

National Park Service
U.S. Department of the Interior



Parkland Adjacent to the Intelligence Community Campus-Bethesda
Montgomery County, Maryland



GEORGE WASHINGTON MEMORIAL PARKWAY
PARKLAND RESTORATION PLAN
ENVIRONMENTAL ASSESSMENT
MAY 2019

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PURPOSE AND NEED

The National Park Service (NPS) is developing a Parkland Restoration Plan to improve drainage and resolve sedimentation issues on parkland downstream of the Intelligence Community Campus-Bethesda (ICC-B) in Bethesda, Maryland. The project area is located on federal land adjacent to the west side of the ICC-B site, which is owned by the Office of the Director of National Intelligence (ODNI). The proposed project is a result of an agreement between ODNI and NPS to address pre-existing erosion and sedimentation concerns caused by stormwater runoff from prior development on the ICC-B site.

The purpose of the proposed project is to improve the long-term ecological function and drainage of two stream channels, stabilize a non-natural erosion channel, and resolve sedimentation issues on NPS land that is downstream of the ICC-B.

The project is needed to address stormwater runoff from neighboring development that has resulted in tree root and streambank undercutting, sedimentation deposition, and channel and culvert blockages, as well as sediment load in the Chesapeake and Ohio (C&O) Canal requiring removal. Channel erosion has decreased the ecological functions and values of these channels and the C&O Canal.

PROJECT AREA

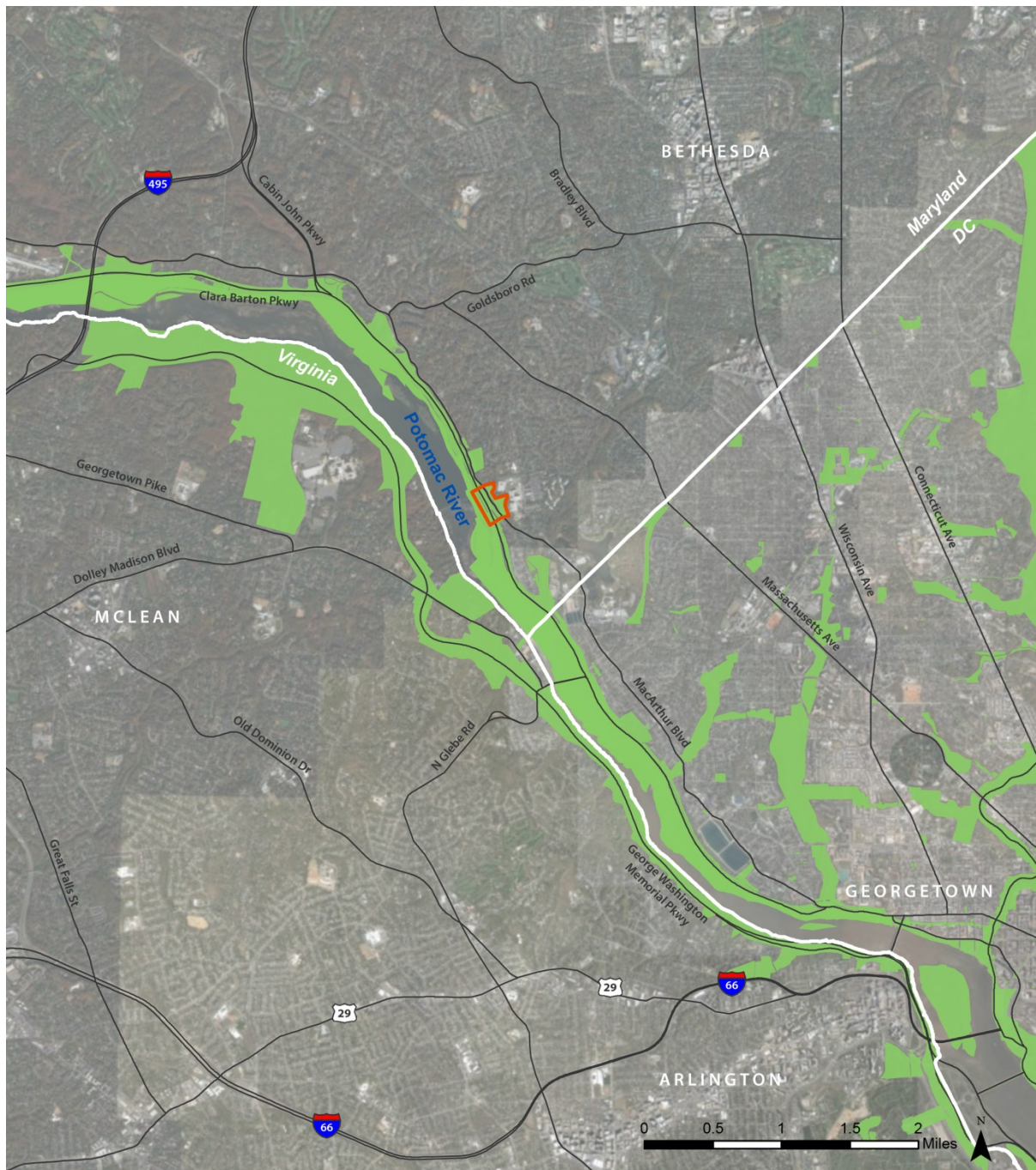
The 27.6-acre project area is located on federal land adjacent to the western side of the ICC-B site, between the ICC-B site and the Potomac River, and south of Wapakoneta Road. NPS property runs continually between the ICC-B site and the Potomac River, except for the area of MacArthur Boulevard that is federal property administered by the U.S. Army Corps of Engineers (USACE). Two NPS units, the George Washington Memorial Parkway (GWMP) and the Chesapeake & Ohio Canal National Historical Park (CHOH) administer the project area (see **Figure 1**).

