

Constitution Gardens
National Mall and Memorial Parks
Washington, D.C.

U.S. Department of the Interior
National Park Service

REHABILITATION OF CONSTITUTION GARDENS

ENVIRONMENTAL ASSESSMENT



JUNE 2015



Rehabilitation of Constitution Gardens

Environmental Assessment

June 2015

PROJECT SUMMARY

Introduction

The National Park Service, National Mall and Memorial Parks proposes to allow its partner, the Trust for the National Mall, to undertake rehabilitation efforts of Constitution Gardens located between the Vietnam Veterans Memorial and 17th Street NW on the National Mall in Washington, DC. The proposed efforts are the subject of this environmental assessment. This environmental assessment was prepared in compliance with the National Environmental Policy Act of 1969, as amended to (1) analyze a reasonable range of alternatives to meet objectives of the proposal, (2) evaluate potential impacts on resources and values, and (3) identify mitigation measures to lessen the degree or extent of such impacts.

Purpose of and Need for the Action

The purpose of the project is to rehabilitate Constitution Gardens to improve the functionality, ecology, visitor services, and accessibility of the area, as envisioned in the 2010 National Mall Plan.

The action is needed because Constitution Gardens, in its present condition, has poor soil conditions, and poor drainage is affecting the site's vegetation. Current walkways are in fair to poor condition. Pedestrian circulation can be confusing and does not meet capacity in some places, and some areas do not meet Architectural Barriers Act Accessibility Standard of 1968 standards for universal accessibility. In addition, vehicular turning movements at the intersection of Constitution and 17th Street NW are difficult. Lastly, the area is underused by park visitors due to lack of public amenities and limited recreational opportunities.

Overview of the Alternatives

The National Park Service explored and objectively evaluated a range of alternatives. The Regenerative Garden is the NPS Preferred Alternative and also the environmentally Preferred Alternative. The alternatives listed below are described in Chapter 2, which also describes mitigation measures and summarizes impacts. Four alternatives were carried forward for further analysis:

- No-action Alternative
- Preferred Alternative – Regenerative Garden
- Alternative 1 – Sustainable Garden
- Alternative 2 – Social Garden

Impacts of the alternatives were assessed in accordance with the National Environmental Policy Act, the National Park Service's Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision Making*, and the National Historic Preservation Act. Several impact topics were dismissed from further analysis because the action alternatives would result in no impacts or negligible to minor and/or short-term impacts on those resources. The Preferred Alternative would result in minor to moderate, short- and long-term impacts and long-term beneficial impacts.

How to Comment

Agencies and the public are encouraged to review and comment on the contents of this environmental assessment during a 30-day public review and comment period. We invite you to comment on this document, and you may do so by any one of two methods. The preferred method of providing comments is on the NPS Planning, Environment, and Public Comment website at <http://parkplanning.nps.gov/COGA>. You may also submit written comments to:

Superintendent

National Mall and Memorial Parks

RE: Constitution Gardens Rehabilitation Project

900 Ohio Drive, SW

Washington, DC 20024

Only written comments will be accepted. Please submit your comments within 30 days of the posting of the notice of availability of this environmental assessment on the Planning, Environment, and Public Comment website. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including personal identifying information—may be made publicly available at any time. Although you can request in your comment to withhold your personal identifying information from public review, NPS cannot guarantee that it will be able to do so.

TABLE OF CONTENTS

1	CHAPTER 1: PURPOSE AND NEED	1-1
	Introduction	1-1
	Purpose of and Need for Action	1-1
	Project Area	1-1
	Project Background	1-2
	Purpose and Significance of the National Mall and Memorial Parks	1-3
	Purpose and Significance of Constitution Gardens	1-5
	Applicable Federal Laws and Regulations	1-5
	Scoping Process and Public Participation	1-13
	Issues and Impact Topics	1-13
2	CHAPTER 2: ALTERNATIVES	2-1
	Introduction	2-1
	Alternatives	2-1
	Assessment Synopsis – Key Differences in Alternatives	2-27
	Phasing	2-28
	Mitigation Measures for the Action Alternatives	2-29
	Alternatives Considered but Not Carried Forward for Detailed Analysis	2-32
	Environmentally Preferable Alternative	2-32
	Summary of Impacts	2-32
3	CHAPTER 3: AFFECTED ENVIRONMENT	3-1
	Natural Resources	3-1
	Cultural Resources	3-5
	Visual Resources	3-18
	Visitor Use and Experience and Safety	3-22
	Traffic and Circulation	3-25
	Park Management and Operations	3-33
4	CHAPTER 4: ENVIRONMENTAL CONSEQUENCES	4-1
	General Methodology for Establishing Impact Thresholds and Measuring Effects by Resource	4-1
	General Analysis Methods	4-1
	Impact Thresholds	4-1
	Cumulative Impacts Analysis Method	4-2
	Natural Resources	4-10
	Cultural Resources	4-27

Visual Resources	4-56
Visitor Use and Experience and Safety	4-61
Traffic and Circulation	4-69
Park Management and Operations.....	4-77
5 CHAPTER 5: CONSULTATION AND COORDINATION.....	5-1
Agency Consultation	5-1
Comment Period.....	5-2
6 CHAPTER 6: PREPARERS AND CONTRIBUTORS	6-1
List of Preparers	6-1
Contributors.....	6-2
7 CHAPTER 7: REFERENCES, ACRONYMS, AND GLOSSARY	7-1
References	7-1
Acronyms	7-7
Key Word Glossary	7-9

APPENDIX A: CONSULTATION AND COORDINATION

TABLES

Table 2.1 – Comparison of Actions	2-19
Table 2.2 – Key Differences in Alternatives.....	2-27
Table 3.1 – Character-defining Features Identified in the 2008 Constitution Gardens Cultural Landscape Inventory	3-16
Table 3.2 – Annual Visitors	3-24
Table 3.3 – Capital Bikeshare Stations	3-28
Table 3.4 – Metrobus Service Information	3-28
Table 3.5 – Signalized LOS	3-31
Table 3.6 – AM and PM Peak Hour Intersection Operations	3-31
Table 3.7 – AM and PM Peak Hour Queue Analysis	3-32
Table 4.1 – Cumulative Impacts Projects or Actions.....	4-3
Table 4.2 – Impacts of the Preferred Alternative on Contributing Features of the Cultural Landscape..	4-37
Table 4.3 –Impacts of Alternative 1 on Contributing Features of the Cultural Landscape	4-42
Table 4.4 – Impacts of Alternative 2 on Contributing Features of the Cultural Landscape	4-48
Table 4.5 – Intersection Pedestrian Signal Timing Requirements	4-72

FIGURES

Figure 1.1 – Constitution Gardens	1-2
Figure 2.1 – No-Action Alternative	2-3
Figure 2.2 – Preferred Alternative - Regenerative Garden	2-9
Figure 2.3 – Alternative 1 – Sustainable Garden	2-13
Figure 2.4 – Alternative 2 – Social Garden	2-17
Figure 3.1 – Area of Potential Effect	3-6
Figure 3.2 – View of West Potomac Park from the Washington Monument, about 1942 or Later.....	3-9
Figure 3.3 – Views and Vistas to Constitution Gardens	3-20
Figure 3.4 – Views and Vistas within Constitution Gardens	3-21
Figure 4.1 – Cumulative Impacts Projects	4-9
Figure 4.2 – Example of 100-foot Curb Radius.....	4-73

CHAPTER 1: PURPOSE AND NEED

INTRODUCTION

The National Park Service (NPS) has prepared this environmental assessment (EA) to evaluate a range of alternatives for the rehabilitation of Constitution Gardens located between the Vietnam Veterans Memorial and 17th Street NW on the National Mall in Washington, DC.

The National Mall is a highly visited and recognizable space and one of the most significant historic landscapes in the United States, extending east to west from the Potomac River to the US Capitol building and south to north from the Thomas Jefferson Memorial to Constitution Avenue NW. Within the National Mall, Constitution Gardens is a wooded park that was designed in the 1970s as “the major site in Washington, DC, commemorating the American Bicentennial. The park is the location for the congressionally mandated Vietnam Veterans Memorial and the Memorial to the 56 Signers of the Declaration of Independence, a monument also built under congressional authorization that supports the Bicentennial theme” (NPS 2008, rev. 2014).

PURPOSE OF AND NEED FOR ACTION

The purpose of the project is to rehabilitate Constitution Gardens to improve the functionality, ecology, visitor services, and accessibility of the area, as envisioned in the 2010 National Mall Plan.

The action is needed because Constitution Gardens, in its present condition, has poor soil conditions, and poor drainage is affecting the site’s vegetation. Current walkways are in fair to poor condition. Pedestrian circulation can be confusing and does not meet capacity in some places, and some areas do not meet Architectural Barriers Act Accessibility Standard of 1968 (ABAAS) standards for universal accessibility. In addition, vehicular turning movements at the intersection of Constitution Avenue and 17th Street NW are difficult. Lastly, the area is underused by park visitors due to lack of public amenities and limited recreational opportunities.

PROJECT AREA

Constitution Gardens is an approximately 43-acre oasis on the National Mall bounded by Constitution Avenue on the north, 17th Street NW to the east, and the Lincoln Memorial Reflecting Pool to the south, and includes the Vietnam Veterans Memorial at the west end (Figure 1.1). Constitution Gardens is situated on the National Mall east of the Potomac River and just south of an area predominantly occupied by federal and other organization offices and headquarters. The approximately 36-acre project area in Constitution Gardens includes a Lockkeeper’s House and an artificial lake with a small island that is home to the Memorial of the 56 Signers of the Declaration of Independence. Rows of trees surround the gardens on all sides and are spaced throughout the gardens in groves and along pathways. There is a terraced paved area at the eastern edge of the lake, curvilinear pathways that serve as the gardens’ circulation system, and a pattern of open lawn areas that create a pastoral setting.

Figure 1.1 – Constitution Gardens



PROJECT BACKGROUND

Public open space in what is now Constitution Gardens was identified in the West Potomac Park legislation (29 Stat 624 March 3, 1897) and the 1902 McMillan Plan. It was later named and designed in further detail by Skidmore, Owings, and Merrill (SOM) in the early 1970s (NPS 2008, rev. 2014) and was completed in 1976. In 1982, the Memorial to the 56 Signers of the Declaration of Independence was dedicated on the small island in the lake.

Constitution Gardens was designed to commemorate the American Bicentennial, providing a landscape with a naturalistic-appearing man-made lake creating a quiet oasis removed from the bustle of the capital. Since its completion in 1976, the area has been plagued by ecological, structural, and physical problems stemming primarily from its design. Six years after the park was completed, the Vietnam Veterans Memorial was built in a meadow at the west end of the gardens that required modification of the grade and planting design. The National Mall Plan called for improvements to be made to Constitution Gardens, including a more active and flexible public space with added amenities and more sustainable lake and facilities. The National Mall Plan provided a blueprint for the rehabilitation of Constitution Gardens and an avenue for the NPS fundraising partner, the Trust for the National Mall (TNM), to help the NPS implement the improvements. The TNM undertook a National Mall Design Competition in 2011–2012 for the redesign of Constitution Gardens. The winning design teams were selected in 2012, and, based on the winning design concept, the NPS, the TNM, and the design team created and refined a range of alternatives. The alternatives seek to improve the sustainability and ecological function of the lake and provide improved visitor use opportunities.

PURPOSE AND SIGNIFICANCE OF THE NATIONAL MALL AND MEMORIAL PARKS

Establishment

The origins of what is now the National Mall and Memorial Parks and Constitution Gardens within it pre-date the official establishment of the park and trace back to the open spaces and parklands envisioned by the L'Enfant Plan and McMillan Plan. Constitution Gardens is within the West Potomac Park Section of the National Mall and was named in the 1970s. A more detailed discussion of the history of the National Mall and Memorial Parks and Constitution Gardens is found in “Chapter 3: Affected Environment.” In 1933–1934, federal parkland in the District of Columbia was consolidated under NPS management. In the years that followed, a number of major memorials were added to the area that would come to be known as the National Mall. Figure 1.2 delineates the boundaries of the National Mall and Memorial Parks.

Purpose

According to the final National Mall Plan/environmental impact statement (NPS 2010a), the purposes of the National Mall are to:

- maintain the National Mall in the heart of our nation’s capital as a stage for national events and a preeminent national civic space for public gatherings because “it is here that the constitutional rights of speech and peaceful assembly find their fullest expression”
- provide a monumental, dignified, and symbolic setting for the governmental structures, museums, and national memorials as first delineated by the L'Enfant Plan and further outlined in the McMillan Plan, as well as other significant plans
- maintain and provide for the use of the National Mall with its public promenades as a completed work of civic art—a designed historic landscape providing extraordinary vistas to symbols of our nation
- maintain National Mall commemorative works (memorials, monuments, statues, sites, and gardens) that honor presidential legacies, distinguished public figures, ideas, events, and military and civilian sacrifices and contributions
- forever retain the West Potomac Park section of the National Mall as a public park for recreation and enjoyment of the people

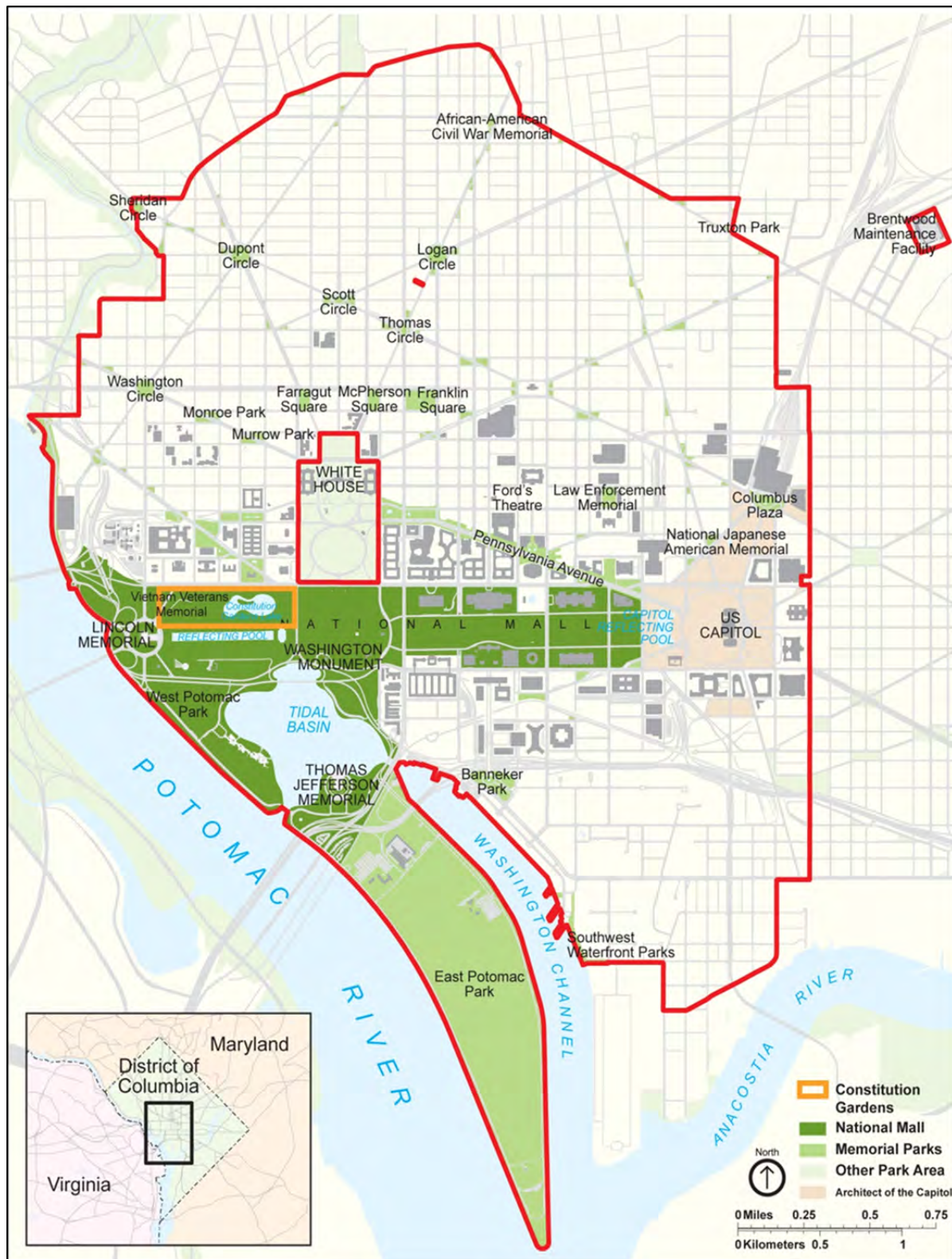
Significance

As stated in the final National Mall Plan/environmental impact statement (NPS 2010a), the National Mall is significant for the following reasons:

- *The National Mall is the heart of our nation’s capital and has endured since the city’s original design by Pierre L’Enfant over 200 years ago.* The form and character of our planned national capital still reflect the historic L'Enfant and McMillan Plans.

The National Mall is an inclusive and open environment where we celebrate our national identity and important events. The National Mall, the nation’s foremost civic space, is the primary location for political demonstrations, First Amendment activities, rallies, parades, and numerous festivals. Visitors of every race, nationality, and faith come to the National Mall to celebrate, commemorate, demonstrate, or recreate.

Figure 1.2 – National Mall and Memorial Parks



Note: In 2011, Union Square was transferred to the US Capitol grounds.

- *The National Mall is a preeminent national landscape, and its history and appearance have been enriched by gifts to the United States from other countries.* It is a combination of formally designed areas, such as the National Mall, the Washington Monument grounds, and naturalistic areas, such as the Tidal Basin and West Potomac Park. Various trees and gardens symbolize cultural and diplomatic exchanges and gifts from other nations, such as the Japanese cherry trees, pagoda, and lantern; the German-American Friendship Garden; and Italy's gift of the *Arts of Peace*.
- *The National Mall is the center of our nation's cultural heritage.* The National Mall is surrounded by many of the country's most significant educational and cultural institutions, including the national museums of the Smithsonian Institution and the National Gallery of Art, along with the nearby National Archives, the US Bureau of Engraving and Printing, and the US Holocaust Memorial Museum.

PURPOSE AND SIGNIFICANCE OF CONSTITUTION GARDENS

Constitution Gardens is a constructed park created in the late 19th and early 20th century from material dredged from the Potomac River (NPS 2008). Based on the Potomac Park enabling legislation, it is to remain a recreation area forever. Redeveloped for the 1976 Bicentennial, Constitution Gardens was intended to provide a pastoral setting for passive recreation and event use. It is the site of the Memorial to the 56 Signers of the Declaration of Independence, which is located on an island in the lake. Constitution Gardens is a contributing feature of the East and West Potomac Parks Historic District based on National Register of Historic Places (National Register or NRHP) Criterion A, in the areas of Landscape Architecture and Commemoration. The gardens fall within the exception to National Register Criteria Consideration G (less than 50 years of age or achieved significance within the past 50 years). Though less than 50 years old, the gardens have achieved exceptional significance, first as a highly visible project celebrating the American Bicentennial in the nation's capital, and later as the landscaped setting for a number of national memorials. The Lockkeeper's House located within Constitution Gardens is the oldest structure on the National Mall and contributes to the Historic District based on National Register Criterion A, in the areas of Architecture and Transportation (for its association with the Washington Canal). It also meets the standards for Criteria Consideration B as a building removed from its original location that is significant primarily for its architectural value, as well as being a surviving structure most importantly associated with a historic event. While significant in its own right, the Lockkeeper's House has no direct connection to Constitution Gardens. In the 1980s, Constitution Gardens became the site of the Vietnam Veterans Memorial at its west end, and in 2004, the World War II Memorial was built south of the gardens.

APPLICABLE FEDERAL LAWS AND REGULATIONS

The NPS is governed by laws, regulations, and management plans before, during, and following any management action considered under any National Environmental Policy Act (NEPA) analysis. The following are laws and regulations that are applicable to the proposed action.

National Environmental Policy Act, 1969, as Amended

The NEPA was passed by Congress in 1969 and took effect on January 1, 1970. This legislation established this country's environmental policies, including the goal of achieving productive harmony between human beings and the physical environment for present and future generations. It provided the tools to implement these goals by requiring that every federal agency prepare an in-depth study of the impacts of "major federal actions having a significant effect on the environment" and alternatives to those actions. It also requires that each agency make that information an integral part of its decisions. The

NEPA also requires that agencies make a diligent effort to involve the interested members of the public before they make decisions affecting the environment.

The NEPA is implemented through regulations of the Council on Environmental Quality (CEQ), effective 1978 (40 Code of Federal Regulation [CFR] §§1500–1508). The NPS has in turn adopted procedures to comply with NEPA and the CEQ regulations. These are contained in Director's Order (DO) 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (2001), and its accompanying handbook (NPS 2011b).

National Historic Preservation Act, as Amended through 2004 (16 USC 470)

The National Historic Preservation Act (NHPA) of 1966, as amended through 2004, protects buildings, sites, districts, structures, and objects that have significant scientific, historic, or cultural value. The NHPA established affirmative responsibilities of federal agencies to preserve historic and prehistoric resources. Effects on properties that are listed in or are eligible for the National Register must be taken into account in planning and operations. Any property that may qualify for listing in the National Register must not be inadvertently transferred, sold, demolished, substantially altered, or allowed to deteriorate.

Section 106 of the NHPA, 54 United States Code (USC) 306108 requires federal agencies to take into account the effects of their undertakings on historic properties either listed in or eligible to be listed in the National Register. The historic preservation review process required by Section 106 is outlined in regulations 36 CFR §800, Protecting Historic Properties, issued by the Advisory Council on Historic Preservation (ACHP), an independent federal agency established by the NHPA in 1966 to promote the preservation, enhancement, and productive use of our nation's historic resources. The goal of the Section 106 review process is to seek ways to avoid, minimize, or mitigate any adverse effects on historic properties.

Historic Sites Act of 1935

This act declares as national policy the preservation for public use of historic sites, buildings, objects, and properties of national significance. It authorizes the Secretary of the Interior and NPS Director to restore, reconstruct, rehabilitate, preserve, and maintain historic or prehistoric sites, buildings, objects, and properties of national historical or archeological significance.

NPS Organic Act

By enacting the NPS Organic Act of 1916 (Organic Act), Congress directed the US Department of the Interior and the NPS to manage units “to conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations” (16 USC 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress” (16 USC 1a-1). Despite these mandates, the Organic Act and its amendments afford the NPS latitude when making resource decisions that balance resource preservation and visitor recreation. An impairment determination will be made in the decision document for this EA.

National Parks Omnibus Management Act of 1998

The National Parks Omnibus Management Act (NPOMA) (16 USC 5901 et seq.) underscores the NEPA and is fundamental to NPS park management decisions. Both acts provide direction for articulating and connecting the ultimate resource management decision to the analysis of impacts, using appropriate technical and scientific information. Both also recognize that such data may not be readily available; therefore, the acts provide options for resource impact analysis should this be the case.

NPOMA directs the NPS to obtain scientific and technical information for analysis. The NPS handbook for DO-12 states that if “such information cannot be obtained due to excessive cost or technical impossibility, the proposed alternative for decision will be modified to eliminate the action causing the unknown or uncertain impact, or other alternatives will be selected” (NPS 2001).

Americans with Disabilities and Architectural Barriers Act Guidelines

Pursuant to the Architectural Barriers Act Accessibility Standard of 1968 (ABAAS), all public buildings, structures, and facilities must comply with specific requirements related to architectural standards, policies, practices, and procedures that accommodate people with hearing, vision, or other disability and other access requirements. Public facilities and places must remove barriers in existing buildings and landscapes, as necessary and where appropriate. The NPS must comply with Architectural Barriers Act Accessibility Standard for this project.

Migratory Bird Treaty Act of 1918, as Amended 1989

The original 1918 Migratory Bird Treaty Act implemented a 1916 treaty between the US and Great Britain (for Canada) for the protection of migratory birds. Later amendments implemented treaties between the US and Mexico, the US and Japan, and the US and the Soviet Union (now Russia). Specific provisions in the statute include a federal prohibition to “pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention...for the protection of migratory birds... or any part, nest, or egg of any such bird” (16 USC 703). This applies to birds included in international conventions between the US and Great Britain, the US and Mexico, the US and Japan, and the US and Russia.

The responsibilities of federal agencies to protect migratory birds are set forth in Executive Order (EO) 13186. The US Fish and Wildlife Service (USFWS) is the lead agency for protecting migratory birds. The Directors of the NPS and USFWS signed a Memorandum of Understanding to Promote the Conservation of Migratory Birds on April 12, 2010, to meet the requirements under section 3 of EO 13186 concerning the responsibilities of federal agencies to protect migratory birds. The Memorandum of Understanding specifies procedures that the superintendent of an NPS unit, or a designated representative of the superintendent, will conduct prior to starting any activity that is likely to result in unintentional take.

Redwood National Park Act of 1978, as Amended

All national park system units are to be managed and protected as parks, whether established as a recreation area, historic site, or any other designation. This act states that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.”

Shipstead-Luce Act (Public Law 231-71)

In 1930, the Shipstead-Luce Act gave the United States Commission of Fine Arts (CFA) authority to review the designs of private construction projects within certain areas of the national capital, specifically for construction that fronts or abuts the grounds of the US Capitol building, the grounds of the White House, and the National Mall, as well as Rock Creek Park, the National Zoo, the Rock Creek and Potomac Parkway, the southwest waterfront, and Fort McNair.

National Capital Park Commission (Public Law 202)

In 1924, Public Law (PL) 202 established the National Capital Park Commission (renamed the National Capital Planning Commission [NCPC] following the passage of the 1952 National Capital Planning Act) and broadly mandated the NCPC to “prevent pollution of Rock Creek, and the Potomac and Anacostia Rivers and to preserve forests and natural scenery in and about Washington.”

Code of Federal Regulations

36 CFR §1.5

36 CFR §1.5 sets closures and public use limits for NPS units.

36 CFR §7.96

36 CFR §7.96 sets forth guidelines to permit and control special events and uses within NPS units, including the National Mall. These regulations control site access, staging, risk management, comfort facilities, first aid, security, transportation, and cost recovery for the special events to minimize impacts on park resources and the public. Further, 36 CFR §7.96 specifies the location, timing, and size of some special events in the National Capital Region NPS units, including the project area.

Commemorative Works Act of 1986

The Commemorative Works Act provides guidance for the planning and design of projects within the monumental core of downtown Washington, DC. Specifically, the intent of the legislation is to:

- preserve the integrity of the comprehensive design of the L’Enfant and McMillan Plans for the nation’s capital
- ensure the continued public use and enjoyment of open space in the District of Columbia and its environs, and encourage the location of commemorative works within the urban fabric of the District of Columbia
- preserve, protect, and maintain the limited amount of open space available to residents of, and visitors to, the nation’s capital
- ensure future commemorative works in areas administered by the NPS and the Administrator of General Services in the District of Columbia and its environs

The Commemorative Works Act was amended in 2003 by Congress, which designated the cross axis of the National Mall and the north-south axis between the Thomas Jefferson Memorial and the White House to be a “substantially completed work of civic art” and prohibited new commemorative works in this area. Congress also directed the NPS to begin planning for the future of the National Mall to protect its character (NPS 2009a).

Executive Orders and Director’s Orders

CHESAPEAKE BAY EXECUTIVE ORDER 13508: PROTECTING AND RESTORING A NATIONAL TREASURE

On May 12, 2009, President Barack Obama signed an executive order that recognizes the Chesapeake Bay as a national treasure and calls on the federal government to lead a renewed effort to restore and protect the nation’s largest estuary and its watershed. The executive order targets the bay and its rivers and includes strengthening stormwater management practices.

SECRETARY'S ORDER 3326: MANAGEMENT AND PROTECTION OF THE NATIONAL MALL AND ITS HISTORIC LANDSCAPE

On January 24, 2013, an order was issued by the Secretary of the Interior to further the goals of the National Mall Plan, implement the Record of Decision dated November 9, 2010, and to guide the NPS as it carries out its multi-phase restoration project.

DIRECTOR'S ORDER 17: NATIONAL PARK SERVICE TOURISM

DO-17 promotes and supports sustainable, responsible, informed, and managed visitor use through cooperation and coordination with the tourism industry. This DO provides guidance to the NPS to balance budgetary needs with resource management practices to keep key visitor attractions and services accessible to the public during peak visitation periods. When park resources must be closed due to construction, this DO directs park superintendents to communicate these closures with the tourism industry. Park superintendents are responsible for informing visitors, state tourism offices, gateway communities, and tourism-related businesses about current conditions of key park resources, including current protection, recovery, and restoration measures.

DIRECTOR'S ORDER 28: CULTURAL RESOURCE MANAGEMENT

DO-28 calls for the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles contained in the *NPS Management Policies* (NPS 2006). This DO also directs the NPS to comply with the substantive and procedural requirements described in the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation*, *Standards for the Treatment of Historic Properties with Guidelines for Treatment of Cultural Landscapes* (Birnbaum 1996) and *Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings* (NPS 1995). Additionally, the NPS will comply with the 2008 Service-wide Programmatic Agreement with the ACHP and the National Conference of State Historic Preservation Officers. The accompanying handbook to this order addresses standards and requirements for research, planning, and stewardship of cultural resources, including archeological resources, cultural landscapes, historic and prehistoric structures, museum objects, and ethnographic resources.

DIRECTOR'S ORDER 28A: ARCHEOLOGY

This DO supplements DO-28: *Cultural Resources Management Guidelines*, providing guidance to park managers and staff regarding archeological programs. This DO also details archeological program requirements within NPS units and all applicable standards and guidelines (NPS 1998a).

DIRECTOR'S ORDER 50C: PUBLIC RISK MANAGEMENT PROGRAM

DO-50c emphasizes the prevention of visitor incidents by providing guidelines for establishing a risk management process, while still preserving natural and cultural resources. Consideration for visitor safety will be built into the planning and design process for NPS facilities. This DO directs the NPS to inspect and update all pre-existing visitor use facilities to meet life safety codes and other state and national safety standards.

DIRECTOR'S ORDER 53: SPECIAL PARK USES

DO-53 sets forth the policies and procedures for administering special park uses on NPS lands and 36 CFR §7.96 controls special park uses in the National Capital Region. Special park uses are identified as mandatory or discretionary based on whether they are a right or a privilege of citizens. This DO specifies special uses compliance, permit terms and conditions, and guidelines for specific use rights, such as special events (NPS 2010b).

NATURAL RESOURCES MANAGEMENT GUIDELINE, NPS-77 (1991)

This document provides guidance to park managers for all planned and ongoing natural resource management activities. Managers must follow all federal laws, regulations, and policies. This document provides the guidance for park management to design, implement, and evaluate a comprehensive natural resource management program.

Local Plans and Policies

All action alternatives must consider local plans and policies. The following initiatives serve to guide development and address important planning issues facing the National Capital Region, the monumental core, and the National Mall.

L'ENFANT PLAN (1791)

The original comprehensive plan of Washington, DC, was designed by Peter (Pierre) Charles L'Enfant in 1791 as the site of the federal city. L'Enfant's plan featured ceremonial spaces and grand radial avenues, while respecting the natural contours of land. The resulting plan was a system of orthogonal streets with intersecting diagonal avenues that connected the most significant and important landmarks in the city. This plan included open vistas from the US Capitol and the White House with an open promenade between the US Capitol and the site of the Washington Monument grounds with buildings on both sides of the promenade to reinforce the visual corridor (NPS 2010a).

THE McMILLAN PLAN (1901)

The McMillan Plan, created by the Senate Park Commission in 1901, sought to reestablish elements of the L'Enfant Plan and reemphasized and expanded the role of the Washington Monument grounds as the center of the city's monumental core (NPS 2010a). The plan called for unobstructed views of the Washington Monument and the US Capitol across the National Mall (NPS 2010a).

In 1930, the Shipstead-Luce Act gave the CFA authority to review the designs of private construction projects within certain areas of the national capital, specifically for construction that fronts or abuts the grounds of the US Capitol building, the grounds of the White House, and the National Mall, as well as Rock Creek Park, the National Zoo, the Rock Creek and Potomac Parkway, the southwest waterfront, and Fort McNair. In 1933–1934, federal parkland in the District of Columbia was consolidated under NPS management. In the years that followed, a number of major memorials were added to the area that would come to be known as the National Mall. Figure 1.4 delineates the boundary of the National Mall and Memorial Parks.

Nevertheless, the origins of what is now the National Mall and Constitution Gardens pre-date the official establishment of the park and trace back to the open spaces and parklands envisioned by the L'Enfant Plan and McMillan Plan. A more detailed discussion of the history of the National Mall and Monument is found in “Chapter 3: Affected Environment.”

SKIDMORE, OWINGS, AND MERRILL PLANS (1966 AND 1973)

In the 1960s, SOM became involved in efforts to redesign the National Mall and Pennsylvania Avenue. As part of its planning efforts, SOM submitted two reports “The Washington Mall Master Plan” in 1966, described in further detail below, and the “Washington Mall Circulation Systems” in 1973. The two reports aimed to remove automotive traffic and parking from the National Mall, replacing them with shuttle buses and underground or off-site parking, visually strengthening the central vista through planting more trees to highlight the lines of American elms, and adding outdoor visitor attractions on the National Mall.

In 1976, SOM prepared a master plan for the NPS (Master Plan for the NPS Washington Mall) that delineated how the McMillan Plan could actually be realized in the 1970s with an emphasis on pedestrian use.

EXTENDING THE LEGACY PLAN (1997)

In 1997, the NCPC completed the plan titled *Extending the Legacy: Planning America's Capital for the 21st Century*, which is the current guiding document for the monumental core. This plan provides a framework that expands on the L'Enfant and McMillan Plans and advocates preserving the open landscape of the National Mall.

THE MEMORIALS AND MUSEUMS MASTER PLAN (2001)

The NCPC's Memorials and Museums Master Plan (2001) was generated out of the recognition that the popularity of the monumental core may soon surpass its capacity to accommodate new monuments and memorials in a setting that remains historic, open, and beautiful. The goal of the plan is to identify and promote new sites outside the monumental core to disperse new monuments and memorials, so the environment and character of the National Mall could be protected. The basis for memorial location is the Commemorative Works Act of 1986, which provides standards for the placement of memorials on certain federal land in Washington, DC, and environs.¹ The project area is located in the "Reserve." Chapter 89 of Title 40 of the Commemorative Zone Policy of the Memorials and Museums Master Plan discourages development on the National Mall and Washington Monument reservation and designates a "Reserve" area on the cross-axis of the National Mall where no new memorials will be permitted (NCPC 2001).

COMPREHENSIVE PLAN FOR THE NATIONAL CAPITAL: FEDERAL ELEMENTS (2004)

In August 2004, the NCPC adopted the Comprehensive Plan for the National Capital: Federal Elements. The plan is a statement of goals, principles, and planning policies for the growth and development of the national capital during the next 20 years. The federal elements of the Comprehensive Plan for the National Capital identify and address the current and future needs of federal employees and visitors to the nation's capital; provide policies for locating new federal facilities and maintaining existing ones; promote the preservation and enhancement of the region's natural resources and environment; protect historic resources and urban design features that contribute to the image and functioning of the nation's capital; and working with local, state, and national authorities, support access into, out of, and around the nation's capital that is as efficient as possible for federal and nonfederal workers.

PLANNING TOGETHER FOR CENTRAL WASHINGTON (2008)

This brochure prepared by the NCPC/CFA, Architect of the Capital, DC Office of Planning, and the NPS identified adjacent planning areas and set common planning goals and implementation priorities.

FEDERAL CAPITAL IMPROVEMENTS PROGRAM 2010-2015 (2009)

In February 2009, the NCPC completed the Federal Capital Improvements Program for fiscal years 2010–2015. This document lays out the proposed budgetary commitments as reviewed and evaluated by the

¹ The Commemorative Works Act provides standards and approval requirements as well as permitting requirements for location and design of new memorials and monuments in the District of Columbia. The act distinguishes between the adjacent portions of the District of Columbia, where the commemorative works of "pre-eminent historical and lasting significance" to the nation may be located, and areas outside this zone where works of "lasting historical significance" can be placed. It also seeks to preserve the urban design legacy of the L'Enfant and McMillan plans by protecting public open space and ensuring that future museums and memorials are appropriately located and designed.

NCPC regarding federal activities in Washington, DC, and the surrounding Maryland and Virginia Counties. The Federal Capital Improvements Program plans the budget for a six-fiscal-year cycle. Projects listed in this document are not assumed to be approved but, rather, the document includes the NCPC's comments and recommendations for future projects, including encouraging federal agencies to design security improvements that are aesthetically appropriate to their surroundings and enhance the public environment. Furthermore, NCPC recommends a comprehensive approach to the design of permanent security measures (NCPC 2009).

MONUMENTAL CORE FRAMEWORK PLAN (2009)

The Monumental Core Framework Plan was led by the NCPC with the CFA. This planning effort illustrates opportunities to create new and accessible destinations for cultural attractions throughout the city. The Framework Plan provides a comprehensive approach to easing demand for construction on the National Mall in addition to creating attractive urban locations throughout the city. A preliminary plan was released in fall 2007, accentuating the Extending the Legacy Plan and the Malls and Memorials Master Plan. A final plan was completed and approved in 2009.

THE NATIONAL MALL PLAN (2010)

The NPS National Mall Plan, which provides a comprehensive long-term vision for the National Mall, was prepared under the NEPA and NHPA and includes input from the public, numerous federal and local agencies, and other stakeholders. While the plan addresses areas under NPS jurisdiction, it has been coordinated with plans by others such as the NCPC, the District Office of Planning, the Architect of the Capitol, surrounding museums, and other federal buildings. Under the National Mall Plan, "the National Mall, as the premier civic and symbolic space for our nation, would be respectfully rehabilitated and refurbished so that very high levels of use could be perpetuated, and the needs of all visitors and users could be met in an attractive, high-quality, energy-efficient, and sustainable manner (NPS 2010a)."

During planning, the NPS evaluated a range of alternatives against how well they resolved known issues, addressed planning needs and objectives, fulfilled law and NPS policies, and met NEPA goals, and what advantages each set of alternative ideas offered. The preferred or proposed action combined ideas from all the alternatives and was continually updated based on public comment. The National Mall Plan addresses natural and cultural resource protection, respects the history of development, and builds on the intent and extant features of historic plans. It also addresses the civic space venues and management (including First Amendment rights, national celebrations, and special events/other permitted activities); multi-modal access and circulation; multiple types of visitor experiences and enjoyment such as tourism, recreation, visitor education/interpretation, visitor facilities and services; park operations; and socioeconomic impacts.

The National Mall Plan vision is for Constitution Gardens to be a high-quality, restful, multi-purpose visitor destination with food service choices (a sit down restaurant) and amenities (a bookstore, restrooms, and retail), as well as education, entertainment, and recreation. The Lockkeeper's House would be relocated and coordinated with new visitor facilities and the levee. Circulation and accessibility would be improved and walks repaved and widened to be flexible and accommodate events. Soil conditions would be improved; the lake would be reconstructed to be self-sustaining and use a non-potable water source and be part of stormwater management.

NPS MANAGEMENT POLICIES

The NPS *Management Policies 2006* (NPS 2006) is the basic NPS-wide policy document, adherence to which is mandatory unless specifically waived or modified by the NPS director or certain departmental officials, including the US Secretary of the Interior. Actions under this EA are in part guided by these management policies.

SCOPING PROCESS AND PUBLIC PARTICIPATION

The 2010 National Mall Plan articulated a vision for the National Mall and identified proposed improvements to Constitution Gardens as one of the highest priorities for the National Mall. The TNM committed to raise money to fund capital improvements and various operations and activities at Constitution Gardens. In 2011–2012, the TNM commenced a National Mall Design Competition for the redesign of Union Square, the Washington Monument grounds near Sylvan Theater, and Constitution Gardens resulting in the selection of winning architectural/engineering teams responsible for developing a design for each site. Predesign and value analysis studies were completed for the Constitution Gardens and Sylvan Theater sites, which culminated in a joint decision by the TNM and NPS that the Constitution Gardens project would receive the partnership's initial commitment for fundraising, design, and construction efforts.

Subsequently the interdisciplinary staff of the National Mall conducted internal scoping during April–May, 2014. The internal scoping process further refined the purpose and need for the Constitution Gardens' EA, as well as the relationship of this plan to other planning efforts at the National Mall and Memorial Parks.

The NPS initiated public scoping for the EA by issuing a scoping letter on May 5, 2014. The letter was posted to the NPS, Environment, and Public Comment (PEPC) website and sent to stakeholders by email. The public scoping meeting for the Constitution Gardens Rehabilitation Project was held on May 22, 2014, at the Ronald Reagan Building, 1300 Pennsylvania Avenue NW, Washington, DC, from 5:00 p.m. to 7:00 p.m.; 12 people signed in to the meeting.

The meeting began with an open house to provide the participants with an opportunity to meet informally with park staff and review informational displays that describe the purpose and need for the proposed action, preliminary alternatives, and the NEPA and NHPA Section 106 compliance processes. The poster boards from the winning design team of the 2012 National Mall Design Competition were also made available during the meeting for the public to review. A supplementary presentation was given on the project background, purpose and need, NEPA and NHPA Section 106 compliance processes, existing conditions, and key planning considerations. Subsequent to the scoping meeting, the presentation was posted to the park's PEPC website.

The public scoping comment period was open from May 5, 2014, to June 5, 2014. During this time, the NPS provided several methods for the community to provide input on the proposed project. At the public meeting, comment sheets were provided and included information on directing comments to the NPS PEPC website at www.parkplanning.nps.gov/COGA. Additionally, public comments were taken during the 2011–2012 National Mall Design Competition, which included designs for the rehabilitation of Constitution Gardens.

During the public scoping period, 11 pieces of correspondence were received containing 12 signatures. Five correspondences were received through the PEPC system, and six were submitted via letter. Additionally, 247 correspondences were received during the design competition phase, containing a total of 248 signatures. Ten commenters were from Washington, DC, one commenter was from Virginia, and 248 commenters were from unknown locations. The majority of the comments (257) received were from unaffiliated individuals; two were from affiliated organizations—Casey Trees and Coalition for Smart Growth.

ISSUES AND IMPACT TOPICS

Issues describe problems or concerns associated with current impacts from environmental conditions or current operations as well as changes, impacts, and potential issues that may arise from the implementation of any of the alternatives. Potential issues associated with the rehabilitation of Constitution Gardens were identified during internal and public scoping. The NPS' primary concern is to

ensure that any alternative considered will allow for increased visitor amenities and recreational opportunities, while preserving character-defining patterns and features of the cultural landscape. The issues and concerns identified during scoping were grouped into impact topics that are discussed in “Chapter 3: Affected Environment” and analyzed in “Chapter 4: Environmental Consequences.”

Impact Topics Analyzed in this Environmental Assessment

NATURAL RESOURCES

Soils

Several proposed actions would affect the future level of soil compaction and erosion such as proposed excavation and replacement of soils. The excavation of buried “tempo” debris layer (8–10 feet deep) may or may not allow balance of cut and fill depending on the suitability of excavated material to be moved. As a result, soils are addressed as an impact topic in the EA.

Water Resources

NPS policies require water quality protection consistent with the Clean Water Act, the purpose of which is to restore and maintain the quality and integrity of the nation’s waters. The proposed action would not directly impact water resources. Water quality, water quantity, and drinking water are expected to be affected by the project through reduction of potable water consumption, interception of stormwater runoff, and reclamation of gray water for reuse on site. Proposed excavation of the lake may intercept the groundwater table, located between 1 to 13 feet deep. As a result, water resources are addressed as an impact topic in the EA.

Vegetation

The proposed alternatives would impact vegetation type and diversity of plant materials in the gardens with potential impacts on the amount of turf, tree removal, and overall tree canopy. In addition, the proposed soil rehabilitation would potentially improve tree conditions. As a result, vegetation is addressed as an impact topic in the EA.

CULTURAL RESOURCES

The NHPA (54 USC 300101 et seq.), NEPA, Organic Act, NPS *Management Policies 2006* (NPS 2006), DO-12 (*Conservation Planning, Environmental Impact Analysis and Decision-making*), and NPS-28 (*Cultural Resources Management Guideline*), require the consideration of impacts on any cultural resources that might be affected. The NHPA, in particular, requires the consideration of impacts on cultural resources either listed in, or eligible to be listed in, the National Register.

According to the NHPA, there are five property types used in the National Register: districts, sites, buildings, structures, and objects. However, based on the unique stewardship role in the management of its historic properties, the NPS *Management Policies 2006* categorizes cultural resources as archeological resources, cultural landscapes, structures, ethnographic resources, and museum objects (prehistoric and historic objects, artifacts, works of art, archival documents, and natural specimens).

Under the regulations implementing Section 106 of the NHPA, the NPS determined that the proposed action would constitute an “undertaking” having a potential effect on NRHP resources and then assessed both a primary and secondary area of potential effect (APE), see Figure 3-1. The majority of the direct effects from the proposed action are anticipated to be constrained to Constitution Gardens itself, which is referred to as the primary APE, while indirect effects could occur within the larger APE, or the secondary APE, which encompasses the National Mall and Memorial Parks. For the purposes of this EA, cultural resource impact topics include historic districts, structures, archeology, and cultural landscapes.

Historic Districts and Structures

Historic structures are those significant in the history of American architecture, culture, engineering, or politics at the national, state, or local level. Historic structures are classified as buildings, structures, sites, objects, or districts (i.e., all the various types of historic property, except for archeological sites) that are potentially eligible for the National Register. A historic district is a geographic area that includes a concentration of sites, buildings, structures, or objects that are historically or aesthetically linked by plan of physical development (NPS 2014a). Constitution Gardens is a contributing resource to two NRHP-eligible historic districts: the East-West Potomac Park Historic District and the L'Enfant Plan of the City of Washington. At Constitution Gardens, both the Lockkeeper's House and the west end concessions are historic structures. The Lockkeeper's House is individually listed in the National Register. The proposed rehabilitation could relocate, restore, or remove these resources, resulting in impacts on historic structures. As a result, historic districts and structures are addressed as an impact topic in this EA.

Cultural Landscapes

A cultural landscape is a geographic area, including both cultural and natural resources and the wildlife and wildlife habitat or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. All action alternatives would impact character-defining features and patterns of the Constitution Gardens cultural landscape (spatial organization, topography, land use patterns, circulation systems, vegetation, buildings and structures, cluster arrangements, and small-scale features). In addition, the proposed rehabilitation of Constitution Gardens could change the topography of the gardens with berms and other topographic alterations. As a result, cultural landscape is addressed as an impact topic in this EA.

Archeological Resources

Prior to the construction of Constitution Gardens, the area served as the site of the Washington Canal and later as an administration center for the Department of the Navy and the Munitions Division of the Department of War. As result, archeological resources may be present within the gardens. Currently, there is one known archeological site in the gardens (the Lockkeeper's House Site original foundation [51NW233]) and one within a half mile of the gardens (51MW176). The site in Constitution Gardens consists of the original location of Lock B (51NW235) of the Washington City Canal.

A Phase IA archeological investigation was conducted in November 2014 to determine the potential for archeological resources in the primary APE. Six soil cores, extending 25 feet below ground, were excavated along a 2,400-foot length of the gardens (Wagner 2014). The results of this investigation indicate that the early-mid-19th century landscape is present below modern fill; however, it was not possible to determine if buried soils are related to the Washington City Canal or to sediments along Tiber Creek.

The Phase IA investigation indicates that there are seven archeological sites within the primary APE. These sites include the former location of Lock B of the Washington City Canal (51NW235), remnants of the 17th Street Wharf (51NW232), the Lockkeeper's House deposits (51NW233), the outlet of the Tiber Creek Sewer (51NW234), potential deposits associated with the foundations of the Navy Administration Buildings, potential remains of the Washington City Canal prism and towpath, and potential remains of the Washington Brewery (Coningham and Company). Site 51NW235 has been determined eligible for listing in the National Register. The other recorded sites have not been evaluated for eligibility. Further archeological research would be needed to determine the exact nature of the impacts of the action alternatives on these resources. However, given the ground disturbance associated with the action alternatives and the high potential for the presence of archeological resources, it is likely that it would have an adverse effect on archeological resources under Section 106. These impacts would be mitigated through consultation with the appropriate parties and development of an agreement document (Memorandum of Agreement).

VISUAL RESOURCES

Some of the action alternatives would introduce new walkways and features in the project area and would change the visual character of the project. In addition, new features and topographic changes could alter the views and vistas to and from the gardens, some of which are character-defining features of the cultural landscape. As a result of potential impacts that would occur from both the No-action and action alternatives, visual resources are addressed as an impact topic in this EA.

VISITOR USE AND EXPERIENCE, INCLUDING SAFETY

The rehabilitation of Constitution Gardens would impact visitor use and experience by affecting movement and circulation, respite areas (such as benches, and the proposed visitor services pavilion areas), visitor interpretation opportunities, and amenities and event spaces. Additionally, the rehabilitation of the gardens would include changes to lighting and visibility. As a result of potential impacts on visitor use and experience from both the No-action and action alternatives, this resource area is addressed as an impact topic in this EA.

TRAFFIC AND CIRCULATION

The proposed rehabilitation of Constitution Gardens could change the southwest corner of 17th Street NW and Constitution Avenue NW, affecting multi-lane vehicular turning by large vehicles and impacting traffic signals and pedestrian street crossings and crosswalks. Additionally, changes to service, delivery, operational, and emergency access are proposed. As a result, traffic and circulation is addressed as an impact topic in this EA. A traffic study will be implemented to determine the need and viability of altering the southwest corner. As the design of the new visitor services pavilion and its specific use develops, access and timing issues related to 17th Street NW will continue to be considered.

PARK OPERATIONS AND MANAGEMENT

The proposed rehabilitation of Constitution Gardens could result in a need for different staff numbers; special expertise; sustainable approaches; operational access; and other park, volunteer, or concessions operations.

The proposed rehabilitation of Constitution Gardens also would reduce potable water use; however, it would add a more complicated filtration system that requires additional maintenance. Although the proposed pumps for the water management system would increase electricity use, the system would be balanced by alternative energy generation. In addition to exploring options to improve the efficiency of water and electricity usage, the NPS would comply with EO 13514 and NPS sustainability and net zero energy policies.

Constitution Gardens, contains numerous underground utilities that could be affected by the proposed rehabilitation. The proposed actions would also affect irrigation, water, and electric supply in the project area and stormwater and wastewater management in the context of the National Mall and downtown Washington, DC.

As a result of potential impacts on park management that would occur from the alternatives, park operations and maintenance are addressed as an impact topic in this EA.

Impact Topics Dismissed from Further Analysis

GEOLOGY

The proposed alternatives would not change or alter geological resources in Constitution Gardens, although soils would be displaced during construction. The findings from the geotechnical study are discussed in “Chapter 3: Affected Environment,” *Soils*. As a result, geology was dismissed as an impact topic.

WILDLIFE

The project area is in an urban setting and is surrounded by manicured lawns and landscaping. It is adjacent to heavily used roads with frequent vehicle noise. As a result, wildlife in the project area is limited to adapted urban species, such as raccoons, waterfowl, squirrels, songbirds, and an occasional hawk using the larger trees to perch. No nesting of raptors is known or expected. Although construction-related activities may temporarily displace wildlife from the area, the proposed alternatives would not result in greater than negligible impacts on wildlife or wildlife habitat. Because of the area's urban context, the level of human activity, and minimal habitat value, wildlife was dismissed as an impact topic.

WETLANDS

There are no wetlands that would be affected by any of the proposed alternatives. The Preferred Alternative and Alternative 1 propose to create aquatic shelves to improve the lake environment. As a result, wetlands was dismissed as an impact topic.

FLOODPLAINS

EO 11988, *Floodplain Management*, provides for the protection of floodplain values, while DO 77-2: *Floodplain Management* (NPS 2003) provides the NPS with requirements for implementing the EO, which was amended, on January 30, 2015. The lake and surrounding area is within the Zone X, 500-year floodplain and will remain so unless the Potomac Park levee improvements are constructed. The project area is not within the 100-year floodplain, although rehabilitation of the Lockkeeper's House will be designed to the 100-year floodplain standards. A floodplain statement of finding is not necessary for this project because the proposed action would not affect floodplain functions or values, affect flood water flows, or involve construction of structures that could be affected by flooding because of the levee berm. As a result, floodplains was dismissed as an impact topic.

RARE, THREATENED, OR ENDANGERED SPECIES

The Endangered Species Act (1973), as amended, requires an examination of impacts on all federally listed threatened or endangered species. NPS policy also requires examination of the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species. In accordance with Section 7 of the Endangered Species Act, letters (dated May 8, 2014) were sent by NPS to solicit comments from the USFWS regarding the existence of one federally listed endangered species and the District Department of Environment regarding state-listed species (see appendix A). To date no responses have been received. However, rare, threatened, or endangered species or habitat are not known nor are they expected to occur in the project area. Should new species become listed under the Endangered Species Act and have the potential to occur in the project area, NPS will consult with the USFWS as needed. As a result, rare, threatened, and endangered species was dismissed as an impact topic.

AIR QUALITY AND CLIMATE CHANGE

The 1963 Clean Air Act, as amended (42 USC 7401 et seq.), requires federal land managers to protect air quality in national parks. The project site is located in the Washington Metropolitan Area airshed, which is in a marginal nonattainment zone for ozone and moderate nonattainment for particulate matter (2.5 microns or smaller). During construction, dust and vehicle emissions would temporarily affect local air. Overall, there would be a slight and temporary degradation of local air quality from dust generated by construction activities, but these effects would be localized and negligible to minor. The gardens' current level of air quality would not be affected by the proposed alternatives; therefore, air quality was dismissed as an impact topic.

Climate change refers to any significant changes in average climatic conditions (such as mean temperature, precipitation, or wind) or variability (such as seasonality and storm frequency) lasting for an

extended period (decades or longer). Recent reports by the US Climate Change Science Program, the National Academy of Sciences, and the United Nations Intergovernmental Panel on Climate Change provide evidence that climate change is occurring as a result of rising greenhouse gas emissions and could accelerate in the coming decades.

While climate change is a global phenomenon, it manifests differently depending on regional and local factors. General changes that are expected to occur in the future as a result of climate change include hotter, drier summers; warmer winters; warmer ocean water; higher ocean levels; more severe wildfires; degraded air quality; more heavy downpours and flooding; and increased drought. Climate change is a far-reaching, long-term issue that could affect the gardens and its resources, visitors, and management. Although some effects of climate change are considered known or likely to occur, many potential impacts are unknown. Much depends on the rate at which the temperature would continue to rise and whether global emissions of greenhouse gases can be reduced or mitigated. Climate change science is a rapidly advancing field, and new information is being collected and released continually.

Construction activities associated with implementation of the proposed action would contribute to increased greenhouse gases emissions, but such emissions would be short term, ending with the cessation of construction, and it is not possible to meaningfully link the greenhouse gases emissions of such individual project actions to quantitative effects on regional or global climatic patterns. Any effects on climate change would not be discernible at a regional scale. Additionally, more intense storms and the potential for flooding from the Potomac River into the project area will be reduced as a result of the Potomac Park levee improvements and the installation of a constructed gate system across 17th Street. The Federal Emergency Management Agency is currently updating its flood maps and it is expected that this area will be shown with an increased elevation. Therefore, the effects of climate change were dismissed from further evaluation.

CULTURAL RESOURCES (OTHER)

Certain cultural resources, not primarily associated with the National Register, are impact topics under NPS regulations that must be evaluated or dismissed in EAs (NPS 1998a).

Ethnographic Resources

Ethnographic resources are defined by the NPS as any “site, structure, object, landscape, or natural resources feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it” (NPS 1998b). In this analysis, the term “ethnographic resources” is equivalent to the term “Traditional Cultural Property” (TCP), which is more widely used in cultural resource management. Guidance for the identification of ethnographic resources is found in NRHP Bulletin #38, *Guidelines for Evaluating and Documenting Traditional Cultural Properties* (NPS 1998b). The key considerations in identifying the TCPs are their association with cultural practices or beliefs of a living community that are (1) rooted in the community’s history, and (2) are important in maintaining the continuing cultural identity of the community (Parker and King 1998). No properties meeting the definition of a TCP lie within the APE²; therefore, ethnographic resources are dismissed as an impact topic.

Museum Collections

Implementation of any alternative would have no impact on how museum collections (prehistoric and historic objects, artifacts, works of art, archival material, and natural history specimens) would be

² Constitution Gardens is adjacent to the Vietnam Veterans Memorial, which has strong association to veterans and has generated a dynamic museum collection.

acquired, accessioned and cataloged, or preserved and protected. Therefore, museum collections was dismissed as an impact topic.

INDIAN TRUST RESOURCES

Secretarial Order 3175 requires that any anticipated impacts on Indian trust resources from a proposed project or action by the US Department of the Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources in the Washington, DC, area. The lands comprising the National Mall are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. However, the NPS intends to send a letter to the Delaware Nation requesting input and comments regarding any possible sites of religious or cultural significance that could be affected by the proposed rehabilitation project. As a result, the impact topic of Indian trust resources was dismissed.

LAND USE

NPS *Management Policies 2006*, provides for the protection of park lands, federal lands, and privately owned lands adjacent to park units. Both the No-action and action alternatives would be consistent with and support the park plans and policies and would not change land use in the project area; therefore, land use was dismissed as an impact topic.

SOCIOECONOMICS

NEPA requires an analysis of impacts on the human environment, which includes economic, social, and demographic elements in the affected area. Construction activities associated with the proposed action may bring a short-term need for additional personnel in the gardens, but this addition would be minimal and would not affect the surrounding community's overall population, income, or employment base. The proposed action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Implementation of the proposed action could provide a temporary and long-term beneficial impact on the economies of nearby area (e.g., minimal increases in employment opportunities for the construction workforce and revenues for local businesses and government generated from construction activities and workers, additional opportunities for recreation, and improved visitor service facilities). Impacts would be beneficial but not noticeable locally or regionally; therefore, socioeconomics was dismissed as an impact topic.

ENVIRONMENTAL JUSTICE

EO 12898, *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to the United States Environmental Protection Agency (EPA), environmental justice is the

...fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The goal of “fair treatment” is not to shift risks among populations but to identify potentially disproportionately high and adverse effects and to identify alternatives that may mitigate these impacts.

Communities surrounding the National Mall contain both minority and low-income populations; however, environmental justice is dismissed as an impact topic for the following reasons:

- The park staff and planning team actively solicited public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- Implementation of the proposed alternatives would not result in any identifiable adverse human health effects. Therefore, there would be no direct or indirect adverse effects on any minority or low-income population.
- Implementation of the proposed alternatives would not result in any identified effects that would be specific to any minority or low-income community.

The impacts associated with implementation of the proposed alternatives would not disproportionately affect any minority or low-income population or community.

CHAPTER 2: ALTERNATIVES

INTRODUCTION

NEPA requires that federal agencies explore a range of reasonable “alternatives” for implementing the proposed action. The alternatives under consideration must include the “no-action” alternative as prescribed by 40 CFR §1502.14. Any alternative analyzed must meet the management objectives of the park, either wholly or partially, while also meeting the purpose of and need for the project.

Project alternatives may originate from the proponent agency, local government officials, or members of the public. Alternatives may also be developed during the early stages of project development at public scoping meetings or in response to comments from coordinating or cooperating agencies. The alternatives analyzed in this document are the result of internal scoping, public scoping, and agency consultation. The components of the action alternatives represent the outcome of extensive collaboration between the NPS and the consultant design team.

NPS staff and the project consultant team’s designers and engineers collaborated to carry forward three action alternatives and a no-action alternative for further analysis in the EA. All action alternatives were developed based on the concept presented by the winning team from the 2012 National Mall Design Competition.

ALTERNATIVES

This chapter includes a description of the No-action and action alternatives to rehabilitate Constitution Gardens. A related map or plan graphic accompanies each summary descriptions of the No-action and each action alternative. Elements common to all action alternatives is provided prior to describing the individual action alternatives. The Regenerative Garden is the Preferred Alternative. After the summary description, Table 2.1 provides a more comprehensive discussion of the alternative actions related to six broad topic areas—natural resources, cultural resources, visual resources, traffic and circulation, visitor use and experience, and park management and operations.

Following Table 2.1 is a discussion of mitigation measures for action alternatives; a listing of alternatives considered but not carried forward; a discussion of the NPS Preferred Alternative and environmentally Preferred Alternative; and an assessment synopsis comparing key alternatives differences (Table 2.2). The chapter ends with a table summarizing the impacts of the alternatives (Table 2.3).

No-Action Alternative

The No-action Alternative represents a continuation of current management, conditions, and uses (Figure 2.1). Under the No-action Alternative, the 1970s era informal and pastoral garden with its rolling terrain, central lake, and diverse mature tree canopy would be maintained. A general description of the existing park features is provided below, and more detail is provided in Table 2.1.

Topography and Soils. The topography would remain a gently rolling and wooded; the slopes and terrain would remain uneven and irregular with low areas as the result of poor soil conditions and poor drainage.

Vegetation. The designed wooded park is comprised primarily of mown lawn and mature shade trees in regular massing or clusters, with some understory trees and shrubs such as dogwood. More than 18 different tree species are on-site, and based on a partial survey, around 53% of them are in poor to fair condition. Trees planted within asphalt walks have not survived or are in poor health, and stumps of trees that have been removed remain. There are emergent and submerged aquatic plants.

Lake. The artificial concrete-lined lake is shallow (18 inches to 4.5 feet), filled with potable water, and has limited recirculation that affects water quality unless managed carefully.

Cultural Resources. The overall character of the cultural landscape as designed by Skidmore, Owings, and Merrill in the 1970s is in poor to fair condition. The topography remains uneven, and the original shape of the lake remains. Water quality in the lake is fair. The Lockkeeper's House is vacant, but would be stabilized. The Memorial to the 56 Signers of the Declaration of Independence island continues to be inaccessible (ABAAS non-compliant) and the plantings are in fair condition. The Overlook and east terraces remain underused. A small, seasonal food concession stand (historic) at the west end of the lake and a small public restroom located at the southwest end of the lake, just beyond the concession stand, comprise the only visitor facilities.

Views. Views within and from outside of Constitution Gardens are of an informal wooded area centered around a lake that reflects both the wooded character and the surrounding features such as the Washington Monument.

Visitor Destinations and Facilities. The Memorial to the 56 Signers of the Declaration of Independence remains inaccessible to visitors using wheelchairs. The Lockkeeper's House is vacant and is located approximately 15 feet from a busy intersection. It is subject to vibrations from traffic, and its location affects turning capacity from the two right lanes from Constitution Avenue to 17th Street NW. The 350 square foot (SF) Lockkeeper's House (slab on grade) was moved previously and is in fair, actively deteriorating condition. Limited recreational activities occur, although walkways connect to surrounding well-visited destinations.

Traffic and Circulation. A series of curvilinear walks meander through the gardens connecting to nearby attractions. Seeded asphalt walks and the Overlook Terrace at the east end of the lake have deteriorated. Access for operations, deliveries, and emergencies is accomplished by jumping the curb because no developed access points have been provided. A tight turning radius affects right turning vehicular movement at the southwest corner of Constitution Avenue and 17th Street NW.

