the status of the species on a five-year basis.

Environmental Assessment — An environmental analysis prepared pursuant to NEPA to determine whether a federal action would significantly affect the environment and thus require a more detailed environmental impact statement (EIS).

Executive Order — Official proclamation issued by the President that may set forth policy or direction or establish specific duties in connection with the execution of federal laws and programs.

Fescue – Grass with wide flat leaves cultivated in Europe and America for permanent pasture, hay, and for lawns.

Floodplain — The flat or nearly flat land along a river or stream or in a tidal area that is covered by water during a flood.

Impairment — Within this document, the term impairment has two separate definitions. The NPS requires an analysis of potential effects to determine whether actions would impact or impair Park resources. NPS is empowered with the management discretion to allow impacts on Park resources and values (when necessary and appropriate) to fulfill the purposes of a Park, as long as the impact does not constitute impairment of the affected resources and values. Impairment is also a classification of poor water quality for a surface water body under the U.S. Clean Water Act.

Mall — The area west of the United States Capitol between Madison and Jefferson Drives from 1st to 14th Streets NW/SW. The east end of the Mall from 1st to 3rd Streets NW/SW between Pennsylvania Avenue and Maryland Avenue is also known as Union Square. The Mall is characterized by the east-west stretch of lawn bordered by rows of American elm trees.

Monumental Core — The Monumental Core currently includes the National Mall and the areas immediately beyond it, including the United States Capitol, the White House and President’s Park, Pennsylvania Avenue and the Federal Triangle area, East and West Potomac Parks, the Southwest Federal Center, the Northwest Rectangle, Arlington Cemetery, and the Pentagon.

National Environmental Policy Act (NEPA) — The act as amended, articulates the federal law that mandates protecting the quality of the human environment. It requires federal agencies to systematically assess the environmental impacts of their proposed activities, programs, and projects including the “no action” alternative of not pursuing the proposed action. NEPA requires agencies to consider alternative ways of accomplishing their missions in ways which are less damaging to the environment.

National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.) — An Act to establish a program for the preservation of historic properties throughout the nation, and for other purposes, approved October 15, 1966 [Public Law 89-665; 80 STAT. 915; 16 U.S.C. 470 as amended by Public Law 91-243, Public Law 93-54, Public Law 94-422, Public Law 94-458, Public Law 96-199, Public Law 96-244, Public Law 96-515, Public Law 98-483, Public Law 99-514, Public Law 100-127, and Public Law 102-575].

National Mall — The area comprised of the Mall, the Washington Monument, and West Potomac Park. It is managed by the NPS’ National Mall and Memorials Parks.

National Register of Historic Places (NRHP) — A register of districts, sites, buildings, structures, and objects important in American history, architecture, archeology, and culture, maintained by the Secretary of the Interior under authority of Section 2(b) of the Historic Sites Act of 1935 and Section 101(a)(1) of the National Historic Preservation Act of 1966, as amended.

Power Slit Seeding — Method of seeding that slits the ground and drops seeds into the slit giving them better soil-to-seed contact and protecting them from animals and the elements.

Quick Coupler System — Fittings on the irrigation system heads that allow for easy and fast manual attachment of hoses or sprinklers.

Sand Soil — Soil that has been modified with processed sand that has very limited particle size. This soil is commonly used to support turf on professional sports fields and golf courses.

Scoping — Scoping, as part of NEPA, requires examining a proposed action and its possible effects; establishing the depth of environmental analysis needed; and determining analysis procedures, data needed, and task assignments. The public is encouraged to participate and submit comments on proposed projects during the scoping period.

Slice Aeration — Method by which air is circulated through the soil. Slice aeration punctures the soil with spikes, up to a foot or more in length, and helps address drainage issues and reduce soil compaction.

Social Trail — An unofficial trail that diverges from an existing trail, as a shortcut to a destination. A social trail usually cuts through a vegetative or natural barrier, such as woods, scrubs, grass fields, or berms.

Threatened Species — Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Turf Panels — For this project, the turf panels are the rectangular areas of lawn on the National Mall that lay on the centerline of the east-west axis of the Mall.

Viewshed — A viewshed includes a total visible area from a particular fixed vantage point.

Vista— A distant or long view, especially one seen through some opening such as an avenue or trees that form an avenue; a site offering such a view.

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APPENDIX **A**: DRAFT IMPAIRMENT DETERMINATION

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The Prohibition on Impairment of Park Resources and Values

NPS Management Policies 2006, Section 1.4.4, explains the prohibition on impairment of park resources and values:

While Congress has given the Service the management discretion to allow impacts within parks, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the Nation Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

What is Impairment?

NPS *Management Policies 2006*, Section 1.4.5, *What Constitutes Impairment of Park Resources and Values*, and Section 1.4.6, *What Constitutes Park Resources and Values*, provide an explanation of impairment.

Impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values.

Section 1.4.5 of *Management Policies 2006* states:

An impact to any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

Per Section 1.4.6 of *Management Policies 2006*, park resources and values that may be impaired include:

- the park's scenery, natural and historic objects, and wildlife, and the processes and condition that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;

- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
- the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and
- any additional attributes encompassed by the specific values and purposes for which the park was established.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park, but this would not be a violation of the Organic Act unless the NPS was in some way responsible for the action.

How is an Impairment Determination Made?

Section 1.4.7 of *Management Policies 2006* states, "[i]n making a determination of whether there would be an impairment, an NPS decision maker must use his or her professional judgement. This means that the decision-maker must consider any environmental assessments or environmental impact statements required by the National Environmental Policy Act of 1969 (NEPA); consultations required under Section 106 of the National Historic Preservation Act (NHPA); relevant scientific and scholarly studies; advice or insights offered by subject matter experts and others who have relevant knowledge or experience; and the results of civic engagement and public involvement activities relating to the decision.