The NPS GWMP unit occupies more than 7,300 acres of land in Virginia, Maryland, and the District of Columbia. It is an administrative unit of the NPS managing more than two dozen associated park sites, including the Clara Barton Parkway, many of which have their own enabling legislation. The George Washington Memorial Parkway runs along the Potomac River protecting the landscape and natural shoreline of the river while offering magnificent scenic vistas of Washington, D.C., and the Great Falls of the Potomac. Along its route, the parkway also connects several important historic sites, memorials, and scenic and recreation areas in the Washington, D.C. metropolitan area. The parkway is listed as an historic district in the National Register of Historic Places (NHRP).

The C&O Canal is a 184.5-mile route of manmade waterway that follows the D.C./Maryland side of the Potomac River. The C&O Canal National Historical Park contains a large number of canal-related resources, including a canal prism, towpath, lift locks, dams, bypass flumes, culverts, wasteweirs, and lockhouses. The C&O Canal National Historical Park, which runs from Georgetown in Washington, D.C. to Cumberland in western Maryland, is listed in the NRHP.

The approximate length of the C&O Canal inside the project area is 1,440 feet. A towpath runs adjacent to the west side of the canal in the project area.

The project area is forested land with multiple elevation changes. MacArthur Boulevard and Clara Barton Parkway traverse the project area. The project focuses on three stormwater drainage channels and the C&O Canal within the project area (see **Figure 2** and **Figure 3**).

Figure 1: Project Area Map**LEGEND**

-  Project Area
-  National Park Service parkland

Figure 2: Project Area Detail Map**LEGEND**

- | | | | |
|---|--------------------------------|---|-----------------------------|
|  | Project Area |  | Stream channels |
|  | National Park Service parkland |  | Non-natural erosion channel |

Figure 3: Photos of Stream Channels

Top Left: Wapakoneta Channel adjacent to Wapakoneta Road. Top Right: Wapakoneta Channel between MacArthur Boulevard and the C&O Canal; Middle Left: Midsite Channel near the ICC-B campus; Middle Right: Midsite Channel between MacArthur Boulevard and the C&O Canal; Bottom Left: Southwest Channel; Bottom Right: Wapakoneta Channel flow into C&O Canal prism

The Wapakoneta Channel, the northernmost channel in the project area, is a stream channel that originates outside of the project area, northeast of Wapakoneta Road. Within the project area, the channel runs along the south side of Wapakoneta Road and flows southwest, where it enters a six-foot diameter culvert at MacArthur Boulevard and flows under the roadway. The channel continues to the southwest of MacArthur Boulevard for approximately 125 feet and flows through a seven-foot wide box culvert beneath the Clara Barton Parkway. The channel continues to flow southwest for approximately 110 feet to Culvert 2, where it flows underneath the C&O Canal and then joins with the Potomac River; during high flows, the channel also flows into the C&O Canal. The approximate length of the Wapakoneta Channel within the project area is 860 feet. Within the stream channel, tree debris accumulations and a scrap metal object block the channel in some areas; water flow has also eroded streambanks.