Figure 2.1 – No-Action Alternative



REHABILITATE CONSTITUTION GARDENS / NO ACTION ALTERNATIVE

NATIONAL MALL AND MEMORIAL PARKS
WASHINGTON, DC

Common Elements to All Action Alternatives

Rehabilitation of Constitution Gardens addresses several common elements – the landscape, the lake, the addition of a pavilion, pedestrian and vehicular circulation, and visitor opportunities. Treatment of these elements may differ between the alternatives, see Table 2-1 for details.

Lake. A naturally functioning, deeper (up to 12-feet) artificial lake in the shape of the current lake would be included. The lake would use an integrated water management approach involving a variety of water sources (mainly non-potable). The water would be collected from storm drains, filtered through and stored below ground in cisterns on-site. Potable water would be used as necessary to keep the lake filled when other water sources are not available.

A shallow concrete-bottom (up to 18-inches deep) lake ring would be incorporated into the lake at its east end. The perimeter of the lake ring would be designed to be walkable so visitors could more closely connect with the resource. The ring would be used for visitor recreation, including model boating, seasonal ice skating, and fishing. Ice for skating would be artificially frozen via a system that would be determined during phase 2 design.

The Vietnam Veterans Memorial. The memorial would be respected. Circulation changes in walks and paths would be sympathetically integrated with the Vietnam Veterans Memorial walkways. Event locations and vigil sites would be retained and identified to facilitate use. Views to the Washington Monument from the memorial would be protected.

The Lockkeeper's House. The Lockkeeper's House would be relocated and adaptively reused and rehabilitated in accordance with Secretary of the Interior's *Standards for the Treatment of Historic Properties*. Use of the building could include visitor education, donor recognition, and park management needs.

Pavilion. A multi-purpose visitor services pavilion with an adjacent event plaza would be constructed at the east end of the lake in the location of the existing Overlook Terrace. A restaurant/bar on the upper level would have outdoor deck space for tables and chairs and an east side event terrace. The lower entrance level would include public restrooms, a refreshment stand with outdoor space for tables and chairs, a bookstore/retail space, a space for recreation rentals, a kitchen space, and park operational or storage space. Access between levels would be provided by an elevator, walkways, and a wide staircase.

Memorial to the 56 Signers of the Declaration of Independence. Access to the memorial would be improved for visitors with disabilities.

Walkways. Walkway alignment would be modified slightly, but spatial organization of the park circulation system and its other features would be retained. New surfaces throughout the gardens would be ABAAS compliant and would be able to withstand use by operational equipment and small service vehicles. Approaches to adjacent memorials (World War II, Vietnam Veterans, and Lincoln Memorial) would be improved. Entry to the gardens would be accentuated with double entry walks, and the 17th Street NW entry would welcome visitors to the National Mall and Constitution Gardens.

Southwest Corner of 17th NW and Constitution. The intersection radius, crosswalks, and signs at the southwest corner of 17th Street NW and Constitution Avenue would be redesigned to improve traffic flow for turning vehicles and provide better pedestrian access. A traffic study would be implemented to determine the need and viability of altering the southwest corner.

Access. Emergency access (a one-way drive going south) would be provided from Constitution Avenue along the wide walk that goes to the World War II Memorial. It would exit on 17th Street NW north of the World War II Memorial. Operational access for deliveries, service vehicles, and other equipment would be improved throughout the site to accommodate grounds keeping, trash removal, and other park, event or

concession needs. As the design of the pavilion and its specific use develops, access and timing issues related to 17th Street NW will continue to be considered.

Site Furnishings. Benches, tables and chairs, signs, lighting, and other site furnishings would be added or improved for visitor comfort, convenience, and safety.

Recreation. New and improved opportunities for recreation would be provided. Rental equipment for skating, model boating, and fishing would be provided through a concession. The size of the operation and related facilities would be determined during design and may include temporary seasonal warming facilities.

Utilities and Energy. Water sources and treatment systems, the sewer system, and the electrical and communications systems would be redesigned and/or replaced as needed to achieve sustainable goals.

Preferred Alternative – Regenerative Garden (Preferred Alternative)

The Regenerative Garden (Preferred Alternative) would rehabilitate Constitution Gardens to improve sustainability and social spaces. The rehabilitation would include greater planting diversity and a mix of lawns and trees canopy with meadows and understory (Figure 2.2). More detail is provided in Table 2.1.

Topography and Soils. The topography would be re-graded to smooth irregularities and accentuate gently rolling hills, improve soil conditions, and provide a cohesive drainage system. Re-grading would work around and protect healthy trees that would remain in place. Existing soil (40–60%) would be combined with imported soils and suitable soils from on-site excavation.

Vegetation. A wooded park (75% of the area) with a mixed mature canopy of shade trees would be designed to replicate the existing massing, number, and canopy. Shade trees would have a diverse understory (25% of the area) of flowering trees, shrubs, and low growing woodland plants. Lawns, meadows, and gardens would be established and dominate in open areas. Trees in good and fair condition (70–85% based on a partial survey) would be protected to the greatest extent possible, and the soil would be reengineered to improve growing conditions. Trees in poor and fair condition or in locations where facilities would be constructed would be removed. Mature trees in locations where facilities would be constructed would be relocated. Aquatic plants would be on a shallow, wide (up to 15-feet), submerged shelf around some of the lake edge and would have openings to allow for access to the water from the walkway.

Lake. A deeper (up to 12-feet), recirculating artificial lake within the same footprint would include a partial aquatic edge planting and a natural (non-concrete) bottom. Non-potable water (approximately 10 million gallons) to fill the lake and for irrigation may be collected from sources such as stormwater runoff; gray or black water collected, treated, and stored on site (in cisterns); or from wells (after further study). Treated potable water would be used only as needed to maintain the water level for the health of the fish or the recirculating system.

A shallow lake ring (up to 56,000 SF and 18-inches deep) with a concrete bottom would be located in the east end of the lake and used for recreational purposes (e.g., ice skating and model boating). The water quality of both the lake and the lake ring would meet the standards set forth by the District of Columbia Department of the Environment (DDOE) and the Environmental Protection Agency (EPA). The lake ring itself would be a walkable ledge, with multiple access points on the east side (east and northeast) and the south side of the pavilion

Cultural Resources. The overall character of the cultural landscape as designed by Skidmore Owings and Merrill in the 1970s would be maintained by retaining and improving its informal pastoral/wooded settings with lake reflections. The topography would change slightly, and an 18-inch stone wall would be added around the edges of Constitution Avenue and 17th Street NW. The proposed pavilion and the

addition of the lake ring would add new features to the landscape. The shape of the lake and island would remain the same.

The Lockkeeper's House would be relocated approximately 18 feet south and 5 feet west from its current location and would be rehabilitated according to the Secretary of the Interior's *Standards for the Treatment of Historic Properties* and adaptively reused. The main floor would be open to the public and would include a new 350-SF basement to the existing 350-SF building for mechanical equipment and storage, and may be connected to a geothermal field for climate control. A plaza would be built in front for interpretation.

The Memorial to the 56 Signers of the Declaration of Independence island would be made universally accessible (ABAAS compliant), and the plantings would be replaced as needed, while retaining the character of the original design. Additional access to the island would be created by possibly adding a stepping stone path on the northwestern edge of the island. Vegetation quality would be improved.

The Overlook and east terraces would be removed to accommodate the pavilion. The historic west concessions building would be adaptively reused.

Views. Existing views in, out, and through the gardens would be preserved and emphasized with wide dual entry walks originating from Constitution Avenue. The pavilion overlook deck and terrace would offer views of the gardens and the Washington Monument. Views from the Vietnam Veterans Memorial and its knoll, from Virginia Avenue to the Washington Monument, and to the World War II Memorial would not be blocked.

Visitor Destinations and Facilities. Located on the east side of the gardens, the proposed pavilion would provide a new multi-purpose visitor facility (including access to food, a bookstore, restrooms, and recreation rentals) with an upper level of 3,700 SF and a lower level of 30,000 SF and space for concessioners and park staff. Service and delivery vehicles would access a loading dock on the lower level of the pavilion via a single curb-cut and below grade service road/turn-around from 17th Street NW. The pavilion would have an outdoor deck overlooking the lake and an event terrace (8,800 SF) on its east side. It would be designed to meet Leadership in Energy and Environmental Design (LEED) Silver standards or higher for sustainability and may include geothermal fields (after further study) as well as reuse of gray water. A green living roof would be planted over the lower level. Utilities would be upgraded as needed. Multi-purpose areas would be established, including vigil sites and an amphitheater. Other areas would be enhanced, including the knoll next to the Vietnam Veteran Memorial and lawn areas. Walkways would be improved and intersections would be widened.

The historic west end concession stand would be adaptively reused. The west end restroom is not included in this project. A lawn amphitheater and paved event spaces would also be constructed on the south side of the lake towards the east.

Traffic and Circulation. Walks would be resurfaced to be fully accessible and slightly reconfigured to improve circulation (walks may be widened up to 20 feet with an average width of 12–15 feet); dual entry walks would welcome visitors, and the entrance near the Lockkeeper's House would serve as a gateway to Constitution Gardens and the National Mall. A 20-foot-wide walk would be built for access to the World War II Memorial. The southwest corner of the intersection of Constitution Avenue and 17th Street NW may be redesigned to improve the turning radius (50–100 feet) for vehicles and the crosswalk for pedestrians (after additional traffic studies). Operational, service, and emergency entry and egress would be improved throughout the gardens, and a below grade access road would be added from 17th Street NW. As the design of the pavilion and its specific use develops, access and timing issues related to 17th Street NW will continue to be considered.

[This page was intentionally left blank.]

Figure 2.2 – Preferred Alternative - Regenerative Garden



REHABILITATE CONSTITUTION GARDENS
FIGURE 2.2 - PREFERRED ALTERNATIVE - REGENERATIVE GARDEN

NATIONAL MALL AND MEMORIAL PARKS
WASHINGTON, D.C.

Alternative 1 – Sustainable Garden

The Sustainable Garden radically rehabilitates Constitution Gardens to more sharply focus on sustainability and an ecologically functioning environment, with greater planting diversity—meadows, lawns, understory, tree canopy, and aquatic vegetation (Figure 2.3). More detail is provided in Table 2.1.

Topography and Soils. The topography would be increased to about 8–10 feet higher than existing in some areas. Re-grading would work around and protect healthy trees that would remain in place. Existing soil (60–90%) would be combined with imported soils and suitable soils from on-site excavation. A cohesive drainage system would be provided.

Vegetation. Vegetation would include a diverse mix of shade and understory flowering trees with low woodland plants. The majority of trees (+/- 95%) would be removed so that soil conditions could be improved and the topography could be accentuated. The total number of new trees that would be planted would exceed the existing number. Unmanaged meadows would replace most lawns (60–75%). Trees in poor and fair condition or in locations where facilities would be constructed would be removed. Aquatic plants would be on a shallow, wide (up to 15 feet), submerged shelf around some of the lake edge. Wetland-type plants, including trees, would be planted between the lake edge and the island where the memorial is located.

Lake. The lake would be treated in the same manner as it would be under the Regenerative Garden Alternative.

Cultural Resources. The overall character of the cultural landscape as designed by Skidmore Owings and Merrill in the 1970s would be altered. It would retain its informal pastoral/wooded settings with lake reflections but the topography would rise from 8–10 feet throughout the park. A 30-inch stone wall would edge the gardens along 17th Street NW and Constitution Avenue. The pavilion would add a new feature to the landscape. The shape of the lake would remain the same; however, a lake ring would be added for increased recreational opportunities. The Lockkeeper's House would be relocated approximately 18 feet south and 5 feet west from its current location, and an outdoor plaza would be constructed. The building would be rehabilitated according to the Secretary of Interior's *Standards for the Treatment of Historic Properties*. A 1,000-SF basement for public use would be added to the existing 350-SF building above, and a freestanding staircase would be added. This space could be used for public donor recognition and education. The Memorial to the 56 Signers of the Declaration of Independence island would be made accessible (ABAAS compliant). Plantings would be improved; however the character of the original design would be retained. The Overlook and east terraces would be removed for construction of the pavilion. The historic west concessions building would be removed.

Views. Views within the gardens would be emphasized, but existing views would be severely altered. Views from the Vietnam Veterans Memorial and the adjacent knoll, from Virginia Avenue to the Washington Monument, and the view of the World War II Memorial would not be blocked. Views out of or into the gardens would be affected by changes in topography, but wide dual entry walks would provide glimpses into the site from along Constitution Avenue. The pavilion overlook deck and event terrace would provide similar views to Overlook Terrace.

Visitor Destinations and Facilities. The new multi-purpose pavilion would be a net zero energy facility (energy neutral), maximizing green and sustainable features and would include access to food, a bookstore, restrooms, and recreation rentals. The pavilion would have a 3,700 SF upper level and a 21,000 SF lower level and would include space for concessioners and park staff. Service and delivery vehicles would access a loading dock on the lower level of the pavilion via a curb cut and below grade service road from 17th Street NW. The pavilion would have an outdoor deck overlooking the lake and an event terrace (8,800 SF) on its east side. The pavilion would plan to meet LEED Platinum standards or higher for sustainability and include geothermal fields (after further study) as well as reuse of gray water. Utilities would be upgraded as needed. A photovoltaic and vegetative green roof would be installed over

part of the lower level. Multi-purpose areas, including vigil sites, would be established, and other areas, including the knoll next to the Vietnam Veterans Memorial and lawn, would be enhanced.

The historic west end concession stand would be removed, and the area would be used for gathering or events. The west end restroom is not included in this project. A lawn amphitheater and paved event spaces also would be constructed on the south side of the lake towards the east.

Traffic and Circulation. Walks would be resurfaced to be fully accessible and reconfigured slightly to improve circulation. Most of the walkways would retain their existing width of 12–15 feet; however, in some locations the width of the walkways would either increase to 20-feet or decrease to 8-feet to manage circulation. Dual 15-foot entry walks would be installed along Constitution Avenue, and a 20-foot-wide walk would be built for access to the World War II Memorial. The southwest corner of the intersection of Constitution Avenue and 17th Street NW could be redesigned to improve the turning radius for vehicles and the crosswalk for pedestrians (after additional traffic study). Operational, service, delivery, and emergency entry and egress would be improved throughout the gardens with on-grade access from 17th Street NW. As the design of the pavilion and its specific use develops, access and timing issues related to 17th Street NW will continue to be considered.

Figure 2.3 – Alternative 1 – Sustainable Garden



REHABILITATE CONSTITUTION GARDENS
FIGURE 2.3 - ALTERNATIVE 1 - SUSTAINABLE GARDEN

NATIONAL MALL AND MEMORIAL PARKS
WASHINGTON, D.C.

Alternative 2 – Social Garden

The Social Garden would rehabilitate Constitution Gardens as a better place for people, providing a sustainable but more flexible social environment with greater planting diversity than currently exists, primarily lawns and tree canopy with some meadows, and understory (Figure 2.4). More detail is provided in Table 2.1.

Topography and Soils. The topography would be increased to about 4–6 feet higher than existing in some areas. Re-grading would work around and protect healthy trees that would remain in place. Existing soil (40–60%) would be combined with imported soils and suitable soils from on-site excavation.

Vegetation. A wooded park (75% of area) with a mixed mature canopy of shade trees would be designed that replicates the existing massing, number, and canopy. Shade trees would have a diverse understory (25% of area) of flowering trees, shrubs, and low growing woodland plants. Lawns, meadows, and gardens would be established and dominate open areas. Trees in good and fair condition (70–85% based on a partial survey) would be protected to the greatest extent possible, and the soil would be reengineered to improve growing conditions. Trees in poor or fair condition or in locations where facilities would be constructed would be removed. Mature trees in locations where facilities would be constructed would be relocated. There would be no new aquatic plantings.

Lake. The lake would be treated in the same manner as it would be under the Regenerative Garden Alternative.

Cultural Resources. The overall character of the cultural landscape as designed by Skidmore Owings and Merrill in the 1970s would be altered. It would retain the informal pastoral/wooded settings with lake reflections but its topography would be enhanced. An 18-inch stone wall would edge the gardens along 17th Street NW and Constitution Avenue. The pavilion and lake ring would add new features to the landscape. The shape of the lake and island would remain the same.

The Lockkeeper's House would be relocated approximately 500-feet west and slightly south from its current location and would be rehabilitated according to the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. A 500-SF addition would be added to the existing 350-SF building. Space could be used for the public, donor recognition, and education.

The Memorial to the 56 Signers of the Declaration of Independence island would be made accessible (ABAAS compliant). Plantings would be improved, while retaining the character of the original design, and stepping stones would be added. The Overlook and east terraces would be removed for construction of the pavilion. The historic west concessions building would be adaptively reused.

Views. Views within the gardens would be moderately altered by the changes in topography. Views from the Vietnam Veterans Memorial and the adjacent knoll, from Virginia Avenue to the Washington Monument, and views to the World War II Memorial would not be blocked. Views out of or into the gardens would be affected by changes in topography but wide dual entry walks would provide glimpses into the site from along Constitution Avenue. The pavilion overlook deck and event terrace would provide similar views to Overlook Terrace.

Visitor Destinations and Facilities. The Memorial to the 56 Signers of the Declaration of Independence would be accessible to all people (ABAAS compliant) via a perimeter walk around the island, and would have multiple entry points and rehabilitated plantings.

The Lockkeeper's House would be relocated approximately 500-feet west and slightly south from its current location and would be rehabilitated according to the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. The main floor would be open to the public. The house would include a new 500-SF basement for mechanical equipment and storage and be connected to a geothermal field. A plaza would be built in front for interpretation.

A new multi-purpose visitor facility (including access to food, a bookstore, restrooms, and recreation rentals) with space for concessioners and park staff would be provided at a pavilion located on the east side of the gardens. Service and delivery vehicles would access a loading dock on the lower level of the pavilion via a curb cut and below grade service road from 17th Street NW. The pavilion would have an outdoor deck overlooking the lake and an event terrace on its east side. It would plan to meet LEED Silver standards or higher for sustainability and may include geothermal fields (after further study) as well as reuse of gray water. A green living roof would be planted over the lower level. Multi-purpose areas, including vigil sites and an amphitheater, would be established, and other areas would be enhanced, including the knoll next to the Vietnam Veterans Memorial and lawn areas.

The historic west end concession stand would be adaptively reused. The west end restroom is not included in this project. A lawn amphitheater and paved event spaces would also be constructed on the south side towards the east.

Traffic and Circulation. Walks would be resurfaced to be fully accessible and slightly reconfigured to improve circulation (walks may be widened up to 20 feet with a general width of 12–15 feet); dual entry walks would welcome visitors, and the entrance near the Lockkeeper's House would serve as a gateway to Constitution Gardens and the National Mall. The southwest corner of the intersection of Constitution Avenue and 17th Street NW could be redesigned to improve the turning radius (50–100 feet) for vehicles and the crosswalk for pedestrians (after additional traffic studies). Operational, service, and emergency entry and egress would be improved throughout the gardens. As the design of the pavilion and its specific use develops, access and timing issues related to 17th Street NW will continue to be considered.

Figure 2.4 – Alternative 2 – Social Garden



REHABILITATE CONSTITUTION GARDENS
FIGURE 2.4 ALTERNATIVE 2 - SOCIAL GARDEN

NATIONAL MALL AND MEMORIAL PARKS
WASHINGTON, D.C.

Table 2.1 – Comparison of Actions

	No-Action Alternative (Current Conditions/Management)	Preferred Alternative – Regenerative Garden	Alternative 1 – Sustainable Garden	Alternative 2 – Social Garden
NATURAL RESOURCES				
Soils <i>Note: If contaminated soils are uncovered in any alternative, they would be remediated to the required standards using approved methods.</i>	<ul style="list-style-type: none"> Poor soils Poor soil drainage 	<ul style="list-style-type: none"> Rehabilitate and amend soils (40-60%) to protect trees remaining in place Provide a cohesive drainage system (surface, subsurface, trees, gardens, and lawn) Use suitable excavated soils from construction of lake, cistern, and pavilion to re-grade gardens Supplement excavated soils with imported soils 	<ul style="list-style-type: none"> Rehabilitate and amend soils (60-90%) and protect healthy mature trees remaining in place Provide a cohesive drainage system (surface, subsurface, trees, gardens, and lawn) Use suitable excavated soils from construction of lake, cistern, and pavilion to re-contour gardens Supplement excavated soils with imported soils 	<ul style="list-style-type: none"> Same as Preferred Alternative
Vegetation – trees	<ul style="list-style-type: none"> Wooded park with a mixed, mature canopy of shade trees in irregular massing or clusters Many trees in fair to poor condition NPS continues to prune trees and remove dead or poor condition trees 	<ul style="list-style-type: none"> Avoid and protect trees that are in good to fair condition (70-85%) Remove trees in poor condition Remove fair trees and remove and relocate mature trees affected by construction Minimal mature tree relocation, increased number of trees in the canopy would be the result of replacement by younger trees that would adapt more quickly (15-30%) 	<ul style="list-style-type: none"> Remove most trees (95%) New trees would be planted to exceed current number. Remove trees in poor condition or in locations where facilities would be constructed. Remove trees in fair and good condition in locations where facilities would be constructed. 	<ul style="list-style-type: none"> Same as Preferred Alternative
Vegetation – understory	<ul style="list-style-type: none"> Mowed lawn, some shrub and bulb planting 	<ul style="list-style-type: none"> Plant mixed understory of flowering trees, lawns dominate (64%), meadow (12%), and woodland (24%) 	<ul style="list-style-type: none"> Replace lawns with meadow (76%) and low woodland understory (24%) 	<ul style="list-style-type: none"> Mixed understory, lawns dominate (76%), and woodland (24%)

	No-Action Alternative (Current Conditions/Management)	Preferred Alternative – Regenerative Garden	Alternative 1 – Sustainable Garden	Alternative 2 – Social Garden
Vegetation – aquatic planting in lake	<ul style="list-style-type: none"> Some emergent and submerged plants 	<ul style="list-style-type: none"> Plant aquatic plants on shallow, wide (15-foot), submerged shelf around some of lake edge 	<ul style="list-style-type: none"> Plant aquatic plants on shallow, wide (15-foot), submerged shelf around entire lake edge Plant wetland-type plants between lake edge and island 	<ul style="list-style-type: none"> No new aquatic planting
Water – lake	<ul style="list-style-type: none"> Concrete bottom 18 inch to 4.5 foot depth 5.5 million gallons Minimal recirculation 	<ul style="list-style-type: none"> Uses non-concrete bottom Built up to 12 feet deep Fill with 10 million gallons Install recirculating system 	<ul style="list-style-type: none"> Same as Preferred Alternative 	<ul style="list-style-type: none"> Same as Preferred Alternative
Water – lake source <i>Note: All non-potable water use will meet all pertinent required water quality standards set forth by DDOE and EPA for their intended uses.</i>	<ul style="list-style-type: none"> DC potable water Dechlorinated to support fish 	<ul style="list-style-type: none"> Uses potential non-potable water sources, treats and reuses storm, gray, and black water Uses potable water backup Integrated management Potentially use wells for groundwater (after additional studies) 	<ul style="list-style-type: none"> Same as Preferred Alternative 	<ul style="list-style-type: none"> Same as Preferred Alternative
Lake Ring <i>Note: meets guidelines set forth by DDOE and EPA</i>	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Build with a shallow concrete bottom area in the east end of the lake to be used for recreation (ice skating and model boating) 56,000 SF, 18 inches deep Install walk/ledge around the lake with multiple access points 	<ul style="list-style-type: none"> Same as Preferred Alternative except provide only a single access point on walk/ledge 	<ul style="list-style-type: none"> Same as Preferred Alternative
Water – irrigation source <i>Note: meets guidelines set forth by DDOE and EPA</i>	<ul style="list-style-type: none"> DC potable water 	<ul style="list-style-type: none"> To be determined during design, non-potable 	<ul style="list-style-type: none"> Treated black water Secondary source – well water (after further study) 	<ul style="list-style-type: none"> Treated stormwater runoff from Constitution Avenue Secondary source – well water (after further study)

	No-Action Alternative (Current Conditions/Management)	Preferred Alternative – Regenerative Garden	Alternative 1 – Sustainable Garden	Alternative 2 – Social Garden
CULTURAL RESOURCES				
Constitution Gardens Lake	<ul style="list-style-type: none"> • Peanut-shaped artificial lake and island 	<ul style="list-style-type: none"> • Configuration of lake edge and island remain • Add recreational lake ring, about 56,000 SF at east end of lake, enclosed by walk 	<ul style="list-style-type: none"> • Same as Preferred Alternative 	<ul style="list-style-type: none"> • Same as Preferred Alternative
Lockkeeper's House	<ul style="list-style-type: none"> • 14 feet from Constitution Avenue • 1½-story slab on grade • 350 SF • Stabilize structure 	<ul style="list-style-type: none"> • Relocate nearby (18 feet south and 5 feet west) • Add 350-SF mechanical room basement to existing 350-SF building above • Rehabilitate interior and exterior • Provide space for possible public use, donor recognition information, and education • Install outdoor plaza for educational exhibits and school groups 	<ul style="list-style-type: none"> • Relocate nearby (18 feet south and 5 feet west) • Add 1,000-SF basement for public use to existing 350-SF building above • Rehabilitate interior and exterior with freestanding staircase • Provide space for possible public use, donor recognition information, and education • Install outdoor plaza for educational exhibits and school groups • Expand public space in basement 	<ul style="list-style-type: none"> • Relocate 500 feet west and slightly south • Add 500-SF addition for public to existing 350-SF building above • Rehabilitate interior and exterior with new lower level façade to be compatible • Provide space for possible public use, donor recognition information, and education • Install outdoor plaza for educational exhibits and school groups • Expand public space in walkout level • Provide public restrooms
Memorial to the 56 Signers of the Declaration of Independence	<ul style="list-style-type: none"> • Remains inaccessible to people with disabilities 	<ul style="list-style-type: none"> • Provide universal accessibility with perimeter walks • Add possible stepping stone entry • Replace vegetation as needed 	<ul style="list-style-type: none"> • Provide universal accessibility with perimeter walks • Replace vegetation as needed 	<ul style="list-style-type: none"> • Same as Preferred Alternative
Overlook Terrace and three terraces	<ul style="list-style-type: none"> • Terraces unchanged • Paving deteriorated 	<ul style="list-style-type: none"> • Remove terraces to accommodate pavilion 	<ul style="list-style-type: none"> • Same as Preferred Alternative 	<ul style="list-style-type: none"> • Same as Preferred Alternative
Historic west end concession stand	<ul style="list-style-type: none"> • Seasonal concession food service building 	<ul style="list-style-type: none"> • Adaptively reuse for park operations 	<ul style="list-style-type: none"> • Remove 	<ul style="list-style-type: none"> • Same as Preferred Alternative

	No-Action Alternative (Current Conditions/Management)	Preferred Alternative – Regenerative Garden	Alternative 1 – Sustainable Garden	Alternative 2 – Social Garden
Cultural landscape – topography	<ul style="list-style-type: none"> Rolling terrain with lake at lowered center surrounded by higher hills and knoll separating the gardens from the Vietnam Veterans Memorial Topography along Constitution Avenue up to 3 feet above sidewalk/street Uneven and irregular terrain 	<ul style="list-style-type: none"> Even out irregular terrain Re-grade rolling hills to even irregularities and smooth terrain throughout the project boundary Install an 18-inch stone perimeter retaining wall along Constitution Avenue and 17th Street NW sidewalks 	<ul style="list-style-type: none"> Increase height of rolling hills up to 8 to 10 feet throughout the project boundary Redesign topography along Constitution Avenue up to 10 feet above sidewalk/street Install a 30-inch stone perimeter retaining wall along Constitution Avenue and 17th Street NW sidewalks 	<ul style="list-style-type: none"> Increase height of rolling hills up to 4 to 6 feet throughout the project boundary Redesign topography along Constitution Avenue up to 6 feet above sidewalk/street Install an 18-inch stone perimeter retaining wall along Constitution Avenue and 17th Street NW sidewalks
VISUAL RESOURCES				
Views and vistas <i>Note- see Visual Resources section with regards to specific views and vistas of concern.</i>	<ul style="list-style-type: none"> No change Unrestricted views into and out of site remain Vistas continue from several locations Washington Monument from the Vietnam Veterans Memorial and knoll, Overlook Terrace, and from Virginia Avenue Lake and westward vistas from Overlook Terrace World War II Memorial from Constitution Avenue 	<ul style="list-style-type: none"> Wide dual entry walks originating from Constitution Avenue would protect views in and out the gardens Views throughout the gardens would be slightly altered by re-grading Pavilion overlook deck and event terrace would provide similar views to Overlook Terrace Protect vistas (to Washington Monument from Vietnam Veterans Memorial and the adjacent knoll, to Virginia Avenue, and to World War II Memorial) 	<ul style="list-style-type: none"> Wide dual entry walks from Constitution Avenue would allow for glimpses into and out of the gardens Views throughout the gardens would be severely altered by raising the topography by up to 10 feet Pavilion overlook deck and event terrace would provide similar views to Overlook Terrace Protect vistas (to Washington Monument from Vietnam Veterans Memorial and the adjacent knoll, to Virginia Avenue, and to World War II Memorial) 	<ul style="list-style-type: none"> Wide dual entry walks from Constitution Avenue would protect views in and out the gardens Views throughout the gardens would be moderately altered by raising the topography by up to 6 feet Pavilion overlook deck and event terrace provide similar views to Overlook Terrace Protect vistas (to Washington Monument from Vietnam Veterans Memorial and adjacent knoll, to Virginia Avenue, and to World War II Memorial)

	No-Action Alternative (Current Conditions/Management)	Preferred Alternative – Regenerative Garden	Alternative 1 – Sustainable Garden	Alternative 2 – Social Garden
Visual character	<ul style="list-style-type: none"> No change Informal pastoral wooded character with lake reflections 	<ul style="list-style-type: none"> Retain informal pastoral wooded character with lake reflections. Plant native and small scale plantings 	<ul style="list-style-type: none"> Same as Preferred Alternative 	<ul style="list-style-type: none"> Same as Preferred Alternative
TRAFFIC AND CIRCULATION				
Intersection – 17 th and Constitution	<ul style="list-style-type: none"> No change East-bound, double right turn lane – tight radius constrains vehicular turning movements Differing turning radii at other corners 	<ul style="list-style-type: none"> Possible redesign of southwest corner of intersection with new radius of 50–100 feet to facilitate dual vehicular turning movement, relocate pedestrian crosswalks and signals (after additional traffic study) 	<ul style="list-style-type: none"> Same as Preferred Alternative 	<ul style="list-style-type: none"> Same as Preferred Alternative
Delivery, operational, service and emergency access	<ul style="list-style-type: none"> No change Vehicles and equipment must jump curb for entry Deliveries, service, operational, and emergency access on walks 	<ul style="list-style-type: none"> Allow for limited deliveries on walks Allow for emergency access on walks Provide pavilion with below grade access and turn-around from 17th Street NW (further design and consultation is needed) 	<ul style="list-style-type: none"> Allow for deliveries on walks Allow for emergency access on walks Provide pavilion with on-grade access from Constitution Avenue via walks (further design and consultation is needed) 	<ul style="list-style-type: none"> Same as Preferred Alternative
VISITOR USE AND EXPERIENCES				
Pedestrian walks	<ul style="list-style-type: none"> No change System of curving walks and lake loop walk (12–15 feet wide) Formal walkway connection World War II Memorial aligns with memorial axis (12–15 feet wide) Deteriorated and uneven walks 	<ul style="list-style-type: none"> Retain system of curving walks and lake loop walk (12–15 feet wide) Revise walk system to improve experiences and connections; widen some walks to 20 feet and maintain width of general walks to 12–15 feet Build 20-foot-wide walk to World War II Memorial Install dual 15-foot-wide 	<ul style="list-style-type: none"> Retain system of curving walks and lake loop walk (12–15 feet wide), similar to No-action Alternative) Revise walk system to improve experiences and connections; widen some walks to 20 feet and reduce width of general walks to 8 feet Build 20-foot-wide walk to World War II Memorial 	<ul style="list-style-type: none"> Same as Preferred Alternative

	No-Action Alternative (Current Conditions/Management)	Preferred Alternative – Regenerative Garden	Alternative 1 – Sustainable Garden	Alternative 2 – Social Garden
		garden entry walks along Constitution Avenue <ul style="list-style-type: none"> Repave walks to be universally accessible Create multiple access points to water ring and island 	<ul style="list-style-type: none"> Install dual 15-foot-wide garden entry walks along Constitution Avenue Repave walks to be universally accessible 	
Visitor facilities - existing <i>Note: The west end restroom is a visitor facility at Constitution Gardens but is not part of this project.</i>	<ul style="list-style-type: none"> No change Historic west end refreshment stand West end restroom* 	<ul style="list-style-type: none"> Retain west end restroom Reuse historic west end refreshment stand Open Lockkeeper's House for public use 	<ul style="list-style-type: none"> Retain west end restroom Remove historic west end refreshment stand Open Lockkeeper's House for public use 	<ul style="list-style-type: none"> Same as Preferred Alternative
Visitor facilities – new pavilion	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Build multi-purpose pavilion at east end of lake with an upper level (approximately 3,700 SF), including restaurant/bar with interior and exterior overlook deck seating, and a lower level (approximately 30,000 SF) with public restrooms, kitchen/storage, refreshment stand, seasonal recreation rentals, retail/bookstore, NPS and concession operational areas, and below grade loading dock 	<ul style="list-style-type: none"> Build multi-purpose pavilion at east end of lake with an upper level (approximately 3,700 SF), including restaurant/bar with interior and exterior overlook deck seating, and a lower level (approximately 21,000 SF) with public restrooms, kitchen/storage, refreshment stand, seasonal recreation rentals, retail/bookstore, NPS and concession operational areas, and below grade loading dock 	<ul style="list-style-type: none"> Same as Preferred Alternative
Multi-purpose areas for activities and entertainment	<ul style="list-style-type: none"> 15,500-SF Overlook Terrace Up to 12 vigil sites (for demonstrations) 1+ acre knoll area adjacent to the Vietnam Veterans Memorial 	<ul style="list-style-type: none"> Build new 8,800 SF event terrace east of pavilion Create up to 12 vigil sites (for demonstrations) Retain 1+ acre knoll area adjacent to the Vietnam Veterans Memorial Build new 27,000-SF lawn amphitheater Plant lawn areas for casual gathering 	<ul style="list-style-type: none"> Build new 8,800-SF event terrace east of pavilion Create up to 12 vigil sites (for demonstrations) Widen walk at west end of lake (3,400 SF) 	<ul style="list-style-type: none"> Build new 8,800-SF event terrace east of pavilion Create up to 12 vigil sites (for demonstrations) Retain 1+ acre knoll area adjacent to the Vietnam Veterans Memorial Build new 27,000-SF lawn amphitheater Plant lawn areas for

	No-Action Alternative (Current Conditions/Management)	Preferred Alternative – Regenerative Garden	Alternative 1 – Sustainable Garden	Alternative 2 – Social Garden
		<ul style="list-style-type: none"> Create flexibility for larger tents Widen walk intersections 		<ul style="list-style-type: none"> casual gathering Widen walk intersections
PARK MANAGEMENT AND OPERATIONS				
Sustainable features	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Maximizes sustainable approaches (minimum LEED Silver) Utilizes geothermal heating and cooling Reuses gray and black water reuse (for horticultural purposes) Plants green roof over part of the lower level 	<ul style="list-style-type: none"> Maximizes sustainable approaches (LEED Platinum) Creates net zero energy building (energy neutral) with systems such as geothermal heating and cooling Reuses gray and black water reuse (for horticultural purposes) Installs photovoltaic and green roof over part of the lower level 	<ul style="list-style-type: none"> Meets minimum LEED Silver Uses variable refrigerant volume mechanical system Reuses gray water reuse Plants green roof over part of the lower level
Utilities	<ul style="list-style-type: none"> No change Existing water, power, telecommunications 	<ul style="list-style-type: none"> Updated as needed to supply new facilities or improve connections 	<ul style="list-style-type: none"> Same as Preferred Alternative 	<ul style="list-style-type: none"> Same as Preferred Alternative

[This page was intentionally left blank.]

ASSESSMENT SYNOPSIS – KEY DIFFERENCES IN ALTERNATIVES

Table 2.2 provides a quick “some, more or most” type of comparison to supplement Table 2.1. This is not an in-depth, assessment comparing the physical changes resulting from the alternatives. It is intended to provide a snapshot showing qualitative differences. This table does not focus on visitor experiences or park operations, nor does it replace the summary of impacts included in Table 2.3.

Table 2.2 – Key Differences in Alternatives

	No-Action Alternative	Preferred Alternative Regenerative Garden	Alternative 1 Sustainable Garden	Alternative 2 Social Garden
Lake – built in 1970s	<ul style="list-style-type: none"> Shallow (18 inches to 4.5 feet) man-made lake with concrete bottom Limited recirculation and aquatic vegetation Potable water source Limited recreation (fishing and ice skating) 	<ul style="list-style-type: none"> Deeper lake (up to 12 feet) with more natural bottom Improved bio- and mechanical recirculation Aquatic planting edging much of lake – greatly improved water quality Non-potable sources only; primary source stormwater with potable back-up; on-site treatment More access points to lake ring developed for recreational use 	<ul style="list-style-type: none"> Deeper lake (up to 12 feet) with more natural bottom Improved bio- and mechanical recirculation Most aquatic vegetation edges all lake (includes trees) – most improved water quality Non-potable sources only; primary source stormwater with well, potable back-up; gray and black water back-ups; on-site treatment One access point to lake ring developed for recreational use 	<ul style="list-style-type: none"> Deeper lake (up to 12 feet) with more natural bottom Mechanical recirculation – improved water quality No aquatic vegetation Potable water source; well as back up More access points to lake ring developed for recreational use
Topography – terrain built in 1970s	<ul style="list-style-type: none"> Gently rolling hills No exterior garden walls 	<ul style="list-style-type: none"> Little change to rolling hills – re-graded to improve uniformity of rolling terrain Lower walls – 18-inch walls 	<ul style="list-style-type: none"> Rolling hills increased to up to 10 feet higher 12 inch higher walls – 30 inch walls 	<ul style="list-style-type: none"> Rolling hills increased to up to 6 feet higher Lower 18-inch walls
Soils and vegetation – from the 1970s	<ul style="list-style-type: none"> Drainage and compaction issues 1800 +/- trees, about half in fair to poor condition Primarily mowed lawns 	<ul style="list-style-type: none"> Soil condition improvements targeted to most tree preservation Fewest trees removed and replaced, least loss of mature tree canopy Most mix of lawns, natural meadow, gardens and understory plantings 	<ul style="list-style-type: none"> All soils replaced to improve conditions Most trees removed and replaced, greatest loss of mature tree canopy Mostly natural meadows and understory plantings 	<ul style="list-style-type: none"> Soil condition improvements targeted to more tree preservation Fewer trees removed and replaced, less loss of mature tree canopy Mostly lawns with some gardens and understory plantings

	No-Action Alternative	Preferred Alternative Regenerative Garden	Alternative 1 Sustainable Garden	Alternative 2 Social Garden
Memorial to the 56 Signers of the Declaration of Independence – from the 1980s	<ul style="list-style-type: none"> On an island, steps create access obstacle Plantings not as envisioned 	<ul style="list-style-type: none"> Accessible route created on island and more access points to island provided Stepping stone secondary access Plantings improved 	<ul style="list-style-type: none"> Accessible route created on island Plantings improved 	<ul style="list-style-type: none"> Accessible route created on island and more access points to island provided Stepping stone secondary access Plantings improved
Lockkeeper's House – oldest structure on National Mall from 1830s	<ul style="list-style-type: none"> Moved 49 feet west and 6 feet north to this location in 1915; original location partially in 17th Street NW. Retains orientation to former canal Constitution Avenue widened became closer – now 14 feet away 	<ul style="list-style-type: none"> Relocate nearby (18 feet south and 5 feet west) Retains orientation to canal location Farther away from busy street 	<ul style="list-style-type: none"> Relocated nearby (18 feet south and 5 feet west) Retains orientation to canal location Farther away from busy street 	<ul style="list-style-type: none"> Relocated 500 feet west and slightly south – farthest away from original location Retains orientation to canal location Farthest way from busy street and intersection
Walks – from the 1970s	<ul style="list-style-type: none"> Walks deteriorated; accommodate flexible and multiple uses No service access planned for maintenance and deliveries 	<ul style="list-style-type: none"> Walk surfaces replaced and revised – wider walks for most flexible uses Improved service access on walks and underground delivery 	<ul style="list-style-type: none"> Walk surfaces replaced and revised – some narrower walks limit uses Improved service access planned on walks 	<ul style="list-style-type: none"> Walk surfaces replaced and revised – wider walks for more flexible uses Most improved service access on walks and underground delivery
Visitor facilities – from the 1970s, proposed east end pavilion not built	<ul style="list-style-type: none"> Limited services provided Small restroom at west end Small seasonal food stand 	<ul style="list-style-type: none"> Most services provided Visitor services pavilion with fast and sit-down food, restrooms, bookstore/retail and recreation rentals Lawn amphitheater West end restroom remains Seasonal food stand not used 	<ul style="list-style-type: none"> More services provided Visitor services pavilion with fast and sit-down food, restrooms, bookstore/retail and recreation rentals West end restroom remains Seasonal food stand removed 	<ul style="list-style-type: none"> Most services provided Visitor services pavilion with fast and sit-down food, restrooms, bookstore/retail and recreation rentals Lawn amphitheater West end restroom remains Seasonal food stand not used

PHASING

The proposed rehabilitation for any of the action alternatives would be conducted in two phases and last approximately 12 months for phase I and 36 to 48 months for phase II. Phase I would include the northeast corner of the gardens and relocation of the Lockkeeper's House and related landscape and walk improvements. Phase II would include ecological landscape restoration, soil remediation, lake restoration, construction of flowering gardens and a pavilion, changes to the pathways and circulation system, construction of event plazas and sustainable infrastructure, work on accessibility improvements to

Memorial to the 56 Signers of the Declaration of Independence island, and construction of an amphitheater. Funding availability would determine the construction timing. Construction staging would occur within the gardens' boundaries.

MITIGATION MEASURES FOR THE ACTION ALTERNATIVES

The NPS places a strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts. To help ensure the protection of natural and cultural resources and the quality of the visitor experience, the following protective measures would be implemented as part of the action alternative that may be selected. The NPS would implement an appropriate level of monitoring throughout the construction process to help ensure that protective measures are properly implemented and achieve their intended results.

Soils

- Best management practices for erosion and sediment control would be employed during and after construction, including stabilization and revegetation after construction is completed.
- An erosion and sediment control plan would be prepared and implemented that conforms to the standards and specifications of the District of Columbia's Soil Erosion and Sediment Control Handbook, which lays out standards and specifications for sediment and erosion control (District Department of the Environment (DDOE) 2003).
- During construction, exposed soils would be covered with plastic sheeting, jute matting, erosion netting, straw, or other suitable cover material to prevent soil erosion and movement during rain or wind events.
- Erosion containment controls, such as silt fencing and sediment traps (e.g., hay bales), would be used to contain sediment on-site.
- Replace soil that would be imported from the surrounding metro area from non-pristine sites and salvaged to the extent practicable, in accordance with NPS policy (4.8.2.4).
- Erosion control best management practices would be monitored during construction to ensure proper function.
- Erosion and sediment control devices would be left in place until all disturbed sites are revegetated and erosion potential has returned to pre-project conditions.
- Any contaminated soils discovered on site would be remediated to required standards using approved methods (NPS policy 9.1.6.2).

Vegetation

- The NPS would protect the root zones of mature trees within the construction zone by placing fencing around the perimeter of the trees to prevent heavy equipment from compacting the roots or damaging the bark.
- Replanting would be implemented as defined in the soil and tree strategy and in NPS guidelines concerning revegetation and landscaping (NPS 2006).
- Vegetation in areas replanted would be monitored following construction to ensure successful establishment. All plants determined to be in an unhealthy condition would be replaced, and any exotic invasive species that appear in the replanted areas would be removed.

Water Resources

- During construction, the NPS would use sediment and erosion control practices consistent with the District of Columbia's stormwater rule and sediment and soil erosion control handbook (DDOE 2013; DCDHA 2003).
- Reclaimed stormwater/gray water and black water would be treated in an on-site facility (according to National Sanitation Foundation/American National Standards Institute (NSF/ANSI) Standard 350) and stored in cisterns or tanks.
- A National Pollution Discharge Elimination System permit would be obtained through the EPA for discharges to the Tidal Basin.

Cultural Resources

- Should an adverse effect on cultural resources be determined an MOA will be required.
- Throughout the design process, the NPS would continue to consult with cooperating agencies and consulting parties
- Stipulations of the MOA are expected to include additional archeology; the time period to which the Lockkeeper's House is being restored to and its appearance; and interpretive messaging about Constitution Gardens history and change over time, the Washington City Canal and the Lockkeeper's House, the 17th Street Wharf, land reclamation, Potomac Park Act, and the Potomac Park Levee.
- Stipulations of the MOA are also expected to address mitigation related to adverse effects on cultural landscapes; views and vistas; buildings and structures (including constructed water features); vegetation; topography; circulation; land patterns; and water features. Impacts on the cultural landscape would be minimized by ensuring that the rehabilitation is conducted in a manner consistent with The Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (Birnbaum 1996).

- Impacts on historic structures would be minimized by ensuring that rehabilitation of Constitution Gardens is conducted in a manner consistent with The Secretary of the Interior's *Standards for the Treatment of Historic Properties*.
- Impacts on spatial organization and land patterns would be minimized to the extent possible. Land patterns would remain similar; the lake (water feature) would retain the same shape and footprint; gently rolling terrain would characterize the site; vegetation would remain diverse and informal in character; and circulation would be similar in alignment but altered to accommodate use and improve accessibility.
- NPS would initiate a program of archeological monitoring and site investigation that would occur concurrently with construction activity. If archeological resources are discovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources can be identified and documented and an appropriate mitigation strategy can be developed. Consultation with the NPS, and/or the NPS regional archeologist and the DC SHPO would be coordinated to ensure that the protection of resources is addressed. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony were discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 would be followed.

Visitor Use and Experience

- The NPS would prepare public interpretation and education materials that broadly address the historical development of Constitution Gardens and its grounds. Public interpretation and historical education media may include, but would not be limited to, wayside exhibits, reconstruction drawings, NPS-style brochures, and internet-based content. The NPS would include "What's Going On?" informational signs to be placed on construction fencing for the duration of construction.
- The NPS would establish and implement a visitor use monitoring plan for Constitution Gardens within a year of the project start and would make this information available to the public.
- Construction activity would be timed so it does not coincide with special events that occur on the National Mall or in the project area.

Visual/Aesthetics

- Ongoing review with regulating agencies within the monumental core (DC SHPO, NCPC, and CFA) within the design development and Section 106 process would ensure that the proposed options blend as harmoniously as possible with the existing scale, context, and landscape in the project area.
- Every attempt would be made to time construction activity so it does not coincide with special events that occur on the National Mall or in the project area, thus reducing visual impacts associated with closures of portions of the project area or character-defining resources within it (such as the Lockkeeper's House).
- In the construction permit, the NPS would specify screening that would be used to shield equipment during construction. These shields would partially obscure the equipment where appropriate and possible.

ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD FOR DETAILED ANALYSIS

The development of alternatives utilized the framework for the overall rehabilitation and revitalization of Constitution Gardens that was developed within the 2010 National Mall Plan and Environmental Impact Statement. The range of alternatives was considered to be reasonable, and no alternatives that fell outside of that framework were carried forward.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The NPS is required to identify the environmentally preferable alternative in its NEPA documents for public review and comment (NPS 2001). According to the CEQ regulations implementing NEPA (43 CFR §46.30), the environmentally preferable alternative is the alternative “that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources.” The responsible official identifies the environmentally preferable alternative by considering and weighing the long-term environmental impacts against short-term impacts to determine the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative.

After completing the environmental analysis, the NPS identified the Regenerative Garden as both the Preferred and environmentally Preferred Alternative. The Preferred Alternative would rehabilitate and remediate soils, enhance tree plantings, diversify the vegetation community, and improve the water quality of the lake by incorporating the aquatic shelf, aeration, and better water circulation. The Preferred Alternative would also provide enhanced visitor facilities at the east end pavilion that would include a restaurant, refreshment area, bookstore, restrooms, and recreation rentals. New facilities would incorporate LEED Silver standards, including sustainable features such as harvesting stormwater and black water, geothermal fields, and the use of a green roof over the lower-level service area only. Under the Preferred Alternative, there is the potential for moderate, adverse impacts on the cultural landscape, as a result of the potential to diminish the integrity of multiple contributing elements to the landscape, as well as the overall topographic landscape characteristic.

SUMMARY OF IMPACTS

The EA is required to include a summary of impacts in Chapter 2. This section repeats the conclusion statements related to each topic analyzed. Conclusions are summarized in Table 2.3. The analysis is based on information about existing conditions in “Chapter 3: Affected Environment,” and the assessment of the impacts of alternative proposals in “Chapter 4: Environmental Consequences.” For more information or analysis for each topic please see related sections of chapters 3 and 4.

Table 2.3 – Summary of Impacts (Environmental Consequences)

Resource Area	No-Action Alternative	Preferred Alternative: Regenerative Garden	Alternative 1: Sustainable Garden	Alternative 2: Social Garden
NATURAL RESOURCES				
Soils	The No-action Alternative would have moderate, long-term, adverse impacts on soils primarily due ongoing poor soil and subsoil conditions. In conjunction with past, present, and reasonably foreseeable future projects, there would continue to be long-term, moderate, adverse cumulative impacts on soils.	The Preferred Alternative would result in short-term, moderate, adverse impacts on soils from construction and excavation activities. Long-term, negligible, adverse impacts would result from visitor use. Overall, the Preferred Alternative would result in long-term, beneficial impacts on soils from the rehabilitation and remediation of soils throughout Constitution Gardens. Past, present, and reasonably foreseeable future projects, would have long-term, beneficial impacts on soils. The Preferred Alternative would have a noticeable beneficial contribution to overall long-term, beneficial impacts on soils.	Alternative 1 would have short-term, moderate adverse impacts on soils from excavation and construction activities. Alternative 1 would also result in long-term, beneficial impacts on soils from the rehabilitation and remediation of soils throughout Constitution Gardens as well as long-term, adverse impacts as a result of the need to further improve drainage and/or repair or replace soils. Past, present, and reasonably foreseeable future projects, would have long-term, beneficial impacts on soils. Alternative 1 would have a noticeable beneficial contribution to overall long-term, beneficial impacts on soils.	Alternative 2 would result in short-term, moderate, adverse impacts on soils from construction and excavation activities. Long-term, negligible, adverse impacts would result from visitor use. Overall, Alternative 2 would result in long-term, beneficial impacts on soils from the rehabilitation and remediation of soils throughout Constitution Gardens. Past, present, and reasonably foreseeable future projects, would have long-term, beneficial impacts on soils. Alternative 2 would have a noticeable beneficial contribution to overall long-term, beneficial impacts on soils.
Vegetation	Under the No-action Alternative, continuing impacts from poor soil and subsoil conditions, soil erosion and compaction, poor drainage, water stress, and declining tree health would result in long-term, moderate, adverse impacts on vegetation in the study area. The No-action Alternative would have a noticeable adverse contribution to minor cumulative impacts on vegetation.	The Preferred Alternative would result in short-term, negligible to minor and long-term, negligible, adverse impacts from construction activities. Overall, enhancements such as trees and other plantings, diversification of the vegetation community, and improved soil conditions would result in long-term, beneficial impacts. The Preferred Alternative would have a noticeable beneficial contribution to overall long-term, cumulative impacts on vegetation.	Alternative 1 would result in short-term, adverse, negligible or moderate impacts and long-term, adverse, moderate impacts from construction activities. Overall, enhancements such as trees and other plantings, diversification of the vegetation community, soil remediation, and improved soil conditions would result in long-term, beneficial impacts. Alternative 1 would have a noticeable beneficial contribution to overall cumulative impacts on vegetation.	Alternative 2 would result in short-term, adverse, minor to moderate impacts and long-term, adverse, moderate impacts. Overall, enhancements such as trees and other plantings, soil remediation, and improved soil conditions would result in long-term, beneficial impacts. Alternative 2 would have a noticeable beneficial contribution to overall cumulative impacts on vegetation.

Resource Area	No-Action Alternative	Preferred Alternative: Regenerative Garden	Alternative 1: Sustainable Garden	Alternative 2: Social Garden
Water resources	<p>The No-action Alternative would continue to have long-term, minor to moderate, adverse impacts on the water quality of the lake because of ongoing issues with poor water quality and algal blooms. There would also be long-term, negligible, adverse impacts on the Potomac River and Tidal Basin into which the lake drains due to stormwater runoff from the adjoining streets contributing to the frequency of CSO events. Impacts from reasonably foreseeable past, present, and future projects would be mostly beneficial and long term, with some short-term, construction-related adverse impacts. The No-action Alternative would have a slight contribution to overall beneficial cumulative impacts on water resources.</p>	<p>The Preferred Alternative would result in long-term beneficial impacts on water quality in the lake and in the Potomac River, as a result of improved soils that would provide a better growing medium for plants, and a drainage system that would be installed to capture stormwater and improve filtration of stormwater into the soils. The improved soils, vegetation, and irrigation system would reduce the amount of sediment and nutrients entering the lake via stormwater runoff, resulting in short-term, negligible to minor, adverse impacts to the water quality of the lake. The overall reduction of runoff entering the lake would also reduce the amount entering the Tidal Basin and Potomac River during seasonal cleaning, resulting in short-term, negligible to minor, adverse impacts to the water quality of these receiving water bodies. Harvesting stormwater and non-potable gray and black water and the green roof over part of the lower level of the pavilion would reduce the volume discharged in the combined sewer system, and improvements to soils and the infiltration capacity of those soils would also reduce the volume of water discharged. There would be short-term, negligible to minor construction-related impacts related to exposed soils that would be managed with accepted sediment and soil erosion control practices. Groundwater impacts are possible, but would likely be negligible. The Preferred Alternative would result in overall beneficial cumulative impacts on water resources.</p>	<p>Alternative 1 would result in mostly beneficial impacts on water quality in the lake and in the Potomac River, as a result of improved soils that would provide a better growing medium for plants, and a drainage system that would be installed to capture stormwater and improve filtration of stormwater into the soils. The improved soils, vegetation, and irrigation system would reduce the amount of sediment and nutrients entering the lake via stormwater runoff, resulting in short-term, negligible to minor, adverse impacts to the water quality of the lake. The overall reduction of runoff entering the lake would also reduce the amount entering the Tidal Basin and Potomac River during seasonal cleaning, resulting in short-term, negligible to minor, adverse impacts to the water quality of these receiving water bodies. Harvesting storm, non-potable gray, and black water, and the green roof over part of the lower level would reduce the volume discharged in the combined sewer system, and improvements to soils and the infiltration capacity of those soils would also reduce the volume of water discharged. There would be short-term, negligible to minor construction-related impacts due to exposed soils that would be managed with accepted sediment and soil erosion control practices. Groundwater impacts are possible, but would likely be negligible. Alternative 1 would result in overall beneficial cumulative impacts on water resources.</p>	<p>Alternative 2 would result in mostly long-term, beneficial impacts on water quality in the lake and in the Potomac River, as a result of improved soils that would provide a better growing medium for plants, and a drainage system that would be installed to capture stormwater and improve filtration of stormwater into the soils. The improved soils, vegetation, and irrigation system would reduce the amount of sediment and nutrients entering the lake via stormwater runoff, resulting in short-term, negligible to minor, adverse impacts to the water quality of the lake. The overall reduction of runoff entering the lake would also reduce the amount entering the Tidal Basin and Potomac River during seasonal cleaning, resulting in short-term, negligible to minor, adverse impacts to the water quality of these receiving water bodies. Harvesting stormwater and the use of a green roof over part of the lower level would reduce the volume in the combined sewer system, and improvements to soils and the infiltration capacity of those soils would also reduce the volume of water discharged. There would be a long-term, negligible to minor, adverse impact on groundwater resources from the well, and short-term, negligible to minor construction-related impacts related to exposed soils that would be managed with accepted sediment and soil erosion control practices. Groundwater impacts are possible, but would likely be negligible. Alternative 2 would result in overall beneficial cumulative impacts on water resources.</p>
CULTURAL RESOURCES				
Historic structures and districts	<p>The No-action Alternative would continue to have an adverse impact on historic structures and districts; however, the East and West Potomac Parks Historic District would not be impacted as a whole. The Lockkeeper's House would continue to deteriorate but would remain in its current location, associated with the Washington City Canal. Continued deterioration of the Lockkeeper's House would affect the integrity of materials and workmanship resulting in moderate, long-term adverse impacts. The No-action Alternative would result in a noticeable contribution to long-term, moderate cumulative impacts on historic buildings and districts.</p>	<p>The Preferred Alternative would result in long-term, beneficial and minor to moderate, adverse impacts (<i>adverse effects</i> under Section 106) on historic structures and districts, particularly the Lockkeeper's House. The relocation of the structure would result in impacts on its integrity of location. The long-term, moderate, adverse impacts of the Preferred Alternative would noticeably contribute to adverse cumulative impacts.</p>	<p>Alternative 1 would result in long-term, minor to moderate, adverse impacts (<i>adverse effects</i> under Section 106) on historic districts and structures, particularly the Lockkeeper's House. The relocation of the structure would result in impacts on its integrity of location. The long-term, moderate, adverse impacts of Alternative 1 would result in a noticeable contribution to adverse cumulative impacts.</p>	<p>Alternative 2 would result in long-term, beneficial and minor to moderate impacts (<i>adverse effects</i> under Section 106) on historic districts and structures, particularly the Lockkeeper's House. The relocation of the structure would result in impacts on its integrity of location. The long-term, moderate, adverse impacts of Alternative 2 would have a noticeable contribution to adverse cumulative impacts.</p>

Resource Area	No-Action Alternative	Preferred Alternative: Regenerative Garden	Alternative 1: Sustainable Garden	Alternative 2: Social Garden
Cultural landscapes	The No-action Alternative would result in long-term, minor, adverse impacts on the cultural landscape. The cultural landscape would continue to deteriorate despite routine maintenance and may reach a stage of deterioration where more intensive maintenance is needed to ensure the integrity of the landscape. The long-term, minor, adverse impacts of this alternative, in combination with the long-term, beneficial and minor, adverse impacts of other past, present, and reasonably foreseeable actions would result in long-term, minor, adverse cumulative impacts. The No-action Alternative would result in a sizeable contribution to the adverse cumulative impact.	The Preferred Alternative would result in negligible to moderate, adverse impacts (<i>adverse effects</i> under Section 106) to the contributing features of the cultural landscape. Under this alternative, changes to the topography, vegetation, buildings and structures, and views and vistas would result in moderate, adverse impacts on the cultural landscape. In particular, the relocation of the Lockkeeper's House, construction of the pavilion, and removal of trees and the Overlook Terrace would result in impacts on its integrity of setting. The Preferred Alternative would provide a noticeable contribution to the long-term, moderate, adverse cumulative impacts.	Alternative 1 would result in long-term, negligible to major, adverse impacts (<i>adverse effects</i> under Section 106) to the contributing features of the cultural landscape. The increased height of the topography, altered views and vistas, relocation of the Lockkeeper's House, construction of the pavilion, and removal of the majority of trees and Overlook Terrace would result in long-term, moderate, adverse impacts to the overall cultural landscape of Constitution Gardens. Alternative 1 would have a noticeable adverse contribution to overall, beneficial and minor, adverse cumulative impacts on the cultural landscape.	Alternative 2 would result in negligible to moderate, adverse impacts (<i>adverse effects</i> under Section 106) to the contributing features of the cultural landscape from the alteration of contributing elements of the cultural landscape, including topography, vegetation, buildings and structures, and views and vistas. The increased height of the topography, altered views and vistas, relocation of the Lockkeeper's House, construction of the pavilion, and removal of trees and Overlook Terrace would result in impacts on the integrity of setting and moderate, adverse impacts to the cultural landscape of Constitution Gardens. Alternative 2 would provide a noticeable contribution to adverse cumulative impacts.
Archeological resources	There would be no impacts on archeological resources under the No-action Alternative because no ground disturbance would occur. No cumulative impacts are expected.	The Preferred Alternative would result in permanent, moderate, adverse impacts (<i>adverse effects</i> under Section 106) on known and potential archeological resources present within the gardens. In particular, the deeper impacts associated with utility construction, the Lockkeeper's House relocation, lake improvements, and the east end pavilion construction have the potential for moderate impacts on Lock B of the Washington City Canal (51NW235), remnants of the 17 th Street Wharf (51NW232), the Lockkeeper's House deposits (51NW233), and the outlet of the Tiber Creek Sewer (51NW234). There may be additional impacts on the Washington City Canal prism and towpath, the foundations of the Navy Administration Buildings, and the Washington Brewery (Coningham and Company). Given the potential for past, present, and reasonably foreseeable projects to impact archeological resources within the National Mall, there is the potential for the Preferred Alternative to have moderate cumulative impacts.	Alternative 1 would result in permanent, moderate, adverse impacts (<i>adverse effects</i> under Section 106) on known and potential archeological resources present within the gardens. In particular, there is the potential for moderate impacts on Lock B of the Washington City Canal (51NW235), remnants of the 17 th Street Wharf (51NW232), the Lockkeeper's House deposits (51NW233), and the outlet of the Tiber Creek Sewer (51NW234). There may be additional impacts on the Washington City Canal prism and towpath, the foundations of the Navy Administration Buildings, and the Washington Brewery (Coningham and Company). Past, present, and reasonably foreseeable projects would have minor adverse impacts on archeological resources within the National Mall. The moderate, adverse impacts of Alternative 1 would be a noticeable contribution to the adverse cumulative impact.	Alternative 2 would result in permanent, moderate, adverse impacts (<i>adverse effects</i> under Section 106) on known and potential archeological resources present within the gardens. In particular, the deeper impacts associated with utility construction, the Lockkeeper's House relocation, lake improvements, and the east end pavilion construction have the potential for moderate impacts on Lock B of the Washington City Canal (51NW235), remnants of the 17 th Street Wharf (51NW232), the Lockkeeper's House deposits (51NW233), and the outlet of the Tiber Creek Sewer (51NW234). There may be additional impacts on the Washington City Canal prism and towpath, the foundations of the Navy Administration Buildings, and the Washington Brewery (Coningham and Company). Given the potential for past, present, and reasonably foreseeable projects to impact archeological resources within the National Mall, there is the potential for Alternative 2 to have moderate cumulative impacts.
VISUAL RESOURCES				
Views and vistas and visual character	Under the No-action Alternative, continuing impacts from the poor conditions of all of the elements contributing to the visual character, views, and vistas of the gardens would result in long-term, minor to moderate, adverse impacts on the visual resources within Constitution Gardens due to the degraded condition of the gardens. The No-action Alternative would have a noticeable adverse contribution to overall beneficial cumulative impacts on visual resources.	Under the Preferred Alternative, the poor conditions of all of the elements contributing to the visual character, views, and vistas of the gardens would be improved, resulting in long-term, beneficial impacts on the visual resources within Constitution Gardens. There would be minor to moderate, long-term, adverse impacts resulting from changes to listed character-defining views and vistas, removal of trees, and alteration of the topography. The Preferred Alternative would have a minor contribution to overall beneficial cumulative impacts on visual resources.	Under Alternative 1, the poor conditions of all of the elements contributing to the visual character, views, and vistas of the gardens would be improved, resulting in long-term, beneficial impacts on the visual resources within Constitution Gardens. There would be minor to moderate, long-term, adverse impacts resulting from changes to listed character-defining views and vistas the removal of trees, and the accentuation of the topography. Alternative 1 would have a minor contribution to overall beneficial cumulative impacts on visual resources.	Under Alternative 2, the poor conditions of all of the elements contributing to the visual character, views, and vistas of the gardens would be improved, resulting in long-term, beneficial impacts on the visual resources within Constitution Gardens. There would be negligible to moderate, long-term, adverse impacts resulting from changes to listed character-defining views and vistas, the removal of trees, amplification of the topography, and relocation of the Lockkeeper's House. Alternative 2 would make a minor contribution to overall beneficial cumulative impacts on visual resources.