NPS Management Policies 2006 further define "professional judgment" as "a decision or opinion that is shaped by study and analysis and full consideration of all the relevant facts, and that takes into account the decision-maker's education, training, and experience; advice or insights offered by subject matter experts and others who have relevant knowledge and experience; good science and scholarship; and, whenever appropriate, the results of civic engagement and public involvement activities relation to the decision

Impairment Determination for the Preferred Alternative

This determination on impairment has been prepared for the preferred alternative described in Chapter 2 of this EA. An impairment determination is made for all resource impact topics analyzed for the preferred alternative. An impairment determination is not made for visitor use and experience, public safety, or Park management and operations because impairment findings relate back to park resources and values, and these impact areas are not generally considered to be park resources or values according to the Organic Act, and cannot be impaired in the same way that an action can impair park resources and values.

The NPS has determined that implementation of the preferred alternative will not result in impairment of park resources and values of the National Mall and Memorial Parks. In reaching this determination, the reconstruction of the turf and soil on the National Mall EA was reviewed to reaffirm the Park's purpose and significance, resource values, and resource management goals and desired future conditions. Based on a thorough analysis of the environmental impacts described in this EA, the public comments received, and the application of the provisions of the NPS Management Policies 2006, the NPS concluded that the implementation of the preferred alternative will not result in impairment of any of the resources and values of the National Mall and Memorial Parks. Although the action alternative entails physical changes to the National Mall and Memorial Parks, the preferred alternative would have beneficial impacts to the

project area's natural resources, would not alter historic fabric, and would be in keeping with NPS management policies and goals.

Findings on Impairment for the Reconstruction of the Turf and Soil on the National Mall

PREFERRED ALTERNATIVE

Utilities and Infrastructure - The preferred alternative would not result in impairment of utilities and infrastructure because all curb and gutter, soil profile, and irrigation system options would result in long-term beneficial impacts to the District of Columbia's stormwater and combined sewer system. Improved drainage and reduced soil compaction would decrease stormwater runoff and reuse of captured water would eliminate the reliance on the municipal system for primary service.

Soils – The preferred options under the action alternative would temporarily removed soil from the project area, it would not result in impairment of soils. The preferred alternative would create the least alteration of the existing soil resources and would result in less-compacted soil that would most closely resemble the original soil. Furthermore, this alternative would add amendments and products to resist compacting forces and to aid in holding moisture resulting in long-term beneficial impacts to the soil resources in the project area. Although the proposed irrigation option, water supply option, and water storage option would result in soil disturbance and excavation, these results would only occur during construction, would be short-term, and would not harm the long-term integrity of the soils resources in the project area.

Vegetation –The preferred alternative would not result in impairment to vegetation in the project area because the curb and gutter, soil reconstruction, and irrigation system options would have long-term beneficial impacts to the turf. Implementation of the preferred alternative would reduce soil compaction, help the turf and soil resist compaction forces, provide consistent watering, and ensure effective water absorption, all of which would help to maintain a healthier and more visually appealing turf stand.

Visual Resources - The preferred alternative would not result in impairment of visual resources because the proposed curb and gutter profile, soil profile, and irrigation system this alternative would result in more clearly defined turf panels with healthier, more visually appealing turf stands. Although there would be some disruptions to visual resources during construction, these impacts would be short-term and would not impair the long-term integrity of the visual resources.

Cultural Resources - The preferred alternative would not result in impairment of cultural resources because the preferred alternative would improve the overall integrity of the Mall and specifically the visible structure of the street pattern (L'Enfant Plan) and the appearance of the Mall as a *tapis vert*. Construction would diminish the overall integrity of the aesthetic environment in the short term, but there would be no long impairment to the historic structures and districts or cultural landscapes in the project area.

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APPENDIX **B**: CONSULTATION AND CORRESPONDENCE

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United States Department of the Interior

NATIONAL PARK SERVICE
National Mall & Memorial Parks
900 Ohio Drive, S.W.
Washington, D.C. 20024-2000



JUN 2 2010

D66 (NCR-NAMA)

Mr. John Wolflin
U.S. Fish and Wildlife Service
177 Admiral Cochrane Drive
Annapolis, Maryland 21401

Dear Mr. Wolflin:

The National Park Service (NPS) is preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), as amended, on the National Mall Turf and Soil Reconstruction Project. The project area is within the National Mall in Washington, D.C., specifically the center grass panels of the Mall, which are bounded by pedestrian walkways north and south, 14th Street NW on the west and 3rd Street, NW on the east. Immediately adjacent are the Smithsonian Institution museums, the National Gallery of Art, the Washington Monument grounds, and the U.S. Capitol Building.

As one of the most popular national tourist destinations, the project area is one of the most used public areas in the District of Columbia for national celebrations, First Amendment demonstrations, special events, and recreation with an annual visitorship of nearly 25 million. However, due to intense use, the turf panels on the Mall have deteriorated. Action is needed to address the management of this civic space to alleviate the intense soil compaction and enable proper air, water and nutrient infiltration. Reducing soil compaction will also improve site drainage, stormwater management, and the condition of turf. To support the new turf system, the current irrigation system needs to be replaced because it has been compromised by the intense use and does not adequately service the project area.

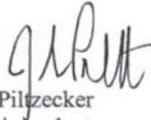
The EA presents a range of alternatives to improve the vegetation and soils on the Mall by removing and replacing the existing soil on the center grass panels, better defining the edges of the grass panels, and replacing the irrigation system.

We are writing you to request a list of federally listed species that may be impacted by this proposed project, and to initiate informal Section 7 consultation. Because of its location in a highly urbanized environment in downtown Washington, DC, it is unlikely that the proposed improvements will affect any federally listed or locally sensitive species. However, we would appreciate written confirmation from your office. A letter is also being sent to the D.C. Department of the Environment to solicit their input.



If you have any questions or require additional information, please contact me or Mark Isaksen, Chief of Resource Management, National Mall and Memorial Parks at (202) 245-4711 or by e-mail at mark_isaksen@nps.gov. Thank you in advance for your assistance.

Sincerely,



John Piltzecker
Superintendent
National Mall and Memorial Parks

Enclosure

cc. Jill Cavanaugh, The Louis Berger Group, Inc.