The Midsite Channel is a stream channel that traverses the middle of the project area. The channel originates just outside of the project area at stormwater outfalls on the ICC-B site and flows southwest where it enters a four-foot diameter culvert and continues to flow under MacArthur Boulevard. The channel continues to the southwest of MacArthur Boulevard for approximately 200 feet and flows through a 3.5-foot wide box culvert beneath the Clara Barton Parkway. Beyond the culvert, the open channel then continues to flow southwest for approximately 85 feet and confluences with the C&O Canal (AECOM 2019). The approximate length of the Midsite Channel within the project area is 1,110 feet. Tree debris accumulations and manmade debris, such as a tire and old pipe debris, are present within the stream channel, and block the channel and culverts leading to the C&O Canal in some areas. Bank erosion and the undercutting of trees have occurred.

The Southwest Channel, the southernmost channel in the project area, is a non-natural erosion channel which flows in a northwest direction. The channel begins at a now obsolete discharge point from the ICC-B site and ends before MacArthur Boulevard. The approximate length of the Southwest Channel within the project area is 300 feet.

PROJECT BACKGROUND

The project site is situated downstream from the ICC-B campus, and historically received stormwater runoff from developed areas of the ICC-B site. Pages 4-11 and 4-14 of the 2011 *ICC-B Environmental Assessment* (ICC-B EA) describe the locations of stormwater outfalls at the ICC-B and their drainage into adjacent streams. As stated on page 4-11, “Drainage Areas A and B discharge to the ephemeral stream north of the site,” referencing the Wapakoneta Channel. Page 4-14 states “Drainage Areas C and F discharge to the creek behind Maury Hall [Midsite Channel].” Additionally Page 4-14 notes that “Drainage Area D drains to the hillside on the southwest portion of the site...Stormwater is collected through a series of inlets and discharges directly to the hillside to convey off property.” The ICC-B is in the process of implementing a master plan that calls for changes to, and/or redevelopment of, buildings, paved areas, and landscaping. As part of the master plan implementation, ICC-B received Stormwater Management and Sediment & Erosion Control Approval, effective June 17, 2016, from the Maryland Department of the Environment (MDE) to carry out improvements that would greatly reduce stormwater runoff through a decrease in impervious areas, elimination of an outfall, and the addition of bioretention facilities (MDE 2016). Many of the master plan improvements have been implemented, including a reduction of discharges conveying to the Wapakoneta, Midsite, and Southwest Channels, with completion anticipated in 2019. In order to address concerns about erosion and sedimentation contributed by the ICC-B stormwater runoff over time, ODNI and the NPS signed a Memorandum of Intent (MOI) on October 18, 2013 regarding the restoration of NPS land. The development of a restoration plan and this EA are identified actions within the MOI.

PLANNING ISSUES AND CONCERNS RETAINED FOR FURTHER ANALYSIS

Through the internal and public scoping process conducted for this Environmental Assessment (EA), NPS, participating agencies and stakeholders, and the public identified the following issues and concerns

to be retained for detailed analysis. These issues and concerns are included in the impact topics that are discussed in the “Affected Environment and Environmental Consequences” section of the EA.

Poorly controlled stormwater generated outside the project site has led to erosion of stream channels within the project site and sedimentation of the C&O Canal, diminishing the ecological condition of the site. Page 4-11 of the ICC-B EA identifies discharge into streams leading to the Wapakoneta Channel, noting that the “creek is severely eroded immediately downstream of the outfall of Drainage Area B. The bank erosion has created a deeply entrenched channel which may require restoration.” Additionally, page 5-12 of the ICC-B EA indicates that water quality has declined in the Wapakoneta Channel, stating that the “current stormwater collection and outfall into a highly eroded ephemeral channel along the northern boundary of the site would continue, resulting in continued flashy, erosive flows and increased turbidity in any water that could be present in the channel.” Uncontrolled stormwater has eroded streambanks, undercutting trees and adding debris to channels within the project site.

The proposed project could introduce or change elements of the documented historic properties listed in the National Register. The George Washington Memorial Parkway and the C&O Canal National Historical Park are listed in the NRHP. Removal of sediment could alter the conveyance of water through historic resources. Also, the removal of vegetation could alter the wooded character of the property. The project’s potential impacts on historic properties and districts are analyzed in detail in the Historic Buildings and Structures and Archeology sections of this EA.