Resource Area	No-Action Alternative	Preferred Alternative: Regenerative Garden	Alternative 1: Sustainable Garden	Alternative 2: Social Garden
VISITOR USE AND EXPERIENCE				
Visitor use and experience and safety	<p>The No-action Alternative generally would result in a long-term, minor to moderate, adverse impact on visitor experience, use, and safety as a result of less than desirable pedestrian experiences, limited opportunities for enjoyment and education, a continued lack of identity, and limited visitor facilities due to its effect on many users of the gardens. There would also be continued beneficial impacts on visitor health and safety from the high visibility in and out of the site. As a result of the increased amenities, enhanced visual aesthetics, and improved circulation surrounding Constitution Gardens, impacts from cumulative actions on visitor use and experience and safety would long-term and beneficial. When combined with long-term, beneficial impacts from cumulative actions, the No-action Alternative would have a slight adverse contribution to overall beneficial, cumulative impacts on visitor use and experience and safety.</p>	<p>The Preferred Alternative generally would result in a long-term, beneficial impact on visitor experience due to improved pedestrian experiences, additional opportunities for enjoyment and education, a strong identity, improved visitor facilities, more convenient locations, and increased visibility and visitor safety, all of which would increase visitation at the gardens. There would also be short-term, moderate, adverse impacts on visitor use and experience as a result of the closure of the gardens during construction. There would be overall beneficial impacts to visitor safety. As a result of the increased amenities, enhanced visual aesthetics, and improved circulation surrounding Constitution Gardens, impacts from cumulative actions on visitor use and experience and safety would long-term and beneficial. When combined with long-term, beneficial impacts from cumulative actions, the No-action Alternative would have a noticeable beneficial contribution to overall beneficial, cumulative impacts on visitor use and experience and safety.</p>	<p>Alternative 1 generally would result in a long-term, beneficial impact on visitor experience, use, and safety as a result of improved pedestrian experiences, additional opportunities for enjoyment and education, a strong identity, and improved visitor facilities and increased lighting all of which would increase visitation at the gardens. In addition to the beneficial impacts, however, there would be moderate, adverse impacts on visitor experience, use, and safety due to the remaining 8-foot width of some sidewalks, constricting pedestrian conditions, and raised topographic hills that would put visitors at risk due to the lack of visibility in and out of the site. There would also be short-term, moderate, adverse impacts on visitor experience, use, and safety due to the closure of the gardens during construction. There would also be overall beneficial impacts to visitor safety from the improved access points to the Memorial to the 56 Signers of the Declaration of Independence; however, the addition of the stepping stones could create the potential for slips and falls resulting in long-term, negligible to minor, adverse impacts. As a result of the increased amenities, enhanced visual aesthetics, and improved circulation surrounding Constitution Gardens, impacts from cumulative actions on visitor use and experience and safety would long-term and beneficial. When combined with long-term beneficial impacts from cumulative actions, Alternative 1 would have a slight adverse and noticeable beneficial contribution to overall beneficial cumulative impacts on visitor use and experience and safety.</p>	<p>Alternative 2 would result in greater long-term beneficial impact than Alternative 1 because of improved pedestrian experiences, additional opportunities for enjoyment and education (the amphitheater and increased opportunities to fish), additional park operations in the Lockkeeper's House, increased access to the Memorial to the 56 Signers of the Declaration of Independence island, a strong identity, improved visitor facilities, and increased visibility and visitor safety, all of which would increase visitation at the gardens. However, there would be long-term, moderate adverse impacts on visitor experience, use, and safety similar to Alternative 1 because of the amplified topography. In addition, visitor experience, use, and safety would experience short-term, moderate, adverse impacts due to the closure of the gardens during construction. There would also be overall beneficial impacts to visitor safety from the improved access points to the Memorial to the 56 Signers of the Declaration of Independence; however, the addition of the stepping stones could create the potential for slips and falls resulting in long-term, negligible to minor, adverse impacts. As a result of the increased amenities, enhanced visual aesthetics, and improved circulation surrounding Constitution Gardens, impacts from cumulative actions on visitor use and experience and safety would long-term and beneficial. When combined with long-term beneficial impacts from cumulative actions, Alternative 2 would have a slight adverse and noticeable beneficial contribution to overall beneficial cumulative impacts on visitor use and experience and safety.</p>

Resource Area	No-Action Alternative	Preferred Alternative: Regenerative Garden	Alternative 1: Sustainable Garden	Alternative 2: Social Garden
TRAFFIC AND CIRCULATION				
<i>Traffic and circulation</i>	Under the No-action Alternative, in spite of the multimodal transportation cumulative benefits, two large vehicles attempting to turn right from Constitution Avenue NW eastbound to 17 th Street NW southbound at the same time would continue to impact the 17 th Street NW northbound vehicles by requiring use of the northbound lane to complete their turns or running over the southwestern corner of the intersection, increasing congestion and resulting in long-term, moderate, adverse impacts. Delivery and emergency vehicle access would continue to result in long-term, minor, adverse impacts because access would be provided at any available existing walkway. When combined with the long-term, beneficial impacts from cumulative actions, the No-action Alternative would have a slight adverse contribution to overall minor, adverse cumulative impacts on circulation.	Under the Preferred Alternative, the multimodal transportation cumulative benefits combined with a better designed intersection capable of processing two large vehicles turning right simultaneously would provide long-term, beneficial impacts with negligible impacts on traffic operations, congestion, or vehicle queuing. Service and emergency vehicle access would be improved by creating official ingress and egress driveways, resulting in long-term, beneficial impacts and long-term, minor, adverse impacts on traffic at the driveway entry and exit points. When combined with the long-term, beneficial impacts from cumulative actions, the Preferred Alternative would have a slight beneficial contribution on overall beneficial cumulative impacts on circulation.	Under Alternative 1, the multimodal transportation and infrastructure cumulative benefits combined with a better designed intersection capable of processing two, large vehicles turning right simultaneously would provide long-term, beneficial impacts with negligible impacts on traffic operations, congestion, or vehicle queuing. Service and emergency vehicle access would be improved by creating multiple access points on walks, resulting in long-term, beneficial impacts and would result in long-term, minor, adverse impacts on traffic at the entry and exit points. When combined with the long-term, beneficial impacts from cumulative actions, Alternative 1 would have a significant beneficial contribution to overall beneficial cumulative impacts on circulation. When combined with the long-term, beneficial impacts from cumulative actions, Alternative 1 would have a slight beneficial contribution to overall beneficial cumulative impacts.	Under Alternative 2, the multimodal transportation and infrastructure cumulative benefits combined with a better designed intersection capable of processing two large vehicles turning right simultaneously would provide long-term, beneficial impacts with negligible impacts on traffic operations, congestion, or vehicle queuing. Service and emergency vehicle access would be even more improved over Alternative 1 by creating official ingress and egress driveways, resulting in long-term, beneficial impacts and long-term, minor, adverse impacts on traffic at the driveway entry and exit points. When combined with the long-term, beneficial impacts from cumulative actions, Alternative 2 would be similar to the Preferred Alternative, having a slight beneficial contribution to overall beneficial cumulative impacts on circulation.
PARK MANAGEMENT AND OPERATIONS				
<i>Park management and operations</i>	The No-action Alternative would result in long-term, negligible to moderate, adverse impacts as a result of consumption of utilities at current levels and maintaining the gardens in its current state. When combined with the beneficial and long-term, moderate, adverse cumulative impacts, would result in continuing moderate, adverse impacts, particularly with regard to policy goals to reduce potable water use and replace aging utility systems. The No-action Alternative would have a slight, adverse contribution to overall long-term, moderate, adverse cumulative impacts on park management and operations.	The Preferred Alternative would result in long-term, beneficial impacts on park operations, management, utilities, and infrastructure, primarily as a result of the implementation of a variety of sustainable approaches, increased specialty skills required, operational space provided, shifting some operations staffing to a concessioner, and the ability to reduce the use of potable water. However, there would also be long-term, minor, adverse impacts because additional special skills would be required, including knowledge about the aquatic shelf, integrated water management, and meadow landscapes. Impacts on the utility systems serving the site would be long-term, negligible to minor, and adverse. Although, the shelf would help maintain the water quality at a sustainable level, it would have adverse impacts on staffing at the gardens. Cumulative actions would result in long-term, beneficial and moderate, adverse impacts. When combined with long-term, beneficial and moderate, adverse impacts from cumulative impacts, the Preferred Alternative would have a noticeable contribution to overall long-term, beneficial cumulative impacts on park management and operations.	Alternative 1 generally would result in long-term, beneficial impacts on park operations, management, utilities, and infrastructure primarily as a result of a variety of sustainable approaches, improved operational access, specialty skills acquired, operational space provided, shifting some operations staffing to a concessioner, and ability to reduce use of potable water. However, special skills would be a liability and despite the beneficial impacts on park management and operations, there would also be long-term, minor to moderate impacts of additional specialty skills. Impacts on the utility systems serving the site would be long-term, negligible to minor, and adverse. Cumulative actions would result in long-term, beneficial and moderate, adverse impacts. When combined with long-term, beneficial and moderate, adverse impacts from cumulative impacts, Alternative 1 would have a noticeable contribution to overall long-term, beneficial cumulative impacts on park management and operations.	Alternative 2 generally would result in a long-term, beneficial impact on park operations, management, utilities, and infrastructure primarily as a result of a variety of sustainable approaches, advantages to require fewer specialty skills, operational space provided, shifting some operations staffing to a concessioner, and ability to reduce use of potable water. However, more specialty skills would be required than are available today resulting in a minor to moderate, adverse impact. Impacts on the utility systems serving the site would be long-term, negligible to minor, and adverse. Cumulative actions would result in long-term, beneficial and moderate, adverse impacts. When combined with long-term, beneficial and moderate, adverse impacts from cumulative impacts, Alternative 2 would have a noticeable contribution to overall long-term, beneficial cumulative impacts on park management and operations.

CHAPTER 3: AFFECTED ENVIRONMENT

This chapter describes existing environmental conditions in the areas potentially affected by the alternatives evaluated. This section describes the following resource areas: soils and topography, vegetation, water resources, cultural resources (cultural landscapes, historic structures and districts, archeological resources, and visual resources), utilities and infrastructure, visitor use and experience, traffic and circulation, and park management and operations. Potential impacts are discussed in “Chapter 4: Environmental Consequences” in the same order.

NATURAL RESOURCES

Soils

Constitution Gardens occupies an area that was previously within the watershed of Tiber Creek, a tributary of the Potomac River. The site was originally part of the mudflats and tidal marshes that characterized the Potomac River shoreline of Washington, DC (Schnabel 2013b). The low-lying marshy land in the area was drained and filled in the 19th century to create buildable land.

Soils on the site are classified as udorthents (NRCS 2014). The soil survey of the District of Columbia describes udorthents as very heterogeneous earthy fill material that has been placed on poorly drained to somewhat excessively drained soils on uplands, terraces, and floodplains of the Coastal Plain and Piedmont to provide sites for buildings, roads, railroads, recreation sites, and other uses. Because udorthents vary widely in their component materials, runoff and drainage are also highly variable (SCS 1976). General characteristics of soils on the National Mall include extreme heterogeneity from area to area, variability in organic matter percentages, variability in fertility and pH, a wide variability in texture, and a tendency for compacted soils to repel moisture (Patterson et al. 1980). Soils throughout the National Mall, including Constitution Gardens, have been subjected to noticeable impacts from heavy daily foot traffic, recreational activities, and special events, which may include impacts from vehicles. These uses have severely compacted soils, resulting in compressed pore space between soil particles and increased bulk density (NPS 2010a). In addition, a 2013 Phase I Environmental Site Assessment concluded that “historical information indicates possible contamination of soil associated with the historic fill and former naval office buildings on the property” (Schnabel 2013b). To date, contaminated soils have not been encountered or documented within Constitution Gardens. A 2014 soil investigation report characterized the soils on the project site as ranging from sandy clay to well graded silty sand and gravel in a random pattern, with low to very low infiltration rates (Pine & Swallow Environmental 2014). A geotechnical report developed by Schnabel Engineering (2013a) and borings cited in a cultural landscape inventory report for the National Mall (NPS 2008, rev. 2014) indicate that, below approximately 4 inches of topsoil, subsurface conditions consist of:

- Approximately 14 inches of fill added to the Constitutions Gardens site in 1975–1976, including wood chips, treated sewage, and leaf mold mixed with existing soil from the fill layer below (NPS 2008, rev. 2014);
- A layer of fill described as “sandy silt and silty sand with building debris” (Schnabel 2013a), including “5,092 double piles of timber spaced at approximately 8 to 10 feet on centers... and the support concrete pilings and basement structures for the old ‘temporary’ buildings (NPS 2008, rev. 2014);” This nineteenth-century fill, varying from two to fifteen feet in depth, was composed of “clay, sand, gravel, brick, and cinders” and was “deepest in the central and north portions of the site (NPS 2008, rev. 2014);”
- A natural deposit of fine-grained alluvial soils with varying amounts of sand (Schnabel 2013a), representing “alluvial deposits of the Potomac River and Tiber Creek, eighteen to thirty-five feet of silty clay and sandy silt with some organic matter (NPS 2008, rev. 2014);”

- A natural deposit of coarse-grained alluvial soils (Schnabel 2013a) or “silty sand, gravel, and clay (NPS 2008, rev. 2014);”
- A layer of disintegrated rock sampled as dense, silty sand with gravel (Schnabel 2013a); and
- Bedrock mostly composed of “granite gneiss” (NPS 2008, rev. 2014).

The layer of native alluvial deposits underlying Constitution Gardens comprises an approximately 21-foot thick layer of very soft, saturated clay. These soils will slowly consolidate over time when surcharge loads (such as building loads) are applied (Schnabel 2013a).

Vegetation

The general vegetative character of the National Mall is that of designed historic landscapes composed of mostly open lawns and shade and ornamental trees typical of the National Capital Region (NPS 2010a). Within the larger National Mall, Constitution Gardens is unique in that it is a more informal, secluded, and wooded area among the open lawns that dominate much of the National Mall landscape. Vegetation within Constitution Gardens includes canopy trees, shrubs, and turf. Ornamental shrubs and other understory plants are present on the Memorial to the 56 Signers of the Declaration of Independence island.

The majority of the trees within Constitution Gardens were planted during 1975–1976 or more recently, with the exception of the American elm trees along Constitution Avenue and 17th Street NW and sycamores along what was formerly 21st Street NW (NPS 2008, rev. 2014). The larger elms along the streets are significantly older than the original 1975–1976 plantings.

Over the years, removals and relocations of original trees have occurred that have resulted in a community of trees that is different from what was originally planned. Changes have occurred because of the poor health of many trees and inappropriate growing conditions. Currently, many trees are considered to be in poor or declining health. Poor soil conditions and other issues impair tree and root health. Unhealthy trees are susceptible to water stress, saturation, heat, disease, and insects. These susceptible trees may eventually need to be replaced or relocated. Of the 1,886 trees planted in 1975–1976, 28% died within three years due to oversaturated conditions or a combination of water stress and disease (NPS 2008, rev. 2014). Tree diseases and pathogens have weakened numerous species leading to declining health and death or removal. Elms and red oaks have been impacted by leaf scorch caused by pathogens and sweetgum by bleeding canker fungus. Soil conditions have allowed the plant-damaging pathogens *Phytophthora* and *Hypoxylen* to affect vegetation (PWP Landscape Architecture and Rogers Partners 2014). In addition to canopy trees, turf and associated vegetation such as dandelions (*Taraxacum officinale*) comprise the majority of the Constitution Gardens vegetative community. The turf primarily consists of perennial rye grass (*Lolium perenne*) and turf-type tall fescue (*Festuca arundinacea*). Turf interspersed with trees slope down from all four sides to the lake. The knoll to the west of the lake is composed of turf and is largely not shaded by any trees. Patches of dead turf or areas with little to no turf exist throughout, possibly due to the effects of saturation or ponding after rain events. Portions of the turf are in poor condition, especially in areas adjacent to the walkways and under trees. Worn and eroded turf is evident underneath tree canopies, on the sides of some slopes, and along the edges of some pathways. Turf is also absent along two social trails or drainage ways leading from the gardens to the Constitution Avenue sidewalk and one trail along the Constitution Avenue sidewalk, resulting in bare, compacted soil.

Trees on the outer edges of Constitution Gardens form linear wooded boundaries followed by dense clusters that begin to thin out towards the interior of the gardens. Many of the pathways have trees, mostly red maples, interspersed along the edges. Originally, trees were planted within the asphalt walkways on the outside edges; however, most of these trees have since died or been removed (NPS 2008, rev. 2014). Three linear terraces with honey locust trees are located on the eastern side of the lake with additional honey locusts planted behind the refreshment kiosk on the west side of the lake. Saplings and other

vegetation are present within this area with a ground cover of stabilizing grass. American elm trees are present along Constitution Avenue and 17th Street NW. Perennial plantings that make up the Circle of Remembrance, although mainly associated with the World War II Memorial, cross into the Constitution Gardens boundary from the southeast.

Currently, the lake is surrounded by turf scattered with trees, but no trees are close enough to the lake to provide shade. No riparian buffer exists around the lake edge either on the mainland or on the island. Underwater planting boxes located close to the north and west banks of the island contain emergent aquatic vegetation. Additionally, submerged aquatic vegetation, mostly *Ceratophyllum demersum*, is located throughout the lake. Flora on the Memorial to the 56 Signers of the Declaration of Independence island includes mixed vegetation within planting beds as well as trees and turf. The trees include saucer magnolia (*Magnolia aoulangeana*) and weeping willow (*Salix babylonica*). The beds originally contained a dense community of multi-layered vegetation ranging from trees to shrubs to low perennial plants. The planting beds still support some remnant vegetation such as a magnolia trees, several shrubs, and perennial and ornamental plants, yet species richness and density is low. Most of the island consists of turf.

The vegetation in Constitution Gardens includes several introduced species that are considered invasive in the Mid-Atlantic region. The invasive species include Norway maple, Callery pear, and sawtooth oak. Invasive species are under control.

The original planting plans for Constitution Gardens contained fewer tree species than currently exist at the gardens (currently 18 species). According to a tree survey of 515 trees in the central portion of the garden from Constitution Avenue south to the Lincoln Memorial Reflecting Pool and from approximately half way between 20th and 21st Streets east to the Overlook Terrace, there are 44 species, indicating a richness not in the original plan (Bartlett Inventory Solutions 2014).

According to a May 2014 inventory of the 515 trees in the central portion of Constitution Gardens, 78 (15%) are in poor condition, 194 (38%) are in fair condition, and 243 (47%) are in good condition (Bartlett Inventory Solutions 2014). Trees from all three condition classes are spread fairly evenly throughout the project site, although none of the trees on the Memorial to the 56 Signers of the Declaration of Independence island are in poor condition. A total of 353 trees are afflicted by some condition or defect, including wounds or cavities on a root, root flare, branch, or stem; girdling of roots; fungi; codominant or suppressed trees; trees that are lean, have an uneven crown, or poor branch structure; and presence of deadwood. The inventory suggested removing 187 trees due to poor condition or a defect, whereas 232 trees could be preserved in their present location and 96 trees could be relocated to another location. Trees recommended for removal, preservation, and relocation are distributed uniformly throughout the project area.

Water Resources

Constitution Gardens Lake is about .25 miles from the Tidal Basin and .5 miles from the Potomac River, and is situated within the Middle-Potomac-Anacostia-Occoquan watershed in the larger Chesapeake Bay watershed. The shallow 6.75-acre artificial lake drains into the Tidal Basin, which in turn drains into the Potomac River. The lake is maintained as an aquatic habitat and is one of the few “fishable” lakes or ponds in the District of Columbia.

WATER QUALITY/QUANTITY

Constitution Gardens Lake—Water Use, Supply, and Loss

The Constitution Gardens Lake is constructed with a concrete liner and is supplied with potable water from the District of Columbia Water and Sewer Authority (DC Water). It has been estimated that between 100 and 110 million gallons of water are used annually in just three designed water features—Constitution Gardens Lake, the Capitol Reflecting Pool, and the Lincoln Memorial Reflecting Pool (NPS 2010a), although with the redesign of the Lincoln Memorial Reflecting Pool, the amount of potable water

used for the reflecting pool has been reduced by at least 40 million gallons. The Constitution Gardens Lake alone holds 5.5 million gallons (NPS 2010a), and is generally 2 to 3 feet in deep, with an 18-inch depth at the water's edge and three depressions that reach a maximum of 4.5 feet (NPS 2008, rev. 2014). The lake is partially drained to the Tidal Basin annually in the spring for cleaning, and debris is removed from the outer edge of the lake. The lake is never completely drained to maintain its aquatic habitat.

Constitution Gardens Lake—Water Quality

The clear water of the gardens' shallow, artificial lake became filled with heavy concentrations of algae soon after construction as a result of poor water circulation (NPS 2010a) and associated issues, such as low dissolved oxygen levels, large amounts of bird waste, and other causes. Over the last 30 years, several attempts have been made to control the problem. Dozens of underwater planting boxes containing aquatic plants were placed in the lake, and periodically muck containing zooplankton and other biota was dredged from Kenilworth Aquatic Gardens and deposited on the bottom of the lake to help establish a balanced ecosystem (NPS 2010a). Dyes, both artificial and natural, have also been used periodically to limit algal growth by reducing sunlight. Water quality is also affected by the additives that DC Water adds to the water supply, such as chloramines to ensure drinking water has been disinfected, and orthophosphates to minimize corrosion in the conveyance system pipes. Water has been treated with chloramines over the past two years. While the NPS has successfully addressed water quality issues in the lake, there continue to be issues with aesthetics in the lake that the public often equates with water quality problems.

Tidal Basin

The Tidal Basin is described because it is the nearest receiving water body for the drainage volume from West Potomac Park, including Constitution Gardens, the Lincoln Memorial Reflecting Pool, and the fountain in the World War II Memorial. The lake at Constitution Gardens drains into the Tidal Basin, which in turn drains into the Potomac River.

The Tidal Basin is a constructed body of water adjacent to the Potomac River covering approximately 107 acres and averaging a depth of 6.5 feet. It was conceived in the late-19th century in part as a way of flushing sediments through the adjacent Washington Channel, a constructed channel and harbor draining to the confluence of the Anacostia and Potomac Rivers a short distance downstream. The Tidal Basin contains two sets of gates (replaced in 2008) that are designed to capture approximately 250 million gallons of water flowing in from the Potomac at high tide and then discharge it through another set of gates down the shipping channel on the ebb tide (NPS 2009b). There have been problems with water quality in the Tidal Basin, partially due to its low flow, lack of flushing, and shallow nature. The combination of these factors means that the basin has a tendency to warm during the summer months, which can exacerbate problems with bacteria, dissolved oxygen, and other parameters of concern. The Tidal Basin cannot currently meet the designated use of primary contact recreation, and as a result has been listed on the Clean Water Act's section 303(d) list as impaired for both fecal coliform and organic compounds, requiring that total maximum daily loads be developed for these pollutants. The Tidal Basin and Washington Channel were also listed for pH in 2002. The Tidal Basin receives input from NPS park land, which is mostly lawn and landscaping (many of the famed cherry trees ring the Tidal Basin), storm sewers, and waterfowl (District of Columbia 2004a). The water quality within the Tidal Basin is influenced by the Potomac River.

Potomac River

Similar to the Tidal Basin, a variety of natural and urban influences impact water quality in the Potomac River. The Potomac River originates in primarily agricultural and forested land upstream, but flows through the highly urbanized Washington, DC region. The river is impacted by nutrients, metals, chlorinated industrial compounds, and volatile organic compounds, as well as organic waste and bacterial loads discharged from combined sewer overflow (CSO) and stormwater runoff. The Potomac River was

the subject of study by the US Geological Survey National Water Quality Assessment Program in the 1990s as part of an effort to identify water quality problems and develop an understanding of the effects of human actions and natural factors on water quality conditions, which provided a wealth of information on water quality in the river (Ator et al. 1998).

GROUNDWATER

Fluctuations in the level of the water table result from seasonal variations in precipitation, surface runoff, and evaporation. Based on the area's topography, the natural direction of groundwater flow is west/southwest from the project area (toward the Potomac River). Localized groundwater flow can be affected by subsurface structures. The groundwater level at the National Mall ranges from being very near the surface along the southern edges (near the Tidal Basin and Potomac River) to 35-feet below existing grades along the northern side (NPS 2007). As of this writing, groundwater levels within Constitution Gardens have not been measured; further study is needed.

CULTURAL RESOURCES

Cultural resources for federal agency planning and environmental review purposes are primarily those resources that are eligible for listing in the National Register, as well as those addressed by certain other laws protecting archeological sites and Native American properties. The NHPA is the principal legislative authority for managing cultural resources associated with NPS projects. Under Section 110 of the NHPA, as amended, federal agencies must assume responsibility for the preservation of historic properties under their jurisdiction and provide for the identification and protection of historic properties. Generally, Section 106 of the NHPA requires all federal agencies to consider the effects of their actions on cultural resources listed in or determined eligible for listing in the National Register. Such resources are also termed "historic properties." Compliance with Section 106 of the NHPA is being carried out in a separate but parallel compliance process. Chapter 5 includes the details of the NHPA Section 106 process.

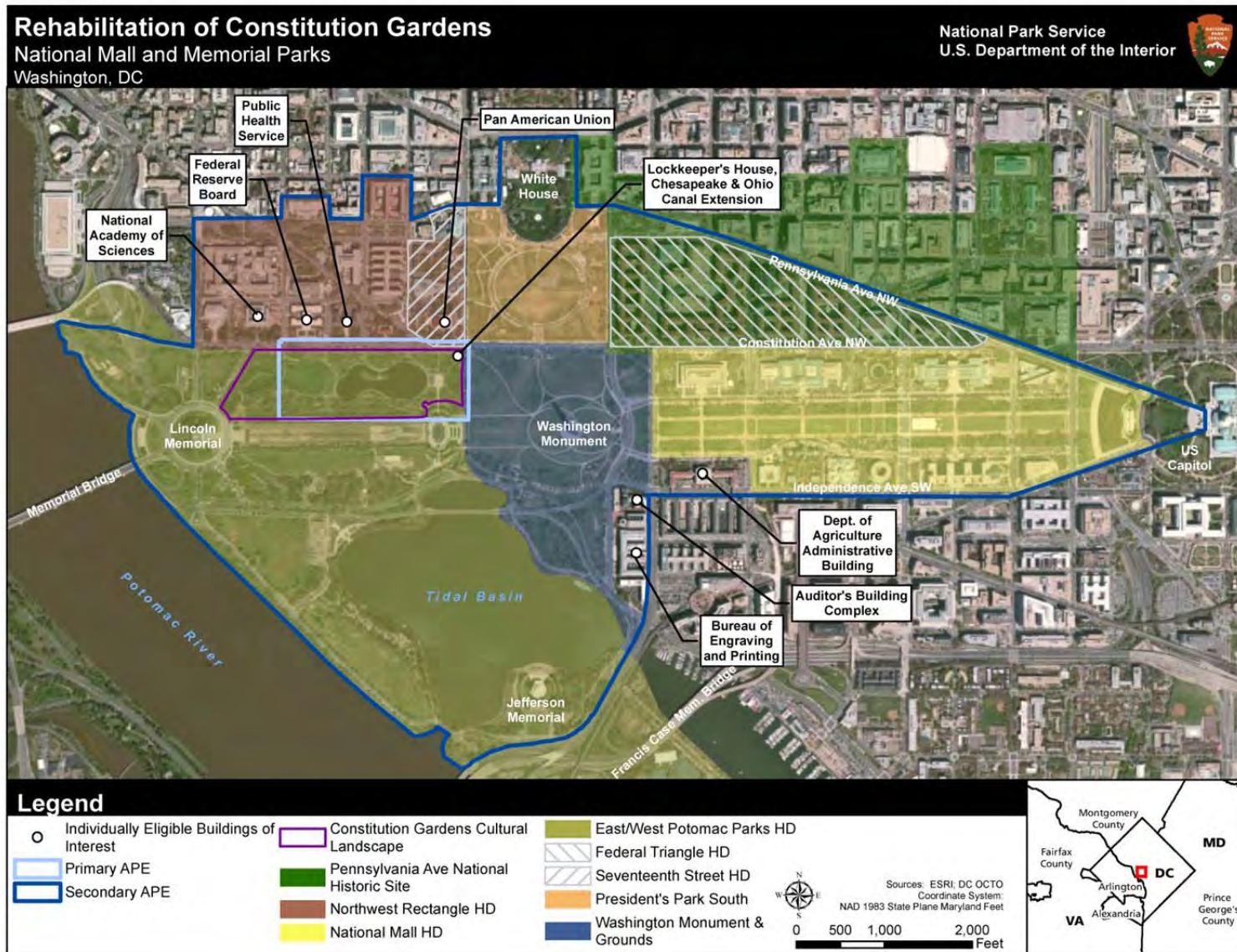
Area of Potential Effect

According to the Section 106 regulations (36 CFR §800), an APE is defined as the geographic area or areas in which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking. In NEPA terms, the APE is the equivalent of the study area for cultural resources.

Constitution Gardens is located south of Constitution Avenue and north of the Lincoln Memorial Reflecting Pool. Henry Bacon Drive bounds the western end of the gardens and 17th Street NW marks the boundary of the east end of the gardens. The 43-acre park located in West Potomac Park is considered to be part of the National Mall area although it remains somewhat hidden by grade changes on all four sides (NPS 2008, rev. 2014).

The NPS assessed the undertaking's APE (i.e., whether it extends beyond the boundaries of the gardens, or even potentially underground, in the case of archeological resources). During the initial consulting parties meeting for this project in August 2014, the NPS proposed a draft APE that encompassed the entirety of the National Mall as well as The White House and President's Park (Figure 3.1). The DC SHPO agreed with this approach to the APE in a letter dated August 14, 2014. NPS made minor refinements to the APE in February 2015, expanding the APE to include stormwater management enhancements with possible direct construction impacts underneath Constitution Avenue NW, and 17th Street NW. The affected environment described below and analysis presented in chapter 4 consider the entirety of the APE but conclude that the majority of direct effects would be limited to Constitution Gardens itself (the primary APE), while indirect effects could occur within the larger APE area (or secondary APE).

Figure 3.1 – Area of Potential Effect



History of Development

EARLY HISTORY (1790-1882)

Originally, the land on which the future Constitution Gardens was built consisted of river bottomlands bordering the Potomac River that were characterized by marshes and wet meadows. Beginning in the late 17th century, the area of the District was settled by Europeans who cleared land for tobacco plantations. By the time the District of Columbia was founded in 1790, soil was becoming exhausted as tobacco leached nutrients from the soil.

The new city's plan by Pierre Charles L'Enfant combined regular orthogonal streets with diagonal avenues radiating from the capitol and president's house. The center of his plan was the seat of the government formed by ceremonial parks and greenswards. These lands set aside for government use eventually became Reservation No. 1, the President's House, Treasury, Executive Office, and areas that would become the Ellipse and Lafayette Square; Reservation No. 2, including the Capitol grounds and a large commons running west to 14th Street NW; and Reservation No. 3, designated as the site of an equestrian statue of George Washington (now the Washington Monument grounds) south of Tiber Creek between 14th and 17th Streets NW.

L'Enfant's plan also included a canal to run from the mouth of Tiber Creek east along B Street (now Constitution Avenue) to 3rd Street NW and from there, south to the Anacostia River (NPS 1997). The canal, meant to spur economic growth in the new city, was begun in 1792 and abandoned in 1795. In 1802, a private company resumed construction on the Washington City Canal. Inferior materials and siltation made navigation difficult and hindered commerce. The canal quickly filled with sewage and was described as "extremely disgusting." By 1832, it had been upgraded by the District of Columbia and linked to the newly developed Chesapeake and Ohio (C&O) Canal at approximately 17th Street. A 2½-story stone building was built at the junction of the two canals to house the lockkeeper (now called the Lockkeeper's House), who collected tolls.

During the first half of the 19th century, the large commons to the west of Capitol (Reservation No. 2) was divided into several tracts rather than being landscaped as a single boulevard. Its undesirable location south of the Washington City Canal hindered development until 1838, when James Smithson donated money to the federal government for an institute of learning. The Smithsonian "castle" was built along the south side of the Mall. In 1848, construction of the Washington Monument began on Reservation No. 4, slightly south of the point of intersection of the north-south and east-west axes laid out by L'Enfant.

General trends toward improvement of public grounds, though briefly checked by the Civil War, continued during the second quarter of the 19th century. Many plans for public grounds improvements were made during the 1850s and 1860s, but lacked funding necessary for implementation. Starting in 1867 and continuing through the 1880s, the Mall was landscaped by the Office of Public Buildings and Grounds as a picturesque park with curving walks and hundreds of massed specimen trees and shrubs (NPS 2008, rev. 2014). This work was based, in part, on an 1851 plan by pioneering American horticulturist and landscape designer Andrew Jackson Downing (NPS 2008, rev. 2014). In 1871, Congress formed the Territorial Government, a short-lived self-government that finally implemented a program of infrastructure improvements to the city. The Territorial Government filled the Washington City Canal in 1873, creating B Street North, and constructed a sewer line along City Canal from 7th to 17th Street where it emptied into the river. Following its dissolution, the Commissioners of the District of Columbia and the US Army Corps of Engineers (USACE) continued improvements. Construction of the Washington Monument recommenced in 1878 and was completed in 1884 (NPS 1997, 2008).

DEVELOPMENT OF THE MALL AND WEST POTOMAC PARK (1882-1916)

Attempts to dredge the Potomac River began in 1870, but were not successful until a Board of Engineer Officers was appointed in 1882 to review previous plans. Following its report, Major Peter C. Hains of

the USACE developed a plan that was approved the same year. Plans began with the goal of clearing navigation channels; only later did the plans evolve to include land reclamation. Reclaimed land stretched from Easby's Point east to the western edge of the Washington Channel.

New lands created using dredged material from the Potomac (now East Potomac Park and West Potomac Park) were designated as parkland in 1887 due to the efforts of Washington banker and philanthropist, Charles Glover. The act establishing the parkland stated "That the entire area formerly known as the Potomac Flats and now being reclaimed, together with the tidal reservoirs, be, and the same are hereby, made and declared a public park, under the name of the Potomac Park, and to be forever held and used as a park for the recreation and pleasure of the people" (AR 1915:1669, in NPS 2008, rev. 2014). The ground was graded and sewer and other pipes were laid for drainage, particularly necessary in the low, marshy land that composed much of the Mall. Topsoil was spread and sown with grass seed or covered with sod.

During the 1890s, numerous plans for the improvement of Washington were made, resulting in the American Institute of Architects devoting its 1900 annual meeting to the question. The direct result of this action was the creation of a committee to lobby Congress to examine the problem. In 1901, Congress appointed a Senate Park Commission, commonly known as the McMillan Commission, to develop a plan for the further refinement of the public grounds of the nation's capital. Headed by Senator James McMillan, its members included architects Daniel Burnham and Charles McKim, landscape architect Frederick Law Olmsted Jr., and sculptor Augustus Saint Gaudens (NPS 2008, rev. 2014).

The McMillan Commission's plan for the District of Columbia drew heavily from City Beautiful and Beaux Arts architecture, focusing on monumental buildings, symmetry, and strong axial arrangements of spaces. The resulting plan attempted to recapture the fundamental principles of the original L'Enfant Plan for the Mall; the original east-west and north-south axes were expanded under the plan. Originally extending from the Capitol to Reservation No. 2 (now the Washington Monument), the McMillan Commission planned to rectify the off-axis placement of the Washington Monument by realigning the Mall and widening it to 1,600 feet. This axis was then to continue west through West Potomac Park along a new, cruciform-shaped reflecting pool to a new monument (the Lincoln Memorial). The north-south axis would also expand south to what would eventually become the Thomas Jefferson Memorial. Overall, the area would be characterized by open vistas, long greenswards stretching between the anchors of the north-south and east-west axes. The Mall was to be transformed into a grassy lawn bordered by carriage drives and ranks of elm trees, dotted with fountains and places to sit, rest, and enjoy the view. Areas north and south of the reflecting pool were to contain roads or walks on orthogonal and diagonal lines connecting key sites.

Work began soon after the plan was presented. Infrastructure was established throughout the Mall and included paths, roads, lighting, water systems, and extensive landscaping. B Street North (now Constitution Avenue) was lined with small trees, and 17th Street with mature American elms, planted in 1907. In 1909, B Street North was "extended to river as a boulevard." Thousands of additional trees were planted between 1910 and 1917 (NPS 2008, rev. 2014).

In 1903, the Lockkeeper's House was acquired by the government from the canal company and refurbished as a watchman's lodge and tool house (NPS 2008, rev. 2014). In 1915, the Lockkeeper's House was moved 49 feet west and 6 feet north, out of the intersection of 17th Street and B Street North. The building was remodeled again in 1916 and remained in use by the park's management department, which existed under several names prior to establishment of the NPS in 1934. An annual report from 1917 noted that "[i]n remodeling this building special care was taken to restore it to its original design as nearly as possible" (AR 1917:3714, in NPS 2008, rev. 2014).

The Lincoln Memorial was completed in 1921, and the reflecting pool was completed the following year (NPS 2008, rev. 2014). The McMillan Plan called for the areas north and south of the reflecting pool to be planted informally, but laid out with formal paths connecting the Lincoln Memorial with other sites. The

Arlington Memorial Bridge was constructed between 1926 and 1932, visually linking the Lincoln Memorial with the Arlington House (NPS 2008, rev. 2014).

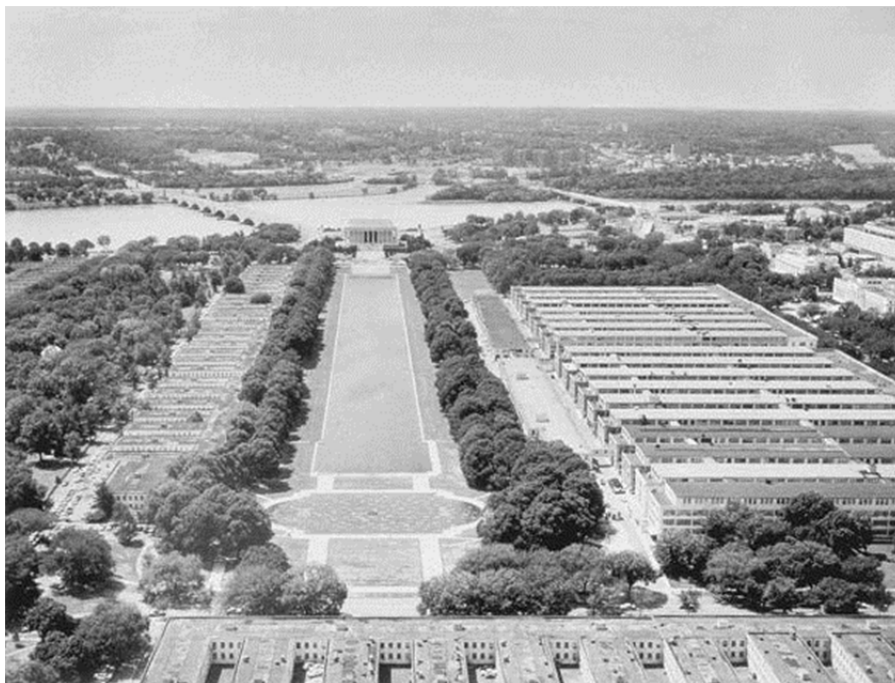
THE NAVY AND MUNITIONS “TEMPOS” (1916-1970)

In the run-up to World War I, a portion of West Potomac Park located at the west end of the National Mall from 17th to 21st Streets (an area known as Constitution Gardens since 1976) was developed as an administration center for the Department of the Navy and the Munitions Division of the Department of War (Figure 3.2). Enormous office buildings were constructed, ostensibly as temporary structures and therefore called “tempos.”

Following a severe flood of the river on March 19, 1936, a temporary levee was constructed to protect downtown Washington in the event of future floods (NPS 2008, rev. 2014). The levee ran parallel to the reflecting pool, north of the double row of elms and south of the Navy and Munitions buildings (NPS 2008, rev. 2014). It extended from the Lincoln Memorial east to 17th Street, with a gap at 23rd Street, where the design required placement of temporary earth fill barriers. In 1938, the USACE rebuilt the levee as a permanent earth and concrete structure.

In 1948, anticipating the removal of the tempos, the CFA noted “that the area along the south side of Constitution Avenue, now occupied by buildings, be planned as a naturalistic park area, within the rigid borders of the straight avenues, roads, and walks, with broad expanses of lawn with trees in mass, in groups, and singly, composed in a manner appropriate for passive recreation and in keeping with the immediate environment of two of the greatest memorials ever erected, the Washington Monument and the Lincoln Memorial. This is no place for active, noisy recreation: the area belongs to the people of the United States and it should not be dedicated for the use by Government employees and other residents of Washington as baseball and football fields” (NPS 2008, rev. 2014). The tempos were not removed until the late 1960s, when they began sinking. By 1970, most of the structures had been demolished, although their foundations were left in place and buried (NPS 2008, rev. 2014).

Figure 3.2 – View of West Potomac Park from the Washington Monument, about 1942 or Later



Note the tempos constructed parallel and to the north of the reflecting pool where Constitution Gardens is now located (NPS 2008, rev. 2014).

DEVELOPMENT OF CONSTITUTION GARDENS (1970-1993)

President Nixon's Bicentennial message on February 4, 1972, announced that a "park and recreation area would be available by 1976" on the site of the old tempos. Anticipating the Bicentennial in 1976, the NPS commissioned SOM to prepare a master plan for the National Mall, which it called the Washington Mall. SOM submitted two reports: "The Washington Mall Master Plan" in 1966 and the "Washington Mall Circulation Systems" in 1973 (NPS 2008, rev. 2014). The master plan provided plans for the development of Constitution Gardens (originally Bicentennial Gardens), although few of the recommendations were carried out for the gardens or the National Mall.

Starting in 1970, SOM developed a series of plans specifically for Constitution Gardens. The CFA reviewed each set of plans for the gardens, and, in 1972, accepted a revised design whose "essential simplicity complements the great formal composition of the Reflecting Pool and surrounding areas." (NPS 2008, rev. 2014). Ultimately, the plan called for a simpler but picturesque park with rolling hills, meandering walks, and a small pond (NPS 2008, rev. 2014). The gardens would be planted with a mix of tree species but would preserve existing notable trees. Additionally, the plan called for a large visitors services building, restrooms, food, a "garden-landscape," a "natural water feature or lake," and access by public transportation. The CFA dropped the last component of the plan.

The vegetative character sought in the SOM design for Constitution Gardens was described in the firm's design narrative:

"The Constitution Gardens are conceived as a wooded park, in keeping with the character of the larger portion of West Potomac Park surrounding the Lincoln Memorial and its reflecting pool. The design establishes a floor plan of softly contoured meadows shaded by a canopy of trees and sloping gently to meet the curving shoreline of an informally shaped lake...To achieve a smooth transition from the formal portion of the Mall into the Gardens, slightly undulating groupings of trees are set back a respectful distance from the formally planted elms flanking the Reflecting Pool. The treatment of the transition between the Gardens and the rectilinear geometry of city streets and buildings along the Constitution Avenue side is different. Here the outermost rows of trees are evenly spaced in straight columns paralleling the street. This regularity dissolves as the plantings continue toward the interior of the Gardens."

Construction of the gardens began in 1974, and the gardens were dedicated on May 27, 1976. The soils at the gardens proved to be of poor quality for growing plants, mostly due to the preparation of the area after the demolition of the tempos, and extensive soil amendments were necessary prior to plantings. A variety of soil mixtures were tried across the gardens, each of which was covered by 4 inches of topsoil, resulting in a layer of 18 inches of soil over the existing ground conditions (NPS 2008, rev. 2014). The majority of the landscaping, paths and the lake and island were completed prior to the dedication. However, poor soil quality and extensive rains cause most of the trees to die by the following spring (NPS 2008, rev. 2014).

Plantings at the gardens primarily occurred between 1975 and 1976. At the time of planting there were approximately 530 trees on the site and 1,886 trees of 18 species were planted, including:

- 400 red oaks (*Quercus borealis*)
- 328 "Emerald Queen" Norway maples (*Acer platanoides*)
- 200 each of red maples and sweetgums (*Liquidamber styraciflua*)
- tulip trees (*Liriodendron tulipifera*)
- scarlet oaks (*Quercus coccinea*)
- bur oaks (*Quercus macrocarpa*)
- eastern white pines (*Pinus strobus*)
- dedfree Dutch elms (*Ulmus hollandica* Dedfree; dedfree means Dutch elm disease free)
- 200 flowering dogwoods (*Cornus florida*)
- 200 shadblow serviceberries (*Amelanchier canadensis*)

- kousa dogwoods (*Cornus kousa*)
- fringe trees (*Chionanthus virginicus*)
- several varieties of crabapples (*Malus* sp.)
- several hundred azaleas and almost 200 rhododendrons
- underplantings of Baltic ivy (*Hedera helix baltica*)
- over 45,000 narcissus (*Narcissus poetaz* [Tazetta])

Although a design for the gardens had been approved, the plan continued to evolve due to problems with plant survival, algae growth in the pond, and the cost of some features. By 1978, 28% of the trees planted had died from drowning or disease promoted by water stress, requiring new plantings, sometimes using plants that were more water tolerant. Plans for a natural amphitheater were replaced by a plan to construct a large food service building. The cost of this structure ultimately led to the abandonment of the idea and following design review, a small refreshment kiosk was placed at the west end of the lake.

In 1978, Congress authorized the construction of a memorial to the 56 men who signed the Declaration of Independence on a site in Constitution Gardens. The selected design for the memorial consisted of a semicircular plaza located on the island's southern shore with stone pavers lain in a radiating pattern, from which the Washington Monument would be clearly visible (NPS 2008, rev. 2014). The location of the memorial proved to be difficult to work with, however, and construction did not begin until April 1982. The memorial was dedicated July 2, 1984.

The Vietnam Veterans Memorial (not within the scope of this project) was constructed at the west end of Constitution Gardens in 1982. The memorial was designed by Maya Ying Lin and was unanimously selected from 1,400 entries by a jury of design professionals (NPS 2008, rev. 2014). Despite this, there was some resistance to the stark design, and a more traditional bronze sculpture was added to the southwest of the memorial. This sculpture is commonly referred to as the "Three Servicemen." The Vietnam Women's Memorial was added to the southeast of the Vietnam Veterans Memorial in 1993 (NPS 2008, rev. 2014).

CULTURAL RESOURCES AND CONSTITUTION GARDENS

Constitution Gardens is a component of two National Register-eligible properties: the East and West Potomac Park Historic District and the L'Enfant Plan of the City of Washington. The gardens as a whole are considered a contributing element to these districts. Additionally, there are features within the gardens that are considered contributing elements to the East and West Potomac Parks Historic District.

Constitution Gardens has also been determined to be a cultural landscape eligible for listing in the National Register under Criteria A, B, and C, with a period of significance of 1882 to 1993. Criterion B, association with the lives of persons significant in our past, applies only to the Lockkeeper's House. Criterion A, association with events significant to broad patterns in our history, and Criterion C, embodies distinctive construction, work of a master, or high artistic values, apply to the gardens as a whole. The Memorial to the 56 Signers of the Declaration of Independence, a part of the cultural landscape, is listed under Criterion F, a commemorative property, and Criterion G, a property less than 50 years of age.

Historic Structures and Districts

According to the NPS' *Cultural Resources Management Guidelines*, a structure is defined as a constructed work, usually immovable by nature or design, consciously created to serve some human activities (NPS 1998a). In the NHPA, historic structures can be classified as buildings, structures, sites, objects, or districts (i.e., all the various types of historic property, except for archeological sites) that are potentially eligible for the National Register. A historic district is a geographic area that includes a concentration of sites, buildings, structures, or objects that are historically or aesthetically linked by a plan of physical development (NPS 2014a).

PRIMARY AREA OF POTENTIAL EFFECT

Within the primary APE, Constitution Gardens is a contributing resource to two National Register-eligible historic districts: the East and West Potomac Parks Historic District and the L'Enfant Plan of the City of Washington. Small portions of the Seventeenth Street and the Northwest Rectangle Historic Districts fall within the primary APE boundaries where it includes the sidewalk along the north side of Constitution Avenue. There is also one individually listed historic structure within the primary APE, the Lockkeeper's House.

East-West Potomac Parks Historic District

The East and West Potomac Parks Historic District includes the area between the Potomac River in the east to 17th Street NW in the west and between the Washington Channel in the south and Constitution Avenue to the north, a total of 730 acres (NPS 1996). The historic district was listed on the National Register in 1972 (with a revision in 1996) and is considered eligible under Criteria A, C, F, and G with a period of significance from 1882 to 1997. The revised National Register nomination lists 35 features that contribute to the district: 3 buildings, 11 sites, 11 structures, and 10 objects. Of these contributing features, four are associated with Constitution Gardens. One is the gardens; the other three are the Vietnam Veterans Memorial, the Memorial to the 56 Signers of the Declaration of Independence, and the Lockkeeper's House.

L'Enfant Plan of the City of Washington Historic District

Pierre L'Enfant designed the plan for the City of Washington in 1791 and mapped the plan the following year (NPS 1997). The plan was implemented gradually over time until the development of the McMillan Plan, which remained consistent with the L'Enfant Plan but was implemented more rapidly. The area nominated for the National Register includes the area of the L'Enfant Plan with modifications from the McMillan Plan. The area is bounded by Florida Avenue from Rock Creek to, NW to 15th, NE; then south to C Street and eastward to the Anacostia River—the same boundaries established 200 years ago. The L'Enfant Plan was listed in the National Register in 1997.

Contributing elements to the L'Enfant Plan in the vicinity of the project area include: the Mall and Washington Monument grounds, East and West Potomac Parks, Constitution Avenue, 17th Street NW, and 23rd Street. The view down Constitution Avenue is considered a prominent vista that contributes to the district. Constitution Gardens and several features within it are called out as important elements of the district. The features mentioned include the Lockkeeper's House, the Memorial to the 56 Signers of the Declaration of Independence, and the Vietnam Veterans Memorial.

Seventeenth Street Historic District

The Seventeenth Street Historic District was listed on the DC Inventory of Historic Sites on March 7, 1968. The historic district is bounded by 17th Street NW to the east, Constitution Avenue NW to the south, 18th Street NW to the west, and New York Avenue NW to the north (excluding 1750 New York Avenue NW). The historic district contains four contributing buildings: the Corcoran Gallery of Art, the Pan American Union, the Daughters of the American Revolution Memorial Continental Hall, and the American National Red Cross.

Northwest Rectangle Historic District

The Northwest Rectangle Historic District has been determined eligible for listing in the National Register. Its boundaries generally follow Constitution, 17th E, and 23rd Streets, NW, including buildings on the north side of E Street NW between 18th and 19th Streets and 20th and 21st Streets. The district includes 17 contributing buildings dating from 1891 to 1963, nearly all constructed of marble or limestone, showing a gradual shift from classicism to modernism and the incremental development of government offices and institutions during this period.

Construction of the Corcoran Gallery of Art in 1891 marked the earliest civic development within the district. The McMillan Commission envisioned the area as predominately a buffer of parkland with a few civic buildings along the west side of the ellipse. The Pan American Union building was constructed between 1908 and 1910, followed by the Daughters of the American Revolution Headquarters in 1910, and the Red Cross in 1915. Rather than becoming a parkland buffer as envisioned by the McMillan Commission, the remainder of the area gradually developed westward. The first federal building, the Interior Department Offices, was built between 1915 and 1917 along with temporary office buildings for cabinet departments. Continued expansion led to formal planning of the area as a counterpart to Federal Triangle, with the first plans for Northwest Rectangle laid out by Frederic Law Olmstead, Jr., in 1931. Planning of the area continued throughout subsequent decades, and although none of the plans were fully realized, the district is unified by the monumental scale of its buildings, design similarities, and materials.

The Lockkeeper's House

The Lockkeeper's House is located at the corner of 17th Street NW and Constitution Avenue. The structure was built in 1837, at the time the C&O Canal was extended southeast from Georgetown to connect with the Washington City Canal at this location, where a basin was created. The basin was a triangular harbor at the mouth of Tiber Creek (NPS 2011a). A small island lay in the northwest corner of the basin, near the Lockkeeper's House. The house was the residence of the lockkeeper, who collected tolls and kept trade records. The canal company conveyed it to the Chief of Engineers, USACE, on August 14, 1902 (NPS 2008, rev. 2014). The house was located just north of the 17th Street Wharf. The Lockkeeper's House is the only remnant of the C&O Canal Extension and is the oldest structure on the National Mall (NPS 2011a).

By 1915, expansion of 17th Street left the house protruding into the roadbed, and so it was moved 49 feet west and 6 feet north, out of the intersection. The 1916 Annual Report of the Office of Public Buildings and Grounds illustrates footprints and photos of the house before and after the move (NPS 2008, rev. 2014). The house originally rose to 2½-stories, banked into the earth. As the grade was raised in this area, the lower story was filled in, and only the upper story-and-a-half was moved in 1915. Internal alterations were made to the structure to house a restroom, bicycle room, and locker room for park watchmen. Many improvements were made to the house's surroundings.

The 1½-story, 3-bay structure now stands on a concrete slab foundation and has a side-gable roof covered with wood shingles. It is constructed of randomly coursed ashlar, using both rock- and smooth-faced stones of widely varied heights and lengths. The front door occupies the central bay. Windows have stone sills and lintels. There are two dormers at both front and rear and two end chimneys, which are later additions to the original structure.

In the 20th century, the house was used for storage; as a police lodge; as a holding cell for people arrested in Potomac Park; and, from 1940 to 1970, as a comfort station. The structure was listed in the National Register in 1973, but the nomination did not include criteria for eligibility. However, the structure is also a contributing feature to the East and West Potomac Parks Historic District, which lists its criteria for eligibility as Criteria A, for events and history, and Criteria C for characteristics of a type, period, or method of construction. It also falls under Criteria B for its association with the Washington City and C&O Canal (NPS 2011a).

The house is presently unused and overall, is considered to be in fair condition, although many features are considered to be in poor condition (NPS 2011a). Recent plans have explored adaptive reuse and the Historic Structures Report (NPS 2011a) discussed relocation.

SECONDARY AREA OF POTENTIAL EFFECT

A large number of cultural resources are located within the secondary APE, including the Washington Monument grounds, National Mall Historic District, President's Park South, the White House, Federal Triangle and Pennsylvania Avenue National Historic Site, and numerous architectural resources within

these historic districts that are individually listed or eligible. The Bureau of Engraving and Printing, the Department of Agriculture (Administration Building), and the Auditor's Building Complex are three individually listed resources located within the secondary APE that do not fall within the above-listed historic districts.

Cultural Landscapes

Cultural landscapes, as defined by *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*, 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 or exhibiting other cultural or aesthetic values" (Birnbaum 1996). In 2008, a Cultural Landscape Inventory (CLI) was completed by the NPS for Constitution Gardens, jurisdictionally a component of the National Mall and Memorial Parks. The proposed alternatives have the potential to directly affect one cultural landscape: Constitution Gardens as defined in the 2008 CLI.

Constitution Gardens has an entirely constructed topography of gently rolling slopes and berms. The gardens are roughly rectangular, the eastern half of which gently slope down to a 6.75-acre lake that has a continuously curving shoreline, oriented with its long axis east-west. The flood control levee, an earthen dike constructed in the late 1930s to protect the downtown area of Washington, DC from flooding of the Potomac River, forms a linear slope along the gardens' south side and southeast corner. The levee provides a physical and visual separation between Constitution Gardens and the reflecting pool area. A low berm along Constitution Avenue partially screens the gardens from views and traffic along Constitution Avenue (NPS 2008, rev. 2014). The maximum height of berms relative to Constitution Avenue is approximately 3 feet.

The highest elevation within the gardens is 26 feet above mean sea level, the height of the crown of the knoll. The new flood control levee has a design height of 19.1 feet. The elevation of the lake is about 8 feet above sea level, or 6 to 8 feet below the elevation of the reflecting pool and Constitution Avenue (NPS 2008, rev. 2014).

Although the landscape is entirely constructed, the gardens were designed as a pleasant and natural appearing area to walk through between the Lincoln Memorial and Washington Monument. The natural approach to the gardens differs from the neighboring portions of the Mall, which feature more formal landscaping and straight-lined features.

There are several defining characteristics of the topography (summarized in Table 3.1). The flood control levee forms a linear slope along the gardens' southern boundary and southeast corner, and a low berm along Constitution Avenue partially screens the gardens from views and traffic along this road (NPS 2008, rev. 2014). From these features, the gardens' gently rolling topography descends in height to the focal point of the gardens, Constitution Gardens Lake. Another prominent topographic feature within the gardens is the plateau at Overlook Terrace, which offers views over the lake and park and toward the World War II Memorial.

Approximately 2 miles of meandering walks run through the gardens for use by pedestrians and cyclists. These are laid out in two, peanut-shaped loops that are aligned to the east to west; one following the shoreline of the lake and the other curving around the large western knoll and the Vietnam Veterans Memorial. Secondary loops branch off from and connect back with the main loops. Nearly all of the walks are paved with gravel-topped asphalt and many are currently in poor condition. Originally, hundreds of Norway maples were planted in circular openings in the asphalt, along one side of the loop walks to create a linear wall of trees shading and emphasizing the curving pedestrian routes. Over time, the growth of the trees led to increasingly narrow pathways. Most of these trees have died and been replaced by red maples, the majority of which were placed outside of the walks.

At the time the CLI was completed, approximately 1,900 trees were growing in Constitution Gardens, most of which are not the original trees planted in 1975–1976 (NPS 2009). Trees are planted regularly around the gardens' perimeter, creating a gradual transition from the formal lines of trees around the gardens to the more natural appearance within the gardens. The trees are primarily a mixture of native deciduous species and flowering understory species. Some planting locations have also been altered. There are several trees that predate the construction of Constitution Gardens that were incorporated into the plan for the gardens. These are located at the west end and near the Vietnam Veterans Memorial and at the east end near the Lockkeeper's House.

Tree mortality has been an ongoing problem at the gardens due to poor soils, which has led to numerous replantings over the history of the gardens. Because of replacements, the original species composition has been altered and is now more complex. Tree removal and replanting has been an ongoing process over the years; however, despite these changes, the current arrangement and mix of tree species is consistent with the intended character of the gardens.

Constitution Gardens Lake is a small, peanut-shaped body of water oriented east to west within the park with an average depth of 2 to 3 feet (NPS 2008, rev. 2014). The man-made lake with a concrete bottom was constructed as the central feature of the gardens and was bordered by a granite curb and perimeter walk. Water quality problems have resulted in periodic algae growth within the lake.

Near the north shore of the lake is a half-acre island. Like the lake itself, the island is retained by granite walls. It was constructed with fill, and originally it was planted with grass, English ivy, and 12 weeping willows, and partly paved with flagstones. A wooden pedestrian bridge provides access to the island and the memorial landscape dedicated to the 56 signers of the Declaration of Independence. From the bridge, a granite walk and steps lead to an asphalt paved semi-circular plaza that opens to the south shore, lined on the north side with 56 granite blocks organized into 13 groups representing each of the original states. Planting beds are situated behind the granite blocks and on the north slope of the island.

Overlooking the lake at the east end is Overlook Terrace, a large, asphalt-paved platform originally planned as the site for a visitor's facility and restaurant. Neither facility was ever built due to lack of funds. Instead, three stonewalled terraces designed for outdoor seating, descend the slope from the plaza to the lake and are planted with honey locusts. The terrace walls are constructed of a blue-grey fieldstone. At the end of each terrace is a broad stairway constructed of stone steps. The terraces are considered to be in good condition.

The refreshment kiosk located at the west end of the lake has a style that is unlike that of other National Mall pavilions, although it would have been architecturally compatible with the East End Visitor Pavilion once approved for Overlook Terrace. The kiosk stands on a widened paved area of the seeded asphalt walk at the west end of the lake. The design of this hexagonal building plays on triangular units. The roof is shaped as a bent pyramid, with a central pyramidal section surrounded by a sloped plane or collar. This collar has an exposed steel-and-wood structure composed of triangular segments that are alternately glass skylights and solid roof. The collar is bent in two planes, the solid sections following the angle of the pyramid roof, and the skylights between them less steeply inclined. The skylights allow for the play of light and shadow on the grounds, an effect sought by the designers: "The motif of dappled shade and reflecting surfaces will be carried forth in the design of the few structures . . ." (Design Statement c. 1974:2). The wall panels are built of tongue-and-groove siding, painted grey, and the wood-and-steel roof is painted brown (NPS 2008, rev. 2014).

The kiosk was intended to stand in the center of a grove of 36 honey locust trees, planted about 18 feet on center. Current site plans show 17 honey locusts remaining along the boundary of the walks; none are now planted directly in the walks, but a few visible circular patches in the asphalt suggest the other trees may have originally been planted and later removed. The kiosk appears to be in good condition.

A curvilinear comfort station, similar to those developed for the National Capital Parks in the mid-1970s by NPS architect Ben Biederman for use in Bicentennial projects, is located in a somewhat inconspicuous location south of the refreshment kiosk, off an asphalt walk and among a grove of trees near the toe of the flood control levee. These comfort stations typically had exposed aggregate siding; however, to meet objections raised by the CFA and the Joint Committee on Landmarks, wood siding was substituted on this structure for the concrete to complement other proposed structures for Constitution Gardens. One-half of the building houses a men's restroom, the other a women's restroom. The comfort station is in poor condition; the plumbing needs replacing and the bathrooms are too small to accommodate many visitors.

The historic Lockkeeper's House is at the northeast corner of the site, built when the Washington City Canal was joined to the C&O Canal in the 1930s. The Lockkeeper's House is listed in the National Register and is discussed in detail under "Historic Structures."

Constitution Gardens is a pastoral landscape, designed not only to provide a pleasant stroll between memorials but to offer a series of more varied, intimate, and restful views than is typical for the rest of the National Mall landscape. Landmarks are partly glimpsed between trees or rising above the tree line.

The Washington Monument serves as a focal point for views, and it is prominently visible throughout the gardens. The Washington Monument and Lincoln Memorial are visible from the eastern end of the gardens and near the Vietnam Veterans Memorial. Other nearby buildings and memorials can be glimpsed from the gardens. The views from the gardens are as important as the views into the gardens from the outside and of the features within the gardens. The views important to the cultural landscape are summarized in Table 3.1 below and are detailed in the "Visual Resources" section of this EA.

Certain broad landscape characteristics are typically identified and evaluated in CLIs. They include natural systems and features, spatial organization, topography, land use, circulation, vegetation, buildings and structures, views and vistas, small scale features, constructed water features, and archeology. Not all are present in every cultural landscape. At a greater level of detail, the CLI includes lists of character-defining features for many of the landscapes. Character-defining features that contribute to the integrity of the cultural landscape are listed in Table 3.1 by landscape characteristic.