D66 (NCR-NAMA)

United States Department of the Interior

NATIONAL PARK SERVICE
National Mall & Memorial Parks
900 Ohio Drive, S.W.
Washington, D.C. 20024-2000



JUN 2 2010

Mr. Brian D. King
Associate Director
Wildlife Management Branch
Fisheries & Wildlife Division
DC Department of the Environment
51 N Street NE
Washington, DC 20002

Dear Mr. King:

The National Park Service (NPS) is preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), as amended, on the National Mall Turf and Soil Reconstruction Project. The project area is within the National Mall in Washington, D.C., specifically the center grass panels of the Mall, which are bounded by pedestrian walkways north and south, 14th Street NW on the west and 3rd Street, NW on the east. Immediately adjacent are the Smithsonian Institution museums, the National Gallery of Art, the Washington Monument grounds, and the U.S. Capitol Building.

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The EA presents a range of alternatives to improve the vegetation and soils on the Mall by removing and replacing the existing soil on the center grass panels, better defining the edges of the grass panels, and replacing the irrigation system.

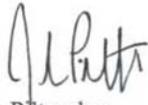
We are writing you to request a list of federally listed species that may be impacted by this proposed project, and to initiate informal Section 7 consultation. Because of its location in a highly urbanized environment in downtown Washington, DC, it is unlikely that the proposed improvements will affect any federally listed or locally sensitive species. However, we would appreciate written confirmation from your office. A letter is also being sent to the U.S. Fish and Wildlife Service to solicit their input.



CONSULTATION AND COORDINATION

If you have any questions or require additional information, please contact me or Mark Isaksen, Chief of Resource Management, National Mall and Memorial Parks at (202) 245-4711 or by e-mail at mark_isaksen@nps.gov. Thank you in advance for your assistance.

Sincerely,

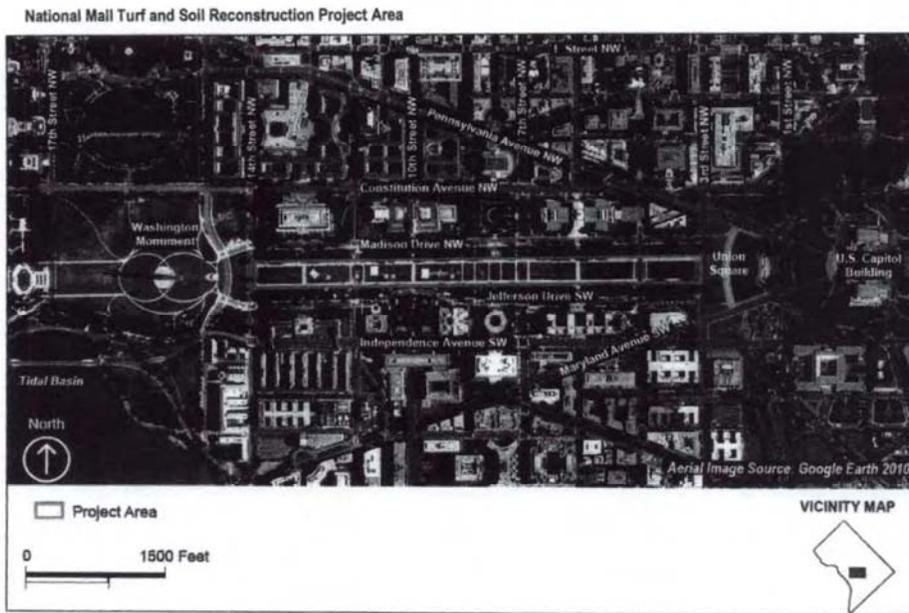


John Piltzecker
Superintendent
National Mall and Memorial Parks

Enclosure

cc. Jill Cavanaugh, The Louis Berger Group, Inc.

Correspondence Enclosure





United States Department of the Interior

NATIONAL PARK SERVICE
National Mall & Memorial Parks
900 Ohio Drive, S.W.
Washington, D.C. 20024-2000



D66 (NCR-NAMA)

JUN 2 2010

Mr. Reid Nelson
Director
Office of Federal Agency Programs
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue, N.W., Suite 803
Washington, D.C. 20004

Dear Mr. Nelson:

The National Park Service (NPS) has initiated consultation with the District of Columbia Historic Preservation Office (DC SHPO) under Section 106 of the National Historic Preservation Act on the National Mall Turf and Soil Reconstruction, an undertaking, in accordance with 36 CFR 800.3 of the regulations of the Advisory Council on Historic Preservation (ACHP).

The Mall is a historic landscape that occupies some of the oldest parkland in the National Park System and hosts some of the most prominent buildings, museums, and monuments in the country. As one of the most popular national tourist destinations, the Mall is one of the most used public areas in the District of Columbia for national celebrations, first amendment demonstrations, special events, and recreation with an annual visitorship of nearly 25 million.

However, due to intense use, the turf panels on the Mall have deteriorated. Action is needed to address the management of this civic space to alleviate the intense soil compaction and enable proper air, water and nutrient infiltration. Reducing soil compaction will also improve site drainage, stormwater management, and the condition of turf. To support the new turf system, the current irrigation system needs to be replaced because it has been compromised by the intense use and does not adequately service the project area.

The Area of Potential Effect (APE) that has been proposed is more inclusive than the turf panels, and corresponds to the Mall defined as open space surrounded and defined by adjacent buildings and the associated views and vistas. The APE consists of the Mall, including the Contributing Reservations 3B, 3, 4, 5, 6, and 6A. The boundaries have been drawn at the line of 16th St. N.W. across the Washington Monument grounds on the west, the western terrace of the U.S. Capitol on the east, Independence Ave. S.W. and Maryland Ave. S.W. plus the line of its continuation northeast toward the Capitol on the south, and Constitution Ave. N.W. and Pennsylvania Ave. N.W. plus the line of its continuation to the southeast toward the Capitol on the north. The enclosed attachment shows the APE.

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IN AMERICA 

Given the potential scope of the Mall Turf project and the ground disturbing activities associated with it, the NPS has determined the need to conduct a phase 1a archeological review, and if necessary, phase 1b archeological testing. The NPS also plans to propose a phased approach for the implementation and construction of this project. We anticipate that phase 1 construction will entail the installation of below grade infrastructure, such as cisterns, water lines, and an pump station along with visible above ground work focused on the installation of curbs and soil and turf in the three most eastern lawn panels in the center of the Mall.