The repair of parkland could remove trees that are in poor condition. Some trees have experienced root undercutting through the erosion of stream banks. In these cases, the condition of the tree may have diminished to a level that requires removal. The project’s potential impacts on trees and parkland vegetation are analyzed in the Vegetation section of this EA.

The restoration of parkland could allow establishment of invasive species within disturbed areas. The proposed project would fill and replant the Southwest Channel and disturb soils within the project site. This could increase the availability of freshly disturbed soils that offers the potential for the establishment of invasive species such as Oriental bittersweet (*Celastrus orbiculatus*). The project’s potential impacts on invasive species expansion are analyzed in the Vegetation section of this EA.

The restoration of parkland could negatively affect aquatic natural resources. Changes to the stream channels could result in impacts on floodplains, wetlands, and other aquatic natural resources from the removal of vegetation during construction or altering the flow of water. The project’s potential impacts on aquatic natural resources are analyzed in the Wetlands section of this EA.

PLANNING ISSUES AND CONCERNS DISMISSED FROM FURTHER ANALYSIS

Some issues and concerns identified during scoping were considered by the NPS, but were ultimately dismissed from detailed analysis because they were determined not central to the proposal or of critical importance. This section provides brief descriptions of the issues and concerns determined to not warrant further consideration, as well as a brief justification for the dismissal of each issue.

Potential for the project to impact threatened and endangered species and common species of wildlife. In accordance with Section 7 of the Endangered Species Act, the NPS consulted with the U.S. Fish and Wildlife Service (USFWS) and Maryland Department of Natural Resources (MDNR) to determine the potential for, respectively, federally and state-listed protected species to be present at the project site. This consultation indicated the presence of the Northern Long-eared Bat (*Myotis septentrionalis*) at the project site. However, because the project would have a tree clearing of less than 15 acres (the level required for additional consultation for the Northern Long-eared Bat), these topics were dismissed from further analysis.

Potential for the project to impact floodplains. Approximately 95 percent (26.17 acres) of the project area is located outside of the 100-year and 500-year floodplains. Only the project area to the west of the C&O Canal is located in the 100-year floodplain (FEMA 2017b). The proposed action focuses on channels located along steep slopes and the C&O Canal, which are within the project area outside of the 100-year and 500-year floodplains. Therefore, this topic was dismissed from detailed analysis.

Potential for the project to impact water resources. Neither of the alternatives analyzed in the EA would have a measurable impact to water quality of the Potomac River. The Wapakoneta Channel would continue to confluence with the Potomac River at lower flows, but would also run into the Potomac River at higher flows after implementation. The Midsite Channel would continue to confluence with the C&O Canal. The overall quality of water entering the channels and the C&O Canal would remain the same under the proposed action with the exception of a reduction in sediment. Therefore, this topic was dismissed from further analysis.

ALTERNATIVES

This EA analyzes the potential environmental consequences of two alternatives. The elements of these alternatives are described in detail in this chapter. Impacts associated with the actions proposed under each alternative are outlined in the “Affected Environment and Environmental Consequences” chapter of the EA. In addition, one other approach to repair and restore the parkland was dismissed from further consideration; this approach is described in this chapter under “Alternatives Considered but Dismissed.”

ALTERNATIVE A: NO-ACTION

Alternative A would not alter the existing stream channels within the project site. At the Wapakoneta Channel, debris within the stream channel would remain. Eroded streambanks would not be repaired or stabilized. Culvert 2 at the C&O Canal would not be cleared, and blockages would remain.

At the Midsite Channel, undercut trees would not be stabilized or removed. Debris within the stream channel would remain. Bank erosion would not be repaired or stabilized. No replanting of vegetation would occur. At the Southwest Channel, the existing eroded gully would remain.

Within the C&O Canal portion of the project site, dead trees and debris blocking culverts would remain. No sediment from the C&O Canal would be removed. The eroded streambank would not be repaired or stabilized.

ALTERNATIVE B: ACTION ALTERNATIVE

Alternative B would implement multiple park restoration measures, as described below.