Table 3.1 – Character-defining Features Identified in the 2008 Constitution Gardens Cultural Landscape Inventory

Landscape Characteristic	Contributing Features
Natural systems and features	<ul style="list-style-type: none"> • None
Spatial organization	<ul style="list-style-type: none"> • Border of trees • Open central area
Topography	<ul style="list-style-type: none"> • Flood control levee • Gentle slopes • Plateau at Overlook Terrace • Western knoll • North berm • Low central area occupied by lake • Slope and cut at the Vietnam Veterans Memorial
Land use	<ul style="list-style-type: none"> • Passive recreation • Visiting the memorials • Ceremonies at the Vietnam Veterans Memorial • Demonstrations • Citizenship ceremony at Overlook Terrace • Catch and release fishing
Circulation	<ul style="list-style-type: none"> • Overlook Terrace • Loop walk around the lake • Loop walk around west end and the Vietnam Veterans Memorial • Secondary walks over slopes

Landscape Characteristic	Contributing Features
	<ul style="list-style-type: none"> • Walks parallel to stairs • Diagonal walk, northeast corner of Overlook Terrace • Walk south, Overlook Terrace to World War II Memorial • Walk north, Overlook Terrace to Constitution Avenue • Two sidewalks along Constitution Avenue • Sidewalk along 17th Street
Vegetation	<ul style="list-style-type: none"> • Deciduous trees • Honey locust trees on Overlook Terrace • Honey locust trees around the refreshment terrace • Sycamores, former 21st Street alignment • Magnolias, Memorial to the 56 Signers of the Declaration of Independence • Remnant plantings, Memorial to the 56 Signers of the Declaration of Independence • Street trees • Lawns
Buildings and structures	<ul style="list-style-type: none"> • Refreshment kiosk • Comfort station • Constitution Gardens Island • Memorial to the 56 Signers of the Declaration of Independence • Lockkeeper's House • Vietnam Veterans Memorial • Three Servicemen Statue • Vietnam Women's Memorial
Views and vistas	<ul style="list-style-type: none"> • Vistas from park to Washington Monument • Vista from Vietnam Veterans Memorial to Washington Monument • Views to reflecting pool area • Vistas to Lincoln Memorial • Views to buildings north of Constitution Avenue • Vistas to the Vietnam Veterans Memorial • Views from Overlook Terrace • Internal views to lake • Internal views to island • Views to buildings on or near Mall • Views from Virginia Avenue to Washington Monument • Views from along Constitution Avenue
Small scale features	<ul style="list-style-type: none"> • Cast iron and wood-slat benches • Lighting • Washington City Canal Memorial stone and plaque • Vietnam Veterans Memorial Flagpole, "In Memory" Plaque, lighting fixtures and locators
Constructed water features	<ul style="list-style-type: none"> • Constitution Gardens Lake
Archeology	<ul style="list-style-type: none"> • None*

*See below discussion of Archeological Resource

Archeological Resources

Constitution Gardens has a lengthy history related to the development of the waterfront of Washington, DC. The northern fringe of the property was the historic shoreline of the Potomac River, and the landscape was largely created during late-19th century land reclamation projects. Prior to the construction of the gardens, the property was used first as the site of the Washington City Canal, and later as an

administrative center for the Department of the Navy and the Munitions Division of the Department of War. Notwithstanding the developmental history of the property, there is the potential for archeological resources to be present within the gardens.

Currently, there are four known archeological sites within Constitution Gardens and three sites that are thought to be present in the park but have not been documented. One of the known sites in the park is deposits associated with the 17th Street Wharf (51NW232) that stood in the area during the early-19th century. During the second and third quarters of the 19th century, the Washington City Canal traversed the northern margin of the park property. The remains of the canal prism and towpath may be present in the park buried underneath fill deposits, and they would constitute an archeological resource once identified. The original location of Lock B of the Washington City Canal was identified in the APE and recorded as Site 51NW235. The Lockkeeper's House has deposits surrounding its original location and present location that have been recorded as Site 51NW233. The Tiber Creek Sewer (Site 51NW234) has also been recorded in the APE. This large sewer structure and headwall were identified during recent studies along 17th Street NW, buried underneath fill. The headwall and masonry sewer structure were partially demolished, but portions remain intact underneath 17th Street, and immediately west, between the roadway and the sidewalk. One of the sites present in the APE that has not been documented is the remains of 20th century temporary buildings (the Main Navy and Munitions buildings); the foundations and basements of the building were left in place and buried on site (NPS 2008, rev. 2014). An additional and final unrecorded resource in the APE is the Washington Brewery (Coningham and Company) facility. Historic documentation indicates that the brewery once stood in Square 129, which was between 19th and 20th Streets NW, south of B Street (Constitution Avenue). The brewery operated between 1796 and circa 1805, and was made of stone and was 2-stories high. It is not known if any remains of the brewery have survived to the present-day. Because some of these remains are more than 100 years old, they would also constitute a site once identified.

An additional three sites have been documented near the park (DC SHPO 2011). One site, the Monument Grounds Site (51NW035), is a prehistoric site recorded east of the primary APE. West of the primary APE was an early wharf known as Commissioner's Wharf; the site location was recorded by the DC SHPO as H-68. It does not have a full site number because it has not been identified archeologically. Commissioner's Wharf became inactive in the early-19th century and the Washington City Gas Works (H-69) was constructed on the wharf property. The Washington City Gas Works has also not been identified archeologically.

The archeological resources present within the gardens are likely historic in nature, and there is little potential for prehistoric archeological sites to be identified. The area has been extensively disturbed during early construction of the city, canal, and later, the administrative buildings. Because the gardens are a completely constructed landscape, any archeological sites present are likely to be under several feet of fill materials.

The NPS has recently completed a Phase IA archeological investigation of Constitution Gardens (Katz and Lamzik 2015) to determine the potential for archeological resources within the park. Six soil cores were excavated along a 2,400-foot length of the gardens along the northern boundary of the park (Katz and Lamzik 2015). These cores extended up to 25 feet below ground surface. The results of this investigation indicate that the early-mid-19th century landscape is present below thick modern fill; however, it was not possible to determine if the buried surface horizon is related to the Washington City Canal or to Tiber Creek.

VISUAL RESOURCES

Key factors and considerations for the aesthetics and visual resources of the affected environment include the following categories, which provide a framework for evaluation:

- **Visual Character** (including salient landscape elements and built features): The visual character of a site, in very general terms, is like a mental snapshot of the place. It embodies the defining and most memorable site features.
- **Views and Vistas**: 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. In the project area, the patterns of circulation, walkways, and open spaces enable views to and from key cultural resources, such as between the Washington Monument and the Lincoln Memorial.

Visual Character

The site’s pastoral character provides a contrast to the formal cross axis of the National Mall and reflects its intended function as an informal contrast to the Elm Walks that line the reflecting pool between the Lincoln Memorial and World War II Memorial. The visual character of the site is dominated by pastoral landscape features in keeping with the larger portion of West Potomac Park surrounding the Lincoln Memorial and its reflecting pool. Softly contoured lawns shaded by a canopy of trees slope to a modern, man-made, peanut-shaped lake and provide views and vistas to several structures, the most prominent of which is the Washington Monument. The character-defining features of the gardens include the elements that shape the experience of quiet respite from the surroundings. The garden’s vegetation, with a variety of tree species from small flowering trees and weeping willows to red oaks, are grouped with irregular spacing to create openings and define views. Its gently-rolling topography contrasts the flat plane of the National Mall and adjacent reflecting pool, both secluding and framing views and vistas within the gardens. Vistas connect the gardens to prominent buildings and memorials in the surrounding area. The design statement describes the type of viewing experience sought:

“The design emphasizes the quality of transparency. The selection of high canopied tree species will create a band of daylight flowing between the dark of the leaves and the grassy meadow floor. Branches would not interfere with views of visually important Mall features such as the District of Columbia War Memorial. Understory trees and shrubs over 4 feet tall will be used only sparingly and will be grouped to provide a sense of scale without disturbing views.” (Design statement c. 1974:2, in NPS 2008, rev. 2014).

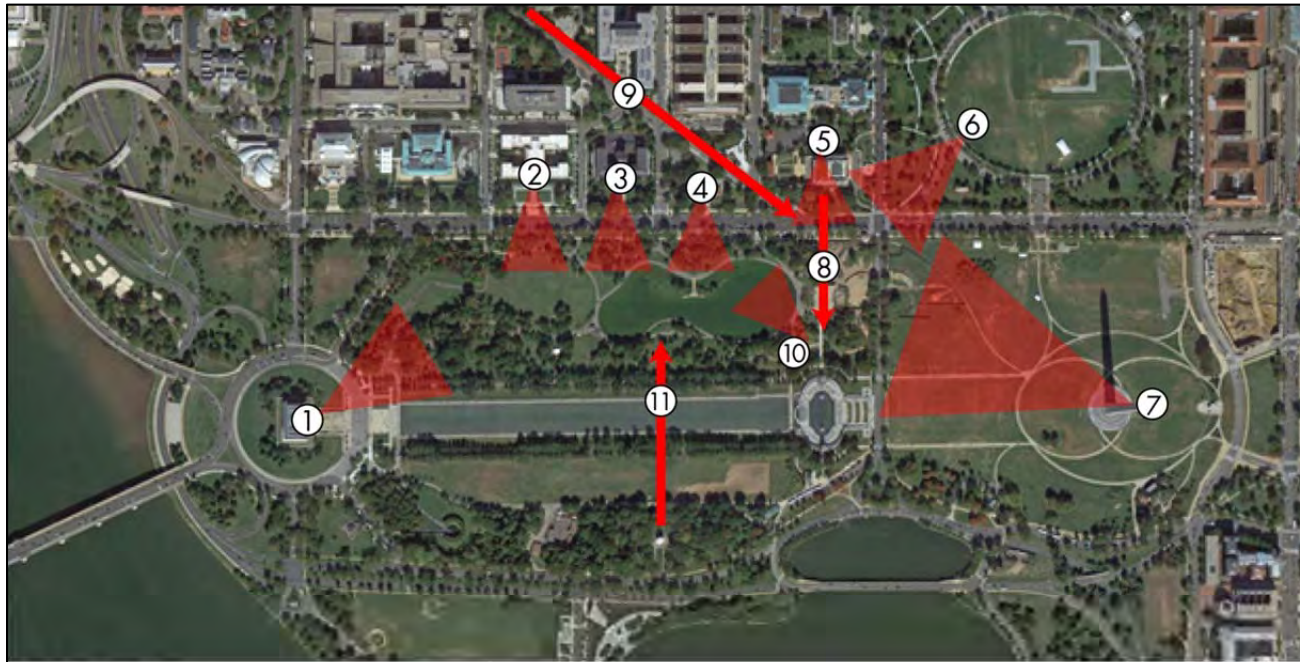
To some extent, this character has been achieved. However, trees have not grown as tall as was expected, so the “band of daylight” is only occasionally apparent. Many of the shrubs have been removed.

Views and Vistas

Nearly every direction to and from Constitution Gardens provides a character-defining view or vista, excluding the one towards Rosslyn, Virginia (NPS 2008, rev. 2014) (Figure 3.3). The 6.75-acre lake in the eastern section is an important focal point of the gardens’ landscape. There are 10 views and vistas identified as contributing, character-defining features of Constitution Gardens (Figure 3.4). In addition, views of the gardens from visual corridors established by the L’Enfant and McMillan Plans and from surrounding buildings and monuments are defining aspects of the visual character of the area. Specifically, views into and out of Constitution Gardens through the trees lining Constitution Avenue were considered part of the McMillan Plan.

The Washington Monument serves as the focal point of a dominant vista. It is prominent to the east from throughout Constitution Gardens, usually seen across the lake and mirrored in its reflective surface. One of the most striking views of the monument occurs from the walk ascending the eastern arm of the Vietnam Veterans Memorial, which is aligned with the monument, and from which it is seen rising above the prominent knoll east of the Vietnam Veterans Memorial. Similarly, the memorial comes into view from the crown and western side of the knoll. This reciprocity of views between important monuments was a key theme of both the L’Enfant and McMillan Plans.

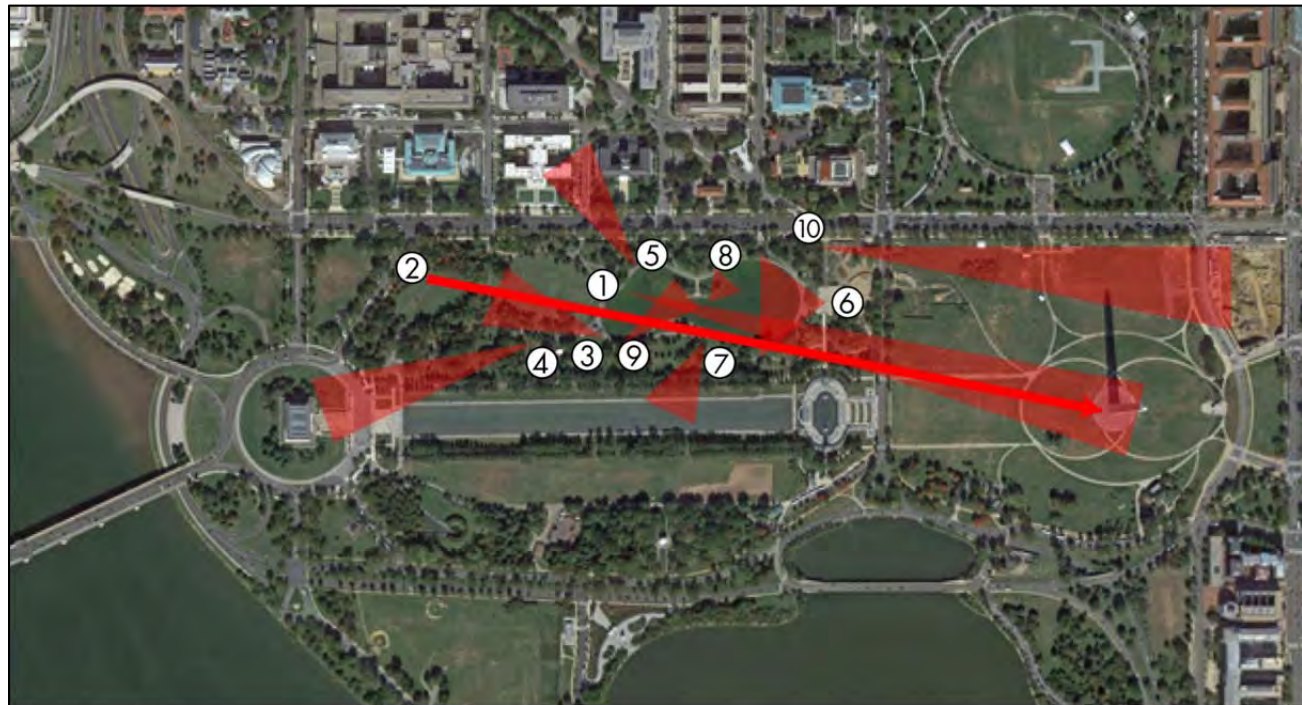
Figure 3.3 – Views and Vistas to Constitution Gardens



LEGEND

- | | |
|---|--|
| 1. Vista from Lincoln Memorial to park | 6. View to Lockkeeper's House |
| 2. View from the Federal Register | 7. Vista from Washington Monument |
| 3. View from the Department of Interior South and Constitution Avenue | 8. View to World War II Memorial |
| 4. View from the Pan American Annex | 9. Vista from Virginia Avenue, NW |
| 5. View from the Organization of American States | 10. Views from Circle of Remembrance |
| | 11. Views from District of Columbia War Memorial |

Figure 3.4 – Views and Vistas within Constitution Gardens



LEGEND

1. Vistas from park to Washington Monument
2. Vista from Vietnam Veterans Memorial
3. Vistas to the Vietnam Veterans Memorial
4. Vistas to the Lincoln Memorial
5. Views to buildings north of Constitution Avenue

6. Views from the Overlook Terrace
7. Views to Reflecting Pool Area
8. Internal views to the Lake
9. Internal views to the island
10. Views from Lockkeeper's House to the National Museum of African American History and Culture

The Capitol Dome and the Old Post Office, as well as museums to the east can be seen from the knoll. The skyscrapers of Rosslyn, Virginia, are plainly visible above the central knoll through a wide gap in the trees of the Vietnam Veterans Memorial site from elevated vantage points, especially from Overlook Terrace at the east end of the lake. The view is non-contributing.

Visible from most areas within the gardens, the lake forms the dominant feature of the eastern section. The walk that hugs its shoreline invites people to stroll along the water's edge, gazing at the reflections in the still water, the wildfowl, the trees massed on the surrounding hills, and the small island with its Memorial to the 56 Signers of the Declaration of Independence. Similar views of the gardens' landscape can be seen from the island, where visitors are first led to the plaza that forms the central feature of the memorial. This vantage point offers perhaps the most dramatic vista of the Washington Monument.

Looking west from Overlook Terrace at the gardens' east end offers expansive views of the lake and its surroundings. Also visible to the south from Overlook Terrace is the "Atlantic archway" leading into the World War II Memorial. The fountains and portions of the colonnade can be partially seen.

Visible from walks on the south and from the levee, are filtered views to the elms along the reflecting pool, the pool itself, and glimpses of the Lincoln Memorial. From some points in the gardens, particularly from the Vietnam Veterans Memorial site, the roofline of the Lincoln Memorial can be seen above or through the trees. The entire memorial, however, is not clearly visible and does not serve as a landmark in the manner of the Washington Monument. The DC War Memorial, the small marble temple on the axis of 19th Street in the grounds south of the reflecting pool, was meant to be a visual feature but is barely visible today.

The stately parade of civic buildings lining the north side of Constitution Avenue across from the gardens—the Organization of American States (architects Albert Kelsey and Paul Cret, 1908–1910; façade faces 17th Street), the Organization of American States Annex (Kelsey and Cret, 1948), the Department of the Interior South Building (Jules Henri de Sibour, 1933), and the Federal Reserve Board (Cret, 1937)—can be partially seen in places through a screen of trees, including the American elms lining the avenue. Parts of other structures are visible above the trees to the east—the red roofs of the Federal Triangle buildings, the towers of the Old Post Office, the dome of the US Capitol, the Smithsonian Castle, and the Sidney R. Yates Federal Building (originally the Bureau of Engraving and Printing). Also visible from within the gardens is a water feature at 20th Street NW that echoes the rainbow pool at the World War II Memorial. These views help to situate the gardens within its urban context.

The revised East and West Potomac Parks Historic District National Register nomination does not list any contributing views or vistas related to Constitution Gardens because these are not features counted in the National Register. It does, however, note: "...though not specifically described below, other views and vistas that preserve this sense of open space should not be precluded from consideration as significant aspects of the parks" (EWPP rev. nomination 2001:Sec. 7 p. 42). Because this wide-ranging visual experience is fundamental to the design of Constitution Gardens, few of the views or vistas are out of character with the landscape. This is particularly so because its surroundings have been carefully developed in accordance with the L'Enfant and McMillan Plans. The only discordant note is the view of the Rosslyn towers to the west.

VISITOR USE AND EXPERIENCE AND SAFETY

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 experience also addresses interpretation, meaning, and values, particularly of memorials and historic places. Although there are no interpretation programs at the gardens, there are programs at nearby attractions and memorials on the National Mall. Visitor use describes the multiple ways in which a site is used. In this

context, the project area is used as a circulation thoroughfare and a recreational and historical destination for memorial sites.

Visitor Experience

While Constitution Gardens is on a prominent site between well-visited symbols of the nation, it has generally been seen as a pastoral interlude on the way to these sites. There are no visitor counts for the area, and the gardens are not sought out by the majority of visitors coming from other areas of the country or world. However, the gardens have a Washington DC-based clientele who regularly visit the site to relax in a natural environment away from the usual urban bustle and participate in activities such as fishing, running, walking, bird watching, and eating lunch. Visitors enjoy the gardens for its quiet surroundings, access to nature, waterfowl, and its peaceful water reflection. Many elements contribute to the project area's visitor experience and visitor use, both of which are considered separately within this analysis.

Constitution Gardens was constructed and designed to provide a pleasant area for visitors to walk through while visiting the Lincoln Memorial and the Washington Monument. The garden's rolling topography, relative seclusion via changes in grades, and trees encourage passive activities such as strolling, picnicking, and resting on benches that view the lake (NPS 2008, rev. 2014). Quiet and somber activities are further encouraged because of the proximity of the Vietnam Veterans Memorial.

Constitution Gardens provides a small restroom and a seasonal refreshment stand, which are on the most southerly walk from the World War II to the Vietnam Veterans Memorial. In addition, there are a few benches near these facilities, but no tables and chairs for food service unlike many of the other food service areas on the National Mall.

PROJECT AREA ATTRACTIONS

Memorial to the 56 Signers of the Declaration of Independence

While the project area in Constitution Gardens does not contain nationally known symbols of the country, it does tell important stories related to US history. The Memorial to the 56 Signers of the Declaration of Independence commemorates the bravery of the founding fathers and one of the most important documents in the nation. The gilded signatures of the signers remind visitors that these men pledged their lives, fortunes, and sacred honor so that a democratic nation would be established. The memorial on the island is not visible from most walkways in the gardens. The memorial is accessed by stairs and does not meet federal standards for accessibility.

The Canal Lockkeeper's House

The Lockkeeper's House, dating from the 1803s, and nearby carriage or horse mounting steps are reminders of early US history, changing modes of transportation, and commerce. A wayside sign describes the history of the house.

NEARBY ATTRACTIONS

Constitution Gardens is discovered by people on their way to nearby well-visited attractions (described below). NPS does not count visitation to Constitution Gardens, but examining visitation at the adjacent sites indicates the potential for future visitation.

The Vietnam Veterans Memorial

The Vietnam Veterans Memorial is a highly recognizable structure and the most visited site in the gardens. It is composed of several disparate elements, including the stark black granite gash in the earth in the form of splayed V shaped walls containing more than 58,000 names, a nearby name locator, a flagpole, and two sculptural groupings—one of three multi-racial soldiers, and another of nurses. In addition, there is an "In Memory" plaque commemorating other consequences of the war. The Vietnam

Veterans Memorial has meaning beyond its original purpose to commemorate Vietnam Veterans. It has become a touchstone for veterans of any conflict; it brought healing to a nation conflicted by the war; and it connects with visitors in many ways, through grief, personal connections and histories, remembrance, comradery, and a wide range of emotions. Spontaneous remembrances left at the wall started what is now a large museum collection that will be incorporated into the future Vietnam Veterans Memorial Center, which is currently under design.

World War II Memorial

This memorial commemorates sacrifices on the home front and two battlefronts with sculptural bas reliefs, display fountains, inscriptions, a fountain, and wall of gold stars honoring more than 400,000 individuals who lost their lives. The memorial also stands as a symbol of the country's productivity and strength during wartime. The memorial surrounds the jetted rainbow pool, columns honor states and territories, while somewhat hidden on the west side are two humorous nods to "Gilroy was here" that typified World War II soldiers' graffiti.

The Lincoln Memorial Grounds

The iconic memorial to the 16th President, which contains Lincoln's Gettysburg and second inaugural addresses, has also been important in the history of civil rights and racial equality in the nation. The 36 columns around the memorial represent states in the union at time of Lincoln's death. Forty-eight states are listed on the memorial frieze, and Alaska and Hawaii are in a plaque in the plaza. A plaque in the steps identifies where Dr. Martin Luther King, Jr., inspired the nation with his "I have a dream" speech in 1963.

The Washington Monument

The memorial honoring George Washington may be the most visible symbol in Washington DC. The simple obelisk honors the man who was "first in war, first in peace, and first in the hearts of his countrymen." The monument also symbolizes the peaceful transfer of power and civilian rule of law that Washington initiated.

Annual visitors to nearby attractions are shown in Table 3.2.

Table 3.2 – Annual Visitors

Attraction	2010	2011	2012	2013
Washington Monument	628,665	430,153	0	0
Lincoln Memorial	6,042,315	5,971,220	6,191,361	6,546,518
World War II Memorial	3,964,351	3,752,172	4,161,684	3,934,166
Vietnam Veterans Memorial	4,555,371	4,020,127	4,424,407	4,142,721

Source: NPS 2014c

Visitor Use

PEDESTRIAN CIRCULATION

The Gardens have a network of somewhat parallel curving east-west walks surrounding the lake that connect to entry points, nearby memorials, and surrounding roads. The walk from Constitution Avenue to the World War II Memorial (added later) is the only straight and somewhat formal walk, one with a focal point of the memorial. The internal meandering walks contrast with the walks surrounding the gardens parallel to roads or the reflecting pool, which are straight and formally lined with vase-shaped trees. A number of visitor-created trails cut across lawns, the result of the desire to get to a visitor facility or destination more expeditiously. In addition, many of the existing intersections are confusing, and in high season, the walks do not provide enough capacity for the number of visitors walking to and from the

Vietnam Veterans Memorial and the World War II Memorial and around the lake. Seeded asphalt walks throughout the gardens have deteriorated; walks are uneven and may have tripping hazards, especially where tree stumps remain within walks. Universal accessibility is not provided in all areas (e.g., the Memorial to the 56 Signers of the Declaration of Independence).

PUBLIC ACCESS

Entrances to the gardens exist on all sides, with the most entrances from Constitution Avenue.

RECREATION

The primary recreational use of Constitution Gardens is to walk, stroll, and enjoy the views of nature within a quieter more secluded area of the National Mall. In addition, the lake provides recreational activities such as fishing, ice skating (when ice is thick enough), and model boating and other seasonal activities. The lawns are infrequently used for picnicking and play because of the bird droppings (NPS 2014d).

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.

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. According to the US Park Police/NPS, there are no instances of visitor safety incidents within the vicinity of the Constitution Gardens project area. Visibility to and from the site contributes to safety at the site. The southern side of the site is the least visible because it is protected by a line of trees as well as the levee that separates the gardens from the Lincoln Memorial Reflecting Pool. On the north side of the site, there is high visibility to and from Constitution Avenue.

The conditions of walks may present safety concerns from uneven surfaces. The depth of the lake near the edge is around 18 inches and there is no record of visitors falling into it. Fatigue may be an issue for some people going to the Vietnam Veterans Memorial from Metro locations. A 2003 Visitor Transportation Survey indicated that nearly 25% of visitors said they had an individual in their party who could only walk a limited distance because of age, youth, discomfort, breathing difficulties, or disabilities that required use of a wheelchair, cane, or walker. Weather-related issues such as heat and humidity, as well as precipitation, may affect visitor experiences, health, and safety. Drinking water is available for purchase at the seasonal refreshment stand and at drinking fountains. Constitution Gardens has benches in shaded areas to provide respite for visitors. There are no athletic fields in the vicinity of the project area, and subsequently no injuries or hazards arise due to athletic fields.

TRAFFIC AND CIRCULATION

The National Mall, which includes Constitution Gardens, is served by a network of roadways, shared bicycle and pedestrian paths, sidewalks, and transit services. Visitors have access to and from the project area via metro bus, DC Circulator, Capital Bikeshare, taxi, pedicabs, sightseeing services, or car. Metrorail (subway stops) within 0.75 mile include the Smithsonian Institution, Federal Triangle, and Foggy Bottom. Limited off street parking can be found near the project area on Constitution Avenue or in the surrounding area (NPS 2013). These networks interconnect and provide access to the gardens by foot, bicycle, and automobile. A traffic study will be conducted to determine the need and viability of altering the southwest corner. As the design of the pavilion and its specific use develops, access and timing issues related to 17th Street NW will continue to be considered.

Roadways

There are three roadways bordering the study area, all principal arterials: Constitution Avenue NW; Henry Bacon Drive NW; and 17th Street NW.

Constitution Avenue NW is an eight-lane roadway oriented in an east-west direction connecting to the Theodore Roosevelt Memorial Bridge, Interstate 66, and Virginia to the west and Pennsylvania Avenue, Capitol Hill, and Robert F. Kennedy Stadium to the east. The District Department of Transportation (DDOT) classifies the roadway as a principal arterial (DDOT 2014a), and the 2012 estimated average daily traffic was 29,100 vehicles per day (DDOT 2014b). The right-most lanes serve metered on-street parking during off-peak hours and operate as travel lanes during the peak hours (7:00 a.m. to 9:30 a.m. and 4:00 p.m. to 6:30 p.m.), and the posted speed limit is 25 miles per hour. The roadway is designated as US Route 50 through the study area, a transcontinental route connecting Maryland and California. Constitution Avenue NW between Henry Bacon Drive NW and 17th Street NW forms the northern boundary of Constitution Gardens.

Henry Bacon Drive NW is a four-lane roadway oriented in a northeast-southwest direction connecting the Lincoln Memorial Circle NW and Arlington Memorial Bridge to the southwest and Constitution Avenue NW to the northeast. DDOT classifies the roadway as a principal arterial (DDOT 2014a). No on-street parking is permitted at any time, and the posted speed limit is 25 miles per hour. Henry Bacon Drive NW forms the western boundary of Constitution Gardens.

Seventeenth Street NW is a four-lane roadway oriented in a north-south direction connecting Farragut Square, Wisconsin Avenue NW, and K Street NW to the north and Independence Avenue SW and the Tidal Basin to the south. DDOT classifies the roadway as a principal arterial (DDOT 2014a), and the 2012 estimated average daily traffic was 18,700 vehicle per day (DDOT 2014b). No on-street parking is permitted at any time. The eastern boundary of Constitution Gardens is formed by 17th Street between Constitution Avenue NW and the World War II Memorial.

The intersection of Constitution Avenue NW and 17th Street NW contains four approaches, none of which allow left turns during the AM and PM peak hours. The eastbound approach consists of a right-turning lane, shared through/right turning lane, and two through lanes. The lane geometry in combination with the existing 30-foot curb radius creates a tight turn for large vehicles, such as tour buses. All other approaches consist of a shared through/right turning lane and through lanes for the remaining lanes. There are pedestrian crossings striped across all approaches.

Parking

Parking near Constitution Gardens is limited to on-street metered parking during off-peak hours along Constitution Avenue NW between 17th Street NW, and Henry Bacon Drive NW. No off-street private parking facilities exist within the study area. On-street parking is not permitted along 17th Street NW through the study area and along Constitution Avenue along the westbound side between 17th Street NW and Virginia Avenue NW as well as 20th and 21st Streets NW. On-street parking is also not permitted along the eastbound side of Constitution Avenue NW between 17th and 18th Streets NW to allow for a taxi stand and tour bus/school bus drop-off area. During the peak periods (7:00 a.m. to 9:30 a.m. and 4:00 p.m. to 6:30 p.m.), no parking is allowed along Constitution Avenue NW. Permitted on-street parking areas are restricted to a 3-hour limit from 9:30 a.m. to 4:00 p.m.

Pedestrian Access

Sidewalks parallel the three roadways described above in the “Roadways” section, on both sides of the street. Along Constitution Avenue, there are sidewalks flush against the roadway measuring approximately 10 feet along both sides. A secondary sidewalk parallels the 4-foot sidewalk along both sides between 21st Street NW and Virginia Avenue NW along the westbound side and the entire study

area along the eastbound side. This secondary sidewalk is setback between 20 to 30 feet from the roadway and is about 12-feet wide. The other sections of Constitution Avenue NW within the study area along the westbound side contain a single sidewalk that is approximately 12-feet wide.

Sidewalks along both sides of 17th Street NW measure between 6- and 10-feet wide. The narrow widths represent existing sidewalks through the ongoing construction zone along 17th Street between Constitution Avenue NW and the World War II Memorial. Both sidewalks are set back approximately 15 feet from the roadway. There are two pedestrian signals providing safe passage across 17th Street NW near the memorial, one 85 feet north of the memorial entrance and one 75 feet south of the memorial entrance.

Henry Bacon Drive has sidewalks along both sides measuring approximately 15 feet along the northbound side and 6 feet along the southbound side. Both sidewalks are set back approximately 15 feet from the roadway.

An intricate network of pedestrian paths connects Constitution Avenue NW, 17th Street NW, and Henry Bacon Drive NW to the Lincoln Memorial Reflecting Pool, World War II Memorial, and the Constitution Gardens site. Within the project area, a series of generally east-west curvilinear, paved walkways with varying width enter Constitution Gardens from Constitution Avenue NW and from the World War II and Lincoln Memorials. The pedestrian paths parallel to the Lincoln Memorial Reflecting Pool forms the southern boundary of Constitution Gardens. A contrasting straight north-south walkway from Constitution Avenue NW provides access to the World War II Memorial.

According to the DDOT Pedestrian Master Plan, the study area sidewalks had a medium level of activity and a low rate of pedestrian injuries between 2000 and 2006 (DDOT 2009). Based on a field visit on August 6, 2014, the designated pedestrian crossings at seven out of the eight study area intersections were compliant with the American with Disabilities Act, requiring a curb ramp at all crosswalks with a minimum ramp width of 3 feet plus a rumble strip (US Department of Justice 2007). The 17th Street NW at Independence Avenue NW crosswalk is missing rumble strips.

All the intersections related to the bordering road network are signalized except for the intersection of Constitution Avenue NW and Virginia Avenue NW. The intersection of 17th Street NW and the pedestrian path running north and parallel to the Lincoln Memorial Reflecting Pool is also signalized.

Crosswalks are provided at all intersections; however, the following intersections have a crosswalk only across the roads that feed into Constitution Avenue NW: the intersection of Constitution Avenue NW and Virginia Avenue NW; the intersection of Constitution Avenue NW and 18th Street NW; and the intersection of Constitution Avenue NW and Henry Bacon Drive NW.

Based on DDOT standards (2013) all crosswalks are required to have a minimum walk interval of 7 seconds. The walk interval may be reduced to 4 seconds under some conditions (if pedestrian volumes are low or if the intersection is frequented by wheelchair users); however, these conditions do not occur in the study area. Therefore all crosswalk users have an average crossing time of more than 7 seconds. The average pedestrian travels at a walking speed of 3.5 feet per second. Walking speed and the crossing distance of the crosswalk (from curb to curb) factor into the calculation of the overall pedestrian walk time. Total pedestrian walk time includes a walk interval, a Flashing Don't Walk interval, a buffer interval, and a Don't Walk interval. The existence of the buffer Interval provides some flexibility to accommodate any minor modifications to the pedestrian walk interval time, if needed.

Bicycle Network

According to the DC Bicycle Map, the study area is located at the edge of the “No Riding on Sidewalks Downtown” zone. The zone is divided by Constitution Avenue NW. The north side of the study area is in the zone, and the south side is outside of the zone. The report also generally characterizes the study area roads as having “fair” traffic conditions for bicycling based on the following three categories: good (or not evaluated), fair, and poor.

There is an off-street designated shared bicycle/pedestrian path that travels through the study area connecting the Lincoln Memorial and Washington Monument paralleling Henry Bacon Drive NW along the eastside and Constitution Avenue NW along the south side. The trail connects to a circular network of bicycle trails serving the National Mall, Tidal Basin, and southwest waterfront.

Other bicycle facilities near the study area include three Capital Bikeshare stations where bicycles can be rented for one-way trips when they are returned to another Bikeshare station in the area. Table 3.3 shows the number of bicycle docks at each of the stations; the number of available bicycles at any one time varies due to use.

Table 3.3 – Capital Bikeshare Stations

Location	Bicycle Docks
19th Street and Constitution Avenue NW	18
21th Street and Constitution Avenue NW	7
Lincoln Memorial	22

Source: capitalbikeshare.com/stations

Transit Network

Metro and commuter buses serve the study area. Currently, five Washington Metropolitan Area Transit Authority (WMATA) bus lines serve the project study area, all of which travel along Constitution Avenue NW. Table 3.4 contains the bus service frequency, service hours, and average weekday ridership for May 2014. A majority of the bus lines operate with weekday peak period headways around 15 minutes and only operate in one direction during each peak period (inbound in the morning and outbound during the evening).

Table 3.4 – Metrobus Service Information

Route	Route Name	Peak Period Headway (weekday)	Service Hours	Weekday Average Ridership
7Y	Lincoln-North Fairlington Line	6-10 minutes (peak direction)	Monday-Friday NB: 5:21 a.m. - 6:33 p.m. Monday-Friday SB: 6:03 a.m. - 7:03 p.m.	3,387*
X1	Benning Road Line	15-25 minutes (peak direction)	Monday-Friday WB: 6:41 a.m. - 9:23 a.m. Monday-Friday EB: 3:38 p.m. - 6:09 p.m.	1,502*
N3	Massachusetts Avenue Line	30-35 minutes (peak direction)	Monday-Friday EB: 7:21 a.m. - 9:24 a.m. Monday-Friday WB: 4:48 p.m. - 6:10 p.m.	4,064*
L1	Connecticut Avenue Line	15-20 minutes (peak direction)	Monday-Friday SB: 7:25 a.m. - 9:30 a.m. Monday-Friday NB: 3:54 p.m. - 6:37 p.m.	5,053*
H1	Brookland-Potomac Park Line	15-20 minutes (peak direction)	Monday-Friday SB: 7:05 a.m. - 9:49 a.m. Monday-Friday NB: 4:15 p.m. - 6:10 p.m.	797

* Ridership includes the combination of other routes

Source: WMATA route schedules, <http://www.wmata.com/bus/timetables>

Due to the high concentration of office development north of the study area, a number of commuter bus services from nearby jurisdictions serve the project study area. The Maryland Transit Administration operates 10 commuter buses near the study area (three bus lines travel through the study area along Constitution Avenue NW) from Charles, Calvert, Prince George's, Anne Arundel, Queen Anne's, St. Mary's, Montgomery, and Howard Counties in Maryland. The closest bus stop is located at 18th and C Streets NW (one block north of the study area) (Maryland Transit Administration 2014). In Virginia, Loudoun County Transit operates seven commuter bus lines near the study area from Loudoun County. The closest bus stop is located at 21st Street NW and Virginia Avenue NW (two blocks north of the study area) (Loudoun County Transit 2014). The Potomac and Rappahannock Transportation Commission operates five commuter bus lines near the study area from Prince William County (these buses are also referred to as OmniRide). The closest bus stop is located at 19th and D Streets NW (three block north of the study area) (Potomac and Rappahannock Transportation Commission 2014).

A unique unplanned carpooling system called slugging is a form of ridesharing where individuals hoping to use high-occupancy vehicle lanes during rush hour to take advantage of faster travel times opt to pick up other riders so they can meet the occupancy threshold for these lanes. Common for commuters in Virginia, slugging uses predetermined pick-up and drop-off points. Multiple morning slug lines from various origin points drop off near the study area along 18th and 23rd Streets NW. There are several evening slug pick-up locations near the study area along 19th Street NW (LeBlanc 2014).

Carsharing, a new mobility option that allows individuals to rent a vehicle for short periods of time (minutes or hours or days), is becoming an increasingly popular way for people to travel around Washington, DC. There are currently several carsharing companies that serve the District, including ZipCar, Hertz 24/7, Enterprise CarShare, and Car2Go. All services are provided by private companies that provide registered users access to automobiles. While ZipCar and Enterprise CarShare rentals must be returned to the same location where the car was picked up and therefore do not allow for one-way trips, Hertz 24/7 has some ability for one-way trips, and Car2Go has ultimate flexibility for one-way trips within almost all areas and neighborhoods of Washington, DC. Unlike the other carsharing companies, due to the one-way trip flexibility of Car2Go vehicles, vehicle locations continually shift as the vehicles are rented. Of these providers, Car2Go has the closest vehicles to the study area located at 18th and C Streets NW, one block north of the study area (Car2Go 2014) (Enterprise CarShare 2014) (Hertz 24/7 2014) (ZipCar 2014).

Tour Bus/School Bus

The National Mall and monumental core attracts a large number of tourists, many of whom arrive by tour bus or school bus. According to the DDOT 2011 Motorcoach Action Plan, approximately 1,000 tour buses enter the city each day during the height of tourist season resulting in an estimated 28,000 plus tour buses or school buses per year. To best handle this demand, the NPS and DDOT have designated specific dropoff and pickup locations and NPS designated parking locations while their customers visit the city sites.

Within the study area, there are five designated dropoff/pickup locations, four along Constitution Avenue NW and one along Henry Bacon Drive. The Constitution Avenue NW locations can store as many as 17 buses, 4 buses along the eastbound side near the intersection with Henry Bacon Drive, 5 buses along the westbound side between 20th and 21st Streets NW, 5 buses along the eastbound between 18th and 19th Streets NW, and 3 buses along the eastbound side between 17th and 18th Streets NW. The location at Henry Bacon Drive can store six buses along the southbound side (DDOT 2011).

Buses cannot park at these locations, only board and discharge passengers to allow for other buses to use the space. The DDOT has designated parking areas for the buses; the closest location is on the south side of the Washington Monument. The District can assess a \$1,000 fine to tour buses or school buses that

violate the parking regulations established to control the tour bus/school bus demand for curb space (DDOT 2011).

Traffic Operations

This section explains the concepts and definitions for analyzing the traffic operations, the process used to analyze the seven study area intersections, and the results.

The Level of Service (LOS) is the primary measure of traffic operations for both signalized and unsignalized intersections. LOS is a performance measure developed by the transportation profession to quantify driver perception for such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles. The LOS provides a scale that is intended to match the perception by motorists of the operation of the transportation facility, as well as providing a scale to compare different facilities.

Detailed LOS descriptions are as follows:

- **LOS A:** Represents the best operating condition where traffic stream is stable and free-flowing.
- **LOS B:** Represents reasonably free-flow conditions. The ability to maneuver is only slightly restricted. Effects of minor incidents are still easily absorbed.
- **LOS C:** Represents speeds at or near free-flow conditions. The freedom to maneuver is noticeably restricted. Queues may form.
- **LOS D:** Represents traffic operations approaching unstable flow. Speeds decline slightly with increasing flows. Road density increases more quickly. The freedom to maneuver is more noticeably limited. Minor incidents cause queuing.
- **LOS E:** Represents operation that is near or at capacity. There are no usable gaps in the traffic stream. Operations are extremely volatile. Any disruption causes queuing.
- **LOS F:** Represents a breakdown in flow and instability. Queues form behind breakdown points. The demand is greater than the capacity.

SIGNALIZED INTERSECTION LEVELS OF SERVICE

The LOS for signalized intersections is based on the Highway Capacity Manual (TRB 2010) and requires several inputs to determine an accurate LOS. The primary inputs include:

- Vehicular volumes
- Pedestrian volumes
- Traffic signal timings
- Roadway geometry
- Speed limits
- Truck percentages
- Peak hour factor (measure of vehicle 15-minute flow rate)

Using these parameters with the Highway Capacity Manual procedures, the average vehicle control delay, in seconds per vehicle, is calculated. This represents the average extra delay in seconds per vehicle caused by the presence of a traffic control device or traffic signal and includes the time required to decelerate, stop, and accelerate. Table 3.5 shows the average control delay and corresponding LOS for signalized intersections.

Table 3.5 – Signalized LOS

LOS	Average Control Delay	
A	Less than or equal to 10	Stable conditions
B	>10-20	
C	>20-35	
D	>35-55	
E	>55-80	Unstable conditions
F	More than 80	Above capacity and unstable conditions

Source: TRB 2010

Seven signalized intersections in the study area were analyzed using the latest version of the Synchro™ Traffic Signal Coordination Software Version 8.0 (Build 805, Revision 878). DDOT provided the Synchro™ model based on 2012 turning movement counts composed of vehicles, pedestrians, bicycles, and truck percentages and traffic signal timings as of October 24, 2014, covering the seven intersections. Based on the Highway Capacity Manual 2000 signalized intersection method, the average vehicle delay calculations and LOS was determined for the intersection as a whole. LOS A through D represents stable conditions, while LOS E or F represents unstable conditions and delays. DDOT typically allows for LOS D to be the lowest acceptable LOS threshold in the District. As of February 2012, all intersections operated at LOS D or better during the AM peak hour and three intersections operated at LOS E or F during the PM peak hour. Table 3.6 contains the AM and PM peak hour intersection operations.

Table 3.6 – AM and PM Peak Hour Intersection Operations

Intersection	AM Peak Hour		PM Peak Hour	
	Control Delay	LOS	Control Delay	LOS
Independence Avenue SW and 17 th Street SW	20.1	C	106.7	F
17 th Street NW Pedestrian Crossing South of World War II Memorial	15.9	B	0.4	A
17 th Street NW Pedestrian Crossing North of World War II Memorial	5.5	A	0.2	A
Constitution Avenue at 17 th Street NW	45.9	D	34.9	C
Constitution Avenue at 18 th Street NW	6.8	A	13.8	B
Constitution Avenue at 19 th Street NW	6.9	A	60.0	E
Constitution Avenue at 20 th Street NW	29.6	C	16.7	B
Constitution Avenue at 21 st Street NW	28.0	C	25.8	C
Constitution Avenue at Henry Bacon Drive NW	16.4	B	76.6	E

Queue Lengths

In addition to analyzing the vehicle delay, the Synchro™ Traffic Signal Coordination Software was used to calculate the vehicle queue lengths for each approach. The 50th percentile queue length is the queue expected during 50% of the analysis period or an average queue length. The 95th percentile queue length is the queue that has a 5% probability of being exceeded or the worst-case scenario. A failing queue length is determined by a queue length exceeding the intersection approach storage capacity. Because the available storage for each intersection approach differs, these values reflect whether the existing storage provides enough space for vehicles waiting to pass through the intersection without blocking another lane or another intersection. Because failing queues might occur along the same approach as a failing LOS,

these values are calculated independently, and might result in one approach receiving a failing LOS score, while another approach has a failing queue length. The study used Synchro™ to calculate both the 50th and 95th percentile queue lengths for the seven signalized intersections.

Based on the analysis, the longest queues (over 500 feet or approximately 20 vehicles) during the AM peak hour occurred along Constitution Avenue NW in the eastbound direction at 17th Street NW, at 18th Street NW, and at 20th Street NW. The longest queue during the PM peak hour (over 1,450 feet) occurred along Constitution Avenue NW in the westbound direction at Henry Bacon Drive NW. Other notable queue lengths during the PM peak hour occurred along the 17th Street SW southbound approach to Independence Avenue SW, the 19th Street NW southbound approach to Constitution Avenue NW, and Constitution Avenue NW eastbound approach to 18th Street NW. Table 3.7 contains the 50th and 95th percentile queue lengths covering the study area.

Table 3.7 – AM and PM Peak Hour Queue Analysis

Intersection	AM Peak Hour		PM Peak Hour	
	50th Percentile	95th Percentile	50th Percentile	95th Percentile
<i>Independence Avenue SW and 17th Street SW</i>				
Westbound (Independence Avenue SW)	199	243	350	419
Southbound (17th Street SW)	130	164	723~	855#
<i>17th Street SW – South Pedestrian near World War II Memorial</i>				
Northbound (17 th Street SW)	97	148	0	0
Southbound (17 th Street SW)	102	134	0	0
<i>17th Street NW – North Pedestrian near World War II Memorial</i>				
Northbound (17 th Street NW)	0	0	0	0
Southbound (17 th Street NW)	81	102m	0	0m
<i>Constitution Avenue at 17th Street NW</i>				
Eastbound (Constitution Avenue NW)	574~	344#m	483~	209m
Westbound (Constitution Avenue NW)	181	220	340	398
Northbound (17 th Street NW)	137	168	150	201
Southbound (17 th Street NW)	46	73	229	305
<i>Constitution Avenue at 18th Street NW</i>				
Eastbound (Constitution Avenue NW)	637~	744#	829~	915#
Westbound (Constitution Avenue NW)	84	112	28	43m
<i>Constitution Avenue at 19th Street NW</i>				
Eastbound (Constitution Avenue NW)	9	10	182	225
Westbound (Constitution Avenue NW)	109	140	131	171
Southbound (19 th Street NW)	42	63	668~	897#
<i>Constitution Avenue at 20th Street NW</i>				
Eastbound (Constitution Avenue NW)	518	557	82	78m
Westbound (Constitution Avenue NW)	21	28	282	293m
Southbound (20 th Street NW)	10	29	60	135
<i>Constitution Avenue at 21th Street NW</i>				
Eastbound (Constitution Avenue NW)	379	374m	149	190

Intersection	AM Peak Hour		PM Peak Hour	
	50th Percentile	95th Percentile	50th Percentile	95th Percentile
Westbound (Constitution Avenue NW)	130	163	32	39
Southbound (21 st Street NW)	25	78	347~	542#
<i>Constitution Avenue at Henry Bacon Drive NW</i>				
Eastbound (Constitution Avenue NW)	37	98	203	213
Westbound (Constitution Avenue NW)	88	155	1238~	1455#m
Northbound (Henry Bacon Drive NW)	312	461#	16	28

Notes:

~ 50th percentile volume exceeds capacity, queue is theoretically infinite

95th percentile volume exceeds capacity, queue may be longer

m Volume for 95th percentile queue is metered by upstream signal. Due to upstream metering, the 95th percentile queue may be less than the 50th percentile queue.

Crash Ratings

Crash ratings were used to determine where safety issues may exist at the Constitution Avenue NW at the 17th Street NW intersection. Crash ratings are calculated based on the recorded crash information collected by DDOT over a three-year period (2011–2013), the daily volume of vehicles that travel through the intersection, and the number of crashes that would occur per million entering vehicles using the following formula:

$$\text{Rate} = C * 1,000,000 / (n * 365 * V)$$

In this formula, C is the total number of intersection related crashes in the study period, n is the number of years of data (i.e., three years), and V is the traffic volumes entering the intersection daily. Daily traffic volumes were calculated from the AM peak hour traffic volumes and adjusted based on the percent of daily traffic that would likely use the intersection during the peak hour. It was assumed the peak hour accounted for 11% of the daily volumes, based on common assumption that peak hour traffic volumes account for 8%–12% of daily traffic depending on the surrounding land use pattern (DDOT 2013b). A crash rate over 1.0 typically warrants further examination to determine a particular cause for the crashes.

The crash rating for the intersection of Constitution Avenue NW at 17th Street NW was 0.40 per million entering vehicles. The majority of the crashes at this intersection were caused by sideswipes (41.2%). The second highest crash type were right turns (23.5%). Rear end (11.8%) and right angle (11.8%) crashes were the third highest crash type. A majority of crashes occurred during the afternoon followed by late morning and evening hours. Most of the crashes occurred during clear weather conditions along dry pavement during daylight hours (DDOT 2014c). There was one crash that involved a bicycle, none involving a pedestrian and no fatalities.

PARK MANAGEMENT AND OPERATIONS

The National Mall and Memorial Parks is an administrative unit of the national park system. Park management structure is divided into the Office of the Superintendent and several divisions, each with a chief who manages administration, maintenance, interpretation and education, permits management, professional services, and resource management. The maintenance department is led by the “Chief of Management” who is in charge of staffing.

The National Mall and Memorial Parks has a staff of approximately 330, organized into 6 divisions, who have responsibility for the National Mall’s historic landscape and commemorative works, as well as the additional 156 US reservations (circular, triangular, and rectangular parks throughout the District of

Columbia) within the National Mall and Memorial Parks (NPS 2010a). Seasonal staff supplements permanent staff primarily in the facilities management and interpretation and education divisions.

Visitor Services

NPS staff provides a variety of services for users and park-goers at Constitution Gardens. These park employees are trained to give on-site guided tours and host special holiday events. There are two full-time staffers assigned to the Vietnam Veterans Memorial kiosk, in addition to two more at the Korean War Veterans Memorial kiosk (White 2014). There are no interpretive rangers assigned to Constitution Gardens.

Park Maintenance

The National Mall and Memorial Parks' maintenance staff performs a majority of the day-to-day labor to maintain the gardens, while resource management staff performs all pest control services. Maintenance duties include, but are not limited to, the following (White 2014):

SANITATION/CUSTODIAL

One full-time employee and one temporary employee are dedicated to sanitation and custodial services. The two employees dedicate 5 hours a day to these services (White 2014).

TRASH PICK-UP

A small packer is used to remove trash from the gardens. One full-time employee and one temporary employee are dedicated to this service. Daily, each employee spends an hour performing this maintenance activity at the gardens (White 2014).

MOWING/TRIMMING

As a part of the gardens' landscaping services, six employees are dedicated to the mowing and trimming of the gardens. Four full-time maintenance workers dedicate 8 hours per week for 30 weeks of the year. In addition, two temporary laborers also dedicate 8 hours each week for 30 weeks of the year to maintaining the mowing and trimming of the project area (White 2014).

SEASONAL LEAF REMOVAL

The gardens require leaf removal services and employ seven laborers to perform the service. This service is provided by a full-time gardener, maintenance worker, and three full-time laborers for 8 hours a week, 10 weeks of the year. In addition, two temporary laborers dedicate 8 hours a week for 10 weeks out of the year (White 2014).

LAKE CLEANING/DRAINING

Each year, NPS partially drain and clean the lake, removing debris from the perimeter of the lake. This service is performed by four motor vehicle operators, an equipment operator, and four laborers for 3 days of the year and three maintenance workers for 5 days of the year (White 2014).

SNOW/ICE REMOVAL

Each year during the winter months, NPS removes snow and ice from the property's walkways and paths. This service fluctuates yearly depending on the weather; however, on average there are about three maintenance workers and three laborers who dedicate 18 hours annually (White 2014).

TREE/WEED MAINTENANCE

Each year, there is about 3 weeks of maintenance on trees including pruning, tree removal, stump removal, and storm damage cleanup. Six tree workers and one motor vehicle operator, all of whom work the full 3 weeks a year, perform this task. Approximately, \$10,000 is spent performing tree maintenance tasks under contract. For the past two years, the gardens have also had weed control under contract (White 2014).

Park Operations

PARK OPERATING BUDGET

Budgets are not assigned to specific memorials or areas of the gardens but rather come as one appropriation. In 2013, Constitution Gardens used \$225,675 in operational costs, allocated as seen below (Kennealy 2014). The existing costs are compared throughout the design developments in a Total Cost of Facility Ownership process to minimize costs.

Special events FY13	\$3,875
Lamping	\$5,000
Irrigation repair	\$1,800
Spring cleaning	\$6,500
Inspections	\$6,000
Grounds care	\$103,000
Custodial	\$70,000
Electricity	\$15,000
Pathways	\$13,000
Miscellaneous maintenance	\$1,500

Employee Safety and Health

There is no history of employee incidents at Constitution Gardens (NPS 2015).

Utilities and Infrastructure

POTABLE WATER

Potable water is used at Constitution Gardens to refill the lake and irrigate the landscaping. The lake, a man-made water feature, is subject to leakage and evaporation that requires periodic replenishment. The National Mall and Memorial Parks has been the biggest user of potable water in the NPS primarily due to its extensive display fountains, the lake at Constitution Gardens, and the Lincoln Memorial Reflecting Pool, although the redesign of the reflecting pool switched the primary water source for the pool to the Potomac River, reducing the use of potable water markedly. NPS is required by Executive Order 13514 to reduce potable water use intensity by 26% (baseline fiscal year [FY] 2007) and water use for landscaping purposes by 20% (baseline FY 2010) by FY 2020. DC Water, the entity responsible for finished water distribution to Washington, DC, furnishes the potable water supply

SEWER

Wastewater is generated by the restrooms at Constitution Gardens and discharged to a combined sewer system operated by DC Water, the entity responsible for wastewater collection and treatment in Washington, DC. CSOs occur during certain storm events when the capacity of the combined sewer system is unable to convey the mixture of wastewater and stormwater to the treatment plant. When this occurs, the mixture of wastewater and stormwater beyond the capacity of the sewer system is discharged directly into the Potomac River with little or no treatment.

STORMWATER

Stormwater from most of Constitution Gardens discharges to the Tidal Basin from separate storm sewers that ultimately drain to the Tidal Basin or the Potomac River, but stormwater from the north edge of the gardens drains into the combined sewers on Constitution Avenue, and makes its way back to the Blue Plains Wastewater Treatment Plant or to the Potomac River through a CSO outfall. The nearest CSO outfall into the Potomac River is located between the Memorial and Theodore Roosevelt Bridges.

The District of Columbia's combined sewer system is often overwhelmed by storm events, which cause the combined sewerage and stormwater to discharge directly to the city's waterways. There are currently an estimated 74 CSO events into the Potomac River annually during heavy storms, with an additional 105 overflow events into Rock Creek and the Anacostia River (DC Water 2013). The District of Columbia is implementing a Clean Rivers initiative, which includes construction of large storage tunnels to capture stormwater runoff during large storms, thereby preventing overflow events. The District is also looking for ways to decrease the volume of stormwater runoff at the source by incorporating low impact development practices such as pervious pavement and green roofs (DC Water 2002).

Constitution Gardens contains approximately 232,900 SF of impervious surface, which constitutes approximately 10% of the gardens. Impervious surfaces in the gardens include walkways, stairways, the Overlook Terrace, and the lake. The remainder of the gardens is landscaped with turf and mature trees. The combination of landscaping and trees provides some reduction of stormwater volume and flow intensity, but does not provide any notable water quality treatment. Additionally, in some parts of the gardens, the turf is compacted and in poor condition, which affects the ability of pervious surfaces to absorb stormwater.

ELECTRICITY

Electricity consumption at Constitution Gardens is for lighting systems, water feature pump operations, operation of the comfort station, and operation of the Lockkeeper's House. The Potomac Electric Power Company owns and maintains the power lines that serve Constitution Gardens. Natural gas is not currently used.

COMMUNICATION INFRASTRUCTURE

There is no comprehensive communication infrastructure at Constitution Gardens. Fiber optic lines run near the National Mall boundaries (NPS 2010a). Mass notification, if necessary, is undertaken by park rangers or police through personal contact, bullhorns, or announcements.

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 CEQ regulations implementing the NEPA, a summary of the environmental consequences for each alternative is provided in Table 2.2 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.” Throughout this document the terms *impact* and *effect* are used interchangeably.

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 2001b) 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 2006* 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 on 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, or 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, or 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; otherwise an environmental impact statement would likely be required.)

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” (CEQ 2005). 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 on a resource from certain proposed actions could be moderate but when considered in the overall context for that resource, could constitute a relatively small incremental portion of the project area and contribute to a collective minor effect.

Table 4.1 summarizes the projects considered for cumulative impacts and describes the various resource areas that could be affected by those projects. In addition to those actions identified below, other current and future plans, including the National Mall Plan/environmental impact statement, are described in “Chapter 1: Purpose and Need.” Figure 4.1 delineates the location of the projects being considered for cumulative impacts. 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 for each resource. These are listed in Table 4.1 and are described below.
4. **Cumulative Impact Analysis**—Summarize impacts of the 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 at the end of the analysis for each alternative.