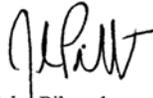
We have enclosed a draft Mall mapping study prepared by Heritage Landscapes, LLC for your consideration and review. This study expands upon the narrative description of the changes in the Mall landscape over time that can be found in the recently completed Cultural Landscape Inventory of the area.

The NPS has also begun an Environmental Assessment (EA) to analyze impacts specific to the Mall Turf project. The NPS intends to coordinate Section 106 process with the National Environmental Policy Act per the ACHP's regulations (36 CFR 800.8).(NEPA). The first meeting open to the public was a public scoping/Section 106 meeting held at the National Capital Region headquarters building on March 9, 2010. The NPS intends to continue consulting with the public per 800.3(e) in public meetings and through our Planning, Environment, and Public Comment (PEPC) website – www.parkplanning/nps.gov. It is anticipated that these outreach efforts will accommodate both NEPA and the 106 process. We will continue to post presentation materials to PEPC that can assist the public and consulting parties in their review of the project.

At this stage in the design process, the NPS is not prepared to make a formal determination of effect for the National Mall Turf and Soil Reconstruction, but looks forward to consultation with the DC SHPO on this and other steps in the process.

Because of the sensitive nature of the project site, and the potential for adverse effects, we are happy to invite the active participation of ACHP in the Section 106 process. Please indicate whether you wish to do so or have any other questions about the undertaking by contacting me or Mark Isaksen, Chief, Resource Management, National Mall and Memorial Parks at (202) 245-4711.

Sincerely,



John Piltzecker
Superintendent
National Mall and Memorial Parks

Enclosure

cc: Mr. Reid Nelson, Advisory Council on Historic Preservation
Ms. Nancy Witherell, National Capital Planning Commission



United States Department of the Interior

NATIONAL PARK SERVICE
National Mall & Memorial Parks
900 Ohio Drive, S.W.
Washington, D.C. 20024-2000



D66 (NCR-NAMA)

JUN 2 2010

Mr. David Maloney
District of Columbia Historic Preservation Officer
1100 4th Street, SW E650
Washington, DC 20024

Dear Mr. Maloney,

Subject: National Mall Turf and Soil Reconstruction

The National Park Service (NPS) wishes to formally initiate consultation with the District of Columbia Historic Preservation Office under Section 106 of the National Historic Preservation Act on the National Mall Turf and Soil Reconstruction, an undertaking, in accordance with 36 CFR 800.3 of the regulations of the Advisory Council on Historic Preservation (ACHP).

The Mall is a historic landscape that occupies some of the oldest parkland in the National Park System and hosts some of the most prominent buildings, museums, and monuments in the country. As one of the most popular national tourist destinations, the Mall is one of the most used public areas in the District of Columbia for national celebrations, first amendment demonstrations, special events, and recreation with an annual visitorship of nearly 25 million.

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Given the potential scope of the Mall Turf project and the ground disturbing activities associated with it, the NPS has determined the need to conduct a phase 1a archeological review, and if necessary, phase 1b archeological testing. Dr. Stephen Potter of the NPS will continue to communicate directly with Dr. Ruth Troccoli of your office on all pertinent archeological issues. The NPS also plans to propose a phased approach for the implementation and construction of this project. We anticipate that phase 1 construction will entail the installation of below grade infrastructure, such as cisterns, water lines, and an pump station along with visible above ground work focused on the installation of curbs and soil and turf in the three most eastern lawn panels in the center of the Mall.

We have enclosed a draft Mall mapping study prepared by Heritage Landscapes, LLC for your consideration and review. This study expands upon the narrative description of the changes in the Mall landscape over time that can be found in the recently completed (2006) Cultural Landscape Inventory of the area.

The NPS has also begun an Environmental Assessment (EA) to analyze impacts specific to the Mall Turf project. The NPS intends to coordinate Section 106 process with the National Environmental Policy Act per the ACHP's regulations (36 CFR 800.8).(NEPA). The first meeting open to the public was a public scoping/Section 106 meeting held at the National Capital Region headquarters building on March 9, 2010. The NPS intends to continue consulting with the public per 800.3(e) in public meetings and through our Planning, Environment, and Public Comment (PEPC) website – www.parkplanning/nps.gov. It is anticipated that these outreach efforts will accommodate both NEPA and the 106 process. We will continue to post presentation materials to PEPC that can assist the public and consulting parties in their review of the project.

At this stage in the design process, the NPS is not prepared to make a formal determination of effect for the National Mall Turf and Soil Reconstruction, but looks forward to consultation with the District of Columbia Historic Preservation Office on this and other steps in the process.

Thank you for your help. If you have any questions, please do not hesitate to call me or Mark Isaksen, Chief of Resource Management, National Mall and Memorial Parks at (202) 245-4711.

Sincerely,



John Piltzecker
Superintendent
National Mall and Memorial Parks

cc. Mr. Reid Nelson, Advisory Council on Historic Preservation
Ms. Nancy Witherell, National Capital Planning Commission
Mr. Thomas Luebke, U.S. Commission of Fine Arts

U. S. COMMISSION OF FINE ARTS

ESTABLISHED BY CONGRESS 17 MAY 1910

401 F STREET NW SUITE 312 WASHINGTON DC 20001-2728 202-504-2200 FAX 202-504-2195 WWW.CFA.GOV

28 May 2010

Dear Ms. O'Dell:

In its meeting of 20 May, the Commission of Fine Arts reviewed the concept submission for turf and soil reconstruction, a new irrigation system, and new granite curbs and gutters for three center lawn panels on the National Mall. The Commission expressed its appreciation for the concept and approved it with the following comments.

The Commission members supported the proposal to edge the lawn panels with masonry curbs and gutters incorporating a drain, which will provide a clean edge for the panels; they unanimously expressed a strong preference for the use of granite instead of precast concrete. They recommended minimizing the width of this border and reducing the radius of the corners to clearly distinguish the design from typical street curb details and noted the importance of carefully integrating the drains into the design.