Wapakoneta Channel - Multiple restoration efforts to the Wapakoneta Channel would occur under Alternative B (see **Figure 4** and **Figure 5**). The restoration measures include the following:

- Vegetated swale stabilization with grading, erosion control, replanting, or mulch. These changes would occur at multiple points through the Wapakoneta Channel.
- Removal of debris. Alternative B would remove blockages from trees limbs and trunks, as well as other debris present within the Wapakoneta Channel and Culvert 2.
- Use of sandy clay backfill to stabilize bank. At multiple points within the site, sandy clay backfill would be used to stabilize banks with coir blacks, fabric, or other materials.
- Formation of step pool. Alternative B would protect the upstream outlet from the ICC-B campus by creating a step pool from stone to avoid downstream erosion.
- Use of riprap. Southeast of MacArthur Boulevard, a small amount of riprap would be installed at the headwall downstream of MacArthur Boulevard path to prevent additional scouring.
- Sediment removal from C&O Canal. Sediment would be removed from the C&O Canal at its intersection with the Wapakoneta Channel.

During stabilization, Wapakoneta Road would provide access to the upper Wapakoneta Channel (northeast of MacArthur Boulevard) for equipment. MacArthur Boulevard and the C&O Canal towpath would provide access to areas of the lower Wapakoneta Channel (southwest of MacArthur Boulevard).

Midsite Channel - Multiple restoration efforts to the Midsite Channel would occur under Alternative B (see **Figure 6** and **Figure 7**). The stabilization measures include the following:

- Vegetated swale stabilization with grading, erosion control, replanting, or mulch. These changes would occur at multiple points along the Midsite Channel.
- Removal of debris. Alternative B would remove blockages from trees limbs and trunks, as well as other debris present within the Midsite Channel. Southwest of MacArthur Boulevard, Alternative B would remove stones from the lower portion of the culvert inlet to clear the opening.
- Use of sandy clay backfill to stabilize the bank. At multiple points within the site, sandy clay backfill and coir blankets, fabric, or other materials would be used to stabilize banks.
- Use of riprap. Southwest of MacArthur Boulevard, Alternative B would place riprap at the culvert outlet southwest of MacArthur Boulevard and adjacent to the C&O Canal towpath in order to address scour and to prevent undercutting of the channel, respectively.
- Removal of sediment from C&O Canal. Within the C&O Canal prism, sediment would be removed from two bars near the intercept with the Midsite Channel.

During stabilization, MacArthur Boulevard would provide access to the upper Midsite Channel (northwest of MacArthur Boulevard). MacArthur Boulevard and the C&O Canal towpath would provide access to areas of the lower Midsite Channel (southwest of MacArthur Boulevard).

Southwest Channel - At the Southwest Channel, the existing gully eroded by stormwater in areas northeast and southwest of MacArthur Boulevard would be filled (see **Figure 8**). A series of timber wall bulkheads would be installed across the eroded gully and then filled with soil or appropriate fill materials. The channel would then be planted with native vegetation.

During the restoration of the parkland at the Southwest Channel, MacArthur Boulevard would provide access to the area.

Site-wide Restoration - Invasive vegetation would be removed in order to improve the local ecology and to prevent the colonization by new invasive vegetation at locations disturbed by the Action Alternative. The removal efforts would particularly focus on Japanese honeysuckle (*Lonicera japonica*), which is known to be present near the affected areas.

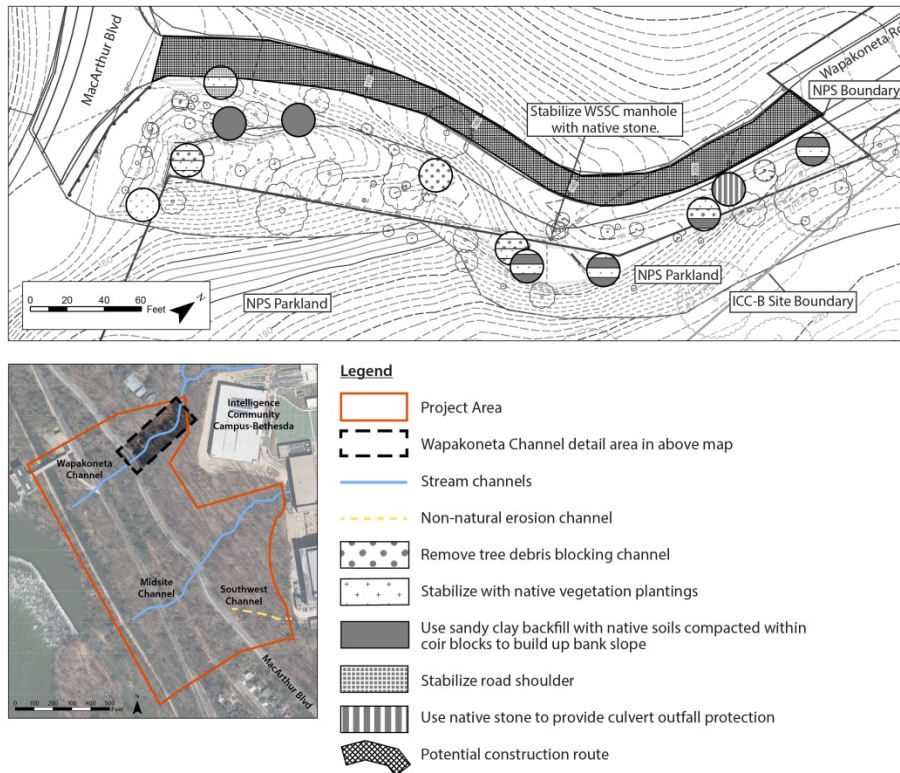
Figure 4: Wapakoneta Channel Stabilization (northeast of MacArthur Boulevard)