Table 4.1 – Cumulative Impacts Projects or Actions

Type of Action	Cumulative Impacts Project	Description	Status
Attractions, including museums and memorials	National Aquarium/ commerce building	Closed during building renovation. Affected Impact Topics: visitor experience and facilities	Past
	Vietnam Veterans Memorial	The memorial was built on about 11 acres at the west end of Constitution Gardens to honor veterans of the conflict and the wall contains the names of those who died. The memorial brought a more commemorative character to Constitution Gardens. Affected Impact Topics: visitor experiences; visual resources; cultural resources; and park operations	Past 1982
	Memorial to the 56 Signers of the Declaration of Independence	The memorial on Singer's Island brought a more commemorative character to Constitution Gardens. Affected Impact Topics: visitor experiences; visual resources; cultural resources; and park operations	Past 1984
	World War II Memorial	The memorial, built south of the east end of Constitution Gardens, recognizes World War II as a pivotal 20th century event that had impacts in two theaters of war as well as at home. The memorial brought an even more commemorative character to Constitution Gardens. Affected Impact Topics: visitor experiences and visitor facilities; visual resources; cultural resources; and park operations	Past 2004
	Martin Luther King, Jr. Memorial	This project memorial to Dr. King on a 3-acre site on the northwestern edge of the Tidal Basin walkway. The memorial conveys the main themes of Dr. King's legacy: love, justice, democracy, and hope. Affected Impact Topics: visitor experiences and visitor facilities; cultural resources; visual resources; and park operations	Past Summer 2011
	White House Visitor Center renovation	Located in the Commerce Building, this project replaced exhibits and provided new interactive exhibits. Affected Impact Topics: visitor experiences and facilities	Past September 2014
	American Veterans Disabled for Life Memorial	The American Veterans Disabled for Life Memorial occupies a 2-acre site south of Independence Avenue SW at 2nd Street SW and Canal Street SW. The memorial honors all those veterans who were permanently disabled while serving in the United States Armed Forces. Opened on October 5, 2014. Affected Impact Topics: visitor experiences; visual resources; cultural resources; and park operations.	Past October 2014
	Dwight D. Eisenhower Memorial	The memorial is to be built south of Independence Avenue from the National Air and Space Museum and north of the Department of Education. The memorial honors the presidential and military legacy of Dwight D. Eisenhower. The project is in design. Affected Impact Topics: visitor experiences and visitor facilities; and park operations.	Present / Future
	Vietnam Veterans Memorial Center	The underground center is being designed and will be built west of Henry Bacon Drive in the northwestern corner of the National Mall near the Vietnam Veterans Memorial. The project is in design. Affected Impact Topics: visitor experiences and visitor facilities; visual resources; and park operations.	Present/ Future

Type of Action	Cumulative Impacts Project	Description	Status
	National Museum of African American History and Culture	This museum would be constructed on a 5-acre parcel east of the Washington Monument grounds between 14th and 15th Streets and Constitution Avenue NW. Affected Impact Topics: visitor experiences and visitor facilities	Present/ Future Opening 2016
	National Museum of Natural History	Ongoing building renovations that primarily revitalize the interior of the museum, but also windows, doors, and skylights. Affected Impact Topics: visitor experience and facilities	Present
	National Air and Space Museum	The Smithsonian Institution is proposing a phased replacement of the deteriorating building façade; aging building heating, ventilation, and air conditioning systems; exhibits; and possible changes to the entrance vestibules and renovation of the terraces. Affected Impact Topics: visitor experience and facilities	Present/ Future
	National Museum of American History	This is a multi-phased public space renewal program that includes renovating galleries, providing amenities, upgrading building systems to modern building code standards, improving the roof and terrace, and replacing windows. Affected Impact Topics: visitor experience and facilities	Present/ Future
	National Museum of the American Latino	There is bill in Congress to establish and potentially locate it in the Arts and Industries Building. Affected Impact Topics: visitor experiences and facilities	Future
Visitor facilities	Restroom – west end Constitution Gardens	Visitor restrooms in south middle section of Constitution Gardens. Affected Impact Topics: visitor facilities; cultural resources; and park operations	Past 1970s
	West end concession stand	A small seasonal concession stand is at the SW end of Constitution Gardens Lake. Affected Impact Topics: visitor facilities; cultural resources; and park operations	Past 1970s
	Lincoln – north concession stand	A year round concession stand with exterior seating, north of the Lincoln Memorial, west of Henry Bacon Drive and the Vietnam Veterans Memorial. Affected Impact Topics: visitor facilities; visual resources; and park operations	2008
	Lincoln – south concession stand	A year round concession stand with exterior seating, south of the Lincoln Memorial, west of Daniel French Drive and the Korean War Veterans Memorial. Affected Impact Topics: visitor facilities; visual resources; and park operations	2008

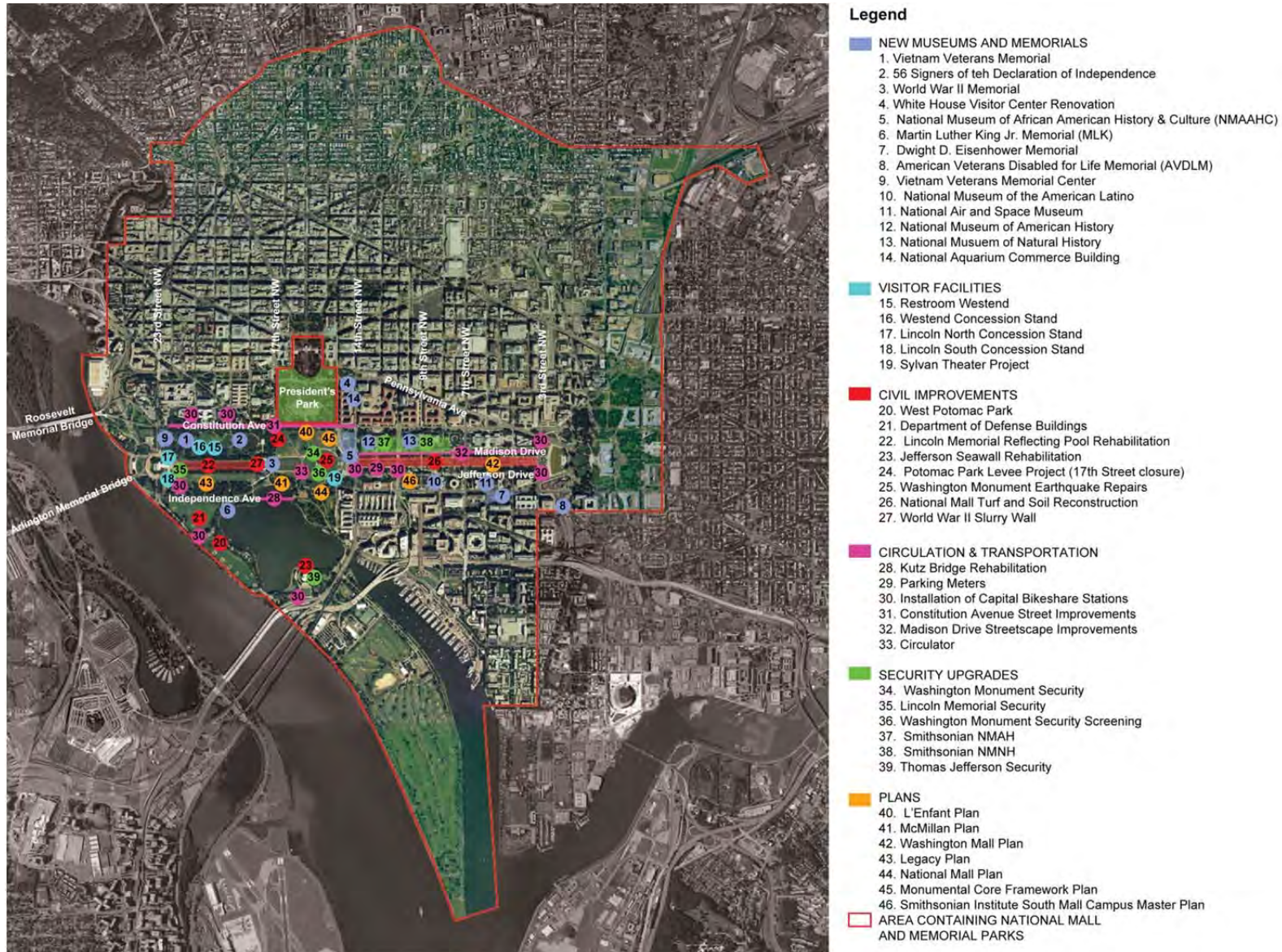
Type of Action	Cumulative Impacts Project	Description	Status
	Sylvan Theater project	<p>This project would rehabilitate the Sylvan Theater area by creating a performance amphitheater to accommodate a variety of events (10K people) increased visitor amenities (restrooms, food service, book store, information, improved access, and staff offices. This project would be funded by the TNM.</p> <p>Affected Impact Topics: visitor use and facilities; park operations; and visual resources</p>	Future
Civil/site works	West Potomac Park	<p>Reclaimed Potomac River wetlands converted to park, West Potomac Park.</p> <p>Affected Impact Topics: visitor facilities; visual resources; cultural resources; and park operations</p>	Past 1890
	Department of Defense buildings	<p>DOD buildings built on West Potomac Park and removed to create Constitution Gardens.</p> <p>Affected Impact Topics: visitor facilities; visual resources; cultural resources; and park operations</p>	Past 1916–1976
	Lincoln Memorial Reflecting Pool rehabilitation	<p>This project rehabilitated and enhanced the infrastructure, circulation, and accessibility around the Lincoln Memorial east Plaza. At the reflecting pool, upgrades to the structural and water systems improved its functionality and sustainability and formalize walkways along the north and south edges of the pool. Site furnishings, including park benches, throughout the project area were refurbished and reconfigured.</p> <p>Affected Impact Topics: visitor experiences; visual resources; cultural resources; and park operations</p>	Past 2009–2012
	Thomas Jefferson Memorial seawall rehabilitation	<p>This project rehabilitated the Thomas Jefferson Memorial Plaza, seawall, and staircases in a manner that improved pedestrian circulation and visitor safety.</p> <p>Affected Impact Topics: visitor safety/visitor experiences; visual resources; park operations; and cultural resources</p>	Past 2010
	Washington Monument earthquake damage repairs	<p>Damage occurred to the Washington Monument following the August 23, 2011 earthquake. Following extensive investigation and repairs the monument reopened in May 2014.</p> <p>Affected Impact Topics: visitor experiences and visitor facilities; visual resources; cultural resources; and park operations</p>	Present 2014
	World War II Memorial Slurry wall	<p>Repairs to the slurry wall protecting the mechanical system and related areas are underway.</p> <p>Affected Impact Topics: cultural resources; visual resources; and park operations</p>	Present 2015

Type of Action	Cumulative Impacts Project	Description	Status
	National Mall turf and soil reconstruction	<p>This project removed and replaced the existing soil and irrigation system and installing new curb and gutter profiles around the turf panels on the National Mall between Madison and Jefferson Drives and 3rd and 14th Streets NW. Turf panel management strategies seeking to minimize turf damage and soil compaction were implemented for this project area.</p> <p>Affected Impact Topics: natural resources; cultural resources; visual resources; and park operations</p>	Present/ Future Phase 1 complete Phase 2/3 2014– 2016
	Potomac Park levee project	<p>This project improves the 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. Future levee work at 23rd Street and along the north side of the reflecting pool would fill in low spots, meet USACE standards for elevation and address utilities cross under the levee.</p> <p>Affected Impact Topics: vegetation; park operations; cultural resources; and visual resources</p>	Present/ Future
Circulation/ transportation	Constitution Avenue street improvements	<p>Constitution Avenue NW between 23rd Street NW and 16th Street NW was rehabilitated; streetscape improvements introduced new street lighting and storm sewer upgrades.</p> <p>Affected Impact Topics: circulation</p>	Past 2011
	Madison Drive streetscape improvements	<p>Madison Drive was rehabilitated with enhancements to streetscape elements.</p> <p>Affected Impact Topics: circulation</p>	Past 2011
	Installation of Capital Bikeshare stations	<p>Six Bikeshare stations within the gardens were installed at the following locations: Smithsonian Metro entrance, Lincoln Memorial area, Thomas Jefferson Memorial area, Washington Monument area, Franklin Delano Roosevelt/Martin Luther King, Jr. Memorial area and East Potomac Park near the tennis area.</p> <p>Affected Impact Topics: visitor experience and circulation/transportation</p>	Past 2012
	Kutz Bridge rehabilitation	<p>This project proposes to rehabilitate Kutz Bridge on eastbound Independence Avenue SW over the Tidal Basin.</p> <p>Affected Impact Topics: visitor experience/ public safety and circulation</p>	Present
	Parking meters	<p>Parking meters will replace free parking within the National Mall.</p> <p>Affected Impact Topics: visitor experience and circulation/transportation</p>	Future 2015

Type of Action	Cumulative Impacts Project	Description	Status
	Circulator	Circulator buses will be replacing NPS provided visitor transportation. Affected Impact Topics: visitor experience and circulation/transportation	Future 2015
Security upgrades	Smithsonian National Museum of American History, Smithsonian National Museum of Natural History	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, DC, area, including the project area. The Smithsonian Institution has recently completed perimeter security projects. Affected Impact Topics: cultural resources; visitor experiences; and park operations	Past/ Present/ Future
	Washington Monument security	Security walls and bollards installed to protect memorial. Affected Impact Topics: Visitor experiences / public safety; visual resources; cultural resources; and park operations	Past
	Lincoln Memorial security	Security walls and bollards installed to protect memorial. Affected Impact Topics: visitor experiences/public safety; visual resources; cultural resources; and park operations	Past
	Washington Monument security screening	An EA has been completed to complete security screening at the entrance to the monument. Affected Impact Topics: NPS and US Park Police operations; visual resources; and visitor experiences/safety	Near Future (3–5 years)
	Thomas Jefferson Memorial security	Security and design planning to protect the memorial. Affected Impact Topics: visitor experiences/public safety; visual resources; cultural resources; and park operations	Future
Plans	L'Enfant Plan	Original Plan for Washington DC; laid out streets and open spaces that became the National Mall. Affected Impact topics: visitor experiences; visual resources; cultural resources; and circulation	1791
	McMillan Plan	Revised Plan for Washington DC to include West Potomac Park; and architectural character and functional use of the National Mall. Affected Impact Topics: visitor experiences; visual resources; cultural resources; and circulation	1901
	Washington Mall Plan	Plan for the 1976 bicentennial in Washington DC – focused on pedestrian use and circulation. Affected Impact Topics: visitor experiences; visual resources; and circulation	1960s–1970s
	Legacy Plan	Update to McMillan Plan for central Washington DC – re-centered on the US Capitol and spreading use off the National Mall. Affected Impact Topics: visitor experiences; visual resources; and circulation	1999
	Monumental Core Framework Plan (NCPC)	This plan looked at the area north of Constitution Gardens and proposed memorials and upgrades to civic spaces. It also identified additional commemorative locations. Affected Impact Topics: visitor experiences	Past 2009

Type of Action	Cumulative Impacts Project	Description	Status
	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> <p>Affected Impact Topics: visitor experience / public safety/ visitor facilities; visual resources; natural resources (soils, water, vegetation/turf, etc.); cultural resources; traffic and circulation; and park operations</p>	Past 2010/ Present/ Future
	Smithsonian Institution South Mall Campus Master Plan	<p>The Smithsonian Institution is preparing a master plan for their south campus (from 7th to 12th Streets, (which would include the Castle, Freer and Sackler Galleries, African Art Museum, Arts and Industries Building, Hirshhorn Museum and Sculpture Garden, and potentially relocate Jefferson Drive.</p> <p>Affected Impact Topics: visitor experiences and facilities and visual resources</p>	Future

Figure 4.1 – Cumulative Impacts Projects



NATURAL RESOURCES

Soils

METHODOLOGY AND ASSUMPTIONS

Under NPS *Management Policies 2006*, the NPS actively seeks to understand and preserve the soil resources of its parks and properties and prevent unnatural erosion, physical removal, or contamination of the soil to the extent possible (NPS 2006). Analysis of possible impacts on soil resources was based on a review of existing literature and maps, information provided by the NPS and other agencies, a soils investigation report conducted for the project area (Pine and Swallow Environmental 2014), and professional judgment. The majority of soils in the project area are poor quality and highly disturbed in nature.

STUDY AREA

The study area for impacts on soils is the limit of disturbance required for implementation of any of the action alternatives along with any necessary staging areas for stockpiling material and construction equipment. Soil disturbance is not expected to occur outside these areas. The study area for cumulative impacts analysis includes the National Mall and landscape in the immediately surrounding vicinity of the study area described above.

IMPACT THRESHOLDS

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

Negligible: Soils would not be visibly disturbed, or soil conditions (e.g., fertility, compaction, drainage, infiltration, erosion potential) would be slightly affected and would have no measurable impact on the health of vegetation communities.

Minor: Soil disturbance would be detectable, and impacts on soil conditions and the health of vegetation communities would be localized within a relatively small area. Mitigation may be needed to offset adverse impacts, would be relatively simple to implement, and would likely be successful.

Moderate: Soil disturbance would be readily apparent, likely long term and would result in the degradation in soil conditions and the health of vegetation communities over a relatively large portion of Constitution Gardens. Mitigation measures would be necessary to offset adverse impacts and would likely be successful.

Major: Soil disturbance would be readily apparent, likely long term and would result in a substantial and permanent degradation in soil conditions and the health of vegetation communities throughout most of Constitution Gardens. Mitigation measures necessary to offset adverse impacts would be needed, would likely be extensive, and their success would not be guaranteed.

Beneficial: No levels of intensity for beneficial impacts are defined.

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

IMPACTS OF NO-ACTION ALTERNATIVE

Analysis

Poor soils and subsoil conditions, including low fertility, poor drainage, and compaction would continue to adversely affect the capacity of the soils to sustain healthy plant communities, particularly the various

canopy tree species. Routine maintenance activities, including removal and replacement of dead or dying vegetation would continue to result in minimal localized disturbance to soils. The continued use of existing social trails would also result in highly localized disturbance such as compaction and erosion of soils. Overall, the No-action Alternative would result in long-term, moderate, adverse impacts on soils due to the continuation of the poor soil conditions and declining health of the vegetation communities throughout Constitution Gardens.

Cumulative Impacts

Constitution Gardens was constructed on landfill material composed of dredged silt from the Potomac River and fill brought in from off-site that was placed in the late-19th century to create West Potomac Park. The quality and structure of the artificial fill material that constitutes the subsoils within Constitution Gardens was subsequently affected by a number of other past actions. The construction of the World War I and World War II era temporary office buildings and their eventual removal in the 1970s disturbed and degraded soil conditions through disposal of building debris over the entire site, as did the on-site disposal of construction debris from the demolition of other buildings on federal land near Capitol Hill in the 1970s. Other past construction projects, including the Vietnam Veterans Memorial and World War II Memorial projects and the Potomac Park levee project have disturbed the soils within portions of the gardens through excavation, regrading, placement of fill, and changes in in slopes and elevations. Overall, these actions have resulted in poor soil conditions that inhibit the capacity of the soils to sustain healthy plant communities.

Future cumulative actions would indirectly benefit soil resources within Constitution Gardens. One of the objectives of the National Mall Plan is to improve the conditions of natural resources such as water, turf, trees/vegetation, and soils to be part of a sustainable urban ecosystem. Implementation of the management strategies outlined in this plan, as well as the expertise and knowledge attained through the design and implementation of the National Mall turf and soil reconstruction project, has provided the basis for improved design and management of natural resources, including soils and associated drainage and irrigation systems within the urban landscape, including Constitution Gardens.

Even though some of the cumulative actions would have beneficial effects, the overall impacts from past, present, and reasonably foreseeable future projects when combined with the impacts on soils under the No-action Alternative would continue to be moderate and adverse due to the poor and highly impacted condition of the soils within Constitution Gardens.

Conclusion

The No-action Alternative would have moderate, long-term, adverse impacts on soils primarily due ongoing poor soil and subsoil conditions. In conjunction with past, present, and reasonably foreseeable future projects, there would continue to be long-term, moderate, adverse cumulative impacts on soils.

IMPACTS OF THE PREFERRED ALTERNATIVE: REGENERATIVE GARDEN

Analysis

The Preferred Alternative combines elements of Alternatives 1 and 2 (discussed below), with the goal of creating both a social garden and sustainable ecology. Under the Preferred Alternative, soils would be excavated and rehabilitated to allow trees in good and fair condition to be retained in place to the extent possible. Trees in poor condition or in locations where facilities would be constructed would be removed and the soils would be reengineered so that growing conditions and drainage could be improved.

Soils in the project area comprise mostly fill material and debris, which is low in organic matter and generally not biologically productive. Consequently, the excavation and removal of these soils over much of the site under the Preferred Alternative would have moderate short-term, adverse impacts on soils. Because of the potential for contaminated soils to be found on site, NPS would ensure that the construction contracts include requirements for the contractor to submit plans for the handling and

disposal of contaminated soils (if encountered) that have been approved by the federal or local authorities with jurisdiction. Also, the construction documents would be required to include measures to control dust, protect exposed soil from precipitation and erosion, and protect workers and any nearby sensitive receptors from exposure to hazardous materials. Over the long term, soil rehabilitation would provide for improved soil quality, soil stabilization, and nutrient cycling, resulting in long-term, beneficial impacts.

Relocation of the Lockkeeper's House and construction of new infrastructure and facilities, including the pavilion, paved plaza, ice rink, irrigation and wastewater systems, and path realignments and widening would result in localized ground disturbance. Most of this disturbance would occur within areas with existing impervious surfaces, highly compacted surfaces, or where soils would be replaced; therefore, impacts from these actions would be short-term, negligible to minor, and adverse. The west end concession stand would be adaptively reused under the Preferred Alternative and would not contribute to impacts on soils. Water from additional impervious or paved spaces would be collected, treated, and used on-site.

Expanded recreational and educational opportunities, as well as the addition of scheduled events and new visitor programs would likely increase visitor use of Constitution Gardens, and could result in long-term, negligible, adverse impacts from continued soil disturbance. Proposed improvements to the soils and site drainage, and improvements to circulation and access designed to discourage the creation and use of social trails that contribute to soil compaction and erosion, would minimize these adverse impacts on soil conditions.

Cumulative Impacts

The past, present, and reasonably foreseeable future projects that could affect soils under the Preferred Alternative are the same as those described for the No-action Alternative. The Preferred Alternative would result in long-term, beneficial impacts on soils throughout much of Constitution Gardens. Implementation of the sustainable soil management strategies and practices derived from the National Mall Plan and the turf and soil reconstruction project would result in additional long-term, beneficial impacts. While the Preferred Alternative would result in some short-term, moderate, and long-term, negligible, adverse impacts on soils, the cumulative impacts from the past, present, and reasonably foreseeable future projects in combination with the long-term, beneficial impacts of the Preferred Alternative would result in an overall long-term, beneficial impact on soils throughout Constitution Gardens.

Conclusion

The Preferred Alternative would result in short-term, moderate, adverse impacts on soils from construction and excavation activities. Long-term, negligible, adverse impacts would result from visitor use. Overall, the Preferred Alternative would result in long-term, beneficial impacts on soils from the rehabilitation and remediation of soils throughout Constitution Gardens. Past, present, and reasonably foreseeable future projects, would have long-term, beneficial impacts on soils. The Preferred Alternative would have a noticeable beneficial contribution to overall long-term, beneficial impacts on soils.

IMPACTS OF ALTERNATIVE 1: SUSTAINABLE GARDEN

Analysis

Rehabilitation of the gardens under Alternative 1 would excavate and replace all of the soils on Constitution Gardens to ensure a planting environment capable of sustaining a thriving tree canopy over the next century. The majority of trees would be removed so that soil conditions could be substantially altered. Excavated soils suitable for reuse on site would be augmented with additional imported fill as needed. A layered soil section that would be engineered to provide an optimal growing medium for trees, shrubs, and groundcover over a sand drainage layer would be installed. This would provide for greater soil quality, soil stabilization, and nutrient cycling over the long term.

Soils in the project area comprise mostly fill material and debris, which is low in organic matter and is generally not biologically productive. Consequently, the excavation and removal of these soils under Alternative 1 would have a moderate, short-term, adverse impact. Alternative 1 would have long-term, beneficial impacts on soil conditions and the capacity of the soils to sustain healthy plant communities due to the rehabilitation and remediation of soils throughout the gardens. Because of the potential for contaminated soils found on site, NPS would ensure that the construction contracts include requirements for the contractor to submit plans for the handling and disposal of contaminated soils (if encountered) that have been approved by the federal or local authorities with jurisdiction. Also, the construction documents would be required to include measures to control dust, protect exposed soil from precipitation and erosion, and protect workers and any nearby sensitive receptors from exposure to hazardous materials.

The perched water table soils system design, soil mix placed over drainage stone, has a limited life span, with drainage effectiveness reduced after 20 years. As the effectiveness of this system deteriorates, future drainage additions, repair, or possible replacement would be required, resulting in long-term, moderate, adverse impacts on soils.

Relocation of the Lockkeeper's House and construction of new infrastructure and facilities, including the pavilion, paved plaza, ice rink; irrigation and wastewater systems; and path realignments and widening would result in localized ground disturbance. Most of this disturbance would occur within areas with existing impervious surfaces, highly compacted surfaces, or where soils would be replaced; therefore, impacts from these actions would be short-term, negligible to minor, and adverse.

Continuing and expanding recreational and educational opportunities as well as the addition of scheduled events and new visitor programs would likely increase visitor use of Constitution Gardens. Increased visitor use could result in adverse impacts from continued soil disturbance, including compaction, increased erosion, and decreased productivity; however, the degree of these impacts is expected to be mitigated by the proposed improvements to the soils and site drainage. Existing compacted and low-productivity soils would be removed and replaced by engineered soil and drainage systems specified to better withstand and recover from higher levels of use. Consequently, visitor use is expected to have long-term, negligible, adverse impacts on soils. The improvements to circulation and access are expected to discourage the creation and use of social trails that contribute to soil compaction and erosion, resulting in beneficial impacts from localized but long-term improvements to soil conditions.

Cumulative Impacts

The past, present, and reasonably foreseeable future projects that could affect soils under Alternative 1 are the same as described for the No-action Alternative. Alternative 1 would alleviate most of the adverse impacts associated with the past actions that have resulted in existing poor soil conditions at Constitution Gardens. Implementation of the sustainable soil management strategies and practices derived from the National Mall Plan and the turf and soil reconstruction project would result in further long-term, beneficial impacts. While Alternative 1 would result in some short-term, moderate, adverse impacts on soils, the cumulative impacts from the past, present, and reasonably foreseeable future projects in combination with the long-term, beneficial impacts of Alternative 1 would result in an overall substantial long-term, beneficial impact on soils throughout Constitution Gardens.

Conclusion

Because of the existing disturbed nature and poor condition of the soils and the use of mitigation measures during excavation and construction activities, adverse impacts on soils from excavation and construction activities would be short-term and moderate. Alternative 1 would also result in long-term, beneficial impacts on soils from the rehabilitation and remediation of soils throughout Constitution Gardens as well as long-term, adverse impacts as a result of the need to further improve drainage and/or repair or replace soils. Past, present, and reasonably foreseeable future projects, would have long-term,

beneficial impacts on soils. Alternative 1 would have a noticeable beneficial contribution to overall long-term, beneficial impacts on soils.

IMPACTS OF ALTERNATIVE 2: SOCIAL GARDEN

Analysis

Under Alternative 2, soils would be excavated and rehabilitated to allow trees in good and fair condition to be retained in place to the extent possible. Soils suitable for reuse on site would be augmented with additional imported fill, as needed. Soils around existing trees would be restructured and amended by integrating sub-drainage routes and drains and incorporating compost and/or sand through air-spading, excavation, or other means. Trees in poor condition or in locations where facilities would be constructed would be removed and soils reengineered so that growing conditions could be improved. The disturbance associated with excavation and removal of soils over a substantial area of Constitution Gardens under Alternative 2 would result in impacts on soils similar to those described for the Preferred Alternative. These impacts would be short-term, moderate, and adverse. Because of the potential for contaminated soils found on site, NPS would ensure that the construction contracts include requirements for the contractor to submit plans for the handling and disposal of contaminated soils (if encountered) that have been approved by the federal or local authorities with jurisdiction. Also, the construction documents would be required to include measures to control dust, protect exposed soil from precipitation and erosion, and protect workers and any nearby sensitive receptors from exposure to hazardous materials. Retention of existing trees would not allow for soil remediation over the full extent of the site; the resulting impacts on soils would be long-term and beneficial, but less pronounced than under Alternative 1.

Relocation of the Lockkeeper's House and construction of new infrastructure and facilities, including the pavilion, paved plaza, ice rink, irrigation and wastewater systems, and path realignments and widening would result in localized ground disturbance. Most of this disturbance would occur within areas with existing impervious surfaces, highly compacted surfaces, or where soils would be replaced; therefore, impacts from these actions would be short-term, negligible to minor, and adverse. The west end concession stand would be adaptively reused under Alternative 2; therefore, soil disturbance associated with the removal of this structure under Alternative 1 would not take place.

Alternative 2 focuses on improving access and visitor services, education, recreation, and entertainment by providing high quality flexible spaces that offer seasonally different experiences. Expanded recreational and educational opportunities, as well as the addition of scheduled events and new visitor programs would likely increase visitor use of Constitution Gardens, resulting in long-term, negligible, adverse impacts on soils similar to those described for Alternative 1. The addition of the lawn amphitheater under Alternative 2 would expand the areal extent of intensified visitor use and related soils impacts relative to Alternative 1. Proposed improvements to soils and site drainage, as well as improvements to circulation and access designed to discourage the creation and use of social trails that contribute to soil compaction and erosion, would minimize these adverse impacts on soil conditions.

Cumulative Impacts

The past, present, and reasonably foreseeable future projects that could affect soils under Alternative 2 are the same as those described for the No-action Alternative. Alternative 2 would alleviate most of the adverse impacts associated with past actions that have resulted in existing poor soil conditions at Constitution Gardens. Implementation of the sustainable soil management strategies and practices derived from the National Mall Plan and the turf and soil reconstruction project would result in further long-term, beneficial impacts. While Alternative 2 would result in some short-term, moderate and long-term, negligible, adverse impacts on soils, the cumulative impacts from the past, present, and reasonably foreseeable future projects in combination with the long-term, beneficial impacts of Alternative 1 would result in an overall long-term, beneficial impacts on soils throughout Constitution Gardens.

Conclusion

Similar to Alternative 1, Alternative 2 would result in short-term, moderate, adverse impacts on soils from construction and excavation activities. Long-term, negligible, adverse impacts would result from visitor use. Overall, Alternative 2 would result in long-term, beneficial impacts on soils from the rehabilitation and remediation of soils throughout Constitution Gardens. Past, present, and reasonably foreseeable future projects, would have long-term, beneficial impacts on soils. Alternative 2 would have a noticeable beneficial contribution to overall long-term, beneficial impacts on soils.

Vegetation

METHODOLOGY AND ASSUMPTIONS

Under DO-77: *Natural Resources Management* (NPS n.d.), the NPS is responsible for managing, conserving, and protecting the natural resources found in national park system units. Information on vegetation and vegetation communities potentially impacted in the project area was compiled based on reconnaissance of the project area and a tree inventory conducted in May 2014 (Bartlett Inventory Solutions 2014). 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 construction and the removal of vegetation.

STUDY AREA

The study area for vegetation includes the area within the boundaries of Constitution Gardens as well as vegetation along the curbs surrounding the gardens and associated areas that would be used for construction staging areas for equipment and supplies. Cumulative projects for this topic include those projects immediately adjacent to the National Mall.

IMPACT THRESHOLDS

Based on maintaining an altered plant community that is managed to sustain the cultural landscape, the following thresholds were used to determine the magnitude of impacts on vegetation:

Negligible: Impacts would have no measurable or perceptible changes in the desired plant community (e.g., abundance, distribution, quantity, or quality). Ecological processes, biological productivity, or sustainability would not be affected.

Minor: Impacts would cause a change in the desired plant community; however, the impact would remain localized within a relatively small area. Ecological processes, biological productivity, or sustainability would be affected slightly.

Moderate: Impacts would cause a change in the desired plant community, and ecological processes, biological productivity, or sustainability would be affected over a relatively large portion of Constitution Gardens.

Major: Impacts would result in a substantial and permanent degradation of the desired plant community, and ecological processes, biological productivity, or sustainability throughout most of Constitution Gardens.

Beneficial: No levels of intensity for beneficial impacts are defined.

Duration: Short-term impacts on vegetation would occur during construction. Long-term impacts on vegetation would persist after construction and implementation of the alternatives.

IMPACTS OF NO-ACTION ALTERNATIVE

Analysis

Trees. The No-action Alternative assumes that the conditions uncovered during the partial tree survey of 515 trees hold true for the entire canopy of 1,800 trees in Constitution Gardens. The partial survey observed that 53% of the trees were in poor to fair condition, 15% were in poor condition, and 38% were in fair condition. The continuing degradation of the tree canopy is primarily a result of poor soil conditions, poor drainage, the planting of trees within asphalt walks, or tree selections that are inappropriate for the site conditions. This degradation would constitute a long-term, moderate, adverse impact. The NPS would continue to remove dead, hazardous trees or trees in poor condition which would reduce the number of trees and the overall tree canopy. This would result in a minor to moderate, long-term, adverse impact that also would be beneficial to general tree health. If trees are replaced, they would not be replanted within the asphalt, but would be placed outside the walks. In spite of some beneficial actions related to tree pruning and removal of unhealthy trees, the overall impact under the No-action Alternative from continuing poor soil conditions would be long-term, moderate, and adverse.

Understory Vegetation. Current turf areas would remain and there would be limited placement of shrubs, bulbs, and other understory vegetation. Types and intensity of visitor use at the gardens would remain the same, resulting in adverse impacts on understory vegetation, such as turf, because of physical disturbances from activities and associated visitors. The existing social paths would also remain in place, preventing the growth of vegetative ground cover. The No-action Alternative would have long-term, negligible to minor, adverse impacts on understory vegetation as a result of the ongoing use of social trails and general visitor usage; however, both of these activities would have very small impacts.

Aquatic Vegetation. Lake depth, volume, water source, and water quality management would remain the same. The aquatic habitat within the lake is limited; the bottom substrate is artificial material, and the depth is homogenous. Limited aquatic plantings reduce the ability of aquatic vegetation to absorb nutrients from the lake water. Therefore, the No-action Alternative would result in long-term, minor, adverse impacts on aquatic vegetation as a result of the limited plant diversity and reduction in nutrient filtration capacity.

Cumulative Impacts

Implementation of the Potomac Park levee project would improve the levee system between 23rd and 17th Streets. The project would require the removal of some trees and other vegetation south of the lake and some trees in the area adjacent to 17th Street within Constitution Gardens. Following construction, understory vegetation would be replaced and trees would be replanted elsewhere. The presence of the levee would protect the vegetation throughout Constitution Gardens over the long-term. Therefore, this action would result in short-term, adverse and long-term, beneficial impacts on the vegetative community of the National Mall and Constitution Gardens.

The National Mall turf and soil reconstruction project replaces the existing soil, irrigation system, curbs, and gutters and employs turf management strategies. These actions would lead to temporary, adverse impacts on soils and vegetation during construction. However, following completion, the actions would serve to illustrate best practices and would demonstrate how design projects can improve soils and drainage and therefore vegetation, as well as establish new management practices to protect turf and reduce or mitigate impacts associated with events, resulting in long-term, beneficial impacts.

Implementation of the National Mall Plan would address cultural and natural resources, access, visitor use, safety, and operations throughout the National Mall. These actions would improve resource conditions and soils, maintain landscape character, and recommend best practices and sustainable approaches affecting vegetation, including management practices that reduce the likelihood of compaction and wear by general visitors and events, resulting in long-term, beneficial impacts.

Impacts on vegetation from past, present, and reasonably foreseeable future actions would result in short-term, minor, adverse and long-term, beneficial impacts on vegetation within the overall National Mall area. Although the Potomac Park levee project would have some short-term, adverse impacts, the National Mall turf and soil reconstruction project and the National Mall Plan would provide overall long-term, beneficial impacts on the vegetative community. As described above, implementation of the No-action Alternative would result in long-term, negligible to moderate, adverse impacts on vegetation in the study area. When combined with the long-term, beneficial and short-term, minor, adverse impacts from cumulative actions, the No-action Alternative would have a noticeable adverse contribution to overall minor, adverse cumulative impacts on vegetation.

Conclusion

Under the No-action Alternative, continuing impacts from poor soil and subsoil conditions, soil erosion and compaction, poor drainage, water stress, and declining tree health would result in long-term, moderate, adverse impacts on vegetation in the study area. The No-action Alternative would have a minor, adverse contribution to cumulative impacts on vegetation.

IMPACTS OF PREFERRED ALTERNATIVE: REGENERATIVE GARDEN

Analysis

Trees. Under the Preferred Alternative, some trees would be disturbed and removed temporarily during soil rehabilitation, topographic enhancement, and during some construction activities; however, hundreds of trees that are in good or fair condition and/or are healthy individuals would be preserved in place. Based on a partial tree survey, approximately 15% of trees are in poor condition, 38% are in fair condition, and 47% are in good condition. Permanent tree removal would occur where facilities and paths are constructed, including the visitor services pavilion, path realignment and replacement actions, well drilling, stormwater and black water cisterns and tanks, and a gathering space. During these processes, there would be more emphasis on protection of existing vegetation, including hundreds of trees that are in good or fair condition. Following vegetation and soil removal procedures and construction actions, appropriate trees would be relocated and replanted elsewhere. Trees that are dead, unhealthy, or hazardous would continue to be removed and replaced as would large, mature trees. New native trees would be planted as replacements within the study area so that the final rehabilitated tree community would be close to or replicate today's massing and canopy. The greater emphasis on the preservation in place of some trees, particularly mature trees, rather than removal would reduce disturbances to the tree community. However, under this alternative, the community would be slightly less robust because some mature healthy trees would be permanently replaced rather than being relocated. The remediation of the existing poor soil and subsoil conditions and drainage and the permanent removal of dead, unhealthy, or hazardous trees would result in an overall healthier tree community and have long-term, beneficial impacts. Although the resulting tree community would be altered, this alteration would be beneficial overall because the current tree community is degraded and disturbed due to previous manipulations. Therefore, in spite of the long-term (the time it would take for new trees to fully mature), minor, adverse impacts resulting from the removal of trees, the impacts on the tree community would be long term and beneficial because of the overall improved tree community and enhanced soil quality and conditions.

Understory Vegetation. Under the Preferred Alternative, adverse impacts would result from the temporary disturbance and removal of some turf, shrubs, and other ground vegetation during construction, soil rehabilitation, and topographic enhancements. Construction activities for various facilities, paths, and roadways would permanently remove small amounts of turf and other understory vegetation. The addition of a green roof over part of the lower level of the pavilion and plantings on Signers Island would add to the vegetative community of Constitution Gardens. The continuing recreational and educational opportunities and the addition of scheduled events and new visitor programs would increase visitor use of the gardens. Following vegetation and soil removal procedures and construction actions, the understory community would be replanted with a mixed native understory dominated by lawns. This would consist

of 64% lawn, 24% woodland understory, and 12% meadow species. The preservation of trees in existing locations would help to reduce the disturbance to the understory community during remediation; therefore, short-term, minor, adverse impacts would result from understory removal during soil rehabilitation and topographic enhancement. The permanent removal of vegetation after construction activities would result in long-term, negligible, adverse impacts on understory vegetation. Long-term, beneficial impacts would result from the addition of plantings, rehabilitation of soil conditions, and an improved and diverse understory assemblage.

Aquatic Vegetation. Under the Preferred Alternative, all aquatic vegetation would be removed temporarily during reconstruction of the lake but would be replaced with an improved community following construction. A submerged shelf would be constructed around portions of the lake edge and planted with aquatic vegetation, but would have openings to allow for access to the water from the walkway. Floral habitat would be improved through modifications, including a natural lake bottom and depth. A larger and more diverse assemblage could absorb and use more nutrients, thereby improving water quality. These enhancements of the aquatic community would initially result in short-term, negligible, adverse impacts during construction followed by long-term, beneficial impacts after construction.

Cumulative Impacts

Impacts on vegetation from past, present, and reasonably foreseeable future actions would be similar to those described under the No-action Alternative where the impact of the Potomac Park levee project, National Mall turf and soil reconstruction project, and National Mall Plan is generally long-term and beneficial, alleviating the minor, short-term, adverse impacts of tree removal for the levee. Implementation of this Preferred Alternative would result in short-term, negligible to minor and long-term, negligible, adverse impacts and long-term, beneficial impacts on vegetation in the study area. When combined with the short-term, minor, adverse and long-term, beneficial impacts from cumulative actions and the fact that the proposed actions would improve the existing vegetative community in the gardens, this alternative would have a noticeable beneficial contribution to overall cumulative impacts on vegetation.

Conclusion

The implementation of the Preferred Alternative would result in short-term, negligible to minor and long-term, negligible to minor, adverse impacts from construction activities. Overall, enhancements such as trees and other plantings, diversification of the vegetation community, and improved soil conditions would result in long-term, beneficial impacts. The Preferred Alternative would have a noticeable beneficial contribution to overall long-term, cumulative impacts on vegetation.

IMPACTS OF ALTERNATIVE 1: SUSTAINABLE GARDEN

Analysis

Trees. Under Alternative 1, the vast majority of trees inside perimeter sidewalks would be disturbed and removed temporarily during soil rehabilitation and topographic enhancement processes, circulation improvements, or other construction activities. All existing trees within the gardens would be impacted to facilitate soil or construction activities. Following vegetation and soil removal procedures and construction actions, the healthy mature trees would be relocated and replanted elsewhere; dead, unhealthy, or hazardous trees would not be relocated. Additionally, trees removed where facilities are located would not be replaced. Along with the relocation of existing trees, new native trees would be planted within the study area so that the final rehabilitated tree community would exceed the number of individuals than the existing community. After soil rehabilitation is completed, overall soil drainage and fertility would be improved and would benefit the overall tree community and associated productivity and sustainability. The adverse impacts from the majority of trees being removed would be mitigated somewhat by the improvement in soil conditions. Long-term, beneficial impacts on trees and vegetation

would result from the remediation of the existing poor soil and subsoil conditions and the addition of more individual trees to the existing community. The permanent removal of dead, unhealthy, or hazardous trees in addition to continued tree maintenance would result in an overall healthier tree community and have long-term, beneficial impacts on the tree community. Therefore, in spite of the long-term (the time it would take for new trees to fully mature), moderate, adverse impacts resulting from the removal of a majority of trees, the overall impacts on the tree community would be beneficial because of improved soil quality and conditions and the addition of individual trees to the current community.

Understory Vegetation. Adverse impacts would result from the temporary removal of the majority of turf, shrubs, and other ground vegetation during soil rehabilitation and topographic enhancement, stormwater management, and construction activities. New native vegetation would supplement what could not be relocated. The pedestrian walkway modifications on Signers Island and in Constitution Gardens, and the implementation of the emergency access drive and the traffic flow improvements would permanently result in slightly less turf and understory vegetation in the proposed construction footprints. Vegetation would be enhanced through additional plantings on Signers Island, construction of a green roof over part of the lower level of the pavilion, and creation of vegetated stormwater treatment areas. The continuing recreational and educational opportunities and the addition of scheduled events and new visitor programs would increase visitor use of the gardens. Following vegetation and soil removal procedures and construction actions, the vegetative community would be replanted with meadow and low woodland understory species except where facilities are located. Long-term, beneficial impacts would result from the addition of the green roof over part of the lower level of the pavilion, improved plantings in the main gardens and on Signers Island, and rehabilitated soil conditions. Therefore, impacts during construction would be short-term, moderate, and adverse. Following constructions impacts would be long-term and beneficial as a result of the improved quality of the understory.

Aquatic Vegetation. Alternative 1 would greatly alter the limited aquatic/wetland edge community associated with the lake to improve water quality. All aquatic vegetation would be removed during reconstruction of the lake but would be replaced with an improved community following construction. A 15-foot wide multi-level submerged shelf would be constructed around the entire lake edge and planted with aquatic vegetation. A wetland would be placed in the aquatic area between Signers Island and the main gardens. A larger and more diverse assemblage of aquatic plants could absorb more nutrients from the lake thereby improving water quality. These enhancements of the aquatic community would initially result in short-term, negligible, adverse impacts during construction followed by long-term, beneficial impacts after construction.

Cumulative Impacts

Impacts on vegetation from past, present, and reasonably foreseeable future actions would be similar to those described under the No-action Alternative where the impact of Potomac Park levee project, National Mall turf and soil reconstruction project, and National Mall Plan is generally long-term and beneficial, alleviating the minor, short-term, adverse impacts of tree removal for the levee. Implementation of Alternative 1 would result in short-term, negligible to moderate and long-term, negligible, adverse impacts and long-term, beneficial impacts on vegetation in the study area. When combined with the short-term, minor, adverse and long-term, beneficial impacts from cumulative actions and the fact that the proposed actions would improve the existing and desired vegetation community, Alternative 1 would have a noticeable beneficial contribution to overall cumulative impacts on vegetation.

Conclusion

Implementation of Alternative 1 would result in short-term, adverse, negligible impacts and long-term, adverse, negligible to moderate impacts from construction activities. Overall, enhancements such as trees and other plantings, diversification of the vegetation community, soil remediation, and improved soil conditions would result in long-term, beneficial impacts. Therefore, Alternative 1 would have a noticeable beneficial contribution to overall cumulative impacts on vegetation.

IMPACTS OF ALTERNATIVE 2: SOCIAL GARDEN*Analysis*

Trees. Under Alternative 2, some trees would be disturbed and removed temporarily during the soil rehabilitation and topographic enhancement processes and water resources construction activities; however, hundreds of trees that are in good or fair condition and/or are mature, healthy individuals would be preserved in place. Permanent tree removal would occur where facilities and paths are constructed. In areas of soil rehabilitation and construction actions, trees would be relocated and replanted elsewhere if it is healthy. Trees that are dead, unhealthy, or hazardous would be removed. Along with the relocation of existing healthy trees, new native trees would be planted within the study area as replacements so that the final revised tree community would have approximately the same number of trees as the existing tree community.

The current tree community is degraded and disturbed due to previous manipulations. Under this alternative, the greater emphasis on the preservation of trees in existing locations would reduce the disturbance to the tree community during remediation and therefore, long-term (the time it would take for new trees to fully mature), minor, adverse impacts would result from tree removal. Although the tree community would be different from the existing community, this change would be overall beneficial as a result of the overall improved tree community and enhanced soil quality and conditions.

Understory Vegetation. Under Alternative 2, adverse impacts would result from the temporary disturbance and removal of some turf, shrubs, and other ground vegetation during construction and stormwater management activities, the soil rehabilitation process, and topographic enhancements. Construction activities for various facilities, paths, and roadways would permanently remove small amounts of turf and other understory vegetation; however, the addition of a green roof over part of the lower level of the pavilion and plantings on Signers Island would add to the vegetative community of Constitution Gardens. The continuing recreational and educational opportunities and the addition of scheduled events and new visitor programs would increase visitor use of the gardens. Following vegetation and soil removal procedures and construction actions, the understory community would be replanted with vegetation similar to the existing mowed lawns with shrub and bulb plantings. The preservation of trees in existing locations would reduce the disturbance to the understory community during soil rehabilitation and topographic enhancement, resulting in short-term, minor, adverse impacts. The permanent removal of vegetation after construction activities would result in long-term, negligible, adverse impacts on understory. The understory community would remain similar to the existing community, and the lack of floral diversity within the replanted understory would result in long-term, negligible, adverse impacts. Long-term, beneficial impacts would result from the addition of plantings and rehabilitation of soil conditions.

Aquatic Vegetation. Alternative 2 would remove all existing aquatic and wetland vegetation associated with the lake during construction. The aquatic community would not be replaced following construction. The removal of all aquatic and wetland plants from the lake would result in short- and long-term, moderate, adverse impacts resulting from the permanent loss of lake vegetation as well as associated vegetative nutrient uptake capability.

Cumulative Impacts

Impacts on vegetation from past, present, and reasonably foreseeable future actions would be similar to those described under the No-action Alternative where the impact of the Potomac Park levee project, National Mall turf and soil reconstruction project, and National Mall Plan is generally long-term and beneficial, alleviating the minor, short-term, adverse impacts of tree removal for the levee. Implementation of Alternative 2 would result in short-term, minor to moderate and long-term, negligible and moderate, adverse impacts and long-term, beneficial impacts on vegetation in the study area. When combined with the short-term, minor, adverse and long-term, beneficial impacts from cumulative actions

and the fact that the proposed actions would improve the existing vegetative community, Alternative 2 would have a noticeable beneficial contribution to overall cumulative impacts on vegetation.

Conclusion

The implementation of Alternative 2 would result in short-term, adverse, minor to moderate impacts and long-term, adverse, moderate impacts. Overall, enhancements such as trees and other plantings, soil remediation, and improved soil conditions would result in long-term, beneficial impacts. Therefore, Alternative 2 would have a noticeable beneficial contribution to overall cumulative impacts on vegetation.

Water Resources

METHODOLOGY AND ASSUMPTIONS

Analysis of potential impacts on water resources focused on the expected extent of impacts on water quality and quantity of the lake, as well as the potential for soil erosion or stormwater runoff that could affect waters of the Tidal Basin and Potomac River because the lake drains into the Tidal Basin and the Tidal Basin drains into the Potomac River. The analysis was based on on-site inspection of the resource in the project area, review of existing literature and water quality standards, information provided by the NPS and other agencies, and professional judgment.

STUDY AREA

The study area for water quality and water resources includes the extent of Constitution Gardens and considers the Vietnam Veterans Memorial, the Lincoln Memorial Reflecting Pool, the Tidal Basin, and the Potomac River. Drainage from Constitution Avenue was also considered, because the conveyance system for wastewater and stormwater runoff from these areas is important to the analysis. The cumulative impact analysis considers additional projects within the National Mall that could affect water quality.

IMPACT THRESHOLDS

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

Negligible: Chemical, physical, or biological effects on water resources would not be detectable, would be well below water quality standards or criteria, and would be within historical or desired water quality conditions and flows. All permit requirements would be met. Impacts on water or wastewater treatment facilities would not be detectable.

Minor: Chemical, physical, or biological effects on water resources would be detectable and local, but would be well below water quality standards or criteria and within historical or desired water quality conditions and flows. Mitigation, if needed, would be simple and successful.

Moderate: Chemical, physical, or biological effects on water resources would be detectable, but would be at or below water quality standards or criteria. However, historical baseline or desired water quality conditions and/or flows would be temporarily altered. Mitigation measures to offset potential adverse impacts could be extensive, but would be successful.

Major: Chemical, physical, or biological effects on water resources would be detectable and would be frequently altered from the historical baseline or desired water quality conditions and flows; and/or chemical, physical, or biological water quality standards or criteria would temporarily be slightly and singularly exceeded. Mitigation measures to offset potential adverse impacts would be extensive, and their success could not be guaranteed.

Beneficial: No levels of intensity for beneficial impacts are defined.

Duration: Impacts would be short-term when changes in water resources are temporary, occurring after major storm events or during construction. Long-term impacts would occur when the recovery period is not temporary, resulting in permanent changes to water resources.

IMPACTS OF NO-ACTION ALTERNATIVE

Analysis

Under the No-action Alternative, existing conditions in Constitution Gardens would remain the same, including the existing, relatively shallow, concrete-lined lake; existing soils and gently sloping topography with lumpy and uneven surfaces and poor drainage; and poor soil quality that impedes the health of the vegetation.

The likelihood of algal blooms and other issues associated with water quality in the lake would continue as a result of the shallow nature of the lake, which creates relatively warm waters in the summer. High nutrient concentrations from fecal matter from waterfowl would also continue, further contributing to the likelihood of algal blooms, in spite of the fact that the NPS has been able to manage lake water quality in recent years.

The existing topography and the degraded condition of the soils and vegetation would continue to hinder drainage and infiltration of stormwater into the soil, increasing stormwater runoff into the lake. This increased runoff would carry nutrients and debris into the lake at an increased rate, resulting in poor water quality and algal blooms that have been a common occurrence since the lake was constructed, resulting in ongoing, long-term, minor to moderate, adverse impacts on the lake.

The overall impacts from the No-action Alternative on water resources would be minor to moderate, long-term, and adverse. It has been difficult to improve water quality in the lake historically; this difficulty would continue under the No-action Alternative. Topography, vegetation, and soil conditions around the lake would affect quantity and quality of stormwater runoff into the lake. Impacts on the water quality of the Tidal Basin and Potomac River would occur during those times of the year when the lake is partially drained for cleaning. As the lake drains, it would flush accumulated nutrients into the Tidal Basin and ultimately into the Potomac River. Adverse impacts on both the Tidal Basin and Potomac River would be short-term and minor due to the volume of the receiving water bodies.

Cumulative Impacts

Past, present, and reasonably foreseeable future projects that could impact water resources in the project area include the rehabilitation of the Lincoln Memorial Reflecting Pool and the National Mall turf and soil reconstruction project. Various construction projects on the National Mall would all result in short-term, construction-related, minor, adverse impacts on water quality, although the projects would be subject to sediment and soil erosion control practices. These projects also include various low impact development measures that would reduce stormwater volume and result in long-term, beneficial impacts on water resources. The National Mall turf and soil reconstruction project would have long-term, beneficial impacts on water resources because the project would reclaim stormwater for irrigation and increase the ability of stormwater to infiltrate into the soil. These actions would contribute to reduction of CSO events in the Potomac River. The implementation of the Lincoln Memorial Reflecting Pool rehabilitation project has resulted in improved water quality in the reflecting pool and has reduced the amount of potable water used, both of which are long-term beneficial impacts. Implementation of the National Mall Plan would replace or augment soils or implement other sustainable technologies to decrease compaction and increase soil quality and productivity in heavily used areas in the center of the Mall. These changes would result in overall long-term, beneficial impacts on water resources. The No-action Alternative would result in long-term, minor to moderate, adverse impacts on water resources. When combined with the long-term, beneficial impacts from cumulative actions, the No-action Alternative would have a slight contribution to the overall beneficial cumulative impacts on water resources.

Conclusion

The No-action Alternative would continue to have long-term, minor to moderate, adverse impacts on the water quality of the lake because of ongoing issues with poor water quality and algal blooms. There would also be long-term, minor, adverse impacts on the Potomac River and Tidal Basin into which the lake drains due to stormwater runoff from the adjoining streets contributing to frequency of CSO events. Impacts from reasonably foreseeable past, present, and future projects would be mostly beneficial and long-term, with some short-term, construction-related adverse impacts. The No-action Alternative would have a slight to noticeable adverse contribution to overall beneficial cumulative impacts on water resources.

IMPACTS OF PREFERRED ALTERNATIVE: REGENERATIVE GARDEN

Analysis

Under the Preferred Alternative, topography would be re-graded, soils would be rehabilitated to provide a better growing medium for plants, and the emphasis would be on saving or relocating healthy trees on-site. The topography of the site would continue to allow stormwater to drain toward the lake or off the site around the perimeter; however, because improved stormwater capture and filtration would allow less stormwater to drain directly into the lake, the impacts of topographic changes on water resources would not be discernible.

Under this alternative, soils would be improved to provide a better growing medium for plants, and a drainage system would be installed to capture stormwater and improve filtration of stormwater into the soils, resulting in long-term, beneficial impacts. The improved soils, vegetation, and irrigation system would reduce the amount of sediment and nutrients entering the lake via stormwater runoff, resulting in short-term, negligible to minor, adverse impacts to the water quality of the lake. In addition, the overall reduction of runoff entering the lake also would reduce the runoff entering the Tidal Basin and Potomac River during seasonal cleaning, resulting in short-term, negligible to minor, adverse impacts on the water quality of these receiving water bodies.

Improvements to soil and the rehabilitation of the lake that drains into the Tidal Basin would all expose relatively large areas of soils that would be prone to runoff and erosion during construction and could affect water quality in the nearby Tidal Basin and Potomac River, resulting in short-term, adverse impacts. However, erosion and sediment control practices would be used in accordance with the DC Soil Erosion and Sediment Control Rule and Handbook (DDOE 2003 and 2013), therefore, these short-term, adverse impacts would be minor.

Similarly, soil disturbance and exposure associated with relocating the Lockkeeper's House, construction of circulation improvements, and the visitor facilities could have short-term impacts on water quality through increased potential for soil erosion and sediment runoff into storm sewers. However, erosion and sediment control practices would be used in accordance with the DC Soil Erosion and Sediment Control Rule and Handbook (DDOE 2003 and 2013), therefore, the short-term, adverse impacts on water resources would be negligible to minor. Introduction of new impervious surfaces associated with these improvements and the introduction of the new turning lane would result in long-term, negligible to minor impacts on water quality that would generally be offset by the stormwater harvesting practices incorporated into the design.

The water source for the lake would be harvested stormwater collected from the site and from off-site along Constitution Avenue with similar non-potable gray and black water, well water, or sustainable sources used. The water would be circulated and filtered, resulting in long-term, beneficial impacts on water quality in the lake. The shallow, concrete-lined lake ring would use a separately treated water source and would not affect the quality of the water. Potable water would be used as a backup.

Irrigation for the plants on the site would also be supplied by some form of non-potable water, likely treated gray and black water harvested from the site and adjacent Constitution Avenue, and treated onsite with a living machine or similar process to standards for non-potable reuse. The overall use of harvested and treated gray and black water to supply water for the lake, irrigation, and non-potable uses in the pavilion, as well as the use of a green roof over the lower portions of the pavilion would provide overall benefits to water resources by reducing the volume of stormwater entering the system and therefore decreasing the number of CSO events over time.

The lake would include aeration rings to maintain water circulation and oxygen levels and prevent stagnation and algal blooms. It would be lined with a heavy-grade pond liner and a soil and biofiltration medium, as well as an aquatic shelf with wetlands that would deter waterfowl and provide natural filtration in the lake. All of these features would be designed to minimize the occurrence of algal blooms and other water quality issues and would result in long-term, beneficial impacts on water quality in the lake.

The depth of the lake would be increased by up to 7.5 feet to a depth of 12 feet. As noted in the affected environment chapter, groundwater resources beneath the National Mall range from very near the surface near the Potomac River to approximately 35 feet deep farther from the river. Increasing the depth of the lake could affect groundwater flow, although it is likely that the groundwater is deeper in this area, because it is situated on the north side of the Mall. Adverse impacts would be negligible.

Cumulative Impacts

Impacts from past, present, and reasonably foreseeable projects would be the same as those described under the No-action Alternative. The Preferred Alternative would contribute mostly long-term, beneficial impacts on water resources, but there would also be short-term, negligible to minor, adverse impacts. When combined with the long-term, beneficial impacts from cumulative actions, the Preferred Alternative would result in overall beneficial cumulative impacts on water resources.

Conclusion

Implementation of the Preferred Alternative would result in long-term, beneficial impacts on water quality in the lake and in the Potomac River, as a result of improved soils that would provide a better growing medium for plants and a drainage system that would capture stormwater and improve filtration of stormwater into the soils. The improved soils, vegetation, and irrigation system would reduce the amount of sediment and nutrients entering the lake via stormwater runoff, resulting in short-term, negligible to minor, adverse impacts to the water quality of the lake. The overall reduction of runoff entering the lake would also reduce the amount of runoff entering the Tidal Basin and Potomac River during seasonal cleaning, resulting in short-term, negligible to minor, adverse impacts on the water quality of these receiving water bodies. Additionally the harvesting of stormwater and non-potable gray and black water and the green roof over part of the lower level of the pavilion would reduce the volume discharged in the combined sewer system, and improvements to soils and the infiltration capacity of those soils would also reduce the volume of water discharged. There would be short-term, negligible to minor construction-related impacts related due to exposed soils that would be managed with accepted sediment and soil erosion control practices. Groundwater impacts are possible but would likely be negligible. The Preferred Alternative would result in overall beneficial cumulative impacts on water resources.

IMPACTS OF ALTERNATIVE 1: SUSTAINABLE GARDEN

Analysis

The topography of the site would continue to allow stormwater to drain toward the lake or off the site around the perimeter. Impacts of topographic changes on water resources would not be discernible because stormwater would continue to drain to the lake.

Under this alternative, soils would be improved to provide a better growing medium for plants, and a drainage system would be installed to capture stormwater and improve filtration of stormwater into the soils resulting in long-term, beneficial impacts. The improved soils, vegetation, and irrigation system would reduce the amount of sediment and nutrients entering the lake via stormwater runoff, resulting in short-term, negligible to minor, adverse impacts to the water quality of the lake. The overall reduction of runoff entering the lake would also reduce the amount of runoff entering the Tidal Basin and Potomac River during seasonal cleaning, resulting in short-term, negligible to minor, adverse impacts to the water quality of these receiving water bodies.

The water source for the lake would be harvested stormwater collected from the site and harvested from off-site along Constitution Avenue or from other similar non-potable sustainable sources. The shallow, concrete-lined lake ring would use a separately treated water source, and would not affect the quality of the water. Potable water would be used as a backup. The water would be circulated and filtered, resulting in long-term, beneficial impacts on water quality in the lake.

Irrigation for the plants on the site would also be supplied by treated gray and black water harvested from the site and adjacent Constitution Avenue, and treated with a living machine or similar process. The backup water source would come from the new well, and the system would be automated to minimize water usage. Gray and black water would be treated to standards for non-potable reuse. The overall use of harvested and treated gray and black water to supply water for the lake, irrigation, and non-potable uses in the pavilion and the green roof over the lower portions of the pavilion would provide overall benefits to water resources by reducing the volume of stormwater entering the system and therefore decreasing the number of CSO events over time.

The treatment system for the black water would either be by an underground system below one of the small meadows by the lake, or a treatment wetland in that same area. Reclaimed water tends to have higher salt concentrations than water from potable water sources, so there could be some effect on vegetation or water quality in the lake. These impacts on water quality in the lake are anticipated to be negligible, because the gray and black water would be treated to standards suitable for uses in which the public would come into contact with the water and for irrigation. The District of Columbia does not have regulations or guidelines addressing water reuse, but it is assumed that the water would be treated in accordance with the National Sanitation Foundation's Standard 350, as discussed in the EPA's 2012 *Guidelines for Water Reuse* (EPA 2012).

Because the treatment of the lake would be the same, impacts on groundwater resources would be the same as those described under the Preferred Alternative.

Cumulative Impacts

Impacts from past, present, and reasonably foreseeable projects would be the same as those described under the No-action Alternative, resulting in long-term, beneficial impacts on water resources. Alternative 1 would result mostly in long-term, beneficial impacts on water resources, but there would also be short-term, negligible to minor, adverse construction-related impacts. When combined with the long-term, beneficial impacts from cumulative actions, overall cumulative impacts on water resources under Alternative 1 would be beneficial.

Conclusion

Implementation of Alternative 1 would result in mostly beneficial impacts on water quality in the lake and in the Potomac River, as a result of improved soils that would provide a better growing medium for plants and a drainage system that would capture stormwater and improve filtration of stormwater into the soils. The improved soils, vegetation, and irrigation system would reduce the amount of sediment and nutrients entering the lake via stormwater runoff, resulting in short-term, negligible to minor, adverse impacts to the water quality of the lake. The overall reduction of runoff entering the lake would also reduce the amount of runoff entering the Tidal Basin and Potomac River during seasonal cleaning, resulting in short-

term, negligible to minor, adverse impacts to the water quality of these receiving water bodies. Additionally, harvesting storm, non-potable gray, and black water and the green roof over part of the lower level of the pavilion would reduce the volume discharged in the combined sewer system, and improvements to soils and the infiltration capacity of those soils would also reduce the volume of water discharged. There would be short-term, negligible to minor impacts due to exposed soils that would be managed with accepted sediment and soil erosion control practices. Groundwater impacts are possible but would likely be negligible. Alternative 1 would result in overall beneficial cumulative impacts on water resources.

IMPACTS OF ALTERNATIVE 2: SOCIAL GARDEN

Analysis

The topography of the site under this alternative would be altered to reinforce and smooth the undulating terrain, but it would continue to allow stormwater to drain toward the lake or off the site around the perimeter. Impacts of topographic changes on water resources would not be discernible because stormwater would drain to the lake in similar patterns as it does currently.

Under this alternative, soils would be improved to provide a better growing medium for plants, and a drainage system would be installed to capture stormwater and improve filtration of stormwater into the soils, resulting in long-term beneficial impacts. The improved soils, vegetation, and irrigation system would reduce the amount of sediment and nutrients entering the lake via stormwater runoff, resulting in short-term, negligible to minor, adverse impacts to the water quality of the lake. The overall reduction of runoff entering the lake would also reduce the amount of runoff entering the Tidal Basin and Potomac River during seasonal cleaning, resulting in short-term, negligible to minor, adverse impacts to the water quality of these receiving water bodies.

The water source for the lake would be well water, which would draw new groundwater, resulting in a long-term, negligible to minor, adverse impact on groundwater resources, because of the volume of withdrawal. Stormwater collected from the site and also harvested from off-site along Constitution Avenue would provide irrigation for the plantings in the gardens. The reduction of stormwater volume in the combined sewer system would provide long-term benefits to water quality in the Potomac River by helping reduce the number of overflow events.

Under this alternative, there would not be a planted aquatic shelf in the lake, but the lake bottom would be the same as in Alternative 1. There would, therefore, not be any enhanced natural filtration in the lake, although there would be other measures to combat water quality issues experienced in the past, including aeration microbubblers and regenerative filtration to maintain water circulation, oxygen levels, and prevent stagnation and development of algal blooms. The lake would be lined with a heavy-grade pond liner and a soil and biofiltration medium, and would be up to 12 feet deep. The depth would help to minimize temperature issues in the lake. The shallow, concrete-lined lake ring would use a separately treated water source and would not affect the quality of the water. Potable water would be used as a backup. Overall, there would long-term, beneficial impacts on water quality in the lake.

The pavilion and visitor facilities under this alternative would have a larger lower level footprint and introduce slightly more impervious surface to the garden, but the impacts would not be noticeably different than those under Alternative 1. The pavilion would be constructed in the area of the existing plaza, and stormwater would be harvested, resulting in long-term benefits related to the reduced amount of stormwater runoff into the lake. Over the short-term, similar to Alternative 1, there would be minor, adverse construction-related impacts from exposed soils. These impacts would be addressed with the implementation of sediment and soil erosion control practices.

As under Alternative 1, there would be construction-related impacts related to exposed soil from improvements to the lake, relocation of the Lockkeeper's House, construction of pathways, the reconfiguration of turning lanes, and the construction of the pavilion and related visitor facilities

Approved sediment and soil erosion control practices would be used. Impacts from construction activities would be short-term, negligible to minor, and adverse.

Because the treatment of the lake would be the same, impacts on groundwater resources would be the same as those described under the Preferred Alternative.

Cumulative Impacts

Impacts from past, present, and reasonably foreseeable projects would be the same as described under the No-action Alternative, resulting in long-term, beneficial impacts on water resources. Alternative 2 would contribute mostly long-term, beneficial impacts on water resources, but there would also be short-term, negligible to minor, adverse construction-related impacts, and long-term, negligible to minor, adverse impacts on groundwater resources. Groundwater impacts are possible but would likely be negligible. When combined with the long-term, beneficial impacts from cumulative actions, overall cumulative effects on water resources under Alternative 2 would be beneficial.

Conclusion

Implementation of Alternative 2 would result in mostly long-term, beneficial impacts on water quality in the lake and in the Potomac River, as a result of improved soils that would provide a better growing medium for plants and a drainage system that would capture stormwater and improve filtration of stormwater into the soils. The improved soils, vegetation, and irrigation system would reduce the amount of sediment and nutrients entering the lake via stormwater runoff, resulting in short-term, negligible to minor, adverse impacts to the water quality of the lake. The overall reduction of runoff entering the lake would also reduce the amount of runoff entering the Tidal Basin and Potomac River during seasonal cleaning, resulting in short-term, negligible to minor, adverse impacts to the water quality of these receiving water bodies. Additionally, harvesting stormwater and the use of a green roof over part of the lower level of the pavilion would reduce the volume in the combined sewer system, and improvements to soils and the infiltration capacity of those soils would also reduce the volume of water discharged. There would be a long-term, negligible to minor, adverse impact on groundwater resources from the well, and short-term, negligible to minor impacts related to exposed soils that would be managed with accepted sediment and soil erosion control practices. Alternative 2 would result in overall beneficial cumulative impacts on water resources.