The Commission members expressed their support for the effort to create a sustainable design that will withstand conditions of heavy use. Regarding the proposed irrigation system, they suggested using only center and edge water supply lines—which should be sufficient and easier to protect from damage—and eliminating the lateral lines. They advised considering biodiversity when selecting plant materials for the lawn panels. Finally, the Commission encouraged the National Park Service to strengthen the policies and procedures governing maintenance and events on the Mall to further protect the lawn panels.

As always, the staff is available to assist you with the next submission.

Sincerely,



Thomas E. Luebke, AIA
Secretary

Margaret O'Dell, Regional Director
National Park Service, National Capital Region
1100 Ohio Drive, SW
Washington, DC 20242

cc: Peter May, National Park Service
Suzette Goldstein, HOK



N. Witherell

NCPC File No. 7110

THE NATIONAL MALL
TURF RECONSTRUCTION ON THREE EASTERNMOST CENTER PANELS

The National Mall
Washington, DC

Submitted by the National Park Service

May 27, 2010

Abstract

The National Park Service (NPS) has submitted a concept design for the reconstruction of the turf and soil on the National Mall. The scope of the current project is the three easternmost center lawn panels (Panels 29, 30, and 33), bounded by 3rd Street, NW on the east and 7th Street, NW on the west. NPS intends to reconstruct all the center lawn panels in three phases. The scope of the current project includes reengineering the subsurface soil, planting new turf, constructing shallow, mountable curbs and gutters around the panels to harvest rainwater and contain the engineered soil, grading the panels with a slight crown on the center line, and constructing a below-grade irrigation and water storage system for the turf. In concert with these physical improvements, NPS will develop and implement new guidelines for managing events on the National Mall. The proposed work is consistent with the goals of the draft National Mall Plan.

Commission Action Requested by Applicant

Approval of comments on the concept design, pursuant to 40 U.S.C. § 8722(b)(1) and (d).

Executive Director's Recommendation

The Commission:

Comments favorably on the concept design for the reconstruction of the turf and soil and the construction of a curb and gutter around the three easternmost center lawn panels of the National Mall, as shown on NCPC Map File No. 1.41(70.00)43062.

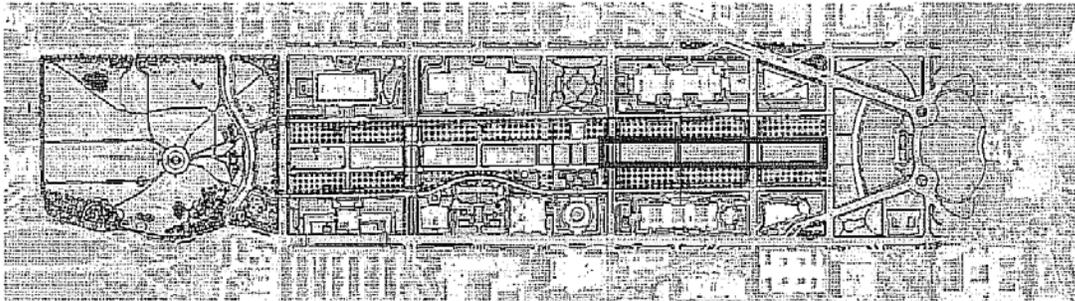
Recommends that the curb be constructed of granite and **notes** that NPS will continue consultation on the dimension of the curb radius as the design is developed further.

* * *

PROJECT DESCRIPTION

Site

The National Park Service (NPS) proposes the first phase of an anticipated three-phase project to reengineer the turf and soil on the center lawn panels of the National Mall. The proposed first phase will extend from 3rd Street to 7th Street, NW. The turf and gutter construction for the first phase is solely for three center lawn panels, and does not include tree panels.



Background

One of the highest priorities in the National Mall Plan, approved in draft by the Commission at its March 4, 2010 meeting, is the improvement of the health, appearance, durability, sustainability, and recoverability of the Mall turf. The soil is heavily compacted and doesn't drain well, the turf is often worn away and presents an irregular and uneven appearance, and the irrigation system doesn't function. The impact of heavy and sustained use creates a strain on the soil and turf, and also on the elm trees. There has been no major reconstruction on the Mall since the Bicentennial. Since that time, demands on the National Mall have increased with more frequent and longer events and higher visitation. The proposed project is the first phase in addressing these conditions. NPS anticipates funding the turf and soil reconstruction of the center panels from 3rd to 14th Street, NW in three phases.

Proposal

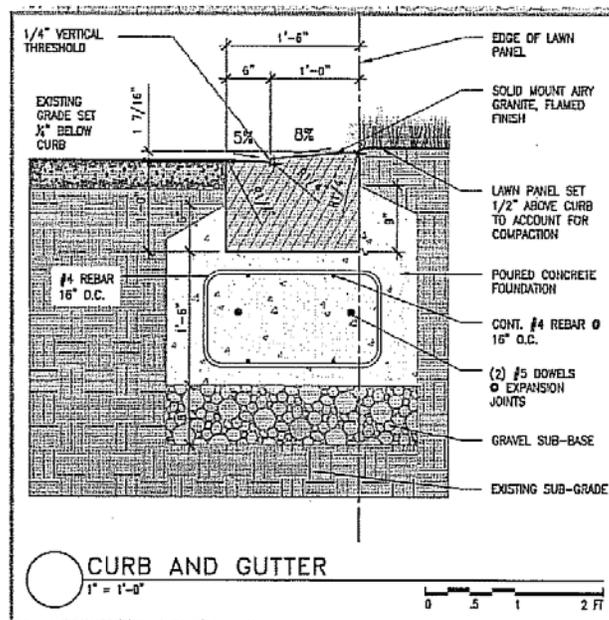
The goals for the turf and soil reconstruction project, as defined by NPS, are:

- Develop and establish a healthy and sustainable natural resources baseline for soils, turf and trees so that the Mall can host anticipated types and levels of use.

- Accommodate the high levels of use in a manner that sustains the character and integrity of the Mall.
- Maximize the site's potential for stormwater absorption and minimize reliance on public water use.
- Preserve existing trees and other vegetation to reinforce the historic landscape and emphasize native species.
- Improve the visual quality of the Mall.