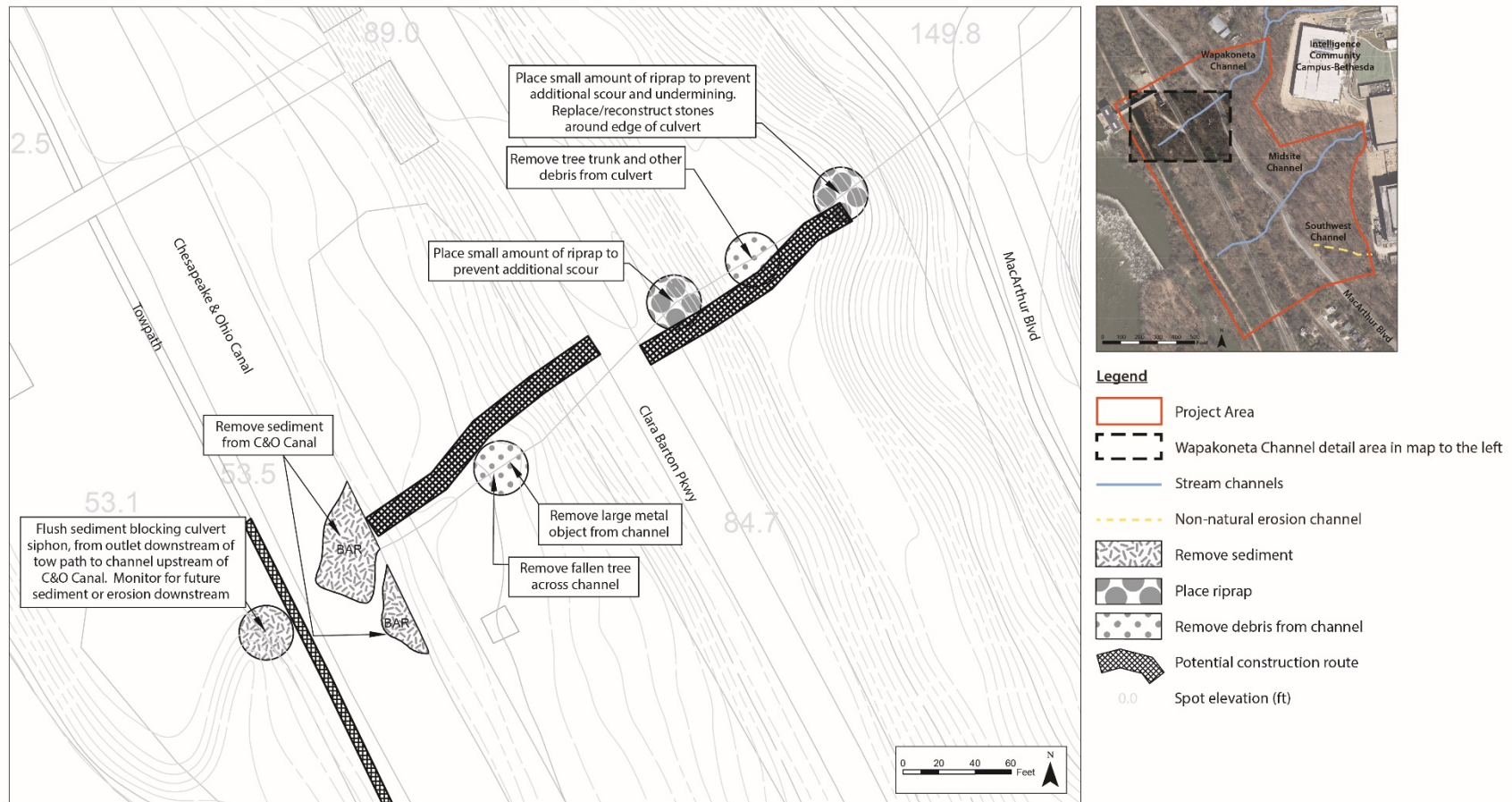
Figure 5: Wapakoneta Channel Stabilization (southwest of MacArthur Boulevard)