CULTURAL RESOURCES

Methodology and Assumptions

The NPS categorizes cultural resources by the following categories: archeological resources, cultural landscapes, prehistoric and historic structures (including historic districts), museum objects, and ethnographic resources. Only impacts on cultural landscapes, historic structures and districts, and archeological resources are analyzed for each of the alternatives. As noted in chapters 1 and 3, museum collections and ethnographic resources have been dismissed from further analysis.

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, as amended. In accordance with ACHP regulations implementing Section 106 (36 CFR §800, Protection of Historic Properties), impacts on cultural resources are 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 National Register (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. An assessment of effects on cultural resources is also taking place through coordination with the DC SHPO, other interested federal agencies, and consulting parties invited by the NPS. Section 106 consultation letters were sent to the DC Historic Preservation Officer and the ACHP (see appendix A).

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, directly or indirectly, any characteristic of a cultural resource 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). Adverse effects also include reasonably foreseeable effects caused by the proposal that would occur later, be farther removed in distance, or be cumulative (36 CFR §800.5). 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 National Register.

CEQ regulations and DO-12 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; for example, 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 the NEPA only. Cultural resources are nonrenewable 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 (NPS 2011b), requires the impact assessment to be scientific, accurate, and quantified to the extent possible. For cultural resources, it is rarely possible to measure impacts in quantifiable terms; therefore, impact thresholds must rely heavily on the professional judgment of resource experts.

Impact Thresholds

The following thresholds were used to determine the magnitude of effects on historic districts and structures under the NEPA and their equivalent determination of effect under Section 106 of the NHPA:

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

Minor: For structures or landscapes, impacts on the character-defining features, elements or landscape patterns would be perceptible or measurable but would be slight and localized, resulting in little, if any, loss of integrity. Impacts on archeological resources would result in little loss of integrity. The determination of effect for Section 106 would be *no adverse effect*.

Moderate: For structures and landscapes, impacts would alter character defining features, elements, or landscape patterns but would not diminish the integrity of the structure or landscape to the extent that its National Register eligibility is jeopardized. For archeological resources, the site(s) would be disturbed but not obliterated. The determination of effect for Section 106 would be an *adverse effect*.

Major: For structures and landscapes, impacts would alter character defining features, elements, or landscape patterns, diminishing the integrity of the structure or landscape to the extent that it is no longer eligible to be listed in the National Register. For archeological resources, the site(s) would be obliterated. The determination of effect for Section 106 would be an *adverse effect*.

Beneficial: Beneficial impacts are defined as those resulting from actions that preserve or protect significant cultural resources and do not diminish the attributes that contribute to their eligibility for listing in the National Register.

Duration: Short-term impacts would occur during all or part of alternative implementation; long-term impacts would extend beyond the implementation of the alternative. Short-term and long-

term impacts are mostly likely related to cultural landscapes and historic structures. Impacts on archeological resources are permanent.

A Section 106 summary is included at the end of the cultural resources impact analysis section for historic structures, cultural landscapes, and archeological resources. The impact analysis is an assessment of the effect of the undertaking (implementation of the alternatives) on National Register-eligible or listed cultural resources only, based on ACHP criteria of adverse effect. The mitigation measures needed to address adverse effects are currently unknown and would be coordinated with the DC SHPO and consulting parties upon the determination of effect. The NPS has initiated consultation with the SHPO and would continue to coordinate.

HISTORIC STRUCTURES AND DISTRICTS

A structure is considered a constructed work, usually immovable by nature or design, and consciously created to serve some human activity (NPS 1998a). Under the NHPA, historic structures are classified as buildings, structures, sites, objects, or districts (i.e., all the various types of historic property, except for archeological sites) that are potentially eligible for the National Register. A historic district is a geographically definable area, urban or rural, possessing a significant concentration, linkage, or continuity of sites landscapes, structures, or objects united by past events or aesthetically by plan or physical developments (NPS 1998a).

STUDY AREA

The primary study area, or APE, for historic structures and districts is entirely within the East and West Potomac Parks Historic District and the L'Enfant Plan of the City of Washington Historic District. The primary APE also includes small portions of the Seventeenth Street and Northwest Rectangle Historic Districts. A large number of cultural resources are located within the secondary APE, including: the Washington Monument grounds, National Mall Historic District, President's Park South, the White House, Federal Triangle and Pennsylvania Avenue National Historic Site, and numerous architectural resources within these historic districts that are individually listed or eligible. The Bureau of Engraving and Printing, the Department of Agriculture (Administration Building), and the Auditor's Building Complex are three individually listed resources located within the secondary APE that do not fall within the above-listed historic districts.

IMPACTS OF NO-ACTION ALTERNATIVE

Analysis

Under this alternative, the gardens and their associated features that contribute to the East and West Potomac Parks and L'Enfant Plan of the City of Washington Historic Districts would be unchanged; therefore, there would be no impact on the historic districts. The Lockkeeper's House would remain in its current location but would be stabilized and mothballed per National Park Service *Preservation Brief #31, Mothballing Historic Buildings*. Its current location, near a high volume primary arterial road, also contributes to ongoing deterioration of the building. The house would retain its association with the Washington City Canal, an important characteristic that contributes to the eligibility of the structure to the National Register, but continued deterioration would affect the integrity of materials and workmanship resulting in moderate, long-term, adverse impacts on the Lockkeeper's House.

Cumulative Impacts

Past cumulative projects that have impacted resources are shown in Table 4.1. The L'Enfant and McMillan Plans created a design framework for planning and had a beneficial impact on cultural resources. Construction of cultural resources such as the Vietnam Veterans Memorial, Constitution Gardens, the Memorial to the 56 Signers of the Declaration of Independence, the World War II Memorial, and the Martin Luther King, Jr. Memorial are additions to the monumental core area that were not

specifically part of the L'Enfant or McMillan Plans but are consistent with these plans and therefore have had no impact on cultural resources. Recent repair and maintenance projects such as the Lincoln Memorial Reflecting Pool rehabilitation and the Thomas Jefferson Memorial seawall rehabilitation ensured that the character of the districts and structures are maintained and, therefore, have had a beneficial impact. Security upgrades to the Washington Monument and Lincoln Memorial introduced new elements to these landscapes, but their design was consistent with the historic nature of the area and had minor impacts on historic resources.

Present and reasonably foreseeable projects that have the potential to impact historic districts and structures include the Washington Monument earthquake damage repair, National Mall turf and soil reconstruction project, the World War II Memorial slurry wall, the National Museum of Natural History upgrades, the Sylvan Theater project, the Monumental Core Plan, and the National Mall Plan. These projects are anticipated to have a beneficial impact on historic districts and structures by ensuring that the historic character of the districts and structures are maintained through rehabilitation and maintenance. The Washington Monument security screening project, Thomas Jefferson Memorial security project, the Potomac Park levee project, parking meters, circulators, and installation of Capital Bikeshare stations could introduce non-historic elements into historic districts and result in minor, adverse impacts on historic buildings and districts.

Overall, past, present, and reasonably foreseeable future projects would have a minor, adverse cumulative impact on historic structures and districts. The moderate, adverse impact of the No-action Alternative, combined with the minor, adverse cumulative impacts of past, present, and reasonably foreseeable future projects impacts, would result in long-term, moderate cumulative impacts on historic buildings and districts. The No-action Alternative would result in a noticeable contribution to adverse cumulative impacts.

Conclusion

The No-action Alternative would continue to have an adverse impact on historic structures and districts; however, the East and West Potomac Parks Historic District would not be impacted as a whole. The Lockkeeper's House would continue to deteriorate but would remain in its current location, associated with the Washington City Canal. Continued deterioration of the Lockkeeper's House would affect the integrity of materials and workmanship resulting in moderate, long-term adverse impacts. The No-action Alternative would result in a noticeable contribution to long-term, moderate cumulative impacts on historic buildings and districts.

IMPACTS OF PREFERRED ALTERNATIVE: REGENERATIVE GARDEN

Analysis

Constitution Gardens, the Memorial to the 56 Signers of the Declaration of Independence, the Lockkeeper's House, and the Vietnam Veterans Memorial are all contributing resources to the East and West Potomac Parks Historic District. Impacts on the Lockkeeper's House are discussed below. The Preferred Alternative includes changes within the gardens that would remove the Overlook Terrace; remove trees in poor condition and fewer in fair condition; remove or relocate trees affected by construction; alter the understory to a mix of lawns, meadow, and woodland; add aquatic shelf planting to the edge of the lake; add a lake ring in the east end of the lake; widen and repave pedestrian walks, and add a 18-inch perimeter retaining wall. These changes would not only affect Constitution Gardens, they would alter the relationship between resources within the historic district. Under this alternative, the Memorial to the 56 Signers of the Declaration of Independence would be rehabilitated and replanted and a new pathway constructed along the perimeter. These changes would alter these contributing resources within the East and West Potomac Parks Historic District but would not affect the overall integrity of the historic district. The Preferred Alternative would result in long-term, minor, adverse impacts on the East and West Potomac Parks Historic District.

Constitution Gardens is a contributing resource to the L'Enfant Plan of the City of Washington. Changes to Constitution Gardens under the Preferred Alternative would be similar to those described above for the East and West Potomac Parks Historic District. Although these changes would alter Constitution Gardens, and slightly alter the relationship of resources within the historic district, they would only slightly affect the integrity of the L'Enfant Plan of the City of Washington Historic District and would result in long-term, minor, adverse impacts on the historic district.

Road work related to stormwater management enhancements could directly affect the Northwest Rectangle Historic District and the Seventeenth Street Historic District if work falls within the boundaries of these districts. Stormwater management enhancements would involve construction activities along Constitution Avenue and 17th Street. Work would have indirect visual impacts on contributing resources within the districts and potentially direct impacts if work takes place within portions of the APE that overlap with district boundaries. Impacts of the stormwater enhancements on the historic districts would be short term; lasting for the duration of construction on Constitution Avenue to tap into existing stormwater lines. The enhancements would not affect the integrity of the district and, as a result, would be short-term, minor, and adverse for any visual impacts on the districts.

Under the Preferred Alternative the Lockkeeper's House would be relocated a short distance (18 feet south and 5 feet west) moving it farther from the Washington City Canal. The structure is listed on the National Register under criteria A and B, specifically because of its association with the Washington City Canal. Although the structure has been moved once before, it still retains its association with the canal and is considered eligible in its current location. The relocation of this structure, addressed in the *Canal Lockkeeper's House Historic Structure Report* (NPS 2011a), would alter its integrity of setting and location, but it would maintain a connection to the canal orientation; so the move would not jeopardize its integrity of association with the Washington City Canal. Moving the building would have a long-term, moderate, adverse impact as a result of moving the building and altering its location and setting. Additionally, the structure would be rehabilitated under this alternative following the *Secretary of the Interior's Standards for the Treatment of Historic Properties* and a 350-SF lower level would be constructed. The basement would be constructed directly under the existing walls and there would be no exterior access. Provided this rehabilitation is completed consistent with the Secretary of the Interior's Standards, the impacts on the structure would be beneficial because these renovations would improve the building's overall condition. Overall, the Preferred Alternative would have a long-term, moderate, adverse impact on the Lockkeeper's House.

The Preferred Alternative has the potential to indirectly impact historic buildings and districts located within the secondary APE. The project includes removal of trees in poor condition, construction of a new pavilion at the east end of the lake, alteration of the Constitution Avenue and 17th Street intersection for an improved turning radius, and stormwater management enhancements. Seven of the resources (the White House, Federal Triangle Historic District, the Pennsylvania Avenue National Historic Site, the National Mall Historic District, the Bureau of Engraving and Printing, the Department of Agriculture (Administration Building), and the Auditor's Building Complex) are far removed from the primary APE and would be slightly impacted indirectly through visual effects, resulting in negligible to minor impacts. Other historic resources within the secondary APE that are closer to the primary APE include: President's Park South, the Washington Monument grounds, and the National Mall. Construction activities related to the intersection improvement, stormwater management enhancements, the removal of trees, and construction of a new pavilion would have short-term, minor, adverse impacts because of interference of views to and from these resources. Other changes within the gardens would not alter the settings of these resources or views from these buildings or historic districts and, therefore, would have long-term, negligible to minor, adverse impacts on these resources.

Cumulative Impacts

Past, present, and reasonably foreseeable projects that have the potential to impact historic districts and structures are the same as those listed for the No-action Alternative and would have overall long-term,

minor impacts on historic buildings and districts. As described above, implementation of the Preferred Alternative would result in long-term, minor, adverse impacts on historic districts within the primary APE, moderate impacts on a historic structure, and negligible to minor, adverse impacts on historic buildings and districts in the secondary APE. The long-term, minor to moderate, adverse impacts of the alternative, in combination with the long-term, beneficial to minor, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, beneficial and negligible to moderate, adverse cumulative impact. The Preferred Alternative would result in a noticeable contribution to adverse cumulative impacts.

Conclusion

Implementation of the Preferred Alternative would result in long-term, beneficial and minor to moderate, adverse impacts (*adverse effects* under Section 106) on historic structures and districts, particularly the Lockkeeper's House. The relocation of the structure would result in impacts on its integrity of location. The long-term, moderate, adverse impacts of the Preferred Alternative would noticeably contribute to adverse cumulative impacts.

IMPACTS OF ALTERNATIVE 1: SUSTAINABLE GARDEN

Analysis

The impacts of this alternative on East and West Potomac Parks Historic District would be similar to those described in the Preferred Alternative. Changes to topography would be amplified by raising the ground level by 10 feet in some locations, most mature trees would be removed or relocated, new trees would replace or exceed the current number, the lawns would be replaced with meadow and low woodland understory, the perimeter retaining wall would be 30-inches high, and the refreshment kiosk would be removed. The Memorial to the 56 Signers of the Declaration of Independence would be impacted by wetland plantings between the edge of the lake and island, affecting views to and from the island. However, impacts on the East and West Potomac Parks Historic District would remain long-term, minor, and adverse because these additional changes would result in little loss of integrity for the historic district.

Under Alternative 1, the Lockkeeper's House would be relocated a short distance (18 feet south and 5 feet west), moving it farther from the Washington City Canal. The structure is listed on the National Register under criteria A and B, specifically because of its association with the Washington City Canal. Although the structure has been moved once before, it still retains its association with the canal and is considered eligible in its current location. Moving the Lockkeeper's House would have a long-term, moderate, adverse impact as a result of altering its location and setting, and the building would no longer retain its connection to the Washington City Canal. Additionally, the structure would be rehabilitated under this alternative following the Secretary of the Interior's *Standards for the Treatment of Historic Properties*, and a 1,000-SF lower level would be constructed. The basement would be constructed under the existing walls with exterior access. Provided this rehabilitation is completed consistent with the Secretary of the Interior's Standards, the impacts on the structure would be beneficial because these renovations would improve the building's overall condition. Overall, Alternative 1 would have a long-term, moderate, adverse impact on the Lockkeeper's House.

The impacts of this alternative on the L'Enfant Plan of the City of Washington Historic District would be similar to those described for the Preferred Alternative. Changes to topography would be amplified by raising the ground level by 10 feet in some locations, most mature trees would be removed or relocated, new trees would replace or exceed the current number, the lawns would be replaced with meadow and low woodland understory, and the refreshment kiosk would be removed. The Memorial to the 56 Signers of the Declaration of Independence would be impacted by wetland plantings between the edge of the lake and island, affecting views to and from the island. However, impacts on the L'Enfant Plan of the City of

Washington Historic District would remain long-term, minor, and adverse because these additional changes would result in little loss of integrity for the historic district.

Impacts on the Seventeenth Street Historic District, Northwest Rectangle Historic District, Lockkeeper's House, and on historic structures and districts in the secondary APE would be the same as those described for the Preferred Alternative.

Cumulative Impacts

Past, present, and reasonably foreseeable projects that have the potential to impact historic districts and structures are the same as those listed for the No-action Alternative—overall long-term, minor impacts on historic buildings and districts. Implementation of Alternative 1 would result in short-term, minor, adverse impacts on historic districts within the primary APE, long-term, moderate, adverse impacts on a historic structure, and long-term, negligible to minor, adverse impacts on historic buildings and districts in the secondary APE. The long-term beneficial and minor to moderate adverse impacts of Alternative 1, in combination with the long-term, minor, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, moderate, adverse cumulative impact. Alternative 1 would result in a noticeable contribution to adverse cumulative impacts.

Conclusion

Implementation of Alternative 1 would result in long-term, minor to moderate, adverse impacts (*adverse effects* under Section 106) on historic districts and structures, particularly the Lockkeeper's House. The relocation of the structure would result in impacts on its integrity of location. The long-term, moderate, adverse impacts of Alternative 1 would result in a noticeable contribution to adverse cumulative impacts.

IMPACTS OF ALTERNATIVE 2: SOCIAL GARDEN

Analysis

The impacts on the East and West Potomac Parks Historic District, the L'Enfant Plan of the City of Washington Historic District, and the Memorial to the 56 Signers of the Declaration of Independence are anticipated to be the same as those described for the Preferred Alternative.

Impacts on the Seventeenth Street Historic District and the Northwest Rectangle Historic District would be the same as those described for the Preferred Alternative.

The relocation of the Lockkeeper's House under this alternative would have a long-term, moderate, adverse impact on aspects of the structure that make it eligible for the National Register. Under this alternative, the structure would be relocated 500 feet primarily west of its current location. Additionally, the structure would be rehabilitated under this alternative following the Secretary of the Interior's *Standards for the Treatment of Historic Properties* and a 500-SF lower level would be constructed. Provided this rehabilitation is completed in line with the Secretary of the Interior's *Standards for the Treatment of Historic Properties*, the impacts on the structure would be negligible and adverse to beneficial because these renovations would improve the building's overall condition. While still a moderate, adverse impact, the impacts of the relocation would be greater under this alternative because of the distance of the move. Impacts on historic structures and districts in the secondary APE would be the same as those described for the Preferred Alternative.

Cumulative Impacts

Past, present, and reasonably foreseeable projects that have the potential to impact historic districts and structures are the same as those listed for the No-action Alternative, and would have overall long-term, minor impacts on historic buildings and districts. Implementation of Alternative 2 would result in long-term, minor, adverse impacts on historic districts within the primary APE; long-term, beneficial and moderate, adverse impacts on a historic structure; and long-term, negligible to minor, adverse impacts on historic buildings and districts in the secondary APE. The long-term, beneficial and minor to moderate,

adverse impacts of the alternative, in combination with the long-term, minor, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, moderate, adverse cumulative impact. Alternative 2 would result in a noticeable contribution to adverse cumulative impacts.

Conclusion

Implementation of Alternative 2 would result in long-term, beneficial and minor to moderate impacts (*adverse effects* under Section 106) on historic districts and structures, particularly the Lockkeeper's House. The relocation of the structure would result in impacts on its integrity of location. The long-term, moderate, adverse impacts of Alternative 2 would have a noticeable contribution to adverse cumulative impacts.

CULTURAL LANDSCAPES

Cultural landscapes are composed of two principal organizational elements: spatial organization and land patterns, and several character-defining landscape features. These character-defining features include topography, vegetation, circulation, water features, structures, site furnishings (including park benches), and objects. The paramount attribute of the organizational elements and the character-defining features is their interrelationships in space.

STUDY AREA

The study area for cultural landscapes encompasses the gardens itself and any important views and vistas as defined in the CLI.

IMPACTS OF NO-ACTION ALTERNATIVE

Analysis

Under the No-action Alternative, the NPS would continue to conduct routine repairs and maintenance of the garden. The primary impacts on the cultural landscape would come from the continued loss of existing trees due to poor soils and deterioration of the pathways and other paved areas in the garden, such as Overlook Terrace. Overall, the cultural landscape was considered to be in fair condition when it was documented in 2008. The 2008 CLI stated that to improve Constitution Gardens to good condition, the following actions should be completed: replace deteriorated gravel-topped asphalt paths and prevent cracking in the base paving; improve Constitution Gardens Lake by resetting and stabilizing the stone coping, control the algae growth and improve the water quality in the lake; and improve the soils for a better growing medium for trees, shrubs, and turf, but the other actions have not been completed. There would be long-term, minor, adverse impacts on the Constitution Gardens cultural landscape under this alternative.

Cumulative Impacts

Past cumulative projects that have impacted cultural landscapes are shown in Table 4.1. The L'Enfant and McMillan Plans created a design framework for planning. Construction of cultural resources such as the Vietnam Veterans Memorial, Constitution Gardens, the Memorial to the 56 Signers of the Declaration of Independence, the World War II Memorial, and the Martin Luther King, Jr. Memorial are additions to the monumental core area that were not specifically part of the L'Enfant or McMillan Plans but are consistent with these plans and therefore have had no impact on cultural resources. Recent repair and maintenance projects such as the Lincoln Memorial Reflecting Pool rehabilitation and the Thomas Jefferson Memorial seawall rehabilitation ensured that the character of cultural resources are maintained and, therefore, have had a beneficial impact. Security upgrades to the Washington Monument and Lincoln Memorial introduced new elements to these landscapes, but their design was consistent with the historic nature of the area and therefore they had minor impacts on historic resources.

Present and reasonably foreseeable projects that have the potential to impact cultural landscapes include the National Mall turf and soil reconstruction project, the World War II Memorial slurry wall, the National Museum of Natural History upgrades, the Sylvan Theater project, the Monumental Core Plan, and the National Mall Plan. These projects are anticipated to have a beneficial impact on cultural landscapes by ensuring that the historic character of the districts and structures are maintained through rehabilitation and maintenance. The Washington Monument security screening project, Thomas Jefferson Memorial security project, parking meters, circulators, and installation of Capital Bikeshare stations could introduce non-historic elements into historic districts and result in minor, adverse impacts on cultural landscapes.

The Potomac Park levee project has the potential for minor, adverse impacts on the cultural landscape by removing trees and constructing a flood control feature to the west of 17th Street. These changes would be permanent.

As described above, implementation of the No-action Alternative would result in long-term, minor, adverse impacts on the cultural landscape. The long-term, minor, adverse impacts of this alternative, in combination with the long-term, beneficial and minor, adverse impacts of other past, present, and reasonably foreseeable actions would result in long-term, minor, adverse cumulative impacts. The No-action Alternative would result in a sizeable contribution to the adverse cumulative impact.

Conclusion

Implementation of the No-action Alternative would result in long-term, minor, adverse impacts on the cultural landscape. The cultural landscape would continue to deteriorate despite routine maintenance and may reach a stage of deterioration where more intensive maintenance is needed to ensure the integrity of the landscape. The long-term, minor, adverse impacts of this alternative, in combination with the long-term, beneficial and minor, adverse impacts of other past, present, and reasonably foreseeable actions would result in long-term, minor, adverse cumulative impacts. The No-action Alternative would result in a sizeable contribution to the adverse cumulative impact.

IMPACTS OF PREFERRED ALTERNATIVE: REGENERATIVE GARDEN

Analysis

The Preferred Alternative would include changes to several important landscape characteristics, including topography, vegetation, and views. It would also include changes to Overlook Terrace and the Lockkeeper's House. Under this alternative, the topography of the gardens would be re-graded. However, the gently rolling nature of the topography would be retained, resulting in minor, adverse impacts on the cultural landscape.

Under this alternative, the topography along Constitution Avenue would be re-graded to correspond to the addition of an 18-inch perimeter retaining wall that would be added along Constitution Avenue and 17th Street.

Some of the trees currently present within the gardens would be relocated on-site, and new trees would be planted to replace those that are removed. Under the Preferred Alternative, Constitution Gardens would be a wooded park with a mixed, mature canopy of shade trees. Trees affected by construction would be removed or relocated, while saving hundreds of trees that are in good to fair condition. Trees in poor condition and fewer trees in fair condition would be removed, resulting in a canopy close to or replicating today's massing and canopy. The NPS would continue to prune and remove trees, and trees would be analyzed on a case-by-case basis during design, resulting in an increased number of trees in the canopy because removed trees would be replaced by younger trees that would adapt more quickly. Lawns would be replaced with a mixed understory with lawns dominating meadow and woodland areas. This alternative would alter character-defining features of vegetation in the cultural landscape. As a result, it is

anticipated to have a moderate, adverse impact on the cultural landscape because the new trees would be less mature, and it would take a number of years to achieve a similar setting.

The removal of Overlook Terrace and the construction of a pavilion in its place would result in the removal of the topographic overlook, though the overlook function would be incorporated into the pavilion facility with outdoor terraces on the upper and lower levels. The removal of these features would result in moderate and permanent, adverse impacts on the cultural landscape.

The shape of the lake would be retained, but a ring would be added at its east end, altering this important feature of the cultural landscape. The ring would be used for ice skating during winter months; this use is consistent with the overall land use of the garden. Changes would have a moderate, adverse effect on a contributing feature of the cultural landscape.

The refreshment kiosk (also known as the west end concession stand) would be retained in place and adaptively reused for park operations. Adaptation from its original intended use would result in a slight loss of integrity and would have minor, adverse impacts on the landscape assuming that the Secretary of the Interior's Standards are followed.

Under the Preferred Alternative, the Lockkeeper's House would be moved 18 feet south and 5 feet west of its current location. These changes would be permanent and have a long-term, moderate, adverse impact on the cultural landscape. Moving the Washington City Canal Memorial Stone, plaque, and mounting block would have long-term, minor, adverse impacts.

The addition of the pavilion, changes to topography, and removal of vegetation would alter views of the Washington Monument from the gardens. The construction of the pavilion at Overlook Terrace also would alter the vantage point and views from this location. Finally, the internal views toward the lake would be altered by the construction of a ring within a lake and the new pavilion. Views of the reflecting pool, Lincoln Memorial, and the Vietnam Veterans Memorial are not expected to change. Views from the Vietnam Veterans Memorial to the Washington Monument would also remain intact, and views from Virginia Avenue are not expected to change. The changes to the existing views would impact the feeling and association of the gardens with the surrounding areas; therefore, there would be a long-term, moderate, adverse impact on the cultural landscape.

Although there would be changes to other landscape characteristics, including the spatial organization, circulation, land use, and small features, these changes would not significantly impact the cultural landscape. The exterior border of trees and central area would be retained, although the trees would require a number of years to mature and create a similar setting. The circulation would be altered to facilitate access to the gardens and adjacent areas, but the overall circulation concept would not be altered. The below-grade access road to the pavilion with an entrance/exit on 17th Street NW would alter the topography. Many of the small-scale features would be replaced in-kind and, therefore, would result in a long-term, negligible to minor, adverse impact on the cultural landscape.

There are several features of the cultural landscape that would not be impacted by this alternative. These include the Vietnam Veterans Memorial, the comfort station, the Three Servicemen Statue, and the Vietnam Women's Memorial.

Impacts on all contributing features to the Constitution Gardens cultural landscape are shown in Table 4.2.

Table 4.2 – Impacts of the Preferred Alternative on Contributing Features of the Cultural Landscape

Landscape Characteristic	Contributing Feature	Change	Impact
Spatial organization	Border of trees	Street trees would remain and the garden with its rolling terrain would be separated from the street by an 18-inch retaining wall; the border of lindens (south of the walk) could be removed because the trees are not in good or fair condition	Minor
	Open central area	Open central area of the gardens would be retained	Minor
Topography	Flood control levee	No change from this project (Impacts from USACE project are discussed in cumulative impacts)	Not applicable
	Gentle slopes	<ul style="list-style-type: none"> • Smoothed, rolling surface • Re-graded site, with maximum slopes of 3:1 • Re-graded slopes to correspond to the 18-inch retaining wall 	Minor
	Plateau at Overlook Terrace	Removed and replaced with a pavilion. Overlook function would be retained with pavilion overlook deck and events terrace to the east	Moderate
	Western knoll	Re-graded, flatter top	Negligible
	North berm	Re-graded to emphasize berm and 18-inch retaining wall	Minor
	Low central area occupied by lake	No change	Negligible
	Slope and cut at the Vietnam Veterans Memorial	No change	Negligible
Land use	Passive recreation	No change	Negligible
	Visiting the memorials	No change	Negligible
	Ceremonies at the Vietnam Veterans Memorial	No change	Negligible
	Demonstrations	No change	Negligible
	Citizenship ceremony at the Overlook Terrace	Overlook Terrace would be replaced with a pavilion, ceremony could occur but would be in a different setting	Minor
	Catch and release fishing	No change	Negligible

Note: Citizenship and other ceremonies will continue to occur throughout the National Mall.

Landscape Characteristic	Contributing Feature	Change	Impact
Circulation	Overlook Terrace	Removed and replaced with a pavilion	Moderate
	Loop walk around the lake	Path location would remain the same, but it would be streamlined and widened from 14 feet to 20 feet along entire path	Minor
	Loop walk around west end and the Vietnam Veterans Memorial	Path location would remain the same, but it would be streamlined along entire path	Minor
	Secondary walks over slopes	These paths would be reconstructed and in some cases streamlined with improved connection at intersections	Minor
	Walks parallel to stairs	Alignment would be retained as part of pavilion design	Minor
	Diagonal walk, northeast corner of Overlook Terrace	Alignment would be retained	Minor
	Walk south, Overlook Terrace to World War II Memorial	Alignment would be retained, but the path would be widened to 20 feet	Minor
	Walk north, Overlook Terrace to Constitution Avenue	Alignment would be retained, but the path would be widened to 20 feet	Minor
	Two sidewalks along Constitution Avenue	Retained, entrances to park expanded to 75 feet wide with two paths entering the garden, each 15 feet wide, instead of one	Minor
	Sidewalk along 17 th Street	No change	Negligible
Vegetation	Deciduous trees	Wooded park with a mixed, mature canopy of shade trees; remove trees in poor condition and fewer trees in fair condition; close to or replicating today's massing and canopy	Moderate
	Honey locust trees at Overlook Terrace	In poor condition, removed and replaced with a pavilion	Moderate
	Honey locust trees around refreshment terrace	Trees in poor health would be removed; trees would not be replaced in asphalt areas	Moderate
	Magnolias, Memorial to the 56 Signers of the Declaration of Independence	Preserved in place whenever possible	Minor

Landscape Characteristic	Contributing Feature	Change	Impact
	Remnant plantings, Memorial to the 56 Signers of the Declaration of Independence	Some removed	Minor to moderate
	Street trees	Remain in place except to allow for service entrance	Moderate
	Lawns	Approximately 64% lawn, 12% meadow, and 24% woodland understory	Minor
Buildings and structures	Refreshment kiosk	Adaptively reused in place for operations or volunteers	Minor, Secretary of the Interior's Standards would be followed
	Comfort station	No change (outside of project area)	Negligible
	Constitution Gardens island	Shape would be retained; a perimeter path and second access path would be added; fishing would be allowed	Minor, Secretary of the Interior's Standards would be followed for the addition of the path
	Memorial to the 56 Signers of the Declaration of Independence	Memorial would be renovated, which would include resetting all the stonework and replacing vegetation where needed; accessibility would be improved by adding a perimeter path and second access path	Minor, Secretary of the Interior's Standards would be followed for the addition of the path
	Lockkeeper's House	<ul style="list-style-type: none"> Relocated 18 feet south and 5 feet west Existing building above a 350-SF lower story for mechanical and storage Rehabilitated Public use and interpretation 	Moderate
	Overlook Terrace and three terraces	Removed	Moderate
	Vietnam Veterans Memorial	No change	Negligible
	Three Servicemen Statue	No change	Negligible
	Vietnam Women's Memorial	No change	Negligible
Views and vistas	Vistas from park to Washington Monument	Altered by the inclusion of the pavilion	Moderate
	Vista from Vietnam Veterans Memorial to Washington Monument	Views would be altered by topography but remain intact	Minor
	Views to reflecting pool area	No change	Negligible

Landscape Characteristic	Contributing Feature	Change	Impact
	Vistas to Lincoln Memorial	No change	Negligible
	Views to buildings north of Constitution Avenue	Viewed changed from the gardens interior by the increased height of the northern berm	Minor
	View from Virginia Avenue to Washington Monument	View would not be altered	Negligible
	Vistas to the Vietnam Veterans Memorial	May be altered by the re-grading within the garden	Minor
	Views from Overlook Terrace	Views would be altered by the construction of the pavilion, which would alter the vantage point, and the addition of the ring in the lake; pavilion overlook deck and event terrace would provide similar views	Moderate
	Internal views to lake	Internal views of the lake would be altered by the addition of the ring in the lake and the pavilion at the east end	Moderate
	Internal views to island	Additional plantings may affect views	Moderate
	Views to building on or near the Mall	Some views to the east may be altered by the addition of the pavilion	Moderate
Constructed water features	Constitution Gardens Lake	The shape of the island would be retained but a ring would be added to the east end; lake would be excavated to 2–12 feet in depth and would have a non-concrete/natural bottom with a liner; aquatic plants would be added along the shoreline	Moderate (primarily due to the addition of the ring at the end)
Small-scale features	Cast iron and wood-slat benches	Lighting, seating, tables and chairs, trash and recycling, etc. would be designed to complement the site context, be sustainable and easy to maintain	Minor, replaced with similar features (in-kind) and follow the Secretary of the Interior's Standards
	Lighting		
	Washington City Canal Memorial Stone, Plaque, and mounting block	These would be relocated along with the Lockkeeper's House	Minor
	Vietnam Veterans Memorial flagpole, "In Memory" Plaque, lighting fixtures and locators	No change	Negligible

Overall, the impacts of the Preferred Alternative on the contributing features, including changes to the topography, vegetation, buildings and structures, and views and vistas, would result in moderate adverse impacts on the overall cultural landscape Constitution Gardens.

Cumulative Impacts

Cumulative impacts would be the same as those described for the No-action Alternative. Overall, past, present, and reasonably foreseeable future projects would have a long-term, minor, adverse cumulative impact on cultural landscapes.

The long-term, negligible to moderate, adverse impacts of this alternative, in combination with the long-term, beneficial and minor, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, moderate, adverse cumulative effect. The Preferred Alternative would result in a noticeable contribution to the adverse cumulative impact.

Conclusion

Implementation of the Preferred Alternative would result in negligible to moderate, adverse impacts (*adverse effects* under Section 106) on the contributing features of the cultural landscape. Under this alternative, changes to the topography, vegetation, buildings and structures, and views and vistas would result in moderate, adverse impacts on the cultural landscape. In particular, the relocation of the Lockkeeper's House, construction of the pavilion, and removal of trees and Overlook Terrace would result in impacts on the integrity of the setting. The Preferred Alternative would provide a noticeable contribution to the long-term, moderate, adverse cumulative impacts.

IMPACTS OF ALTERNATIVE 1: SUSTAINABLE GARDEN

Analysis

Alternative 1 would include alterations to several important landscape characteristics, including topography, vegetation, and views, as well as to multiple contributing features within the gardens (e.g., Overlook Terrace, the refreshment kiosk, and the Lockkeeper's House). Because these changes would be long-term, and in some cases permanent, and would alter multiple contributing elements of the cultural landscape, this alternative would have a long-term, moderate to major, adverse impacts on the cultural landscape.

Under this alternative, all of the topsoil would be removed and replaced, and the topography would be changed by adding 8–10 feet of soil above and beyond the current elevation of the gardens. This would amplify the topography and result in a change to the gently rolling setting that defines the cultural landscape. Additionally, the western knoll would be changed from a single hill to series of amplified hills, effectively removing this contributing element to the landscape. Overlook Terrace would also be removed and replaced with a pavilion, removing that contributing topographic element. The north berm would be raised and portions of it removed to allow for larger entrances to the gardens from Constitution Avenue. A 30-inch perimeter retaining wall would be added along Constitution Avenue and 17th Street NW. The primary impacts under this alternative would be the increased height of the topography and the potential for that to change to the integrity of setting and feeling of the landscape, resulting in moderate to major, adverse impacts on the cultural landscape.

The removal of all the soils would require that all of the vegetation be removed from within the gardens. Trees affected by construction would be removed or relocated. Constitution Gardens would become a wooded park with a mixed canopy of young trees that would not provide as much shade and would alter the tree massing and canopy. Most trees would be removed or relocated and new trees would be planted to exceed the total number currently present. Meadow and low woodland understory would replace lawns. Street trees would remain largely unaffected with the exception of trees along Constitution Avenue near the north-south walk to the World War II Memorial, which would be removed to provide service access. This alternative would result in the removal of almost all of the contributing elements to the vegetation

landscape. Although this vegetation would be replaced, it would be replaced with less mature trees that would take a number of years to become established and achieve the same setting. The remnant plantings at the Memorial to the 56 Signers of the Declaration of Independence would be replaced with a perimeter path instead of in-kind replacement of vegetation, permanently removing this element from the feature. These changes would result in a minor to moderate, adverse impact on the Constitution Gardens cultural landscape.

Similar to the Preferred Alternative, the removal of Overlook Terrace would result in permanent, moderate, adverse impacts on the cultural landscape.

Other changes to contributing features include the removal of the refreshment kiosk and associated honey locusts and the relocation of the Lockkeeper's House, associated Washington City Canal Memorial Stone and Plaque, and a mounting block that would be relocated somewhere in the vicinity of the Lockkeeper's House. These changes would be permanent and have minor to moderate, adverse impacts on contributing elements to the cultural landscape. Changes to the lake would be the same as those described for the Preferred Alternative.

Impacts on views and vistas would be the same as those described for the Preferred Alternative, though the amplified topographic changes under Alternative 1 would have a greater impact on views than the Preferred Alternative.

Although there would be changes to other landscape characteristics, including the spatial organization, circulation, land use, and small features, these changes would not overly impact the cultural landscape. The exterior border of trees and central area would be retained, although the trees would require a number of years to mature and create a similar setting. The circulation would be altered to facilitate access to the gardens and to adjacent areas, but the overall circulation concept would not be altered. Many of the small-scale features would be replaced in-kind and, therefore, would result in negligible to minor, adverse impacts on the cultural landscape.

There are several features of the cultural landscape that would not be impacted by this alternative. These include the Vietnam Veterans Memorial, the comfort station, the Three Servicemen Statue, and the Vietnam Women's Memorial.

Impacts on all contributing features to the Constitution Gardens cultural landscape are shown in Table 4.3.

Table 4.3 –Impacts of Alternative 1 on Contributing Features of the Cultural Landscape

Landscape Characteristic	Contributing Feature	Change	Impact
Spatial organization	Border of trees	Street trees would remain and the gardens with its rolling terrain would be separated from the street by a 30-inch retaining wall; the border of lindens (south of the walk) could be removed since trees are not in good or fair condition	Minor
	Open central area	Open central area of the gardens would be retained	Negligible

Landscape Characteristic	Contributing Feature	Change	Impact
Topography	Flood control levee	No change from this project (USACE project in cumulative impacts discussion)	Not applicable
	Gentle slopes (man-made)	<ul style="list-style-type: none"> Smoothed, amplified surface Increased hill height 8–10 feet Maximum slopes 4:1 Height relative to Constitution Avenue: +10 feet, tapering to a 30-inch retaining wall 	Moderate
	Plateau at Overlook Terrace (man-made)	Overlook function remains with new visitor services pavilion	Moderate
	Western knoll	Area would be recontoured	Moderate
	North berm	<ul style="list-style-type: none"> Berm height increased 8–10 feet 30-inch retaining wall along Constitution Avenue 	Moderate (due to widening the entrances and raising the berm)
	Low central area occupied by lake	No change	Negligible
	Slope and cut at Vietnam Veterans Memorial	No change	Negligible
Land use <i>Note: Citizenship and other ceremonies will continue to occur throughout the National Mall.</i>	Passive recreation	No change	Minor
	Visiting the memorials	No change	Negligible
	Ceremonies at the Vietnam Veterans Memorial	No change	Negligible
	Demonstrations	No change	Negligible
	Citizenship ceremony at the Overlook Terrace	Overlook Terrace would be replaced with a pavilion, ceremony could occur there but would be a different setting	Minor
	Catch and release fishing	No change	Negligible
Circulation	Overlook Terrace	Removed and replaced with a pavilion; overlook function remains with new visitor services pavilion, overlook deck, and events terrace	Moderate
	Loop walk around the lake	Path location would remain the same, but it would be streamlined and widened from 14 feet to 20 feet along entire path	Minor

Landscape Characteristic	Contributing Feature	Change	Impact
	Loop walk around west end and the Vietnam Veterans Memorial	Path location would remain the same, but it would be streamlined and widened from 14 feet to 20 feet along entire path	Minor
	Secondary walks over slopes	These paths would be reconstructed and in some cases streamlined with improved connections at intersections	Minor
	Walks parallel to stairs	Parallel walks would be revised as part of pavilion design	Minor
	Diagonal walk, northeast corner of Overlook Terrace	Diagonal walk revised	Minor
	Walk south, Overlook Terrace to World War II Memorial	Alignment retained, but the path would be widened from 12–15 feet to 20 feet.	Minor
	Walk north, Overlook Terrace to Constitution Avenue	Alignment retained, but the path would be widened from 12–15 feet to 20 feet	Minor
	Two sidewalks along Constitution Avenue	Retained, entrances to park expanded to 75 feet wide with two paths entering the garden, each 15 feet wide, instead of one	Minor
	Sidewalk along 17 th Street	No change	Negligible
Vegetation	Deciduous trees	Wooded park, but altered because most trees would be removed and replaced by young or relocated trees, primarily mixed canopy of young trees, not providing as much shade, and altering the massing and canopy	Major
	Honey locust trees at Overlook Terrace	Removed	Moderate
	Honey locust trees around refreshment terrace	Removed (in poor condition)	Moderate
	Magnolias, Memorial to the 56 Signers of the Declaration of Independence	Remove and replace.	Moderate (short term if replaced in kind)
	Remnant plantings, Memorial to the 56 Signers of the Declaration of Independence	Dome removed and replaced with perimeter wall	Minor to moderate

Landscape Characteristic	Contributing Feature	Change	Impact
	Street trees	Street trees would remain and the gardens with its rolling terrain would be separated from the street by a 30-inch retaining wall; border of lindens (south of the walk) could be removed since trees are not in good or fair condition	Moderate
	Lawns	Primarily meadow and woodland understory planting approximately 24 inches maximum height; meadows would be mowed to function as lawns	Minor
Buildings and structures	Refreshment kiosk	Removed	Moderate
	Comfort station	No change (not within project area)	Negligible
	Constitution Gardens island	Shape retained, a perimeter path would be added and fishing would be allowed	Minor, Secretary of Interior's Standards would be followed for the addition of the path
	Memorial to the 56 Signers of the Declaration of Independence	Memorial would be rehabilitated, accessibility would be improved and a perimeter path constructed around the island, new plantings	Moderate, Secretary of Interior Standards would be followed for the addition of the path
	Lockkeeper's House	<ul style="list-style-type: none"> Relocated 18 feet south and 5 feet west Existing building over a 1,000-SF lower level Rehabilitated Public use and interpretation 	Moderate
	Overlook Terrace and three terraces	Removed and replaced with a pavilion	Moderate
	Vietnam Veterans Memorial	No change	Negligible
	Three Servicemen Statue	No change	Negligible
	Vietnam Women's Memorial	No change	Negligible
Views and vistas	Vistas from park to Washington Monument	Altered by the inclusion of the pavilion	Moderate
	Vista from Vietnam Veterans Memorial to Washington Monument	View would be altered by topography but remain intact	Minor
	Views to reflecting pool area	No change	Negligible
	Vistas to Lincoln Memorial	No change	Negligible

Landscape Characteristic	Contributing Feature	Change	Impact
	Views to buildings north of Constitution Avenue	Obscured from the gardens interior by the increased height	Moderate
	View from Virginia Avenue to Washington Monument	View would not be altered	Negligible
	Vistas to the Vietnam Veterans Memorial	May be altered by the raised topography within the garden	Moderate
	Views from Overlook Terrace	Views would be altered by the construction of the pavilion and the addition of the ring in the lake, which would alter the vantage point; however, the pavilion, overlook deck, and event terrace would provide similar views	Moderate
	Internal views to lake	Internal views of the lake would be altered by the addition of the ring in the lake and the pavilion at the east end	Moderate
	Internal views to island	Additional plantings may affect views	Moderate
	Views to building on or near Mall	Some views to the east may be altered by the addition of the pavilion	Moderate
Constructed water features	Constitution Gardens Lake	The shape of the island would be retained but a ring would be added to the east end; the lake would be excavated to 12 feet in depth at its center and would have a non-concrete/natural bottom with a liner; aquatic plants would be added along the shoreline	Moderate
Small-scale features	Cast iron and wood-slat benches	Lighting, seating, tables and chairs, trash and recycling, etc. would be designed to complement the site context, be sustainable and easy to maintain	Minor, replaced with similar features (in-kind) and following Secretary of the Interior's Standards
	Lighting		
	Washington City Canal Memorial Stone, Plaque and Mounting Block	These would be relocated along with the Lockkeeper's House	Minor
	Vietnam Veterans Memorial Flagpole, "In Memory" Plaque, lighting fixtures and locators	No change	Negligible

Overall, the impacts of Alternative 1 on the contributing features, including changes to the topography, vegetation, buildings and structures, and views and vistas would result in moderate, adverse impacts on the overall cultural landscape Constitution Gardens.

Cumulative Impacts

Cumulative impacts are the same as those presented in the Preferred Alternative. As described above, implementation of Alternative 1 would result in long-term, negligible to moderate, adverse impacts on the cultural landscape. The long-term, negligible to moderate, adverse impacts of this alternative, in combination with the long-term, beneficial and minor, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, moderate, adverse cumulative effect. Alternative 1 would result in a noticeable contribution to the adverse cumulative impact.

Conclusion

Implementation of Alternative 1 would result in long-term, negligible to moderate, adverse impacts (*adverse effects* under Section 106) to the contributing features of the cultural landscape. The increased height of the topography, altered views and vistas, relocated the Lockkeeper's House, construction of the pavilion, and removal of the majority of trees and Overlook Terrace would result in long-term, moderate, adverse impacts to the overall cultural landscape of Constitution Gardens. Alternative 1 would have a noticeable contribution to adverse cumulative impacts on the cultural landscape.

IMPACTS OF ALTERNATIVE 2: SOCIAL GARDEN

Analysis

Under this alternative, soils would be remediated in place, and an additional 4–6 feet of soils would be added to the existing topography. However, the gently rolling nature of the gardens would be retained. The western knoll would be retained, although it would be raised in height. The north berm would be altered by expanding the entrances, raising the berm, and installing an 18-inch retaining wall along Constitution Avenue and 17th Street. The primary impacts under this alternative would be the increased height of the topography and the potential for that to change to the integrity of setting and feeling of the landscape. Topographic features would not be altered as much as they would be under Alternative 1, but the change would affect the majority of Constitution Gardens. The rolling terrain that currently characterized the garden's topography would remain, though higher with the addition of 4–6 feet of soils in places. The changes to the topography are anticipated to have a moderate, adverse impact on the cultural landscape.

Under this alternative, trees would not be impacted as much as they would be under Alternative 1. Constitution Gardens would be a wooded park with a mixed, mature canopy of shade trees. Trees affected by construction would be removed or relocated and replaced with approximately the same number. Hundreds of trees in good and fair condition would be identified for protection in place. Trees in poor condition and some trees in fair condition would be removed, somewhat altering the tree massing and canopy. Trees would be replaced to approximately the existing number. Understory vegetation would be similar to that described for the No-action Alternative, with mowed lawn and some shrub and bulb planting. Although the trees would be replaced, they would not necessarily be replaced in kind and would take years to become established and achieve a similar feel to what is currently present. Therefore, these changes would result in a moderate, adverse impact on the cultural landscape.

The impacts of the removal of Overlook Terrace and the construction of a pavilion in its place would be the same under this alternative as under the Preferred Alternative. The topographic overlook would be removed, along with the honey locusts, and three terraces. Walks parallel to the stairs would be retained but altered, as would the diagonal walk from the northeast corner of Overlook Terrace. The below-grade access road to the pavilion with an entrance/exit on 17th Street NW would alter the topography. The addition of features and the removal of others would result in a permanent, moderate, adverse impact on

their integrity of location and introduce new features to the landscape that would alter the design and setting of the garden.

Under this alternative, the Lockkeeper's House would be relocated 500 feet to the southwest of its current location, a greater distance than in the other alternatives. This action would move it farther from away from the Washington City Canal, which removes an important aspect of the context for the structure, resulting in moderate, adverse impacts. The Washington City Canal Memorial Stone and Plaque currently associated with the structure would also be removed and relocated elsewhere. These changes would be permanent and have a minor, adverse effect on these elements of the cultural landscape.

Impacts on the refreshment kiosk would be the same as those described for the Preferred Alternative.

Impacts on the lake would be the same as those described for the Preferred Alternative.

Impacts on important views and vistas are anticipated to be the same under this alternative as under Alternative 1; however, the topography would be slightly lower and therefore the impacts may not be as great. The impacts on circulation would also be the same under this alternative as under Alternative 1.

There are several features of the cultural landscape that would not be impacted by this alternative. These include the Vietnam Veterans Memorial, the comfort station, the Three Servicemen Statue, and the Vietnam Women's Memorial.

Under this alternative the overall changes to the gardens (e.g., removal of important features, addition of new features, and changes in the setting and feeling of the garden) would result in negligible to moderate, adverse impacts on the cultural landscape. The end result of this alternative would be more in line with the SOM plan for the gardens than the No-action Alternative and therefore, it may be possible to minimize or mitigate the impacts of this alternative.

Impacts on all contributing features to the Constitution Gardens cultural landscape are shown in Table 4.4.

Table 4.4 – Impacts of Alternative 2 on Contributing Features of the Cultural Landscape

Landscape Characteristic	Contributing Feature	Change	Impact
Spatial organization	Border of trees	Street trees would remain and the gardens with its rolling terrain would be separated from the street by an 18-inch retaining wall; the border of lindens (south of the walk) could be removed since trees are not in good or fair condition	Minor
	Open central area	Open central area of the gardens would be retained	Minor
Topography	Flood control levee	No change from this project (USACE project in cumulative impacts discussion)	Not applicable
	Gentle slopes (man-made)	<ul style="list-style-type: none"> Smoothed, rolling surface Increased hill height 4–6 feet Maximum slopes 3:1 	Moderate

Landscape Characteristic	Contributing Feature	Change	Impact
	Plateau at Overlook Terrace (man-made)	Overlook function remains with new visitor services pavilion, overlook deck, and event terrace	Moderate
	Western knoll	Retained but height increased 4–6 feet, entrances expanded and an 18-inch retaining wall added along Constitution Avenue	Moderate (due to the widening of the berm at entrances and addition of the wall)
	North berm	Retained, but height increased by 4–6 feet tapering to an 18-inch retaining wall	Moderate
	Low central area occupied by lake	No change	Negligible
	Slope and cut at Vietnam Veterans Memorial	No change	Negligible
Land use <i>Note: Citizenship and other ceremonies will continue to occur throughout the National Mall.</i>	Passive recreation	No change	Negligible
	Visiting the memorials	No change	Negligible
	Ceremonies at the Vietnam Veterans Memorial	No change	Negligible
	Demonstrations	No change	Negligible
	Citizenship ceremony at the Overlook Terrace	Overlook Terrace would be replaced with a pavilion, ceremony could occur but would be in a different setting	Minor
	Catch and release fishing	No change	Negligible
Circulation	Overlook Terrace	Removed and replaced with a pavilion; overlook function remains with new visitor services pavilion	Moderate
	Loop walk around the lake	Path location would remain the same but it would be streamlined and widened from 14 feet to 20 feet along entire path	Minor
	Loop walk around west end and Vietnam Veterans Memorial	Path location would remain the same but it would be streamlined and widened from 14 feet to 20 feet along entire path	Minor
	Secondary walks over slopes	These paths would be reconstructed and in some cases streamlined with improved connection at intersections	Minor
	Walks parallel to stairs	Revised as part of pavilion plan	Minor

Landscape Characteristic	Contributing Feature	Change	Impact
	Diagonal walk, northeast corner of Overlook Terrace	Revised	Minor
	Walk south, Overlook Terrace to World War II Memorial	Alignment would be retained but the path would be widened to 20 feet	Minor
	Walk north, Overlook Terrace to Constitution Avenue	Alignment would be retained but the path would be widened to 20 feet	Minor
	Two sidewalks along Constitution Avenue	Retained, entrances to park expanded to 75 feet wide with two paths entering the garden, each 15 feet wide, instead of one	Minor
	Sidewalk along 17 th Street	No change	Negligible
Vegetation	Deciduous trees	Wooded park with a mixed, mature canopy of shade trees; remove or relocate trees affected by construction; identify hundreds of trees in good and fair condition to protect in place and healthy trees on-site or nearby; replace trees to approximate existing number	Moderate
	Honey locust trees at Overlook Terrace	Removed and replaced with a pavilion	Moderate
	Honey locust trees around refreshment terrace	Removed and replaced with a pavilion	Moderate
	Magnolias, Memorial to the 56 Signers of the Declaration of Independence	Preserved in place whenever possible	Minor
	Remnant plantings, Memorial to the 56 Signers of the Declaration of Independence	Remove	Minor to Moderate
	Street trees	Remain with few exceptions, separated from gardens by 18-inch wall	Moderate
	Lawns	Primarily lawn	Minor
Buildings and structures	Refreshment kiosk	Adaptively reused in place for operations or volunteers	Minor, Secretary of the Interior's Standards would be followed.
	Comfort station	No change (not within project area)	Negligible

Landscape Characteristic	Contributing Feature	Change	Impact
	Constitution Gardens Island	Shape would be retained; a perimeter path and second access path would be added; fishing would be allowed	Minor, Secretary of the Interior's Standards would be followed for the addition of the path
	Memorial to the 56 Signers of the Declaration of Independence	Memorial would be renovated and accessibility improved by adding a perimeter path and second access path	Minor, Secretary of the Interior's Standards would be followed for the addition of the path
	Lockkeeper's House	<ul style="list-style-type: none"> Relocated 500 feet west and a few feet south Existing building over a 500-SF lower story exposed on the south Rehabilitated Public use and interpretation 	Moderate
	Overlook Terrace and three terraces	Terrace removed, but overlook function retained	Moderate
	Vietnam Veterans Memorial	No change	Negligible
	Three Servicemen Memorial	No change	Negligible
	Vietnam Women's Memorial	No change	Negligible
Views and vistas	Vistas from park to Washington Monument	Altered by the inclusion of the pavilion, including views toward the Washington Monument and the monument's reflection in the lake	Moderate
	Vista from Vietnam Veterans Memorial to Washington Monument	May be altered by the raised topography within the garden	Negligible
	Views to reflecting pool area	No change	Negligible
	Vistas to Lincoln Memorial	No change	Negligible
	Views to buildings north of Constitution Avenue	Obscured from the gardens interior by the increased height of the northern berm	Moderate
	View from Virginia Avenue to Washington Monument	View would not be altered	Negligible
	Vistas to Vietnam Veterans Memorial	May be altered by the raised topography within the garden	Moderate
	Views from Overlook Terrace	Views would be altered by the construction of the pavilion, which would alter the vantage point, and the addition of the ring in the lake	Moderate

Landscape Characteristic	Contributing Feature	Change	Impact
	Internal views to lake	Internal views of the lake would be altered by the addition of the ring in the lake and the pavilion at the east end	Moderate
	Internal views to island	No change	Moderate
	Views to building on or near the Mall	Some views to the east may be altered by the addition of the pavilion	Moderate
Constructed water features	Constitution Gardens Lake	The shape of the island would be retained but a ring would be added to the east end; the lake would be excavated to 2–12 feet in depth and would have a non-concrete/natural bottom with a liner; no aquatic plants would be added	Moderate (primarily due to the addition of the ring at the end).
Small-scale features	Cast iron and wood-slat benches	Lighting, seating, tables and chairs, trash and recycling, etc. would be designed to complement the site context, be sustainable and easy to maintain	Minor, replaced with similar features (in-kind) and following Secretary of the Interior's Standards
	Lighting		
	Washington City Canal Memorial Stone, Plaque and Mounting Block	These would be relocated along with the Lockkeeper's House	Minor
	Vietnam Veterans Memorial flagpole, "In Memory" plaque, lighting fixtures and locators	No change	Negligible

Overall, the impacts from Alternative 2 on the contributing features, including changes to the topography, vegetation, buildings and structures, and views and vistas would result in moderate adverse impacts on the overall cultural landscape Constitution Gardens.

Cumulative Impacts

Cumulative impacts are the same as those described for the Preferred Alternative. Implementation of Alternative 2 would result in long-term, moderate, adverse impacts on the cultural landscape. The long-term, moderate, adverse impacts of this alternative, in combination with the long-term, beneficial and minor, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, moderate, adverse cumulative effect. Alternative 2 would result in a noticeable contribution to the adverse cumulative impact.

Conclusion

Implementation of Alternative 2 would result in negligible to moderate, adverse impacts (*adverse effects* under Section 106) to the contributing features of the cultural landscape due to the alteration of contributing elements of the cultural landscape, including topography, vegetation, buildings and structures, and views and vistas. The increase in the height of the topography, altered views and vistas,

relocation of the Lockkeeper's House, construction of the pavilion, and removal of trees and Overlook Terrace would result in impacts on its integrity of setting, resulting in moderate, adverse impacts to the cultural landscape of Constitution Gardens. Alternative 2 would provide a noticeable contribution to adverse cumulative impacts.

ARCHEOLOGICAL RESOURCES

Because archeological resources exist essentially in subsurface contexts, potential impacts on archeological resources are assessed according to the extent to which the proposed alternatives would involve ground-disturbing activities such as excavation or grading. The analysis of possible impacts on 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 study area for archeological resources encompasses the locations where ground disturbance would occur—the primary APE. The study area includes parkland currently in use as Constitution Gardens, a section of the 17th Street roadway, and a section of the Constitution Avenue roadway. The Vietnam Veterans Memorial is located outside of this area.

IMPACTS OF NO-ACTION ALTERNATIVE

Analysis

Because there would be no ground disturbance, there would be no impacts on archeological resources under this alternative.

Cumulative Impacts

The No-action Alternative would not impact archeological resources because no ground disturbance would occur. Therefore, there would be no cumulative impacts.

Conclusion

There would be no impacts on archeological resources under this alternative because no ground disturbance would occur. Additionally, no cumulative impacts are expected.

IMPACTS OF THE PREFERRED ALTERNATIVE: REGENERATIVE GARDEN

Analysis

The Preferred Alternative would have a long-term, moderate, adverse impact on archeological resources. Impacts on near-surface archeological resources are anticipated as a result of the topsoil rehabilitated within the project area. Soil remediation would be localized around trees that would be preserved in place and where new plantings are proposed. This disturbance would likely be restricted to the top 2 feet of soil but may extend farther in areas where large trees would be planted. While near-surface impacts would be comparatively minimal, there would still be deep impacts under this alternative. Deeper impacts (below 2 feet) would be anticipated (1) in areas where underground utilities would be installed, including cisterns, (2) at the proposed site of the Lockkeeper's House, (3) in the area surrounding the lake, and (4) in the area of the east end pavilion and pavilion access road. The Navy Administrative Building foundations would not be removed under the Preferred Alternative, but could be impacted by underground utility installation.

Given the deeper impacts, there is the potential for this alternative to have permanent, moderate, adverse impacts on archeological resources.

The NPS is currently completing preliminary archeological studies of the gardens. A Phase IA archeological investigation was conducted in November 2014 to determine the potential for archeological resources in the primary APE. Six soil cores, extending 25 feet below ground surface, were excavated along a 2,400-foot length of the gardens (Wagner 2014). The results of this investigation indicate that the early-mid-19th century landscape is present below modern fill; however, it was not possible to determine if buried soils are related to the Washington City Canal or to sediments along Tiber Creek.

The Phase IA investigation indicates that there are seven archeological sites within the primary APE. These sites include the former location of Lock B of the Washington City Canal (51NW235), remnants of the 17th Street Wharf (51NW232), the Lockkeeper's House deposits (51NW233), the outlet of the Tiber Creek Sewer (51NW234), potential deposits associated with the foundations of the Navy Administration Buildings, potential remains of the Washington City Canal prism and towpath, and potential remains of the Washington Brewery (Coningham and Company). Site 51NW235 has been determined eligible for listing in the National Register. The other recorded sites have not been evaluated for eligibility. Further archeological research would be needed to determine the exact nature of the impacts of this alternative on these resources. However, given the ground disturbance associated with this alternative and the high potential for the presence of archeological resources, it is likely that it would have an *adverse effect* on archeological resources under Section 106. These impacts would be mitigated through consultation with the appropriate parties and development of an agreement document (MOA).

Cumulative Impacts

Implementation of the Preferred Alternative would result in permanent, moderate, adverse impacts on archeological resources. Past, present, and reasonably foreseeable projects that have the potential to impact archeological resources include the Lincoln Memorial Reflecting Pool rehabilitation project, the Potomac Park levee project, and the National Mall turf and soil reconstruction project. Impacts from the Lincoln Memorial Reflecting Pool rehabilitation project have been previously studied and found to have minor, adverse impacts on archeological resources (LeeDecker 2012). Impacts from the Potomac Park levee project were also found to have minor, adverse impacts on archeological resources (LeeDecker 2013). A study of the National Mall turf and soil reconstruction project found it to have no impacts on archeological resources (LeeDecker and Wagner 2010; Wagner 2015). Taken cumulatively, these prior actions had minor, adverse impacts on archeological resources. The moderate, adverse impacts of this alternative, in combination with the permanent, minor, adverse impacts of past, present, and reasonably foreseeable future actions, would result in permanent, moderate, adverse cumulative effects. The moderate, adverse impacts of the Preferred Alternative would be a noticeable contribution to the adverse cumulative impact.

Conclusion

Implementation of the Preferred Alternative would result in permanent, moderate, adverse impacts (*adverse effects* under Section 106) on known and potential archeological resources present within the gardens. In particular, the deeper impacts associated with utility construction, the Lockkeeper's House relocation, lake improvements, and the east end pavilion construction have the potential for moderate impacts on Lock B of the Washington City Canal (51NW235), remnants of the 17th Street Wharf (51NW232), the Lockkeeper's House deposits (51NW233), and the outlet of the Tiber Creek Sewer (51NW234). There may be additional impacts on the Washington City Canal prism and towpath, the foundations of the Navy Administration Buildings, and the Washington Brewery (Coningham and Company). Given the potential for past, present, and reasonably foreseeable projects to impact archeological resources within the National Mall, there is the potential for the Preferred Alternative to have moderate cumulative impacts.

IMPACTS OF ALTERNATIVE 1: SUSTAINABLE GARDEN

Analysis

This alternative has the potential to have permanent, moderate, adverse impacts on the same seven archeological sites within the primary APE that would be affected by the Preferred Alternative.

The vast majority of topsoil present within the gardens would be removed and replaced under this alternative. The removal of the soils would potentially adversely impact intact deposits associated with all of the archeological sites. Deeper impacts (below topsoil) would be anticipated (1) in areas where underground utilities would be installed, including cisterns and tanks, (2) at the proposed site of the Lockkeeper's House, (3) at the area immediately surrounding the lake, (4) at the west end concession stand area, and (5) at the area of the east end pavilion. These deeper impacts also have the potential to impact archeological resources.