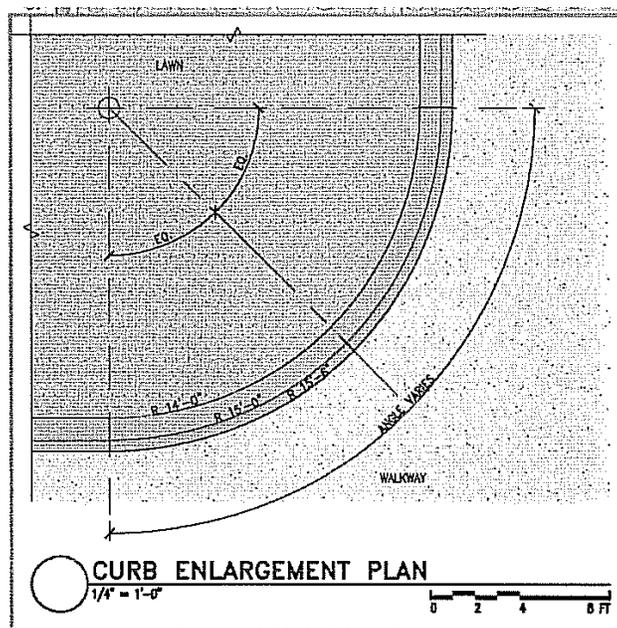
Most of the improvements associated with the current proposal are below grade and not visible to the public. The proposed visible feature would be a shallow, mountable curb and gutter 18 inches in width and 1/4 inch in height around the perimeter of the three easternmost center lawn panels. The purpose of the curb is to provide structural support and containment for the engineered soil and to direct the run-off to the below-grade water management system.

The curb and gutter would be barely perceptible in height, and fully accessible to those using wheelchairs and strollers. The curb, comprising 12 inches in width of the total 18-inch width, will have an 8% slope with a 1/4-inch vertical threshold. The gutter, comprising the outermost 6 inches of the 18-inch width, will have integrated grating-covered catch basins every 36 feet (and possibly farther apart) that will direct runoff into a stormwater drainage line under the lawn panels. The drainage lines will convey the collected runoff to below-grade storage cisterns.



NPS proposes White Mount Airy granite with a flame finish for the curb and gutter. A second choice is precast concrete. Staff strongly recommends the use of granite. Fifteen-foot curb radii are proposed for the corners of the lawn panels, which would return the curb radii to the dimension in use on the Mall from the 1930s--when Frederick Law Olmsted, Jr. implemented the McMillan Plan--until the 1970s, when Skidmore, Owens, and Merrill redesigned the roads and paths on the National Mall by, in part, filling the east-west street beds with gravel.

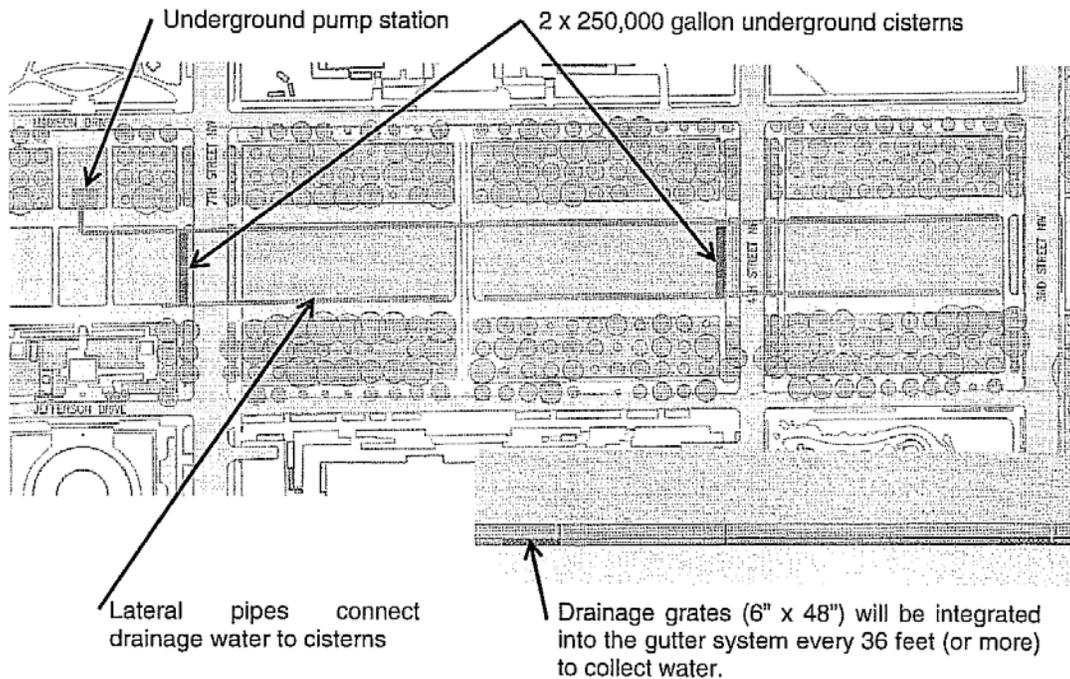
NPS recommends the 15-foot curb radii in part to restore the earlier appearance of the lawn panels, but also as a method of minimizing the compaction of the soil in the lawn panels and the deterioration and loss of turf at the corners, a typical and unsightly condition with the current gravel paths. In addition, gravel migrates to the lawn panels and soil migrates to the paths. Rainwater ponds at the edges of the gravel paths because it does not drain adequately.