The results of the Phase IA investigation determined that additional archeological research within the gardens is necessary to determine the extent of impacts on canal resources and other archeological resources as a result of the proposed project.

Additionally, further archeological research would be needed to determine the exact nature of the impacts of Alternative 1 on archeological resources. However, given the ground disturbance associated with this alternative, and the high potential for the presence of archeological resources, it is likely that the alternative would have an *adverse effect* on archeological resources under Section 106. These impacts would be mitigated through consultation with the appropriate parties and development of an agreement document (MOA).

Cumulative Impacts

Implementation of Alternative 1 would result in permanent, moderate, adverse impacts on archeological resources. Past, present, and reasonably foreseeable projects that have the potential to impact archeological resources are the same as those listed for the Preferred Alternative, and would result in overall long-term, minor impacts on archeological resources. The moderate, adverse impacts of this alternative, in combination with the permanent, minor adverse impacts of past, present, and reasonably foreseeable future actions, would result in permanent, moderate, adverse cumulative effects. The moderate, adverse impacts of Alternative 1 would be a noticeable contribution to the adverse cumulative impact.

Conclusion

Implementation of Alternative 1 would result in permanent, moderate, adverse impacts (*adverse effects* under Section 106) on known and potential archeological resources present within the gardens. In particular, there is the potential for moderate impacts on Lock B of the Washington City Canal (51NW235), remnants of the 17th Street Wharf (51NW232), the Lockkeeper's House deposits (51NW233), and the outlet of the Tiber Creek Sewer (51NW234). There may be additional impacts on the Washington City Canal prism and towpath, the foundations of the Navy Administration Buildings, and the Washington Brewery (Coningham and Company). Past, present, and reasonably foreseeable projects would have minor adverse impacts on archeological resources within the National Mall. The moderate, adverse impacts of Alternative 1 would be a noticeable contribution to the adverse cumulative impact.

IMPACTS OF ALTERNATIVE 2: SOCIAL GARDEN

Analysis

This alternative would have a long-term, moderate, adverse impact on archeological resources. Impacts on near-surface archeological resources are anticipated to be less than those described for Alternative 1 because the topsoil would not be entirely removed from within the project area. Instead, soil remediation would be localized around trees that would be preserved in place and where new plantings are proposed.

This disturbance would likely be restricted to the top 2 feet of soil but may extend farther in areas where large trees would be planted. While near-surface impacts would be comparatively minimal, there would still be deep impacts under this alternative. Deeper impacts (below 2 feet) would be anticipated (1) in areas where underground utilities, including cisterns would be installed, (2) at the proposed site of the Lockkeeper's House, (3) in the area surrounding the lake, and (4) in the area of the east end pavilion and pavilion access road. The Navy Administrative Building foundations would not be removed under Alternative 2, but could be impacted by underground utility installation.

Given the deeper impacts, there is the potential for this alternative to have permanent, moderate, adverse impacts on archeological resources. As described in Alternative 1, the results of the Phase IA investigation indicate that there are seven archeological sites within the primary APE. Further archeological research would be needed to determine the exact nature of the impacts of this alternative on these resources. However, given the ground disturbance associated with this alternative and the high potential for the presence of archeological resources, it is likely that it would have an *adverse effect* on archeological resources under Section 106. These impacts would be mitigated through consultation with the appropriate parties and development of an agreement document.

Cumulative Impacts

Although less ground disturbance is proposed under Alternative 2 than under Alternative 1, the cumulative impacts would be the same as those described for Alternative 1.

Conclusion

Alternative 2 would result in permanent, moderate, adverse impacts (*adverse effects* under Section 106) on known and potential archeological resources present within the gardens. In particular, the deeper impacts associated with utility construction, the Lockkeeper's House relocation, lake improvements, and the east end pavilion construction have the potential for moderate impacts on Lock B of the Washington City Canal (51NW235), remnants of the 17th Street Wharf (51NW232), the Lockkeeper's House deposits (51NW233), and the outlet of the Tiber Creek Sewer (51NW234). There may be additional impacts on the Washington City Canal prism and towpath, the foundations of the Navy Administration Buildings, and the Washington Brewery (Coningham and Company). Given the potential for past, present, and reasonably foreseeable projects to impact archeological resources within the National Mall, there is the potential for Alternative 2 to have moderate cumulative impacts.

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 within Constitution Gardens between 17th \ Street NW and 21st Street NW.

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 have a noticeable effect on the visual character, views or vistas affiliated with the project area.

Minor: The proposed action would have a noticeable effect but would not alter the visual character, views, or vistas affiliated with the project area.

Moderate: The proposed action would alter but not to the point where the visual character, views, or vistas affiliated with the project area would no longer remain.

Major: The proposed action would alter the visual character, views, or vistas affiliated with the project area to the point where they would no longer be identifiable.

Beneficial: No levels of intensity for beneficial impacts are defined.

Duration: In the short-term, 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 NO-ACTION ALTERNATIVE

Analysis

Visual Character. Under the No-action Alternative, the visual resources of Constitution Gardens would not be rehabilitated and would remain in their current condition. The informal character comprised of gently rolling hills and mixed plantings of canopy trees with views and vistas of the surrounding landscape would remain. The quality of the elements composing the viewing experience is integral to the overall effect, and the deteriorated condition of the designed landscape counteracts the intended effect of the gardens as a manicured refinement of natural conditions. The unmanicured appearance of the plantings, pathways, lake, and visitor facilities undermines the aesthetic experience by making signs of failure the significant characteristic of the landscape.

Views and Vistas. The majority of views are not directly impacted by the condition of the gardens beyond the diminished aesthetic quality with the exception of those views and vistas that include the lake. The reflective surface of the lake is interrupted by mats of algae and occasionally covered with fish carcasses, which mars the effect of the lake's reflective surface. Under the No-action Alternative, these views would continue to be occasionally marred by algae and fish but would continue to contribute to the visual character of this informal area of the National Mall.

Implementation of the No-action Alternative would result in long-term, negligible, adverse impacts on the visual resources of Constitution Gardens.

Cumulative Impacts

Future implementation of the Potomac Park levee project would remove trees and other vegetation south of the lake in Constitution Gardens to meet standards but would replace the trees elsewhere. This action would result in both short- and long-term, minor, adverse impacts on the visual character of the National Mall and Constitution Gardens but negligible impacts on the views and vistas. Vegetation is the predominant element of the visual environment of Constitution Gardens and, therefore, impacts on visual resources from the Potomac Park levee project would be similar to impacts on vegetation. In the No-action Alternative, replacement of the vegetation would not occur as part of the rehabilitation of Constitution Gardens, resulting in long-term, moderate, adverse impacts on the visual resources of Constitution Gardens.

Past, present, and future implementation of the National Mall turf and soil reconstruction project would replace the existing soil, irrigation system, curbs, and gutters and implement turf management strategies. These actions would lead to temporary, adverse impacts on soils and vegetation during implementation actions. However, following completion, the actions would minimize damage to soils and turf and thereby enhance the appearance of the turf panels. There would be long-term, beneficial impacts on the visual resources of Constitution Gardens, specifically on the visual character of views from within the gardens to surrounding areas of West Potomac Park.

Past, present, and future implementation of the National Mall Plan would address cultural and natural resources, access, visitor use, safety, and operations throughout the National Mall. These actions would improve existing soils and vegetation, including trees and turf leading to an improved aesthetic quality and long-term, beneficial impacts on the visual resources of the National Mall but would not directly affect Constitution Gardens.

These past, present, and reasonably foreseeable future actions would result in the temporary removal of vegetation throughout the National Mall and within Constitution Gardens. The NPS would continue to prune trees and vegetation or remove hazardous and dead vegetation to improve the health of communities in Constitution Gardens, the National Mall, and other park areas resulting in short-term, minor, adverse or beneficial impacts on visual character depending on the action. However, following construction, these actions would replace lost vegetation and improve existing vegetation and soils. Turf and soil management strategies would improve the overall condition of the visual resource. Although there would be short-term, moderate, adverse impacts on visual resources during construction due to disturbance of vegetation, there would be long-term, beneficial impacts on visual resources from the improved vitality and aesthetic quality of plantings within and around Constitution Gardens.

The No-action Alternative would result in long-term, moderate, adverse impacts on visual resources. The impacts of the No-action Alternative, in combination with both the beneficial and moderate, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, beneficial cumulative effect. The No-action Alternative, however, would not contribute to this beneficial cumulative effect.

Conclusion

Although the essential visual character, views, and vistas would remain under the No-action Alternative, continuing impacts from the poor conditions of all of the elements contributing to the visual character, views, and vistas of the gardens would result in long-term, minor to moderate, adverse impacts on the visual resources within Constitution Gardens due to the degraded condition of the gardens. The No-action Alternative would have a noticeable adverse contribution to overall beneficial cumulative impacts on visual resources.

IMPACTS OF PREFERRED ALTERNATIVE: REGENERATIVE GARDEN

Analysis

Visual Character. Under the Preferred Alternative, the topography and plantings would be revised, affecting the visual resources of the gardens although not affecting the informal character of the site. Topography would be re-graded, changing some views into and out of the park, resulting in a minor to moderate, adverse impact depending on the location. The site's key elements of gently rolling terrain, informal plantings, and a man-made lake at the center and views and vistas would remain. Large specimen trees would be retained in place and trees removed would be replaced with better adapted species planted in better conditions and capable of achieving healthy, mature form and stature. Removal of the existing trees would result in a long-term, minor, adverse impact because there would be a noticeable alteration of the visual character of the gardens as well as noticeable alteration of all views and vistas. The duration of the adverse impact would be long-term but temporary; the replacement trees would require 10–20 years to achieve the size of the current plantings. The improved quality of the plantings would result in a long-term, beneficial impact on the visual resources of the gardens.

Under the Preferred Alternative, the deteriorated gravel-topped asphalt circulation paths and the trees and stumps set in the paths would be removed and walkways would be repaved. The more durable materials would result in an improved aesthetic quality and visual character of Constitution Gardens and would improve virtually all character-defining views and vistas. Construction of the lake ring circular walkway at the east end of the lake and the addition of an aquatic shelf around the lake perimeter would alter internal site views but would not change the overall visual character and would add visual resources in the

form of new features. Implementation of the Preferred Alternative would result in long-term, beneficial impacts on the visual resources of Constitution Gardens and long-term, minor adverse impacts on the character of the lake.

In this alternative, the Lockkeeper's House would be relocated a short distance (18 feet south and 5 feet west) from its current location and restored, resulting in both long-term, negligible to minor, adverse impacts due to the change to visual resources and long-term, beneficial impacts as a result of the improved quality of the facility.

Under the Preferred Alternative, the deteriorated west end concession stand, its ancillary features such as trash containers, and the deteriorated pavement and dead trees in its immediate setting would be adaptively reused, resulting in improved aesthetic quality and visual character. The design intent of the original park plan to provide visitors to the National Mall with enhanced services through the construction of a visitor pavilion at the east end of the lake would be realized, resulting in a significant improvement of the aesthetic quality of the garden. The construction of a visitor services pavilion would have a long-term, minor, adverse impact on visual character because it would change the visual character at the east end of the lake.

Under the Preferred Alternative, the quality of the aesthetic experience of the gardens would be improved, allowing the realization of the fundamental purpose of Constitution Gardens as a place of respite within the context of the National Mall. Implementation of Preferred Alternative would result in long-term, beneficial impacts on the visual resources of Constitution Gardens as well as negligible to minor, long-term, adverse impacts resulting from the impact on the tree canopy, alternation of the topography, and construction of a new pavilion.

Views and Vistas. Under the Preferred Alternative, views and vistas would be somewhat different as a result of facilities that are new, relocated, or removed, resulting in minor to moderate, adverse impacts. Views from Overlook Terrace would be altered by the construction of the pavilion, which would replace the vantage point with a building, overlook deck, and event terrace; however, the pavilion would remain an overlook site with long-term, beneficial impacts. Views of the lake and the island would be altered by the addition of the lake ring, which introduces an element not originally part of the lake.

The addition of several feet of soil to the north berm would change and alter some views into and out of the garden, resulting in long-term, minor to moderate, adverse impacts on the views and vistas, including views to and from the buildings across Constitution Avenue and views and vistas of the Washington Monument. The views into and out of the gardens from these vantage points would be retained at the termination of side streets, where the gardens' entrances would be widened. The construction of the pavilion at the eastern end of the lake would alter the vista from the gardens to the Washington Monument by including the pavilion in the vista from some locations. The addition of the visitor pavilion would introduce a new vista encompassing the lake, plantings, and pavilion as seen upon entry into the gardens from the Vietnam Veterans Memorial. Views to the Washington Monument would remain prominent from the Vietnam Veterans Memorial, from throughout the gardens, and from the pavilion and its event terrace.

The following views and vistas within the project area would be unchanged:

- Views to reflecting pool area
- Vistas to Lincoln Memorial
- Vistas to Vietnam Veterans Memorial

Views to buildings on or near the National Mall Cumulative Impacts

Impacts from past, present, and reasonably foreseeable projects would be the same as those described for the No-action Alternative. The Preferred Alternative would result in both beneficial and minor to

moderate, adverse impacts on visual resources. The impacts of the Preferred Alternative, in combination with both the beneficial and moderate, adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, beneficial cumulative impact and long-term, moderate, adverse impacts as a result of changes to topography and the tree canopy. The Preferred Alternative would be a small component of the beneficial cumulative effect.

Conclusion

Under the Preferred Alternative, the poor conditions of all of the elements contributing to the visual character, views, and vistas of the gardens would be improved, resulting in long-term, beneficial impacts on the visual resources within Constitution Gardens. There would be minor to moderate, long-term, adverse impacts resulting from changes to listed character-defining views and vistas, removal of trees, and alteration of the topography. The Preferred Alternative would have a minor contribution to overall beneficial cumulative impacts on visual resources.

IMPACTS OF ALTERNATIVE 1: SUSTAINABLE GARDEN

Analysis

Impacts on visual resources resulting from implementation of Alternative 1 would be the similar to those described for the Preferred Alternative, except Alternative 1 would result in a long-term, moderate adverse impact on the visual character and views and vistas because of a more pronounced accentuation of the topography (up to 10 feet) and the removal of the majority of trees.

Cumulative Impacts

Impacts from past, present, and reasonably foreseeable projects would be the same as those described under the No-action Alternative. Alternative 1 would result in both beneficial and minor to moderate, adverse impacts on visual resources. The impacts of Alternative 1, in combination with both the beneficial and moderate adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a long-term, beneficial cumulative effect. Alternative 1 would be a small component of the beneficial cumulative effect.

Conclusion

Under Alternative 1, the poor conditions of all of the elements contributing to the visual character, views, and vistas of the gardens would be improved, resulting in long-term, beneficial impacts on the visual resources within Constitution Gardens. There would be minor to moderate, long-term, adverse impacts resulting from changes to listed character-defining views and vistas the removal of trees, and the accentuation of the topography. Alternative 1 would have a minor contribution to overall beneficial cumulative impacts on visual resources.

IMPACTS OF ALTERNATIVE 2: SOCIAL GARDEN

Analysis

Impacts on visual resources resulting from implementation of Alternative 2 would be the similar to those described for the Preferred Alternative except that in this alternative, the Lockkeeper's House would be relocated 500 feet away from its present location. Although the Lockkeeper's House would retain its current orientation, its relocation would result in a moderate, long-term, adverse impact due to the lost context of its original location.

Cumulative Impacts

Impacts from past, present, and reasonably foreseeable projects would be the same as those described under the No-action Alternative. Alternative 2 would result in both beneficial and minor to moderate, adverse impacts on visual resources. The impacts of Alternative 2, in combination with both the beneficial and moderate, adverse impacts of other past, present, and reasonably foreseeable future actions,

would result in a long-term, beneficial cumulative effect. Alternative 2 would be a small component of the beneficial cumulative effect.

Conclusion

Under Alternative 2, the poor conditions of all of the elements contributing to the visual character, views, and vistas of the gardens would be improved, resulting in long-term, beneficial impacts on the visual resources within Constitution Gardens. There would be negligible to moderate, long-term, adverse impacts resulting from changes to listed character-defining views and vistas, the removal of trees, amplification of the topography, and relocation of the Lockkeeper's House. Alternative 2 would make a minor contribution to overall beneficial cumulative impacts on visual resources.

VISITOR USE AND EXPERIENCE AND SAFETY

Methodology and Assumptions

The impact analysis assesses the effects of the proposed alternatives on visitor use and experience in the project area that would be affected by the rehabilitation of Constitution Garden. The current uses of the area and the potential effects of the construction and implementation of the alternatives were considered. In addition, the activities and types of visitor use and experience that occur in the gardens that might be affected by the proposed actions, and the visual character of the area and noises experienced by the visitors were also considered.

The analysis of public safety considers risks to the general public, park employees, and volunteers and concessioners associated with the project area, as well as the proposed construction, maintenance, and implementation of new visitor facilities and programs. Impacts for this resource area were analyzed qualitatively, using information provided by the NPS.

Study Area

The proposed action would be located north of the Lincoln Memorial grounds bound by Constitution Avenue to the north, Henry Bacon Drive to the east, 17th Street to the west, and the Lincoln Memorial Reflecting Pool on the south. However, for this impact analysis, the study area for visitor use and experience and safety 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 impacts analysis.

Impact Thresholds

Impact thresholds are as follows:

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.

Beneficial: No levels of intensity for beneficial impacts are defined.

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

IMPACTS OF NO-ACTION ALTERNATIVE

Analysis

Under the No-action Alternative, visitor access, intensity of use, circulation, and programming would continue at existing levels. The gardens would continue to be used primarily by visitors to the National Mall, who are on their way between popular destinations such as the World War II Memorial, the Vietnam Veterans Memorial, and the Lincoln Memorial. Park programming in this area is very limited, and peak visitation would continue to occur on weekends.

Pedestrian Walkways. Under the No-action Alternative, the location, size, and condition of the gravel-topped asphalt circulation paths would remain unchanged, and access for visitors with disabilities would continue to be limited, contributing to the overall appearance of an area that is not worth visiting because the quality of the facilities are not commensurate with the overall value and public expectations for the National Mall. The width of walkways would not change, and the pedestrian guide system would remain in place. The Memorial to the 56 Signers of the Declaration of Independence would continue to be inaccessible to visitors with disabilities because of the steps leading to it. The continuing impact on pedestrian experiences would be long-term, moderate, and adverse in spite of a diverse array of walkways, pedestrian signs, and walking experiences.

Visitor Facilities. Few facilities are currently provided at Constitution Gardens. There is a small restroom and seasonal walk-up concession stand with no tables or chairs, although some benches are located nearby. Visitors to the gardens would continue to use the west end concession stand exclusively as a seasonal concession service, restricting visitor use during the off-season. Visitation to existing facilities would continue to be limited, and the visitor facilities at Constitution Gardens would remain an unpopular destination on the Mall. Although these facilities are called out on park maps, they would continue to remain inconvenient or not visible to visitors of the Mall, resulting in an ongoing minor to moderate impact.

Visitor Enjoyment and Education. Under the No-action Alternative, the Memorial to the 56 Signers of the Declaration of Independence would continue to remain out of the way and unknown to most visitors, and the Lockkeeper's House would remain closed to the public. The park would continue to provide no regular educational programming.

Park recreational activities would continue to be limited as a result of inadequate infrastructure—catch and release fishing is currently only possible from the edge of the lake, ice skating is only allowed when natural ice is deemed safe by NPS staff, and the Overlook Terrace is only available for passive activities. Ice skaters would continue to be subject to the risk of skating on natural ice, rather than on an officially constructed ice skating rink. The number of events and demonstrations that could take place would continue to be limited, and Constitution Gardens would remain off the beaten track without a strong identity. The continued lack of identity would result in moderate, adverse impacts on visitor enjoyment and education.

Visitor Health and Safety. Under the No-action Alternative there would be ongoing beneficial impacts from the visibility in and out of the site. However, there would be no protection from temperature or precipitation, resulting in a continuing minor, adverse impact on visitor health and safety. The ongoing emphasis on security and visibility following the events of 9/11 would result in a beneficial impact on visitor health and safety. In addition, access for emergency vehicles would be limited to the one access point that would require the vehicle to jump the curb, which would further result in minor, adverse impacts on visitor health and safety.

Cumulative Impacts

A number of past, present, and reasonably foreseeable future projects would create or improve visitor attractions in the area, such as memorials and museums (the National Museum of African American History and Culture, the Martin Luther King, Jr. Memorial, the Dwight D. Eisenhower Memorial, the American Veterans Disabled for Life Memorial, the Vietnam Veterans Memorial Center, and the National Museum of the American Latino), visitor concession stands (near the Lincoln Memorial), and civic infrastructure improvements to roads, bridges, and the reflecting pool. As a result of increased programming surrounding the project area, there would be long-term, beneficial, cumulative impacts on visitor use, experience, and safety. During the construction phase of the surrounding developments there would likely be short-term, adverse impacts. However, these impacts would be nullified by the increase in developments and attractions in the area providing steady or increased visitation.

The National Mall Plan vision for visitor experiences includes improvements to visitor facilities and experiences; improvements to the appearance and quality of park resources; increased variety and diversity of recreational, enjoyment, and educational opportunities; the creation of venues that can sustainably accommodate a variety of events; the rehabilitation of Constitution Gardens and other areas to provide attractive convenient visitor services and facilities; and improved multi-modal transportation such as the new circulator, which would provide lower cost frequent visitor transportation on the National Mall with a stop near the Lockkeeper's House. In addition, Bikeshare stations have been installed throughout the National Mall; the Lincoln Bikeshare station is the most heavily used site in the city, providing visitors with diversified transportation options.

Cumulative impacts on safety would occur as a result of the ongoing upgrades to security measures at the Washington Monument security screening, the Smithsonian National Museum of American History, and the Smithsonian National Museum of Natural History. Ongoing general emphasis on security post-9/11 would result in increased security and policing in the area, which would provide a safer environment for visitors. As a result of the increased safety surrounding Constitution Gardens, there would be long-term, beneficial, cumulative impacts on visitor use and experience and safety.

As a result of the increased amenities, enhanced visual aesthetics, and improved circulation surrounding Constitution Gardens, impacts from cumulative actions on visitor use and experience and safety would long-term and beneficial. The No-action Alternative would result in in long-term, minor to moderate, adverse impacts on visitor use and experience and safety. When combined with long-term, beneficial impacts from cumulative actions, the No-action Alternative would have a slight adverse contribution to overall beneficial, cumulative impacts on visitor use and experience and safety.

Conclusion

The No-action Alternative generally would result in a long-term, minor to moderate, adverse impact on visitor experience, use, and safety as a result of less than desirable pedestrian experiences, limited opportunities for enjoyment and education, a continued lack of identity, and limited visitor facilities due to its effect on many users of the gardens. There would also be continued beneficial impacts on visitor health and safety from the high visibility in and out of the site. As a result of the increased amenities, enhanced visual aesthetics, and improved circulation surrounding Constitution Gardens, impacts from cumulative actions on visitor use and experience and safety would long-term and beneficial. When combined with long-term, beneficial impacts from cumulative actions, the No-action Alternative would have a slight adverse contribution to overall beneficial, cumulative impacts on visitor use and experience and safety.

IMPACTS OF THE PREFERRED ALTERNATIVE: REGENERATIVE GARDEN*Analysis*

Under the Preferred Alternative, rehabilitation of Constitution Gardens would maximize sustainable approaches while simultaneously providing visitors services. The Preferred Alternative focuses on improving access, visitor services, education, recreation, and entertainment by providing high-quality, flexible spaces that offer seasonally different experiences. Additional advantages to the Preferred Alternative include improved access to the lake ring, the addition of a lawn amphitheater, and more lake edge fishing opportunities. In this alternative, the Lockkeeper's House would be closer to the primary entrance and would serve as a location for visitor education, and the lake would provide somewhat different fishing opportunities due to more aquatic shelf. It is expected there would be short-term, minor to moderate, adverse impacts on visitor use due to the closure of the gardens during construction.

Pedestrian Walkways. Under the Preferred Alternative, the surfaces of pedestrian walkways would be improved and the walkways would be widened, which would increase accessible routes to attractions and enhance walkways, resulting in long-term, beneficial impacts. In addition, there would be beneficial impacts from the additional access to the Memorial to the 56 Signers of the Declaration of Independence island. These improvements would result in a long-term, beneficial impact on visitor experience.

Visitor Facilities. Under the Preferred Alternative, the Lockkeeper's House would provide education and visitor information and would be relocated 18 feet south and 5 feet west, away from the intersection to a more convenient location. A multi-purpose pavilion would be constructed with a restaurant/bar, refreshment stand, restrooms, retail/bookstore, and recreational rental in the place of the west end concession stand. The west end concession stand would be adaptively reused for park operations. These additions would provide needed and desirable visitor facilities in a convenient and accessible location that would be visible from the entrance points providing a long-term, beneficial impact. As a result of improved services and facilities and the existing west end restrooms, there would be a long-term, beneficial impact on visitor experience.

Visitor Enjoyment and Education. Under the Preferred Alternative, impacts on visitor enjoyment and education at the gardens include increased visibility of the Memorial to the 56 Signers of the Declaration of Independence, increased educational and ranger programming, vigil sites, increased recreation and equipment rentals, and the addition of a lake ring for skating and model boating. Under this alternative, an additional access point would be added to the Memorial to the 56 Signers of the Declaration of Independence island, which would provide a long-term, beneficial impact for visitors by providing increased accessibility. There would also be a stepping stone path connecting the northwestern portion of the island. In addition a lawn amphitheater would be constructed, as well as an event plaza, and several spaces for activities and performances. The addition of these amenities and improvements would create a stronger identity for Constitution Gardens. Additional improvements to fishing and a more conveniently located Lockkeeper's House for visitor information would provide a long-term, beneficial impact. As a result of these improvements, enjoyment and education opportunities would be improved, and there would be long-term, beneficial impacts on visitor experience.

Visitor Health and Safety. Additional pedestrian lighting and the addition of facilities, such as the pavilion and the Lockkeeper's House would increase safety for visitors and result in long-term, beneficial impacts. Below grade delivery and operational access to the pavilion also would increase safety. In addition, under the Preferred Alternative, access points to the Memorial to the 56 Signers of the Declaration of Independence island and water ring would be increased, which also would have beneficial impacts on visitor health and safety. The addition of a stepping stone pathway to the island may create tripping/slipping hazards and would not be universally accessible, which could result in long-term, negligible to minor, adverse impacts to health and safety. To mitigate this, non-slip stones would be used, and signage would be installed explaining the possible hazards, and informing visitors about alternate access points.

The amplified topography would negatively affect visitors' safety by decreasing views in and out of the site, although not as much as it would under Alternatives 1 and 2. This would result in a negligible to minor, adverse impact on visitor health and safety. Overall, visitor health and safety would experience long-term, beneficial impacts.

Cumulative Impacts

Cumulative impacts from other actions and projects would be the same as those described under the No-action Alternative, resulting in long-term, beneficial impacts from increased visitation surrounding the project area as well as the increased safety measures, amenities, and access in the vicinity of Constitution Gardens. When combined with long-term, beneficial impacts from cumulative actions, the Preferred Alternative would have a noticeable beneficial contribution to overall beneficial cumulative impacts on visitor use and experience and safety.

Conclusion

The Preferred Alternative generally would result in a long-term, beneficial impact on visitor experience due to improved pedestrian experiences, additional opportunities for enjoyment and education, a strong identity, improved visitor facilities, more convenient locations, and increased visibility and visitor safety, all of which would increase visitation at the gardens. There would also be short-term, moderate, adverse impacts on visitor use and experience as a result of the closure of the gardens during construction. There would be overall beneficial impacts to visitor safety; however, the addition of the stepping stones could create the potential for slips and falls resulting in long-term, negligible to minor, adverse impacts. As a result of the increased amenities, enhanced visual aesthetics, and improved circulation surrounding Constitution Gardens, impacts from cumulative actions on visitor use and experience and safety would long-term and beneficial. When combined with long-term, beneficial impacts from cumulative actions, the No-action Alternative would have a noticeable beneficial contribution to overall beneficial, cumulative impacts on visitor use and experience and safety.

IMPACTS OF ALTERNATIVE 1: SUSTAINABLE GARDEN

Analysis

Under Alternative 1, the Lockkeeper's House would be adaptively reused for visitor education, and a multi-purpose visitor facility would provide a wide range of visitor services, including restrooms, food services, book/retail stores, and seasonal recreational rentals such as fishing poles, ice skates, and model boats. The gardens would provide more visual interest and improved walking experiences. The facilities would be designed to maximize sustainability and related education would be emphasized.

Pedestrian Walkways. Under Alternative 1, the deteriorated gravel-topped asphalt circulation paths would be replaced and the circulation system would be slightly redesigned to improve the pedestrian walking experience; obstacles such as trees and stumps set in the paths would be removed, and heaved pavement would be replaced, providing a safer walkway for those pedestrians circulating through the gardens and enhancing visual aesthetics. The path alignment would be revised from the west of the knoll into Constitution Gardens and to the surrounding areas. The addition of raised 30-inch retaining walls and dual entry points at the retaining walls would define entries, emphasize the gateway, and provide better access and circulation in and out of the gardens. These actions would improve circulation throughout the gardens by providing visitors with clear pathways to all attractions and areas available for recreation activities. The width of major walkways would be increased throughout the gardens to 20 feet, creating a more inviting space and providing visitors with a better flow for pedestrian traffic. However, some walkways would remain 8 feet wide, and would not efficiently accommodate multiple uses such as bicycling, walking, jogging, groups, maintenance, or emergency vehicles. The National Mall has a long history illustrating how narrow walks result in obliterated landscapes adjacent to walkways of this width. The impact of narrow walkways would be moderate, adverse, and long-term since it would be readily apparent and affect visitors. However, a pedestrian guide system via signage would be provided and as a

result, there would also be a long-term, beneficial impact. The improved walk surfacing and accessibility, increased access and connections to attractions, and a sense of arrival or gateway together with the pedestrian guide system would result in a long-term, beneficial impact on pedestrian walkways, and therefore visitor experience, at the gardens.

Visitor Facilities. Under Alternative 1, the Lockkeeper's House would provide education and visitor information, and a multi-purpose pavilion would be constructed with a restaurant/bar, refreshment stand, restrooms, retail/bookstore, and recreational rentals. The services provided at the pavilion would replace the services currently provided at west end concession stand, which would be removed under this alternative. These additions would provide needed and desirable visitor facilities in a convenient accessible location visible from entries to the gardens and would consolidate services and amenities, providing a long-term, beneficial impact. As a result of improved services and facilities and the existing west end restrooms, there would be a long-term, beneficial impact on visitor experience.

Visitor Enjoyment and Education. Under Alternative 1, the Lockkeeper's House would be relocated 18 feet and 5 feet west of its current location and would include an exterior exhibits area. The house would provide separation from road noise on the related educational plaza, while remaining clearly visible. The Lockkeeper's House would also offer more opportunities for the public to learn about local history in a historic house and related educational plaza.

Under this alternative, the Memorial to the 56 Signers of the Declaration of Independence would be made more accessible and visible to provide more opportunities for visitors to celebrate and learn about the founding fathers. In the plaza area, a new pavilion would act as a visible, multi-purpose destination that would provide a range of foodservice options in an enjoyable park setting as well as seasonal recreation centered around the lake and lake ring at the east end of the lake. Visitors of all ages and ability levels would be able to enjoy watching fish and birds, experiencing meadow and garden plantings, fishing, sailing model boats or ice skating. Informal gathering spaces such as the grand staircase and paved spaces or plaza adjacent to the pavilion or near walk intersections would be used for events, educational programming, or performances. Fishing opportunities for beginners would be somewhat limited by the 15-foot-wide aquatic shelf around the entire lake. These additions to the gardens would provide visitors with increased park amenities thus enhancing the visitor experience and increasing visitation. Overall, a stronger visual identity for the gardens would be enhanced by a perimeter wall, entry points, signage, and visitor facility improvements. As a result, there would be long-term, beneficial impacts on visitor enjoyment and education.

Visitor Health and Safety. The construction of the pavilion would improve visitor health and safety by offering some opportunities to take shelter from precipitation and temperature extremes in a climate-controlled environment. However, the area of the pavilion that is open would not provide protection in the form of shade or shelter from precipitation, and would require additional maintenance to keep the stairs clear and safe resulting in a long-term, moderate, adverse effect on visitor health and safety. The Lockkeeper's House would protect visitors from outside temperatures or precipitation in form of shade or shelter from precipitation; however, the beneficial impacts would be a negligible due to the small size of the house.

The knoll separating the gardens from the Vietnam Veterans Memorial would not have additional light fixtures to retain and protect night views to the Washington Monument, but sufficient ambient lighting and openness of the area would provide beneficial impacts on visitor safety. As a result of the sufficient lighting and locations for weather relief, there would be a long-term, beneficial impact on visitor health and safety. However, beneficial impacts of the pavilion would be reduced by the safety and security concerns of taller berms limiting the ability to see in and out of the gardens.

Visibility is a key component of safety, therefore blocked views into the area would leave visitors vulnerable to crime. Due to the 10-foot berms proposed under Alternative 1, the Crime Prevention through Environmental Design principles do not apply. This also relates to the single entrance point to the

Memorial to the 56 Signers of the Declaration of Independence island, the limited number of access points would also result in an adverse effect on visitor safety. As a result, visitor safety could be adversely affected, and there would be a moderate, adverse impact on visitor health and safety, thus reducing the beneficial impacts from the pavilion, the Lockkeeper's House, and the additional lighting.

Cumulative Impacts

Impacts from other actions and projects in the project area would be the same as those described under the No-action Alternative. As a result, there would be long-term, beneficial impacts from increased visitation surrounding the project area due to future developments that create or improve visitor attractions in the area such as memorials and museums, visitor concession stands, and civic infrastructure improvements to roads, bridges, and the reflecting pool. In addition, there would be increased safety measures and amenities due to increased emphasis on security post 9/11, and access in the area around Constitution Gardens. Alternative 1 would result in short-term, minor, adverse and long-term, beneficial impacts on visitor use and experience and safety. When combined with long-term beneficial impacts from cumulative actions, Alternative 1 would have a slight adverse and noticeable beneficial contribution to overall beneficial cumulative impacts on visitor use and experience and safety.

Conclusion

Alternative 1 generally would result in a long-term, beneficial impact on visitor experience, use, and safety as a result of improved pedestrian experiences, additional opportunities for enjoyment and education, a strong identity, improved visitor facilities, and increased lighting—all of which would increase visitation at the gardens. In addition to the beneficial impacts, however, there would be moderate, adverse impacts on visitor experience, use, and safety as a result of the remaining 8-foot-wide sidewalks that create constricted pedestrian conditions and the raised topography that would put visitors at risk due to the lack of visibility in and out of the site. There would also be short-term, moderate, adverse impacts on visitor experience, use, and safety as a result of the closure of the gardens during construction. Overall beneficial impacts to visitor safety would result from the improved access points to the Memorial to the 56 Signers of the Declaration of Independence. As a result of the increased amenities, enhanced visual aesthetics, and improved circulation surrounding Constitution Gardens, impacts from cumulative actions on visitor experience, use, and safety would long-term and beneficial. When combined with long-term beneficial impacts from cumulative actions, Alternative 1 would have a slight adverse and noticeable beneficial contribution to overall beneficial cumulative impacts on visitor use and experience and safety.

IMPACTS OF ALTERNATIVE 2: SOCIAL GARDEN

Analysis

Under Alternative 2, improvements to the facilities, identity, and recreational opportunities available at Constitution Gardens would be similar to those described for Alternative 1. Alternative 2 focuses on improving access and visitor services, education, recreation, and entertainment by providing high-quality, flexible spaces that offer seasonally different experiences. Additional advantages to Alternative 2 that do not exist under the Alternative 1 include additional access to the Memorial to the 56 Signers of the Declaration of Independence, the addition of a lawn amphitheater, and more lake edge fishing opportunities. It is expected there would be short-term, minor to moderate, adverse impacts on visitor use due to the closure of the gardens during construction.

Pedestrian Walkways. Under Alternative 2, impacts on visitor pedestrian experience would be similar to those described for Alternative 1 with regard to increased accessible routes to attractions, enhanced walkways, and increased width of walkways; however, there also would be beneficial impacts from additional access to points on the Memorial to the 56 Signers of the Declaration of Independence island. Under this alternative, additional walkways would be increased from 8 feet wide to 10 to 15 feet wide—wide enough to accommodate multiple uses—which would benefit visitors circulating through the gardens. There would also be a stepping stone path connecting the northwestern portion of the island. In

addition, the perimeter walls would be 18 inches high, which would allow better visibility in and out of the site, also providing long-term, beneficial impacts.

Visitor Facilities. Under Alternative 2, the Lockkeeper's House would be located farther away from other facilities, which would result in a long-term, minor to moderate, adverse impact due to lack of convenience for visitors. However, there would be a walkout lower level with restrooms and an additional room for educational activities. The convenience and additional programming resulting from this change would result in a beneficial impact on visitors. In addition, the west end concession stand would remain, but would no longer be utilized for visitor use. The concession stand would be maintained for park management use and the services provided by the west end concession stand would be replaced by the newly constructed pavilion, which would provide even more amenities for users and result in a beneficial impact.

Visitor Enjoyment and Education. Under Alternative 2, impacts on visitor enjoyment and education would be similar to those described for Alternative 1 with regard to the visibility of the Memorial to the 56 Signers of the Declaration of Independence, increased educational and ranger programming, vigil sites, and increased recreational and equipment rentals. Under this alternative, an additional access point would be added to the Memorial to the 56 Signers of the Declaration of Independence island, which would provide a long-term, beneficial impact for visitors by providing increased convenience. In addition, a lawn amphitheater would be constructed, as well as an event plaza and several spaces for activities and performances would be provided. The addition of these amenities and improvements would create a stronger identity similar to Alternative 1. As a result of the stronger identity and facility improvements, enjoyment and educational opportunities would be improved, and there would be long-term, beneficial impacts on visitor experience. These impacts would be even greater than those that would be experienced under Alternative 1 because of addition of the lawn amphitheater and event performance space.

Visitor Health and Safety. Impacts on visitor health and safety would be similar to those described for Alternative 1. Although the topography would be amplified to a lesser extent under Alternative 2, height would still remain a safety concern and as a result there would be a long-term, moderate, adverse impact on visitor health and safety. Additionally, below grade delivery and operational access to the Pavilion will increase safety. Lastly, there would be overall beneficial impacts to visitor safety from the improved access points to the Memorial to the 56 Signers of the Declaration of Independence; however, the addition of the stepping stones could create the potential for slips and falls resulting in long-term, negligible to minor, adverse impacts.

Cumulative Impacts

Cumulative impacts from other actions and projects would be the same as those described under the No-action Alternative. As a result, there would be long-term, beneficial impacts from increased visitation surrounding the project area due to future developments that create or improve visitor attractions in the area such as memorials and museums, visitor concession stands, and civic infrastructure improvements to roads, bridges, and the reflecting pool. In addition, there would be increased safety measures as a result of the increased emphasis on security post 9/11, including increased access for emergency vehicles in the area around Constitution Gardens. When combined with long-term, beneficial impacts from cumulative actions, Alternative 2 would have a slight adverse and noticeable beneficial contribution to overall beneficial, cumulative impacts on visitor use and experience and safety.

Conclusion

The long-term, beneficial impact on visitor experience, use, and safety association with Alternative 2 would be greater than the impact associated with Alternative 1 because of improved pedestrian experiences, additional opportunities for enjoyment and education (the amphitheater and increased opportunities to fish), additional park operations in the Lockkeeper's House, increased access to the Memorial to the 56 Signers of the Declaration of Independence island, a strong identity, improved visitor

facilities, and increased visibility and visitor safety, all of which would increase visitation at the gardens. However, there would be long-term, moderate adverse impacts on visitor experience, use, and safety similar to Alternative 1 because of the amplified topography. In addition, visitor experience, use, and safety would experience short-term, moderate, adverse impacts due to the closure of the gardens during construction. There would also be overall beneficial impacts to visitor safety from the improved access points to the Memorial to the 56 Signers of the Declaration of Independence; however, the addition of the stepping stones could create the potential for slips and falls resulting in long-term, negligible to minor, adverse impacts. As a result of the increased amenities, enhanced visual aesthetics, and improved circulation surrounding Constitution Gardens, impacts from cumulative actions on visitor use and experience and safety would long-term and beneficial. When combined with long-term beneficial impacts from cumulative actions, Alternative 2 would have a slight adverse and noticeable beneficial contribution to overall beneficial cumulative impacts on visitor use and experience and safety.

TRAFFIC AND CIRCULATION

Methodology and Assumptions

Potential impacts on transportation systems were derived from data gathered from various sources, including DDOT and the NPS. The data included historical traffic volumes; crash data; completed, ongoing, and reasonably foreseeable transportation and resource management projects at Constitution Gardens and in the surrounding region; physical road characteristics; and operational road characteristics. All alternatives were quantitatively evaluated in detail based on the data provided. Each alternative was also evaluated considering the cumulative impacts of the proposed action plus other past, present, and reasonably foreseeable future actions. The impacts on the ability of emergency service vehicles (police and fire) to maintain current operational status and response times were also examined.

Study Area

The study area for transportation is focused on Constitution Avenue NW between Henry Bacon Drive NW and 17th Street NW and 17th Street between Constitution Avenue NW and Independence Avenue SW.

Impact Thresholds

The following thresholds were used to determine the magnitude of effects on local traffic and transportation networks and pedestrian circulation:

Negligible: The impact would be a change that would not be perceptible or would be barely perceptible by most motorists or pedestrians.

Minor: The impact would have an adverse or beneficial change to congestion levels and safety. The effect would be noticeable, but would result in little inconvenience to motorists or pedestrians.

Moderate: The impact would affect the travel time of a large number of motorists and would result in a noticeable change in congestion levels or safety to motorists or pedestrians.

Major: The impact would have a substantial effect on the travel time of a large number of motorists, and would be highly noticeable and have a considerable effect on congestion levels and safety to the extent that the use of arterial roads near Constitution Gardens would be undesirable to motorists or to pedestrian circulation.

Beneficial: No levels of intensity for beneficial impacts are defined.

Duration: Short-term impacts would occur during all or part of alternative implementation; long-term impacts would extend beyond the implementation of the alternative.

IMPACTS OF NO-ACTION ALTERNATIVE

Analysis

Under the No-action Alternative, the existing intersection geometry (eastbound curb radius) would continue to affect the efficient movement of two, large vehicles attempting to turn right at the same time from Constitution Avenue NW eastbound to 17th Street NW southbound. Large vehicles such as tour buses would continue to either drive over the curb or require the 17th Street NW northbound vehicles to yield and allow large vehicles to use the left northbound travel lane to complete the turn. Because of its location near visitor destinations, this intersection sees a great deal of tour and sightseeing bus traffic. The intersection would continue to operate at LOS D during the AM peak hour and LOS C during the PM peak hour and therefore the impact on traffic and circulation would continue to be moderate and adverse.

Pedestrian crossings would remain the same—providing 49.5 seconds to cross Constitution Avenue NW and 50.5 seconds to cross 17th Street NW, matching the total time allotted for the traffic signal to serve both roadways. DDOT is currently reviewing all traffic signal timings in its network, and plans to make subsequent adjustments if necessary. If the traffic signal were to be adjusted, the minimum pedestrian time to cross Constitution Avenue NW would be 33.5 seconds, and the minimum pedestrian time to cross 17th Street NW would be 25 seconds.

Delivery and emergency accesses to Constitution Gardens would continue to occur by vehicles jumping the curb along Constitution Avenue NW and 17th Street NW to access various locations in the gardens. Because these locations are not clearly identified as vehicular access points, other vehicular traffic would continue to be taken unaware, affecting traffic flow and safety. This activity would continue to result in minor, adverse impacts on service access, deliveries, and emergency access.

While the conditions would remain unchanged with negligible, long-term, adverse impacts on intersection signals and pedestrian safety, the existing curb radius along the Constitution Avenue NW and 17th Street NW southwestern corner would continue to result in a long-term, moderate, adverse impact on Constitution Avenue NW eastbound turning at the only intersection in the area with LOS D. Emergency and delivery access would continue to experience long-term, minor, adverse impacts caused by jumping the curb to enter Constitution Gardens and long-term, minor, adverse impacts on traffic operations and pedestrian safety at the point where delivery and emergency vehicles chose to enter Constitution Avenue NW or 17th Street NW. While there are some minor, adverse impacts on traffic operations and pedestrian safety, there would be overall continuing long-term, moderate, adverse impacts due to the moderate, adverse impacts of congestion at the intersection of Constitution Avenue NW and 17th Street NW (at LOS D), the turning issues experienced by large vehicles at this same intersection, and the ongoing minor, adverse impact of having no planned access to Constitution Gardens for deliveries and maintenance.

Cumulative Impacts

The National Mall Plan vision for multi-modal improved transportation and the planned new DC Circulator route will provide improved access for visitors wishing to visit the National Mall. The DC Circulator is planned to have a bus stop near Constitution Avenue NW and 18th Street NW that will connect visitors to other transit options such as the Metro and Union Station. The Circulator could likely make it easier to visit the area using low cost transit, with the addition of a route catered towards visitors to the National Mall. Parking meters are being installed along the National Mall and include Constitution Avenue NW, which will limit parking duration and allow more visitor access to the National Mall. Capital Bikeshare stations that have been installed on the National Mall have resulted in greater use of bicycles as highlighted by Lincoln Station, which has the highest use in the city. Additional Bikeshare stations are expected to be added in the vicinity of the World War II Memorial. It is also likely that valet parking may become available in the future for events or for those going to the pavilion. Additionally,

tour bus drop offs could use Constitution Gardens' visitor facilities. All of these improvements would likely attract more visitors and directly benefit the gardens area as would Constitution Avenue NW street improvements and civil infrastructure improvements to roads, walks, and bridges within the National Mall.

Other past, present, or reasonably foreseeable future projects would create or improve visitor attractions such as memorials and museums and visitor facilities or would have long-term, beneficial impacts in terms of further drawing tourism to this area with a high number of visitor attractions. Visitor attractions may also increase vehicles along Constitution Avenue NW and 17th Street NW and may cause long-term, minor, adverse impacts on intersection operations surrounding the gardens.

The No-action Alternative would result in long-term, moderate, adverse impacts. When combined with the long-term, beneficial impacts from cumulative actions, the No-action Alternative would have a slight adverse contribution to overall minor, adverse cumulative impacts on circulation.

Conclusion

Under the No-action Alternative, in spite of the multimodal transportation cumulative benefits, two large vehicles attempting to turn right from Constitution Avenue NW eastbound to 17th Street NW southbound at the same time would continue to impact the 17th Street NW northbound vehicles by requiring use of the northbound lane to complete their turns or running over the southwestern corner of the intersection, increasing congestion and resulting in long-term, moderate, adverse impacts. Delivery and emergency vehicle access would continue to result in long-term, minor, adverse impacts because access would be provided at any available existing walkway. When combined with the long-term, beneficial impacts from cumulative actions, the No-action Alternative would have a slight adverse contribution to overall minor, adverse cumulative impacts on circulation.

IMPACTS OF THE PREFERRED ALTERNATIVE: REGENERATIVE GARDEN

Analysis

Because the final design for the curb radius would be completed at a later date, this analysis provides a range of results to evaluate. If the curb radius is increased to 100 feet, the all-red interval would require adjustment for two of the four intersection approaches and would change the LOS for the intersection for both the AM and PM peak hour. The AM peak hour LOS would change from a control delay of 45.9 to 48.7, both LOS D. The PM peak hour LOS would change from LOS C (control delay of 34.9) to LOS D (control delay of 35.7). The maximum queue lengths would not increase more than 5 feet as a result of the change in the all-red interval. However the changed curb radius would allow for two large vehicles such as tour buses to turn at the same time from Constitution Avenue NW eastbound to 17th Street NW southbound in a more efficient manner, thus improving the operation of the intersection to a better LOS than reported above.

For this analysis, the study assumes a range between 50 to 100 feet at the southwestern corner of the intersection at Constitution Avenue NW at 17th Street NW. The increase in the radius would require the existing 17th Street NW northbound approach and Constitution Avenue NW eastbound approach pedestrian crossings to be shifted to connect the new curb location to the existing curbs on the far sides of the street. The change in curb radius would require lengthening the pedestrian crossing between 6 to 17 feet along the Constitution Avenue NW eastbound approach and between 9 to 29 feet along the 17th Street NW northbound approach. Figure 4.2 illustrates an example of a 100-foot radius

To accommodate the increased walking distance for pedestrians to safely cross these two shifted crosswalks, the existing traffic signal pedestrian interval timings would also require adjustment. DDOT regulations stipulate that the pedestrian walk sign must be illuminated for a minimum of 7 seconds. Based on DDOT's formula for calculating the minimum walk interval time, both approaches would require 7 seconds. Once the Flashing Don't Walk sign illuminates, there must be enough interval time allotted to

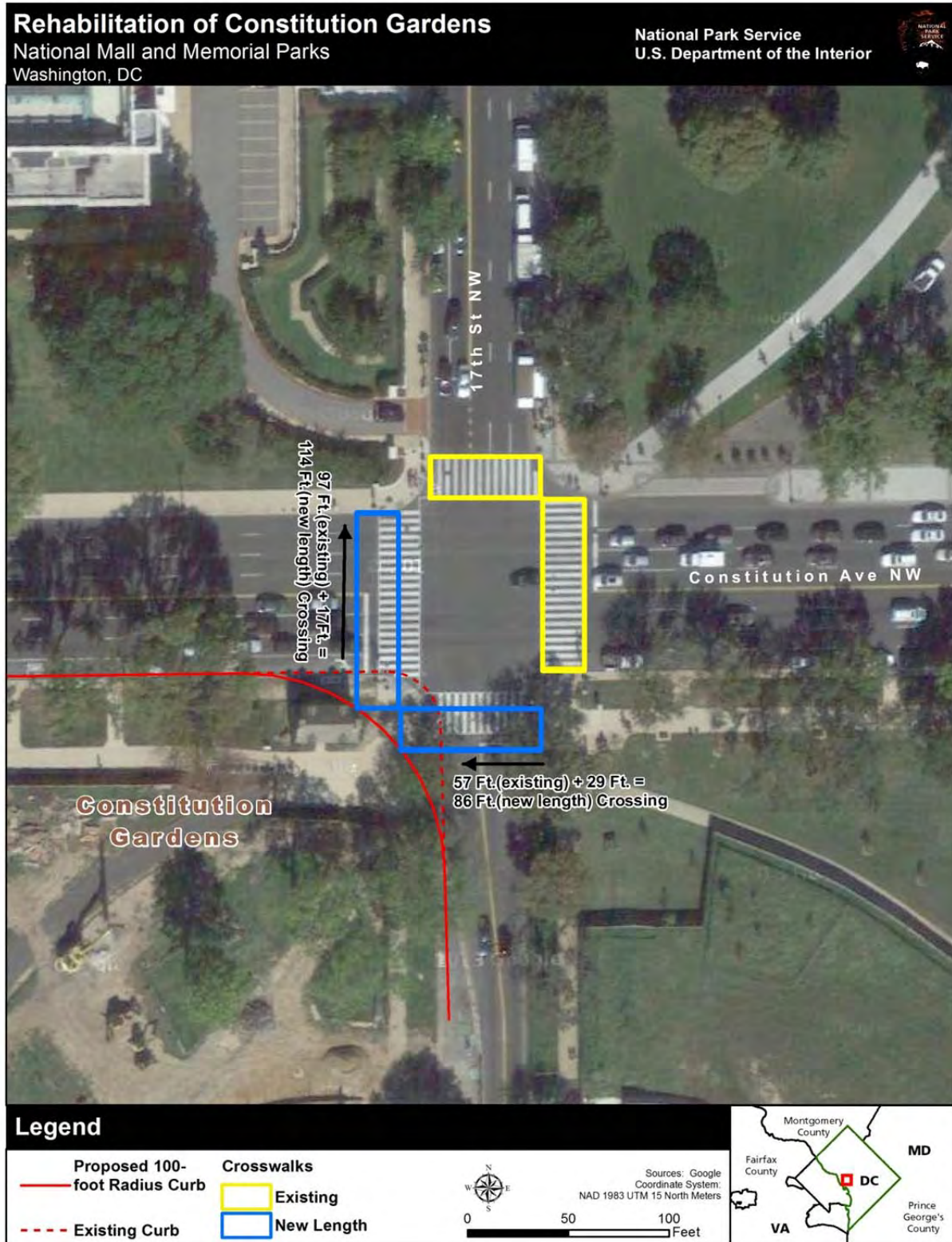
allow a pedestrian to cross the intersection at an average speed of 3.5 feet per second (DDOT 2013b). The proposed new Constitution Avenue NW eastbound approach crosswalk distance would be between 101–114 feet, which would require 29–33 seconds to safely complete the crossing. The proposed new 17th Street NW northbound approach crosswalk distance would be between 66–86 feet, which would require 19–25 seconds to safely complete the crossing. A minimum of 3 additional seconds would be required after the completion of the Flashing Don't Walk interval to allow for a buffer interval (DDOT 2013b), although this time can be matched to the traffic signals' yellow interval. The all-red interval (all approaches indicate a red light to allow for any vehicles or pedestrians to clear the intersection) may require a change, depending on the new curb radius. For example, a 100-foot curb radius would require a change in the all-red interval from 2.0 to 2.5 seconds for the Constitution Avenue NW eastbound approach to account for the existing stop line along Constitution Avenue NW shifting approximately 10 feet to the west and a change from 2.5 to 3.0 seconds for the 17th Street NW northbound approach to account for the existing stop line along 17th Street NW shifting approximately 8 feet to the south.

The total amount of seconds to cover all required pedestrian intervals (Walk + Flashing Don't Walk + buffer interval + all-red interval) for the Constitution Avenue NW eastbound approach and 17th Street NW northbound approach would be between 42.5–46.5 and 32–38.5 seconds, respectively. Table 4.5 summarizes the intersection pedestrian signal timing requirements.

Table 4.5 – Intersection Pedestrian Signal Timing Requirements

Constitution Avenue NW eastbound approach	Existing Seconds	Proposed Seconds
Walk Interval	10	7
Flashing Don't Walk Interval	17	29–33
Buffer Interval	4	4
All-Red Interval	2.5	2.5–3.0
Total Pedestrian Timing	33.5	42.5–46.5
17th Street NW northbound approach	Existing Seconds	Proposed Seconds
Walk Interval	10	7
Flashing Don't Walk Interval	9	19–25
Buffer Interval	4	4
All-Red Interval	2.0	2.0–2.5
Total Pedestrian Timing	25	32.0–38.5

Figure 4.2 – Example of 100-foot Curb Radius



The traffic signal is programmed as a pre-timed signal, which means the amount of time allocated to each approach remains the same each time the traffic signal proceeds through all the required intervals, also called cycle length. As explained in chapter 3, based on DDOT-provided Synchro™ files, this signal operates on a 100-second cycle length during the AM and PM peak hour, and is timed to provide 49.5 seconds for all Constitution Avenue intervals to occur and 50.5 seconds for all 17th Street NW intervals. The existing, programmed pedestrian interval timings are less than the total amount of time allocated to these two roadways and are intended to be used on a traffic signal that is not pre-timed, but one that shifts timings based on traffic demand during each cycle. Because the current traffic signal is pre-timed, the proposed pedestrian interval timings in the table above could be programmed into the traffic signal without the need to change the overall 100-second cycle length or total time allocated toward servicing each approach (50.5 and 49.5 seconds).

Based on the analysis, the curb radius change would result in long-term, beneficial impacts on traffic flow (specifically the eastbound right turn for large vehicles), negligible impacts on the intersection operations (LOS and vehicle queues), and negligible impacts on pedestrian safety (pedestrian crossing times would not impact the current 100-second cycle length. Other improvements to Constitution Gardens, including the new pavilion, ice skating rink, improved pedestrian paths, new Capital Bikeshare station, and other amenities would attract increased visitors to the National Mall, encouraging repeat local and regional visitation, and would enhance visitor experience. This may increase vehicles along Constitution Avenue NW and 17th Street NW and cause long-term, minor, adverse impacts on intersection operations surrounding Constitution Gardens.

This Preferred Alternative includes a one-way vehicle access for emergency purposes, using the walkways to access the pavilion connecting from Constitution Avenue NW to 17th Street NW. The Preferred Alternative would additionally include an on-grade emergency, operational, and maintenance access as well as a new underground service access connecting from the pavilion to 17th Street NW. This below-grade service entrance also would be used during the early morning or evening hours to avoid the peak vehicular and pedestrian periods. This service entrance would primarily be used for deliveries to the pavilion concession; emergency vehicles and most maintenance vehicles would likely not use the below-grade service access. The number of vehicle trips generated by this service entrance would be minimal and the driveway would include appropriate signs such as “Active Driveway” for pedestrians to take note and “Yield to Pedestrians” for service vehicle drivers to take note. While on-site operational, delivery, and service vehicles would use the walkways during the early morning or late evening hours to avoid times when pedestrians are present, primary walks would be wide enough to accommodate pedestrians and operational vehicles.

The new underground service access would result in long-term, beneficial impacts by creating official ingress and egress points for delivery vehicles to the pavilion concessions, with minor, adverse impacts on traffic operations and pedestrian safety at the driveway entrance/exit and points where sidewalks cross the driveway.

Cumulative Impacts

Past, present, and reasonably foreseeable projects that have the potential to impact traffic and circulation are the same as those listed for the No-action Alternative. These projects would create or improve visitor attractions, such as memorials and museums and visitor facilities, or would have long-term beneficial impacts in terms of further drawing tourism to this area with a high number of visitor attractions. Visitor attractions may also increase vehicles along Constitution Avenue NW and 17th Street NW and may cause long-term, minor, adverse impacts on intersection operations surrounding the gardens.

The Preferred Alternative would result in long-term, beneficial impacts on circulation. When combined with the long-term, beneficial impacts from cumulative actions, the Preferred Alternative would have a slight beneficial contribution on overall beneficial cumulative impacts on circulation.

Conclusion

Under the Preferred Alternative, the multimodal transportation cumulative benefits combined with a better designed intersection capable of processing two large vehicles turning right simultaneously would provide long-term, beneficial impacts with negligible impacts on traffic operations, congestion, or vehicle queuing. Service and emergency vehicle access would be improved by creating official ingress and egress driveways, resulting in long-term, beneficial impacts and long-term, minor, adverse impacts on traffic at the driveway entry and exit points. When combined with the long-term, beneficial impacts from cumulative actions, the Preferred Alternative would have a slight beneficial contribution on overall beneficial cumulative impacts on circulation.

IMPACTS OF ALTERNATIVE 1: SUSTAINABLE GARDEN

Analysis

The proposed action related to curb radius under Alternative 1 would be the same as that described for the Preferred Alternative.

Other improvements to Constitution Gardens such as the new pavilion, ice skating rink, improved pedestrian paths, new Capital Bikeshare station, and other amenities would attract increased visitors to the National Mall, encouraging repeat local and regional visitation, and would enhance visitor experience. This may increase vehicles along Constitution Avenue NW and 17th Street NW and cause long-term, minor, adverse impacts on intersection operations surrounding Constitution Gardens.

The planned action also includes one-way vehicle access for operational, maintenance, delivery, and emergency purposes, using the walkways to access the pavilion connecting from Constitution Avenue NW to 17th Street NW. In addition, there would be grade delivery access from Constitution Avenue NW. Vehicles would use the walkways during the early morning or late evening hours to avoid times when pedestrians are present. The number of vehicle trips generated by this service entrance would be minimal and the walkways would include appropriate signs to indicate the walkway has a shared-use by service vehicles.

Based on the analysis, the curb radius change would result in long-term, beneficial impacts on traffic flow (specifically the eastbound right turn for large vehicles), negligible impacts on the intersection operations (LOS and vehicle queues), and negligible impacts on pedestrian safety (pedestrian crossing times would not impact the current 100-second cycle length). The delivery and emergency access would result in long-term, beneficial impacts (creating official shared driveways with existing pedestrian walkways) with long-term, minor, adverse impacts on the traffic operations and pedestrian safety at the driveway point of entry (Constitution Avenue NW) and exit (17th Street NW). However these adverse impacts would now be focused on a limited area (the established driveway point of entry).

Cumulative Impacts

Past, present, and reasonably foreseeable projects that have the potential to impact traffic and circulation are the same as those listed for the No-action Alternative. These projects would create or improve visitor attractions, such as memorials and museums and visitor facilities, or would have long-term, beneficial impacts in terms of further drawing tourism to this area with a high number of visitor attractions. Visitor attractions may also increase vehicles along Constitution Avenue NW and 17th Street NW and may cause long-term, minor, adverse impacts on intersection operations surrounding Constitution Gardens.

Alternative 1 would result in long-term, beneficial impacts on circulation. When combined with the long-term, beneficial impacts from cumulative actions, Alternative 1 would have a significant beneficial contribution to overall beneficial cumulative impacts on circulation. Cumulative impacts from Alternative 1 would be slightly less beneficial than the Preferred Alternative

Conclusion

Under Alternative 1, the multimodal transportation and infrastructure cumulative benefits combined with a better designed intersection capable of processing two, large vehicles turning right simultaneously would provide long-term, beneficial impacts with negligible impacts on traffic operations, congestion, or vehicle queuing. Service and emergency vehicle access would be improved by creating multiple access points on walks, resulting in long-term, beneficial impacts and would result in long-term, minor, adverse impacts on traffic at the entry and exit points. When combined with the long-term, beneficial impacts from cumulative actions, Alternative 1 would have a significant beneficial contribution to overall beneficial cumulative impacts on circulation. When combined with the long-term, beneficial impacts from cumulative actions, Alternative 1 would have a slight beneficial contribution to overall beneficial cumulative impacts.

IMPACTS OF ALTERNATIVE 2: SOCIAL GARDEN

Analysis

The proposed action related to curb radius under Alternative 2 would be the same as the Preferred Alternative.

The proposed action related to service access under Alternative 2 would be the same as the Preferred Alternative.

Cumulative Impacts

Past, present, and reasonably foreseeable projects that have the potential to impact traffic and circulation are the same as those listed for the No-action Alternative. These projects would create or improve visitor attractions, such as memorials and museums and visitor facilities, or would have long-term, beneficial impacts in terms of further drawing tourism to this area with a high number of visitor attractions. Visitor attractions may also increase vehicles along Constitution Avenue NW and 17th Street NW and may cause long-term, minor, adverse impacts on intersection operations surrounding Constitution Gardens.

Alternative 2 would result in long-term, beneficial impacts on circulation. When combined with the long-term, beneficial impacts from cumulative actions, Alternative 2 would be similar to the Preferred Alternative, having a slightly more beneficial contribution than Alternative 1 to overall beneficial cumulative impacts on circulation.

Conclusion

Under Alternative 2, the multimodal transportation and infrastructure cumulative benefits combined with a better designed intersection capable of processing two large vehicles turning right simultaneously would provide long-term, beneficial impacts with negligible impacts on traffic operations, congestion, or vehicle queuing. Service and emergency vehicle access would be even more improved over Alternative 1 by creating official ingress and egress driveways, resulting in long-term, beneficial impacts and long-term, minor, adverse impacts on traffic at the driveway entry and exit points. When combined with the long-term, beneficial impacts from cumulative actions, Alternative 2 would be similar to the Preferred Alternative, having a slight beneficial contribution to overall beneficial cumulative impacts on circulation.

PARK MANAGEMENT AND OPERATIONS

Methodology and Assumptions

For this analysis, park management and operations refer to the ability of park and concession staff to operate and maintain facilities, provide services, and function efficiently. Park management and operations also includes the ability to meet policy and park goals, including sustainability, energy efficiency, and potable water. The analysis of park management and operations was completed with the help of knowledgeable park staff, and was based on the current description of park operations presented in chapter 3.

Impacts for this resource area were analyzed qualitatively, using information provided by the National Mall and Memorial Parks and NPS staff familiar with the current operation and maintenance within the project area. Analysis of possible impacts on utility systems and the serviced community was based on a comparison of utility requirements for existing infrastructure versus the utility requirements for new and modified buildings and other utility-consuming elements of the proposed alternatives.

Study Area

The boundaries of Constitution Gardens are Constitution Avenue to the north, the flood control levee to the south, 17th Street to the east, and the Vietnam Veterans Memorial to the west. The study area for utility impacts includes the area within the boundaries of Constitution Gardens as well as the stormwater collection system within Constitution Avenue, which collects stormwater from areas outside Constitution Gardens.

Impact Thresholds

Impact thresholds are as follows.

Negligible: Impacts on park or concession operations may be noticeable, but would be of a magnitude that would not result in an appreciable or measurable change to park operations. There would be no noticeable temporary or permanent disruption to utilities and the serviced community.

Minor: Impacts on park or concession operations may be noticeable, but would be of a magnitude that would not result in an appreciable or measurable change to park operations. The impact on the utility lines and the serviced community would not be substantial; utility lines could 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: Impacts on park or concession operations 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. 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: Impacts on park or concession operations 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. The impact on the utility lines and the serviced community would be substantial, resulting in permanent changes

and/or diminished service experienced by the system and the community, and markedly noticeable increased loads on the utility.

Beneficial: No levels of intensity for beneficial impacts are defined.

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

IMPACTS OF NO-ACTION ALTERNATIVE

Analysis

Construction. Under the No-action Alternative, no construction would occur in the gardens.

Sustainable Approaches. Under the No-action Alternative, there would continue to be no initiatives regarding sustainable approaches to park operations, resulting in a minor to moderate, adverse impact on the ability to achieve the NPS sustainability goals.

Staffing. Maintenance staffing for grounds and facilities in the national park system is generally geographically assigned for operational efficiency. Under the No-action Alternative, the NPS would continue to perform the majority of the day-to-day labor to maintain the grounds and the lake, and the concession stand would continue to operate its limited seasonal service. As a result of maintaining the gardens in their current state, there would be long-term, negligible, adverse impacts on park management and operations.

Special Required Skills. Under the No-action Alternative, algae control (the only task that currently requires special skill) would continue in the artificial lake. Under this alternative, there would be no change or impact on park operations.

Business, Concession, and Partnership Opportunities. Under the No-action Alternative, limited seasonal concession opportunities would continue and there would be no change to park operations.

Operational Spaces. There would continue to be a lack of space for park staff to utilize for operations and storage. There would also continue to be limited spaces for the concessioner, resulting in lock boxes surrounding the stand. Access to park operational spaces require jumping the curb for ingress and egress. As a result, under the No-action Alternative, long-term, minor to moderate, adverse impacts on efficient operations and ease of maintenance would continue.

Utilities and Infrastructure. Under the No-action Alternative, consumption of utilities would continue at current levels. Potable water would continue to be used for lake replenishment, irrigation, and at the existing visitor's facilities. The No-action Alternative would have a long-term, moderate, adverse impact on policy goals to reduce use of potable water. Electricity would continue to be utilized for lighting. Wastewater and stormwater runoff would continue to be generated and discharged at current levels. Under this alternative, utility systems, including sewer, power, water, and telecommunications would continue to exist but would age and thereby decrease efficiency and sustainability. In addition, facilities would continue to age and require periodic component renewal to keep ahead of deferred maintenance resulting in a minor, adverse impact. Because of the predictable nature of river flooding, there would be ample time for NPS to place the Potomac Park levee gates across 17th Street NW, resulting in a negligible impact.

Cumulative Impacts

As a result of a number of recent projects and additional memorials (Lincoln Memorial Reflecting Pool, World War II Memorial, American Veterans Disabled for Life, Martin Luther King, Jr. Memorial, and the National Mall turf and soil reconstruction project) there are more resources or more complicated resources to maintain with the same staff, which results in a long-term, moderate, adverse impact on park budgets and operations. Additional specialty skills may be required or have been acquired related to water

feature or turf/soils management, which result in a long-term, beneficial impact on operations and a long-term, minor to moderate, adverse impact on staffing, budgets, and operations. Since 2001, there has been an increased awareness of security and public safety requirements affecting NPS and US Park Police operations, design of projects, and management of events and public spaces, resulting in a long-term, moderate, adverse impact on park operations.

During construction of projects, operations and staffing are impacted, and there is a minor, adverse, short-term impact. Design and construction projects are required to analyze and assess the total cost of new facilities on all aspects of park operations, which results in a long-term, beneficial impact.

The National Mall Plan sets a vision for a more sustainable and efficient park, planned and redesigned for today and tomorrow's needs, employing staff with special skills needed to operate state of the art facilities, exemplifying sustainable and energy efficient approaches, continually examining best management practices, and meeting a variety of park, local, and NPS policies or goals. Continuing to implement the plan would result in a long-term, beneficial impact on park management and operations.

When combined with the beneficial and long-term, moderate, adverse cumulative impacts, the No-action Alternative would result in continuing moderate, adverse impacts, particularly with regard to policy goals to reduce potable water use and replace aging utility systems. The No-action Alternative would have a slight, adverse contribution to overall long-term, moderate, adverse cumulative impacts on park management and operations.

Conclusion

The No-action Alternative would result in long-term, negligible to moderate, adverse impacts as a result of consumption of utilities at current levels and maintaining the gardens in its current state. When combined with the beneficial and long-term, moderate, adverse cumulative impacts, would result in continuing moderate, adverse impacts, particularly with regard to policy goals to reduce potable water use and replace aging utility systems. The No-action Alternative would have a slight, adverse contribution to overall long-term, moderate, adverse cumulative impacts on park management and operations.

IMPACTS OF THE PREFERRED ALTERNATIVE REGENERATIVE GARDEN

Analysis

Under the Preferred Alternative, the design would maximize sustainable approaches while still providing improved visitor services to enhance the gardens.

Construction. Construction activities related to the Preferred Alternative are expected to last approximately 12 months during phase I and an additional 36–48 months for phase II. During this time, Constitution Gardens would be closed to the public, and no staff members would be needed for maintenance or operations. Existing staff would continue to maintain all of the gardens under the National Mall and Memorial Parks and would remain employed during this time, resulting in overall beneficial impacts on National Mall and Memorial Parks operations and maintenance.

Sustainable Approaches. Under the Preferred Alternative, the gardens would be rehabilitated and enhanced by maximizing sustainable practices. A minimum LEED silver certification building, would be construction and geothermal wells would be added. The utility systems would be replaced to a higher, more efficient standard. In addition, potable water use would be reduced; heating, ventilation, and air conditioning systems would increase efficiency; and gray and black water would be reused. As a result of these initiatives, park operations would achieve the sustainable goals set by the NPS, and there would be a long-term, beneficial impact on sustainable approaches at Constitution Gardens.

A pavilion with a total footprint of approximately 30,000 SF on the lower level with a smaller upper level would be constructed. The building design would integrate sustainable approaches, targeting LEED silver certification. Systems would include an energy-efficient mechanical system, gray and black water reuse,

and a partial green roof. The sustainable design of the building would contribute minor impacts on the utility systems serving the site. During the design phase, the NPS would coordinate with the respective utility providers to ensure that adequate service is available to serve the anticipated demands of the proposed pavilion.

Staffing. Under the Preferred Alternative, the NPS would maintain grounds and concession operators and would take on management of additional facilities, the adjacent paved plazas, and the improved lake ring. In addition, concession staff would be responsible for the pavilion and related areas, including the event terrace and water ring. As a result of the decreased NPS staffing, there would be a long-term, beneficial impact on staffing at Constitution Gardens.

Special Required Skills. Under the Preferred Alternative, there would be a decrease in NPS staffing as concessioners assume increased responsibilities. This would result in a long-term, beneficial impact. NPS staff would be required to have certain special staff skills including: LEED silver building management for the concession stand; knowledge of meadows/ecological systems; perennial/native and naturalize plant management; lake water systems and aquatic plant management; storm and gray water management; and water ring and ice manufacturing systems. Acquiring specialty skills would be a beneficial impact as well as a moderate, adverse impact on park staffing and budget. Overall, the beneficial impact would outweigh the costs in terms of long-term park operations.

Business, Concession, and Partnership Opportunities. Multiple concession opportunities, including food service, bookstore/retail, recreation rentals, and after-hours pavilion rentals, would increase. As a result of the increased business at the gardens, there would be long-term, beneficial impacts on business, concession, and partnership opportunities at Constitution Gardens.

Operational Spaces. Under the Preferred Alternative, there would be an expanded pavilion with a lower level providing added space for concession and NPS volunteer activities. The addition of space for NPS and volunteers as well as sufficient space for concession operations would be a long-term benefit in spite of the long-term, minor to moderate, adverse impact of somewhat limited on-grade access to the pavilion. In addition, the west end concession stand would be converted for park operations, further resulting in a long-term, beneficial impact. As a result of the increased amount of space, there would be a long-term, beneficial impact on operational spaces at Constitution Gardens.

Utilities and Infrastructure. Under the Preferred Alternative, source water for the lake and irrigation would be non-potable and would include recaptured stormwater (on-site and off-site sources), well water, and gray or black water that is treated on site through a variety of mechanical and natural means. A lake ring at the east end of the lake would be shallow (approximately 2 feet deep) compared to the greater lake area (up to 12 feet deep) and the water level would be controlled seasonally. Source water for the lake ring would be treated stormwater. Potable water would be used only as necessary to keep the lake filled when other water sources are not available. Manufactured ice in the water ring would support seasonal ice skating. Implementation of the Preferred Alternative would reduce the demand for potable water from irrigation and lake replenishment activities, resulting in a long-term, beneficial impact on the potable water system and achievement of reduced potable water and sustainability goals. Diversion and treatment of on-site and off-site stormwater to serve as lake water would be a beneficial impact on the stormwater collection system. Treatment and reuse of black water would have a beneficial impact on the wastewater collection system. Mechanical recirculation of the lake water would be provided by low-energy use aeration microbubblers and by pumps moving water from cisterns and filtration tanks that are part of the stormwater harvesting system. These systems would likely increase electricity usage but would have a negligible impact on the overall utility systems.

Under the Preferred Alternative, the Lockkeeper's House would be equipped with a geothermal heating and cooling system and a new electrical system. This building is not currently in use, and utility usage would increase when the building is back in use. This increase would have a negligible impact on the overall utility systems. The west end concession stand would be repurposed under the Preferred

Alternative, which would have a negligible impact on utilities. Circulation improvements would include changes to the on-site lighting, which would have negligible impacts on utilities.

The pavilion design for the Preferred Alternative would integrate sustainable approaches and use an energy-efficient mechanical system, geothermal heating and cooling system, gray water reuse, and a partial green roof. The sustainable design of the building would contribute only long-term, negligible, adverse impacts on the utility systems serving the site.

Under the Preferred Alternative, a 17,000-SF manufactured ice skating rink within the lake ring would be constructed and operated along with ice maintenance activities. Freezing and maintaining the ice would require more power than is currently used at the lake. The amount of power is largely dependent on the design of the rink, the operating schedule, and weather conditions during the months of operation. During the design phase, the NPS would coordinate with the Potomac Electric Power Company to ensure that adequate power is available to serve the anticipated seasonal demands of the rink. Negligible to minor impacts on the utility systems are anticipated.

Similar to the No-Action Alternative, because of the predictable nature of river flooding, there would be ample time for NPS to place the Potomac Park levee gates across 17th Street NW, resulting in negligible impacts to NPS operations.

Cumulative Impacts

Cumulative impacts from other actions and projects would be the same as those described under the No-action Alternative, resulting in long-term, beneficial impacts from additional specialty skills, the requirements to analyze and assess total cost of facilities, and benefits from the National Mall Plan. However, there would also be moderate, adverse impacts from increased resources in the area to maintain, increased required skills, and the increased awareness of security and public spaces from the public's perspective due to 9/11. The Preferred Alternative would result in long-term, beneficial impacts as well as long-term, minor, adverse impacts on park management and operations. When combined with long-term, beneficial and moderate, adverse impacts from cumulative impacts, Preferred Alternative would have a noticeable beneficial contribution the overall long-term, beneficial impact on park management and operations.

Conclusion

The Preferred Alternative would result in long-term, beneficial impacts on park operations, management, utilities, and infrastructure, primarily as a result of the implementation of a variety of sustainable approaches, increased specialty skills required, operational space provided, shifting some operations staffing to a concessioner, and the ability to reduce the use of potable water. However, there would also be long-term, minor, adverse impacts because additional special skills would be required, including knowledge about the aquatic shelf, integrated water management, and meadow landscapes. Impacts on the utility systems serving the site would be long-term, negligible to minor, and adverse. Although, the shelf would help maintain the water quality at a sustainable level, it would have adverse impacts on staffing at the gardens. Cumulative actions would result in long-term, beneficial and moderate, adverse impacts. When combined with long-term, beneficial and moderate, adverse impacts from cumulative impacts, the Preferred Alternative would have a noticeable contribution to overall long-term, beneficial cumulative impacts on park management and operations.

IMPACTS OF ALTERNATIVE 1: SUSTAINABLE GARDEN

Analysis

Construction. Construction activities related to Alternative 1 are expected to last approximately 12 months during phase I and an additional 36–48 months for phase II. During this time, Constitution Gardens would be closed to the public, and no staff members would be needed for maintenance or operations because the gardens would be maintained by a contractor. Existing staff would have more

availability for backlog parks under the National Mall and Memorial Parks and would remain employed during this time, resulting in overall long-term, beneficial impacts on National Mall and Memorial Parks operations and maintenance.

Sustainable Approaches. Under Alternative 1, the gardens would be rehabilitated and enhanced by maximizing sustainable practices. There would be the construction of a net zero energy use building, the addition of geothermal wells, and utility systems would be replaced to a higher, more efficient standard. In addition, potable water use would be reduced; heating, ventilation, and air conditioning systems would increase efficiency; and gray and black water would be reused. Due to the increased sustainable approaches, park operations would achieve the sustainable goals set by the NPS. As a result, there would be a long-term, beneficial impact on sustainable approaches at Constitution Gardens.

Under Alternative 1, the pavilion building footprint would be approximately 21,000 SF and would maximize sustainable approaches (LEED Platinum). It would be designed as a net zero energy building with systems such as photovoltaic roof panels, geothermal heating and cooling system, gray and black water reuse, and a partial green roof. Because of the sustainable design of the building, it would have negligible impacts on the utility systems serving the site.

Staffing. Under Alternative 1, impacts on staffing would be similar to those described for the Preferred Alternative resulting in long-term, beneficial impacts due to decreased staffing and increased specialty skills.

Special Required Skills. Under Alternative 1, numerous special skills would be required for park management and staff, including net zero building management for the concession stand; meadow and ecological systems management; artificial lake water systems and aquatic plant management; storm, gray, and black water management; and water ring and ice manufacturing systems. Similar to the Preferred Alternative, acquiring a greater level of specialty skills is both a beneficial impact and a long-term, moderate, adverse impact on park staffing and budget. However, the benefits outweigh the costs in terms of long-term sustainability.

Business, Concession, and Partnership Opportunities. Under Alternative 1, impacts on business, concession, and partnership opportunities would be similar to those described for the Preferred Alternative and would result in a long-term, beneficial impact.

Operational Spaces. Under Alternative 1, impacts on operational spaces would be similar to those described for the Preferred Alternative and would result in a long-term, beneficial impact on operational spaces at the gardens.

Utilities and Infrastructure. Alternative 1 impacts on utilities due to proposed changes to the lake and irrigation systems would be the same as those described for the Preferred Alternative and would result in long-term, negligible, adverse and beneficial impacts.

Under Alternative 1, the Lockkeeper's House would be equipped with a geothermal heating and cooling system and a new electrical system. This building is not currently in use, and utility usage would increase when the building is back in use. This increase would have a negligible impact on the overall utility systems. The west end concession stand would be removed under Alternative 1, which would have a beneficial impact on utilities. Circulation improvements would include changes to the on-site lighting, which would have negligible impacts on utilities. The Alternative 1 impacts on utilities due to circulation improvements would be the same as those described for the Preferred Alternative, resulting in long-term, negligible, adverse impacts. Impacts on utilities due to the new visitor facilities also would be the same as those described for the Preferred Alternative, resulting in long-term, negligible, adverse impacts. Finally, impacts on utilities from the manufactured ice skating rink would be the same as those described for the Preferred Alternative, resulting in long-term, negligible to minor, adverse impacts.

The pavilion design for Alternative 1 would integrate sustainable approaches and be designed as a net zero energy building. Its design would contribute negligible impacts on the utility systems serving the site.

The gathering spaces proposed under Alternative 1 may require additional lighting to power events, which would have a negligible impact on utilities.

Similar to the No-Action Alternative, because of the predictable nature of river flooding, there would be ample time for NPS to place the Potomac Park levee gates across 17th Street, resulting in negligible impacts to NPS operations.

Cumulative Impacts

Impacts from other actions and projects in the cumulative area of analysis would be the same as those described under the No-action Alternative, resulting in long-term, beneficial impacts from additional specialty skills, the requirements to analyze and assess total cost of facilities, and benefits from the National Mall Plan. However, there would also be moderate, adverse impacts from increased resources in the area to maintain, increased required skills, and the increased awareness of security and public spaces from the public's perspective due to 9/11. Alternative 1 would result in long-term, beneficial impacts as well as long-term, minor, adverse impacts on park management and operations. When combined with long-term, beneficial and moderate, adverse impacts from cumulative impacts, Alternative 1 would have a noticeable beneficial contribution the overall long-term, beneficial impact on park management and operations.

Conclusion

Alternative 1 generally would result in long-term, beneficial impacts on park operations, management, utilities, and infrastructure primarily as a result of a variety of sustainable approaches, improved operational access, specialty skills acquired, operational space provided, shifting some operations staffing to a concessioner, and ability to reduce use of potable water. However, special skills would be a liability and despite the beneficial impacts on park management and operations, there would also be long-term, minor to moderate impacts of additional specialty skills. Impacts on the utility systems serving the site would be long-term, negligible to minor, and adverse. Cumulative actions would result in long-term, beneficial and moderate, adverse impacts. When combined with long-term, beneficial and moderate, adverse impacts from cumulative impacts, Alternative 1 would have a noticeable contribution to overall long-term, beneficial cumulative impacts on park management and operations.

IMPACTS OF ALTERNATIVE 2: SOCIAL GARDEN

Analysis

Under Alternative 2, the design aims to achieve sustainable goals, but to a slightly lesser extent than Alternative 1. This alternative focuses on improving access and visitor services, education, recreation, and entertainment.

Construction. Construction activities related to Alternative 2 are expected to last approximately 12 months during phase I and additional 36–48 months for phase II. During this time, Constitution Gardens would be closed to the public, and no staff members would be needed for maintenance or operations. Similar to Alternative 1, existing staff would continue to maintain all of the gardens under the National Mall and Memorial Parks and would remain employed during this time, resulting in overall beneficial impacts on National Mall and Memorial Parks operations and maintenance.

Sustainable Approaches. Under Alternative 2, impacts would be similar to those described for Alternative 1; however, the concession stand would be minimum LEED silver. Although fewer sustainable approaches would be employed, there would be long-term, beneficial impacts on sustainable approaches at Constitution Gardens.

Under Alternative 2, a pavilion with a total footprint of approximately 30,000 SF on the lower level with a smaller upper level would be constructed. The building design would integrate sustainable approaches, targeting LEED silver certification. Systems would include an energy-efficient mechanical system, gray water reuse, and a partial green roof. Due to the sustainable design of the building, it would have minor impacts on the utility systems serving the site. During the design phase, the NPS would coordinate with the respective utility providers to ensure that adequate service is available to serve the anticipated demands of the proposed pavilion.

Staffing. Under Alternative 2, impacts on staffing would be similar to those described for Alternative 1 as a result of decreased staffing and increased specialty skills, resulting in long-term, beneficial impacts.

Special Required Skills. Under Alternative 2, the addition of certain special skills would be required, including; LEED silver building management for the concession stand; mixed perennial/native and naturalized plant management; lake water systems management; storm and gray water management; and water ring and ice manufacturing systems. Similar to Alternative 1, acquiring specialty skills would be a beneficial impact as well as a moderate, adverse impact. Overall, the beneficial impact would outweigh the costs in terms of the long-term ability of the National Mall and Memorial Parks to maintain the gardens.

Business, Concession, and Partnership Opportunities. Under Alternative 2, business, concession, and partnership opportunities would increase at Constitution Gardens, and would result in beneficial impacts on park operations similar to those described for Alternative 1.

Operational Spaces. Under Alternative 2, there would be an expanded pavilion with a lower level providing added space for concession and NPS volunteer activities. Similar to Alternative 1, the addition of space would result in a long-term, beneficial impact on operational spaces. In addition, the west end concession stand would be converted for park operations, further resulting in a long-term, beneficial impact.

Utilities and Infrastructure. Under Alternative 2, the water source for the lake would be a well drilled to a depth of approximately 200 feet. Municipal potable water would supply make-up water if well water is not available. Irrigation water would be supplied by stormwater collected from on-site and off-site, and an on-site well would be utilized as a back-up source. These changes would reduce the demand for potable water for irrigation and lake make-up water, resulting in a beneficial impact on the potable water supply.

Alternative 2 would have similar power and utility demands for the Lockkeeper's House, the west end concession stand, the manufactured ice skating rink, and circulation improvements similar to those described for Alternative 1. This negligible to minor, adverse impact would likely be outweighed by the positive impact overall on park operations.

Similar to the No-Action Alternative, because of the predictable nature of river flooding, there would be ample time for NPS to place the Potomac Park levee gates across 17th Street, resulting in negligible impacts to NPS operations.

Cumulative Impacts

Impacts from other actions and projects in the cumulative area of analysis would be the same as those described under the No-action Alternative, resulting in long-term, beneficial impacts from additional specialty skills, the requirements to analyze and assess total cost of facilities, and benefits from the National Mall Plan. However, there would also be moderate, adverse impacts from increased resources in the area to maintain, increased required skills, and the increased awareness of security and public spaces from the public's perspective due to 9/11. Alternative 2 would result in long-term, beneficial impacts as well as long-term, minor, adverse impacts on park management and operations. When combined with long-term, beneficial and moderate, adverse impacts from cumulative impacts, Alternative 2 would have a

noticeable beneficial contribution to the overall long-term, beneficial impact on park management and operations.

Conclusion

Alternative 2 generally would result in a long-term, beneficial impact on park operations, management, utilities, and infrastructure primarily as a result of a variety of sustainable approaches, advantages to require fewer specialty skills, operational space provided, shifting some operations staffing to a concessioner, and ability to reduce use of potable water. However, more specialty skills would be required than are available today resulting in a minor to moderate, adverse impact. Impacts on the utility systems serving the site would be long-term, negligible to minor, and adverse. Cumulative actions would result in long-term, beneficial and moderate, adverse impacts. When combined with long-term, beneficial and moderate, adverse impacts from cumulative impacts, Alternative 2 would have a noticeable contribution to overall long-term, beneficial cumulative impacts on park management and operations.

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 provide input and comment on proposed actions. As part of the NPS NEPA and Section 106 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. Coordination with local and federal agencies was conducted during the NEPA process to identify issues and/or concerns related to natural and cultural resources at the Constitution Gardens project location. NPS conducted a public meeting to solicit input and comment from members of the public. The meeting was held on May 22, 2014, at the Ronald Reagan Building, 1300 Pennsylvania Ave NW, Washington, DC from 5:00 p.m. to 7:00 p.m. to solicit input from the public on the concept design alternatives. These public scoping efforts are described in more detail in “Chapter 1: Purpose and Need.”

Compliance with Section 106 of the NHPA, as amended, included consultation with the DC SHPO, the ACHP, the CFA, and the NCPC. In addition, a number of agencies, organizations, and stakeholders, including members of the public, were invited to participate in this process as consulting parties throughout the Section 106 process. A consulting parties meeting was held at NPS National Capital Region offices on August 7, 2014, to discuss the APE and potential impacts from the proposed alternatives.

The assessment of effect will be completed and documented separately from this EA. NPS began consultation with the DC SHPO on May 8, 2014 (see appendix A); coordination and consultation are ongoing.

In accordance with Section 7 of the Endangered Species Act, on May 8, 2014, NPS requested an updated list of rare, threatened, and endangered species known to be present in the project area. No response from the USFWS was received. NPS also sent a letter to the District Department of Environment, Fisheries and Wildlife Division, dated May 8, 2014, requesting an updated list of rare, threatened, and endangered species known to be present in the project area. No response from the DDOE was received.

AGENCY 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 Constitution Gardens rehabilitation. In accordance with Section 7 of the Endangered Species Act, consultation letters were sent from the NPS to the USFWS on May 8, 2014, and to the District of Columbia Department of the Environment, Fisheries and Wildlife Division on May 8, 2014 (see appendix A).

Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings on historic properties. In accordance with the regulations implementing Section 106, letters initiating the process were sent to the District of Columbia State Historic Preservation Office (DC SHPO) and ACHP on May 8, 2014. The DC SHPO responded on August 14, 2014, accepting the proposed Area of Potential Effect (APE) and stating concerns for the treatment of the Lockkeeper’s House. A final Determination of Area of Potential Effect letter was sent to the DC SHPO on April 1, 2015. Documentation of these efforts to obtain public agency consultation is contained in appendix A.

In addition, a number of agencies, organizations, stakeholders were invited to participate in this process as consulting parties. Below is a list of consulting parties that participated:

- National Capital Planning Commission
- Advisory Council on Historic Preservation
- Friends of the World War II Memorial
- Organization of American States
- Commission of Fine Arts
- Committee of 100
- District of Columbia State Historic Preservation Office
- DC Preservation League
- National Coalition to Save Our Mall
- National Parks Conservation Association
- National Trust for Historic Preservation
- Washington, DC, Guild of Professional Tour Guides
- Trust for the National Mall
- Vietnam Veterans Memorial Foundation

Throughout this project, the Section 106 process and NEPA assessment have been closely coordinated, and in some cases, public scoping has been utilized to satisfy the requirements for both processes. For the purposes of Section 106, several consulting party meetings were held:

- The public meeting for the EA was also the initial public meeting for the Section 106 process. The meeting was held on May 22, 2014, at the Ronald Reagan Building, 1300 Pennsylvania Ave NW, Washington, DC.
- The NPS hosted a site visit on May 13, 2015, with staff from the National Capital Planning Commission (NCPC) and DC SHPO to discuss the proposed alternatives, potential effects, and the Lockkeeper's House rehabilitation.
- The NPS held two consulting party meetings on August 7, 2014, at the National Capital Regional office at 1100 Ohio Drive SW, Washington, DC; and on June 3, 2015, at the National Mall and Memorial Parks headquarters, 900 Ohio Drive SW, Washington, DC. Both meetings discussed the APE and potential effects from the proposed alternatives.

An additional public scoping meeting will be held following the release of this Draft EA in July 2015.

Note that concept approval was received from the US Commission of Fine Arts, the National Capital Planning Commission and the National Park Service Development Advisory Board.

COMMENT PERIOD

To comment on this EA, you may mail comments or submit them online at <http://parkplanning.nps.gov/COGA> and follow the appropriate links. 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, the NPS cannot guarantee its ability to do so. Please mail comments to

Superintendent
National Mall and Memorials Park
Attn: Constitution Gardens Rehabilitation Project
900 Ohio Drive, SW
Washington DC 20024

CHAPTER 6: PREPARERS AND CONTRIBUTORS

LIST OF PREPARERS

Louis Berger Group, Inc.

Julia Yuan Senior Environmental Scientist/Project Manager M.P.S., SUNY College of Environmental Science and Forestry B.S., SUNY College of Environmental Science and Forestry <i>Project Manager</i>	Julie Eitner Environmental Planner/Deputy Project Manager Environmental Planner B.S., Cornell University <i>Overall Document Management, Graphic Support</i>
Steven Bedford Principal Architectural Historian Ph.D., Columbia University B. Arch., Rensselaer Polytechnic Institute <i>Resource Area: Cultural Resources, Section 106</i>	Mark Berger Principle Transportation Planner M.S., New Jersey Institute of Technology B.A., Rutgers University <i>Resource Area: Traffic and Circulation</i>
Rudi Byron Senior Environmental Planner M.U.R.P., Virginia Polytechnic Institute B.S., University of Maryland <i>Quality Assurance/ Quality Control</i>	Sean Gannon Environmental Planner B.S., University of Rhode Island <i>Resource Area: Visitor Use and Experience, Park Management and Operations and Overall Document Support</i>
Erin Hagan Environmental Scientist M.E.M., Duke University <i>Resource Area: Vegetation</i>	Erin Hudson Senior Archeologist M.A., University of New Mexico <i>Resource Area: Cultural Resources (Cultural Landscapes, Historic Districts and Structures, and Archeological Resources)</i>
Deborah Mandell Senior Technical Editor M.B.A., Northwestern University B.A., Wesleyan University <i>Editor</i>	Jason Medema Environmental Planner M.S., University of Montana <i>Resource Area: Soils and Topography</i>

Carolyn Mitchell Principle Landscape Architect M.L.A, University of Virginia B.A., George Washington University <i>Resource Area: Visual Resources</i>	Kyle Nixon GIS Analyst B.S., Radford University <i>GIS Support</i>
Dana Otto Vice President M.S., Florida State University B.S., Florida State University <i>Quality Assurance Review</i>	Denise Short Senior Technical Editor M.S., Tufts University B.A., College of Wooster <i>Editor</i>
Margaret Stewart Senior Environmental Planner M.R.P., University of North Carolina at Chapel Hill <i>Resource Area: Water Resources</i>	Tristyne Youngbluth, P.E. Principle Environmental Engineer B.S. Civil/Environmental Engineering, University of Rhode Island <i>Resource Area: Utilities and Infrastructure</i>

CONTRIBUTORS

US Department of the Interior

NPS, DENVER SERVICE CENTER

Andrea Lind, Project Manager/Landscape Architect
Michael Morelli, Project Manager/Landscape Architect
Elaine Rideout, Natural Resources Specialist
Greg Cody, Cultural Resources Specialist

NPS, NATIONAL CAPITAL REGION

Robert Vogel, Regional Director
Peter May, Associate Regional Director, Lands, Planning and Design
Joy Beasley, Chief, Cultural Resources Preservation Services
Joel Gorder, Regional Environmental Coordinator
Maureen Joseph, Cultural Landscapes Program Manager
Tammy Stidham, Planning Chief

NPS, NATIONAL MALL AND MEMORIAL PARKS

Robert Vogel, Superintendent (Former)
Karen Cucurullo, Acting Superintendent
Stephen Lorenzetti, Deputy Superintendent for Planning (Deceased)
Sean Kennealy, Acting Deputy Superintendent
Catherine Dewey, Chief of Resource Management

Michael Commisso, Cultural Resource Program Manager
Mary Willeford-Bair, Natural Resource Program Manager
Susan Spain, Project Executive/Landscape Architect
Joe Coratola, Historic Architect
Jeffrey Gowen, Landscape Architect
Michael Stachowicz, Turf Manager
Eliza Voigt, Park Planner
Ned Wallace, Civil Engineer

Trust for the National Mall

Teresa Durkin, Senior Project Director
Filipe Pereira, Architectural Technician

[This page was intentionally left blank.]

CHAPTER 7: REFERENCES, ACRONYMS, AND GLOSSARY

REFERENCES

Ator, S.W., J.D. Blomquist, J.W. Brakebill, J.M. Denis, M.J. Ferrari, C.V. Miller, and Z. Humbert

- 1998 Water Quality in the Potomac River Basin, Maryland, Pennsylvania, Virginia, West Virginia, and the District of Columbia, 1992-96. US Geological Survey Circular 1166.

Bartlett Inventory Solutions

- 2014 Constitution Gardens Pre-Construction Tree Assessment. May 2014.

Birnbaum, C.A.

- 1996 The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. National Park Service, Washington, DC.

Capital Bikeshare

- 2014 Capital Bikeshare website. Available at <https://www.capitalbikeshare.com>. Accessed August 4, 2014.

Car2go

- 2014 Car2go website. Available at <https://www.car2go.com/en/washingtondc/>. Accessed August 4, 2014.

Council on Environmental Quality (CEQ)

- 1997 Council on Environmental Quality (CEQ). Environmental Justice Guidance under the National Environmental Policy Act. Executive Office of the President. Washington, DC.

District of Columbia

- 2004a Final Total Maximum Daily Loads for Bacteria in Tidal Basin and Washington Ship Channel, December 2004.
- 2004b Final Total Maximum Daily Load for Fecal Coliform Bacteria in Upper Potomac River, Middle Potomac River, Lower Potomac River, Battery Kemble Creek, Foundry Branch, and Dalecarlia Tributary, July 2004.
- 2012 Sustainability DC: Sustainable DC Plan. Available at <http://sustainable.dc.gov/finalplan>. Accessed August 11, 2014.

District of Columbia Department of the Environment (DDOE)

- 2003 2003 District of Columbia Standards and Specifications for Soil Erosion and Sediment Control. Washington, DC.
- 2013 Notice of Final Rulemaking: Stormwater Management and Soil Erosion and Sediment Control.

- 2014 Fishing in the District Web page. Available at <http://ddoe.dc.gov/service/fishing-district>. Accessed November 6, 2014.

District of Columbia Department of Health Administration (DCDHA)

- 2003 2003 District of Columbia Standards and Specifications for Soil Erosion and Sediment Control. Bureau of Environmental Quality, Watershed Protection Division.

District of Columbia Department of Transportation (DDOT)

- 2003 DDOT Guidelines on Vehicular and Pedestrian Interval Calculation (revision 6 – January 25, 2013) Available at <https://comp.ddot.dc.gov/Documents/Guidelines%20on%20Vehicular%20and%20Pedestrian%20Interval%20Calculation.pdf>.
- 2005 District of Columbia Bicycle Master Plan, Washington DC. April 2005.
- 2009 District of Columbia Pedestrian Master Plan, Washington DC. April 2009.
- 2011 Motorcoach Action Plan, Washington DC. December, 2011.
- 2013a DDOT Guidelines on Vehicular and Pedestrian Interval Calculation. Available at <https://comp.ddot.dc.gov/Documents/Guidelines%20on%20Vehicular%20and%20Pedestrian%20Interval%20Calculation.pdf>.
- 2013b Maryland Avenue SW Transportation Study Data Collection Report, Prepared by Parsons Brinckerhoff, Washington DC. October 2013.
- 2014a Functional Class Map. Available at <http://ddot.dc.gov/publication/functional-classification-map>. Accessed August 4, 2014.
- 2014b 2012 Traffic Volumes. Available at <http://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/DCTrafficCityWide2012.pdf>. Accessed August 26, 2014.
- 2014c Accident Summary Report (R-7), DC Department of Transportation – Traffic Accident Reporting and Analysis System. Accessed September 24, 2014 by DDOT.

District of Columbia Historic Preservation Office

- 2011 Project Data Request for Archaeological Site information in the Vicinity of the Vietnam Veterans Memorial Education Center. Received September 28, 2011.

District of Columbia Water and Sewer Authority (DC Water)

- 2002 WASA's Recommended Combined Sewer System Long Term Control Plan, Executive Summary. July 2002.
- 2013 *Waste Water Collection Combined Sewer System*. Available at http://www.dewater.com/wastewater_collection/css/default.cfm.
- 2014 Combined Sewer Overview webpage. Available at <http://www.dewater.com/about/cip/cso.cfm>. Accessed August 11, 2014.

Enterprise CarShare

- 2014 Enterprise CarShare Website. Available at <http://www.enterprisecarshare.com/>. Accessed August 4, 2014.

Hertz 24/7

- 2014 Hertz 24/7 Website. Available at <https://www.hertz.com/rentacar/productservice/index.jsp?targetPage=hertzondemand.jsp>. Accessed August 4, 2014.

Kennealy, S.

- 2014 E-mail correspondence with Julia Yuan (LB) and Sean Kennealy (NPS) regarding the budget of park operations and management at Constitution Gardens. September 11, 2014.

LeBlanc, D.

- 2014 Slug-Line Locations. Available at <http://slug-lines.com>. Accessed August 4, 2014.

LeeDecker, C.

- 2012 Archeological Monitoring of Sewer Line Tunneling, Lincoln Memorial Reflecting Pool, National Mall and Memorial Parks, District of Columbia. The Louis Berger Group, Inc., Washington, DC.
- 2013 Archeological Monitoring of Construction, Potomac Park Levee, National Mall and Memorial Parks, District of Columbia. The Louis Berger Group, Inc., Washington, DC.

LeeDecker, C. and D. Wagner

- 2010 Geoarcheological Investigations for the National Mall Turf and Soil Reconstruction Project, National Mall and Memorial Parks, District of Columbia. The Louis Berger Group, Inc., Washington, DC.

Loudoun County Transit

- 2014 Loudoun County Transit Bus Schedules. Available at <http://www.loudoun.gov/index.aspx?NID=221>. Accessed August 4, 2014.

Maryland Transit Administration

- 2014 Maryland Administration Commuter Bus Schedules. Available at <http://mta.maryland.gov/quick-schedule-links>. Accessed August 5, 2014.

National Capital Planning Commission

- 2001 Memorials and Museums Master Plan: NCPC. September, 2001.
- 2009 Federal Capital Improvements Program for 2010-2015. National Capital Planning Commission, February 2009. Available at <http://www.ncpc.gov>.

National Park Service (NPS)\

- n.d. Director's Order 77: *Natural Resource Protection*. In development.
- 1993 *Preservation Brief #31, Mothballing Historic Buildings*. September 1993. Available at: <http://www.nps.gov/tps/how-to-preserve/briefs/31-mothballing.htm>.

- 1995 Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings.
- 1996 East and West Potomac Parks Historic District. Revised National Register of Historic Places Nomination.
- 1997 L'Enfant Plan of the City of Washington, District of Columbia. National Register of Historic Places Nomination Form.
- 1998a Director's Order 28: *Cultural Resources Management Guidelines*.
- 1998b National Register Bulletin #38, Guidelines for Evaluating and Documenting Traditional Cultural Properties. Available at <http://www.nps.gov/history/nR/publications/bulletins/nrb38/>.
- 2001 Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*
- 2006 Management Policies 2006. Available at <http://www.nps.gov/policy/mp2006.pdf>.
- 2007 Annual Investigators Report, March 21, 2007." Center for Urban Ecology, Natural Resources and Science, National Capital Region, Washington, DC.
- 2008 Cultural Landscape Inventory. Constitution Gardens, National Mall & Memorial Parks - West Potomac Park. Available at: http://www.nps.gov/nationalmallplan/Documents/ConstitutionGardens_CLI_2008.pdf. Revised 2014.
- 2009a Potomac Park Levee Environmental Assessment. Washington, DC. January 2009.
- 2009b Lincoln Memorial Reflecting Pool Environmental Assessment. Available at <http://parkplanning.nps.gov/document.cfm?parkID=427&projectID=26512&documentID=31077>. Accessed on September 14, 2014
- 2010a Final National Mall Plan/Environmental Impact Statement. 2010. Available at <http://www.nps.gov/nationalmallplan/FEISdocs.html>. Accessed September 12, 2014
- 2010b Director's Order 53: Special Park Uses.
- 2011a Canal Lockkeeper's House Historic Structure Report. National Mall and Memorial Parks, Washington, District of Columbia.
- 2011b Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making. Effective date: October 5, 2011.
- 2013 Washington Monument Visitor Screening Environmental Assessment. Available at http://www.npc.gov/files/projects/Washington_Monument_Visitor_Screening_Facility_National_Mall_Environmental_Assessment_6176_Mar2014.pdf. Accessed September 14, 2014.
- 2014a National Register Bulletin: How to define Categories of Historic Properties. Available at http://www.nps.gov/nr/publications/bulletins/nrb15/nrb15_4.htm. Accessed November 6, 2014.

- 2014b Constitution Gardens. Available at <http://www.nps.gov/coga/index.htm>. Accessed September 6, 2014.
- 2014c National Park Service Statistics. Available at <https://irma.nps.gov/Stats/Reports/Park>. Accessed October 31, 2014.
- 2015 National Park Service comments on 2nd draft of Environmental Assessment for the Rehabilitation of Constitution Gardens.

Parker, P.L., and T.F. King

- 1998 Guidelines for Evaluating and Documenting Traditional Cultural Properties. National Register Bulletin 38. National Register of Historic Places, Washington, DC.

Patterson, J.C., J.J. Muray, and J.R. Short

- 1980 The Impact of Urban Soils on Vegetation Metropolitan Tree Improvement Alliance (METRIA) Proc. 3:33-56, 1980.

Pine & Swallow Environmental

- 2014 Soil Investigation Report and Preliminary Soil Recommendations. Constitution Gardens, National Mall, Washington, DC. P&S Project Number 11200.

Potomac and Rappahannock Transportation Commission

- 2014 Potomac and Rappahannock Transportation Commission Bus Schedules. Available at <http://prtctransit.org/index.html>. Accessed August 4, 2014.

PWP Landscape Architecture and Rogers Partners

- 2014 Design Concept Assessment Report for Constitution Gardens. March 7, 2014, revised March 20, 2014.

Schnabel Engineering

- 2013a Preliminary Geotechnical Engineering Report Constitution Gardens Trust for the National Mall, Washington, DC. Schnabel Project No. 12612069. June 13, 2013
- 2013b Phase I Environmental Site Assessment. Constitution Gardens. Constitution Avenue, Washington, DC. 20006. Schnabel Project No. 12612069. April 16, 2013

Transportation Research Board

- 2010 Highway Capacity Manual, Transportation Research Board for the National Academies of Science, December 2010.

US Department of Agriculture

- 1993 NSSH Part 622. Farmland Classification (622.03). Available at <http://soils.usda.gov/technical/handbook/contents/part622.html>. Accessed March 5, 2013.

US Department of Agriculture Natural Resources Conservation Service (NRCS)

- 2014 Web Soil Survey of District of Columbia. Available at <http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>. Accessed July 31, 2014.

US Department of Agriculture Soil Conservation Service

- 1976 Soil Survey of District of Columbia. Soil Conservation Service.

US Department of Justice

- 2007 Civil Rights Division, Standards for Accessibility Design – Chapter 6, Curb Ramps and Pedestrian Crossings. May 2007

US Environmental Protection Agency (EPA)

- 2012 Guidelines for Water Reuse. US Environmental Protection Agency, Office of Wastewater Management, Office of Water, Washington, DC. September 2012.

Wagner, D.P., Ph.D.

- 2014 Geoarchaeological Interpretations of Soil Coring Borings in Constitution Gardens. Washington, DC. Geo-Sci Consultants, LLC, University Park, Maryland.
- 2015 Geoarchaeology at the Location of Cistern 2, Panel 22, National Mall Turf Rehabilitation, Phase 2, Washington, DC. Geo-Sci Consultants, LLC, University Park, Maryland.

Washington Metropolitan Area Transit Authority (WMATA)

- 2014 WMATA website. Available at www.wmata.com. Accessed August 4, 2014.

White, M.

- 2014 E-mail Correspondence with Julia Yuan (LB) and Mike White (NPS) regarding maintenance activities performed at constitution Gardens. August 28, 2014.

Zipcar

- 2014 ZipCar website. Available at <http://www.zipcar.com>. Accessed August 4, 2014.

ACRONYMS

Advisory Council on Historic Preservation	(ACHP)
Americans with Disabilities Act	(ADA)
Architectural Barriers Act Accessibility Standard	(ABAAS)
Area of Potential Effect	(APE)
Canal Lockkeeper's House	(Lockkeeper's House)
Chesapeake and Ohio Canal	(C&O)
Choosing by Advantages and Value Analysis	(CBA/VA)
Code of Federal Regulation	(CFR)
Combine Sewer Overflow	(CSO)
Constitution Gardens	(COGA)
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 SHPO)
District of Columbia Water and Sewer Authority	(DC Water)
District Department of Transportation	(DDOT)
Environmental Assessment	(EA)
Executive Order	(EO)
Leadership in Energy and Environmental Design	(LEED)
Level of Service	(LOS)
Memorandum of Agreement	(MOA)
National Capital Planning Commission	(NCPC)
National Environmental Policy Act	(NEPA)
National Historic Preservation Act	(NHPA)
National Park Service	(NPS)
National Park Service Organic Act of 1916	(Organic Act)
National Parks Omnibus Management Act	(NPOMA)
National Register of Historic Places	(National Register or NRHP)
Natural Resources Conservation Service	(NRCS)
Northwest	(NW)
Planning, Environment, and Public Comment	(PEPC)
Public Law	(PL)
Skidmore, Owings, and Merrill	(SOM)
Southwest	(SW)
Square Feet	(SF)
State Historic Preservation Officer	(SHPO)
The Trust for the National Mall	(TNM)
Traditional Cultural Property	(TCP)
United States Army Corps of Engineers	(USACE)
United States Code	(USC)
United States Commission of Fine Arts	(CFA)
United States Environmental Protection Agency	(EPA)

United States Fish and Wildlife Service

(USFWS)

Washington Metropolitan Area Transit Authority

(WMATA)

KEY WORD GLOSSARY

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

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.

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 NEPA of 1969. The CEQ coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives.

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.

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 §1508.7).

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 USFWS, 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.

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.

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—The NPS requires an analysis of potential effects to determine whether actions would impact or impair Park resources. The 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.

Lake Ring—A shallow, concrete lined portion within Constitution Gardens lake surrounded by a walkway. The lake ring would use a separate water source, and be used for recreational purposes such as ice skating and model boating.

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 and 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—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 (54 USC 300101 et seq)—An Act to establish a program for the (PL 89-665; 80 STAT. 915; 54 USC 306108, as amended by PL 91-243, PL 93-54, PL 94-422, PL 94-458, PL 96-199, PL 96-244, PL 96-515, PL 98-483, PL 99-514, PL 100-127, and PL 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—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 NHPA of 1966, as amended.

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.

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.

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.

West Potomac Park—Consists of Lincoln Memorial, World War II Memorial, Vietnam Veterans Memorial, Constitution Gardens, Thomas Jefferson Memorial, Martin Luther King, Jr. Memorial, Franklin Delano Roosevelt Memorial, George Mason Memorial, Korean War Veterans Memorial, and the Tidal Basin.

APPENDIX **A**: CONSULTATION AND COORDINATION

[This page intentionally left blank.]



United States Department of the Interior

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



MAY - 8 2014

Mr. Keith A. Anderson
Director
D.C. Department of the Environment
1200 First Street NE, 5th Floor
Washington, DC 20002

RE: Proposed Rehabilitation of Constitution Gardens, National Mall, Washington D.C.

Dear Mr. Anderson:

The National Park Service (NPS), in partnership with The Trust for the National Mall (the Trust), is preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 for the rehabilitation of Constitution Gardens on the National Mall in Washington, D.C. (figure 1). This project grew out of the 2010 National Mall Plan, a general management and visioning plan for a sustainable National Mall. The project team was selected through a national design competition in 2012.

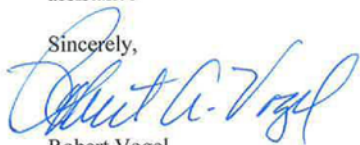
Situated between the Lincoln Memorial and the Washington Monument, Constitution Gardens was designed as pastoral landscape with a natural lake, a quiet oasis removed from the bustle of the capital. This 52-acre park was officially dedicated in 1976, with the island in the center dedicated to the 56 Signers of the Declaration of Independence in 1982. Sadly, within just a few years of its opening, the conditions of the lake and the trees began to be of concern. Poor soil conditions have kept some of the trees from reaching full maturity to this day. Subsequently, many of the walkways have deteriorated and the visitor services facility once imagined at the eastern end of the lake was never realized.

The purpose of this project is to rehabilitate Constitution Gardens to improve the ecology, accessibility, cultural and recreational opportunities, and visitor services of the area. It conforms to the National Mall Plan which calls for the rehabilitation of Constitution Gardens to improve resource conditions and circulation, relocate the canal lockkeeper's house, provide flexible opportunities for relaxation, entertainment, and recreation, as well as improved visitor service facilities.

The purpose of this initial correspondence is to request a list of any state listed species or habitats that may occur on the proposed project site and to solicit any early input or concerns that you may have regarding this proposed action. Because of its location in a highly urbanized environment in downtown Washington, D.C., it is unlikely that the proposed rehabilitation would affect any federally listed or locally sensitive species. However, NPS would appreciate written confirmation from your office. A similar letter is also being sent to the U.S. Fish and Wildlife Service to solicit its input.

If you have any questions or require additional information, please contact James Perry by phone at (202) 245-4711, by fax at (202) 426-9309, or by email at james_perry@nps.gov. Thank you in advance for your assistance.

Sincerely,



Robert Vogel
Superintendent,
National Mall and Memorial Parks
National Park Service

Enclosure



United States Department of the Interior

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



IN REPLY REFER TO:

MAY - 8 2014

Ms. Genevieve LaRouche
Field Supervisor
Chesapeake Bay Field Office
U.S. Fish and Wildlife Service
177 Admiral Cochrane Drive
Annapolis, MD 21401

RE: Proposed Rehabilitation of Constitution Gardens, National Mall, Washington D.C.

Dear Ms. LaRouche:

The National Park Service (NPS), in partnership with The Trust for the National Mall (the Trust), is preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 for the rehabilitation of Constitution Gardens on the National Mall in Washington, D.C. This project grew out of the 2010 National Mall Plan, a general management and visioning plan for a sustainable National Mall. The project team was selected through a national design competition in 2012.

Situated between the Lincoln Memorial and the Washington Monument, Constitution Gardens was designed as pastoral landscape with a natural lake, a quiet oasis removed from the bustle of the capital. This 52-acre park was officially dedicated in 1976, with the island in the center dedicated to the 56 Signers of the Declaration of Independence in 1982. Sadly, within just a few years of its opening, the conditions of the lake and the trees began to be of concern. Poor soil conditions have kept some of the trees from reaching full maturity to this day. Subsequently, many of the walkways have deteriorated and the visitor services facility once imagined at the eastern end of the lake was never realized.

The purpose of this project is to rehabilitate Constitution Gardens to improve the ecology, accessibility, cultural and recreational opportunities, and visitor services of the area. It conforms to the National Mall Plan which calls for the rehabilitation of Constitution Gardens to improve resource conditions and circulation, relocate the canal lockkeeper's house, provide flexible opportunities for relaxation, entertainment, and recreation, as well as improved visitor service facilities.

The purpose of this initial correspondence is to request a list of any federal listed species or habitats that may occur on the proposed project site and to solicit any early input or concerns that you may have regarding this proposed action. Because of its location in a highly urbanized environment in downtown Washington, DC, it is unlikely that the proposed rehabilitation would affect any federally listed or locally sensitive species. However, NPS would appreciate written confirmation from your office.

If you have any questions or require additional information, please contact James Perry by phone at (202) 245-4711, by fax at (202) 426-9309, or by email at james_perry@nps.gov. Thank you in advance for your assistance.

Sincerely,



Robert Vogel
Superintendent,
National Mall and Memorial Parks
National Park Service

Enclosure



United States Department of the Interior

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



MAY - 8 2014

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

Subject: Proposed Rehabilitation of Constitution Gardens, National Mall, Washington, DC

Dear Mr. Nelson:

The National Park Service (NPS) has initiated consultation with the District of Columbia State Historic Preservation Officer (DC SHPO) under Section 106 of the National Historic Preservation Act on the planned rehabilitation of Constitution Gardens on the National Mall in Washington, D.C., an undertaking that will have an effect upon historic properties under Section 106 of the National Historic Preservation Act. Additionally, the NPS is currently preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969. Its partners in the proposed project are The Trust for the National Mall.

Situated between the Lincoln Memorial and the Washington Monument, Constitution Gardens was designed as pastoral landscape with a natural lake, a quiet oasis removed from the bustle of the capital. This 52-acre park was officially dedicated in 1976, with the island in the center dedicated to the 56 Signers of the Declaration of Independence in 1982. Sadly, within just a few years of its opening, the conditions of the lake and the trees began to be of concern. Poor soil conditions have kept some of the trees from reaching full maturity to this day. Subsequently, many of the walkways have deteriorated and the visitor services facility once imagined at the eastern end of the lake was never realized.

The purpose of this project is to rehabilitate Constitution Gardens to improve the ecology, accessibility, cultural and recreational opportunities, and visitor services of the area. It conforms to the National Mall Plan which calls for the rehabilitation of Constitution Gardens to improve resource conditions and circulation, relocate the Canal Lockkeeper's House, provide flexible opportunities for relaxation, entertainment, and recreation, as well as improved visitor service facilities. The proposed rehabilitation is the subject of the EA and constitutes an undertaking under Section 106.

The NPS wishes to formally initiate consultation with the Advisory Council on Historic Preservation under Section 106 of the National Historic Preservation Act on the rehabilitation of Constitution Gardens. The NPS will present an overview of the project at a public scoping meeting on May 22, 2014 from 5:00 PM to 7:00 PM at the Ronald Reagan Building, 1300 Pennsylvania Avenue, Washington, D.C. 20004 - and would be pleased to have you or a member of your staff attend and furnish comments.

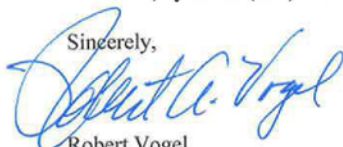
At this early stage, we are unable to propose either an area of potential effect (APE) or to make any determination of effect. The NPS plans to coordinate the Section 106 and NEPA processes to the greatest extent possible and to use the NEPA public scoping process to fulfill the requirement to take the views of the public into account. However, we do not intend to utilize the regulatory path of "substituting" the EA for Section 106.

The NPS will present an overview of the project at a public scoping meeting on May 22, 2014 from 5:00 PM to 7:00 PM at the Ronald Reagan Building, 1300 Pennsylvania Avenue, Washington, D.C. 20004 - and would be pleased to have you or a member of your staff attend and furnish comments.

A copy of the draft EA will be provided to your office for review when it becomes available, and we anticipate further consultation with your office as mandated by Section 106.

If you have any questions or require additional information, please contact James Perry by phone at (202) 245-4711, by fax at (202) 426-9309, or by email at james_perry@nps.gov

Sincerely,



Robert Vogel
Superintendent,
National Mall and Memorial Parks
National Park Service



United States Department of the Interior

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



IN REPLY REFER TO:

MAY - 8 2014

Mr. David Maloney
State Historic Preservation Officer
District of Columbia Office of Planning
1100 Fourth Street S.W., Suite E650
Washington, D.C. 20024

Subject: Proposed Rehabilitation of Constitution Gardens, National Mall, Washington, DC

Dear Mr. Maloney:

The National Park Service (NPS), in partnership with The Trust for the National Mall (the Trust), is preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 for the rehabilitation of Constitution Gardens on the National Mall in Washington, D.C. This project grew out of the 2010 National Mall Plan, a general management and visioning plan for a sustainable National Mall. The project team was selected through a national design competition in 2012.

Situated between the Lincoln Memorial and the Washington Monument, Constitution Gardens was designed as pastoral landscape with a natural lake, a quiet oasis removed from the bustle of the capital. This 52-acre park was officially dedicated in 1976, with the island in the center dedicated to the 56 Signers of the Declaration of Independence in 1982. Sadly, within just a few years of its opening, the conditions of the lake and the trees began to be of concern. Poor soil conditions have kept some of the trees from reaching full maturity to this day. Subsequently, many of the walkways have deteriorated and the visitor services facility once imagined at the eastern end of the lake was never realized.

The purpose of this project is to rehabilitate Constitution Gardens to improve the ecology, accessibility, cultural and recreational opportunities, and visitor services of the area. It conforms to the National Mall Plan which calls for the rehabilitation of Constitution Gardens to improve resource conditions and circulation, relocate the Canal Lockkeeper's House, provide flexible opportunities for relaxation, entertainment, and recreation, as well as improved visitor service facilities.

The 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 rehabilitation of Constitution Gardens, an undertaking, in accordance with 36 CFR 800.3 of the regulations of the Advisory Council on Historic Preservation (ACHP). At this early stage, we are unable to propose either an area of potential effect (APE) or to make any determination of effect. The NPS plans to coordinate the Section 106 and NEPA processes to the greatest extent possible and to use the NEPA public scoping process to fulfill the requirement to take the views of the public into account. However, we do not intend to utilize the regulatory path of "substituting" the EA for Section 106.

The NPS will present an overview of the project at a public scoping meeting on May 22, 2014 from 5:00 PM to 7:00 PM at the Ronald Reagan Building, 1300 Pennsylvania Avenue, Washington, D.C. 20004 - and would be pleased to have you or a member of your staff attend and furnish comments.

A copy of the draft EA will be provided to your office for review when it becomes available, and we anticipate further consultation with your office as mandated by Section 106.

If you have any questions or require additional information, please contact James Perry by phone at (202) 245-4711, by fax at (202) 426-9309, or by email at james_perry@nps.gov.

Sincerely,



Robert Vogel
Superintendent,
National Mall and Memorial Parks
National Park Service

GOVERNMENT OF THE DISTRICT OF COLUMBIA
STATE HISTORIC PRESERVATION OFFICER



August 14, 2014

Mr. Robert Vogel, Superintendent
National Mall and Memorial Parks
National Park Service
900 Ohio Drive, SW
Washington, DC 20024-2000

RE: Proposed Rehabilitation of Constitution Gardens, National Mall, Washington, DC

Dear Mr. Vogel:

Thank you for initiating Section 106 consultation with our office regarding the above-referenced undertaking and for hosting a meeting on August 7, 2014 so that interested parties could learn about the rehabilitation plans for Constitution Gardens. Based upon our review of the information presented in that meeting, we are writing to provide our initial comments regarding effects on historic properties in accordance with 36 CFR Part 800 and the 2010 National Mall Plan Programmatic Agreement.

As you are aware, Constitution Gardens is a contributing element of the National Register of Historic Places-listed East and West Potomac Parks Historic District. It is also surrounded by numerous other historic properties. In our opinion, the Area of Potential Effect (APE) proposed by the NPS should be sufficient to take into account all of the direct and indirect effects associated with the undertaking so we have no recommendations for expansion or refinement of the APE at this time.

We are pleased that much of what is proposed in the two draft alternatives appears to be generally in keeping with the 1970s plan developed for the gardens by the firm of Skidmore, Owings and Merrill (SOM) – including the proposal to construct a pavilion on the easternmost knoll – but more specific information will be necessary to fully evaluate the effects of each alternative. For example, comparative illustrations and supporting quantitative/qualitative data that better explain the degree to which changes are proposed to the existing walkway designs, materials and coverage area would be useful in evaluating effects on the circulation system while research into SOM's design intent for the edge condition of the lake (i.e. was it intended to be perceived as natural or man-made?) may help inform decisions about appropriate treatments along the shore. However, our primary concerns with the proposed alternatives relate to the treatment of the 1832-33 Lockkeeper's House.



Even though the Lockkeeper's House has been relocated in the past, it is the oldest structure in East and West Potomac Parks and the only remaining one in the historic district that is directly associated with the C&O and Washington City Canals. The original western foundation wall of the house was recently unearthed (circled in red in the image to the right) as part of a sewer line replacement project and the wall's location confirmed that the house originally stood only about 49 feet to the east and 10 feet to the south of its current location. As such, relocating the building approximately 500 feet further to the west – as proposed in Alternative 2 – would significantly remove the house from its location near the canal lock. This would constitute an adverse effect on the building which is individually listed in the National Register.



Similarly, any substantial alteration of the Lockkeeper's House to accommodate a new use that requires a great deal of additional space – such as a canal interpretive center – would also likely result in an adverse effect even though the building has been altered in the past. Therefore, the treatment of the Lockkeeper's House should be based first upon identifying an appropriate, compatible and supportable use that meets the "Purpose and Need" of the project and then upon careful consideration of design alternatives that will retain and respect the building's remaining integrity as much as possible.

Other comments relating to the information presented in last week's meeting include:

- The importance of respecting the Virginia Avenue view corridor the rehabilitation designs;
- Views to the World War I Memorial should be protected and encouraged;
- The proposed new pavilion seems appropriate since the SOM plan called for a new structure at the eastern end of the park, but the effects of the design of the new building (e.g. change in character to the park etc.) should be carefully evaluated as consultation moves forward;
- Construction of a new wall and berm around most of the park's periphery has the potential to interrupt views to and from the Federal Reserve Board, the American Pharmacists Association Building and other historic properties which help to establish the setting for the park; and
- We note that a "hybrid" alternative made up of aspects from the two action alternatives may also be possible.

If you should have any questions or comments regarding this matter, please contact me at andrew.lewis@dc.gov or 202-442-8841. Otherwise, we look forward to consulting further with all parties to complete the Section 106 review of this undertaking.

Sincerely,



C. Andrew Lewis
Senior Historic Preservation Specialist
State Historic Preservation Office

14-195

cc: Jennifer Hirsch, NCPC



United States Department of the Interior



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

April 1, 2015

Mr. David Maloney
State Historic Preservation Officer
District of Columbia Office of Planning
1100 Fourth Street S.W., Suite E650
Washington, D.C. 20024

**Subject: Determination of Area of Potential Effect for the Rehabilitation of Constitution
Gardens**

Dear Mr. Maloney:

The National Park Service (NPS), in partnership with The Trust for the National Mall (the Trust), is currently considering rehabilitation of Constitution Gardens on the National Mall in Washington, D.C. The NPS provided an initial letter to your office outlining the project on May 8, 2014 and hosted a consulting parties meeting on August 7, 2014. At this meeting, the NPS proposed an Area of Potential Effect (APE) that encompasses the entirety of the National Mall as well as the White House, Presidents Park, and an area north of Constitution Avenue. In a letter dated August 14, 2014, your office indicated that this APE should be sufficient to take into account all of the direct and indirect effects of the undertaking.

In accordance with the National Historic Preservation Act, as amended, the NPS is writing to notify your office that they have revised the APE for this undertaking based on an assessment of the potential effects of the undertaking and comments received from the consulting parties. The APE for the project is considered to encompass the entirety of the area described during the August 7, 2014 consulting parties meeting. However, for the environmental assessment, the majority of the direct effects are anticipated to be constrained to Constitution Gardens itself, referred to as the primary APE, while the indirect effects could occur within the larger APE, or the secondary APE (see figure 1). The primary APE now captures the areas where new stormwater lines may connect into the existing stormwater system. The primary APE extends to the edge of the street on the north side of Constitution Avenue and to the east side of 17th Street, NW. Based on this revision, the primary APE now includes a portion of the 17th Street Historic District.

If you require additional information, please contact Catherine Dewey, Acting Chief of Natural Resources, by phone at (202) 245-4711 or by email at catherine_dewey@nps.gov.

Sincerely,

A handwritten signature in dark ink, appearing to read 'K.L. Cucurullo', followed by a long, horizontal, slightly wavy line extending to the right.

Karen L. Cucurullo
Acting Superintendent
National Mall and Memorial Parks
National Park Service

Enclosure



United States Department of the Interior



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

Figure 1: Area of Potential Effect