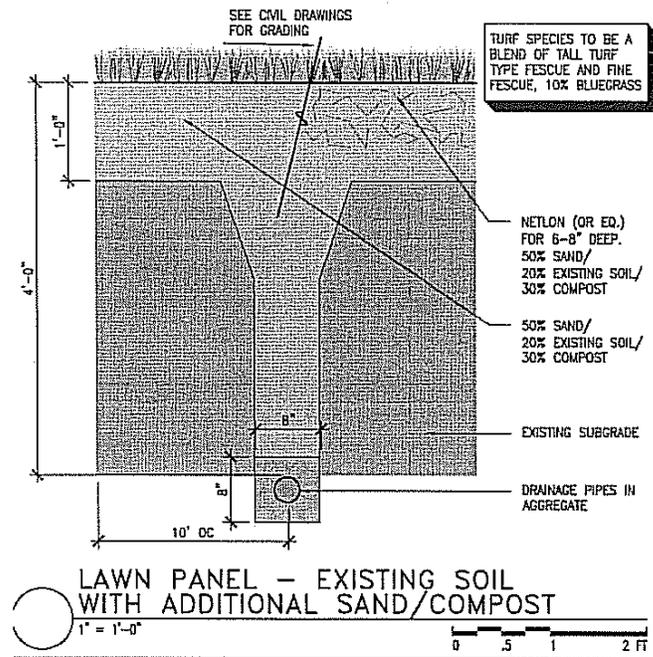
Rapid drainage of soil water is critical if the Mall is to continue to be scheduled for use for events, regardless of rain. The center panels will be re-graded with a slight crown in the center line to facilitate capture of stormwater runoff in the gutters and drains. The slight rise in the grade will also have the benefit of visually connecting the lawn panels as they are seen in long views. In addition, the gravel pedestrian paths will be re-graded slightly to drain toward the lawn panels and the gutters. Low points conducive to ponding will be eliminated, especially in the area west of 4th Street, NW.

Rainwater will be harvested through the new system of gutters. A reliable and durable drip irrigation system will be installed beneath the turf, deep enough to avoid puncture by tent stakes. Two 250,000-gallon cisterns to be installed below the north and south walkways west of 7th

Street, NW and west of 4th Street, NW, connected to the network of lateral pipes and a below-grade pump station. The irrigation pump station will be constructed below the treeless, open panel on the 8th Street cross-axis south of Madison Drive.

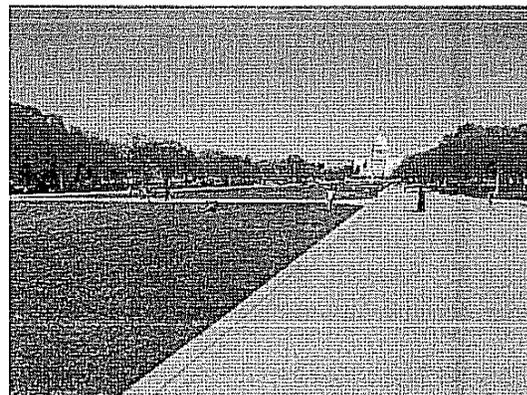
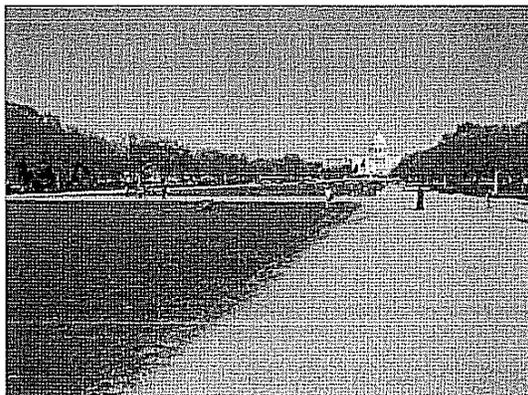


Accompanying the proposed water management system is the full reengineering of the soil under the turf. The top six inches of existing soil will be removed and stockpiled at the site. Up to an additional 12 inches of soil will be removed from the site. The subgrade will be fine-graded to contours parallel to the proposed finish grades and with a 2% cross slope on the lawn panels. An aggregate drainage layer will be laid. Coarse concrete sand will be added to the topsoil. The soil mix will then be added and compacted to the optimum density. The addition of Netlon (a soil mesh reinforcement product) or a similar product will be laid to a depth of six to eight inches below the finished grade to improve compaction resistance. The mesh is a benign, extruded plastic with a strong memory that is resilient to compaction. Finally, the turf (at present, proposed to be a blend of tall, turf-type fescue and fine fescue, mixed with 10% bluegrass) will be grown. The turf blend must accommodate short-term repairs and replacement after events, but also long-term health and viability.



NPS anticipates an appropriation for this phase of the work in Fiscal Year 2011, awarding a construction contract in March 2011, and completing construction work by June 2013.

Below are a current photograph of the edge of a center lawn panel showing an irregular turf edge and ponding of rain water ("before") and a rendering of the panel with the curb and gutter ("after").



PROJECT ANALYSIS

Staff comments favorably on the proposed concept design for the reconstruction of the turf and soil on the National Mall, including the construction of a curb and gutter around the center lawn panels. The scope of the current proposal is the three easternmost center lawn panels, between 3rd and 7th Streets, NW.

Staff supports the goals of the National Park Service, as stated in the draft National Mall Plan, of improving the health and appearance of the Mall turf and trees, improving the level of sustainable management of the Mall and its resources, improving the durability and recoverability of the turf for events and recreational activities, and providing accessibility throughout the Mall.

At the design concept stage, the project is still in design development and will require further analysis and consultation. The environmental assessment, when it is completed, will provide additional information and analysis, as will the Section 106 consultation.

An initial public scoping meeting for the project was held on March 9, 2010, and several consultation and technical meetings have been held with review agency staffs, consulting parties, and experts, including members of the project team. The team includes HOK, Jim Urban, and Patricia O'Donnell, experts in the design and maintenance of turf fields, tree protection, and historic landscape preservation.

The subject of most discussion, and the visible alteration in this project, is the installation of a low curb and gutter around the perimeter of the center lawn panels. Staff recommends that granite be used. The vertical height of the "curb" will be imperceptible to the eye, but the 18-inch width of the curb and gutter will be a change from the current condition. The SOM scheme, as planned, had 90-degree corners where the lawn panels met the gravel paths. The corners soon deteriorated, however, due to visitors and vehicles crossing them, and it has become difficult if not impossible for NPS to re-sod and maintain the corners. The gravel has migrated into the grass panels not only at the corners but along the edges, so that it is difficult to discern the true edges of the panels.

NPS has proposed, therefore, to return to the radii of the previous era of the Mall, where street curbs implemented to the designs of Frederick Law Olmsted, Jr. in the 1930s were dimensioned with a 15-foot radius curve. NPS hopes that the curbs will provide a visual clue to visitors to stay on the gravel paths when reaching a path intersection, rather than cutting across the panel corners. On the other hand, the curb and gutter are shallow and easily mountable by wheelchair and stroller users who wish to use the center lawn panels. More important, the curb and gutter will mark where vehicles should not drive more emphatically than the current irregular edges can do.

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029**

March 15, 2010

Ms. Susan Spain, Project Executive
The National Mall Plan
National Mall & Memorial Parks
900 Ohio Drive, S.W.
Washington, D.C. 20024

Re: National Mall Plan, To Prepare a Long-Term Plan that will Restore National Mall, Implementation, Draft Environmental Impact Statement, Washington, D.C. (CEQ #20090432)

Dear Ms. Spain:

In accordance with the National Environmental Policy Act (NEPA) of 1969, Section 309 of the Clean Air Act and the Council on Environmental Quality regulations implementing NEPA (40 CFR 1500-1509), the U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the National Mall Plan in Washington, D.C.

The National Mall covers approximately 684 acres and each year the National Park Service (NPS) receives over 6,000 applications for public gathering permits, resulting in around 3,000 events. In one year (2008), for instance, the National Mall received approximately 22.3 million visits. The purpose and need for the proposed action is to develop a long-term plan that will restore the National Mall so that it may continue to symbolize the ideals and greatness envisioned for the United States of America. The approved plan will be followed by site-specific implementation plans including additional compliance with the NEPA and National Historic Preservation Act (NHPA), as needed.

The DEIS examines five alternatives for the management of the National Mall in Washington, D.C. They are: the No-Action Alternative which would continue current conditions; Alternative A would focus on the historic landscape with its memorials and planned vistas; Alternative B would focus on creating a welcoming national civic space for public gatherings, events, and high-use levels; Alternative C would focus on urban recreation and use plus a sustainable urban ecology; and the Preferred Alternative which combines ideas from all of the other alternatives considered. It would establish a sense of place and an overall identity for the National Mall, creating a coherent pedestrian environment that would complement and balance the natural environment, formal and informal features, and national commemorative works.

In general, the Preferred Alternative would involve refurbishing the premier civic space so that very high levels of use could be perpetuated and the needs of visitors met in an energy-efficient and sustainable manner. Its memorials and landscapes would be protected, with large areas of open space as defining features of the historic landscape. Lawns and elm trees would be improved and protected. Compacted soils would be removed and replaced with engineered soils capable of better withstanding intensive use. Visitor amenities would be added throughout the Mall including the addition of a multipurpose facility to include food service, restrooms, education exhibits, information, a book store, retail, recreation equipment rentals (model boats, portable lawn chairs). Pedestrian circulation would be improved including constructing separate bicycle and pedestrian trails and redesigning the tour bus drop-off area, widening walkways, and paving gravel walkways. The Preferred Alternative would incorporate additional recreational opportunities and improved playing fields, more shaded seating, additional pedestrian lighting, and an emergency notification system. In addition, the Tidal Basin seawalls would be rebuilt; a vegetated shoreline would be established along the Potomac River. The lake at Constitution Gardens would be rebuilt to be self-sustainable, with potentially a nonpotable, sustainable water source. A small reflecting pool is considered at Union Square which may be constructed for various uses.

EPA supports the purpose and need for the proposed action and the Preferred Alternative. However, as a result of our review of the DEIS, EPA developed comments and questions (presented in the attached Technical Comments). Specific concerns are expressed regarding water resources, fish and wildlife, and soils; in particular impacts to habitat in the Tidal Basin. EPA rated the DEIS an EC-2 (Environmental Concerns/Insufficient Information), which indicates that we have environmental concerns regarding the proposal and that there is insufficient information in the document to fully assess the environmental impacts of this project. A copy of the EPA's rating system is enclosed for your information.

Thank you for providing EPA with the opportunity to review this project. If you have questions regarding these comments, the staff contact for this project is Karen DelGrosso; she can be reached at 215-814-2765.

Sincerely,



Barbara Rudnick
NEPA Team Leader
Office of Environmental Programs

Enclosures (4)

Note: Only the comments relative to Turf and Soil are included in this Appendix as part of the EPA correspondence.

Soils/Vegetation

The NPS is proposing to improve soil conditions in heavily used areas in the center of the Mall by replacing or augmenting soils or implementing other sustainable technologies. In doing so, the hope would be to decrease soil compaction, increase soil quality and productivity by increasing the soils capacity to hold water and air. There is no mention of the kinds of sustainable technologies that may be used to improve soils. However, the NPS is planning to prepare an EA to address the alternatives for improving the growing conditions for turf and trees and an evaluation of options will be addressed. EPA is interested in receiving the proposed EA to assess the NPS alternatives. In the meantime, EPA poses the following questions:

With replacing or augmenting soils or implementing sustainable technologies, can it be projected how long the improved soil conditions are expected to last and a plan developed to incorporate a timetable for scheduled monitoring or maintenance? Has the NPS considered implementing soil stabilization (seeding or covering areas that have been disturbed, tilled, etc) during construction? It is suggested that the NPS consider infiltration trenching (adding a sub-layer of permeable material such as gravel, to increase infiltration) as well as consider directing run off from paved areas to the permeable ones.

In an effort to protect the hundreds of American elm trees and many acres of turf affecting the historic tapis verte (grass panels) which is the essential feature of the 1930 version of McMillan Plan, it would seem prudent to implement a monitoring plan to ensure permeability of soils and overall health of turf and trees. EPA commends the NPS for its discussion and commitment (page 66, Monitoring and Adaptive Management) to propose undertaking implementation plans to lay out how to achieve desired resource conditions as well as monitor progress. EPA suggests that an in depth discussion of the monitoring plans for the proposed alternatives to improve soils, turf and trees be outlined and compared in the proposed EA.



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.