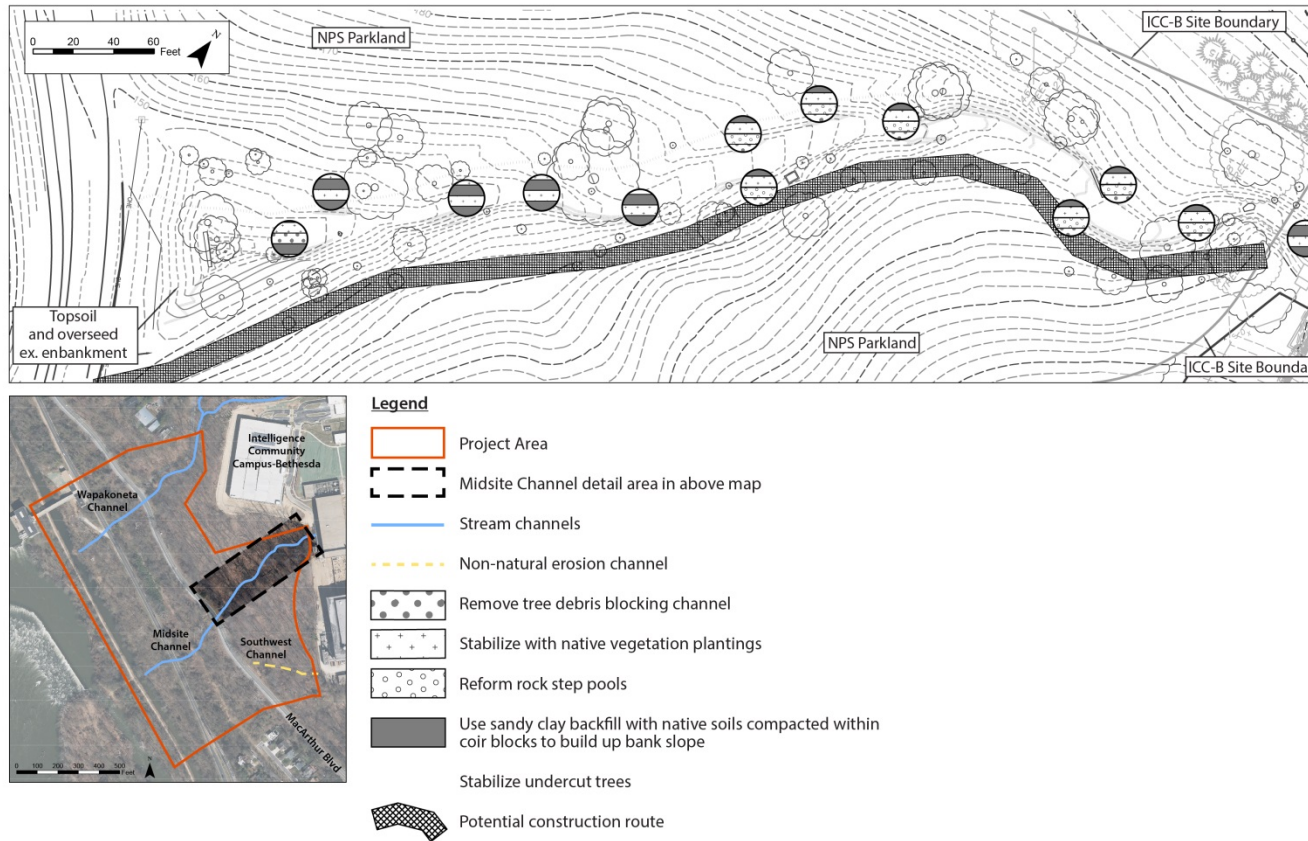
Figure 6: Midsite Channel Stabilization (northeast of MacArthur Boulevard)

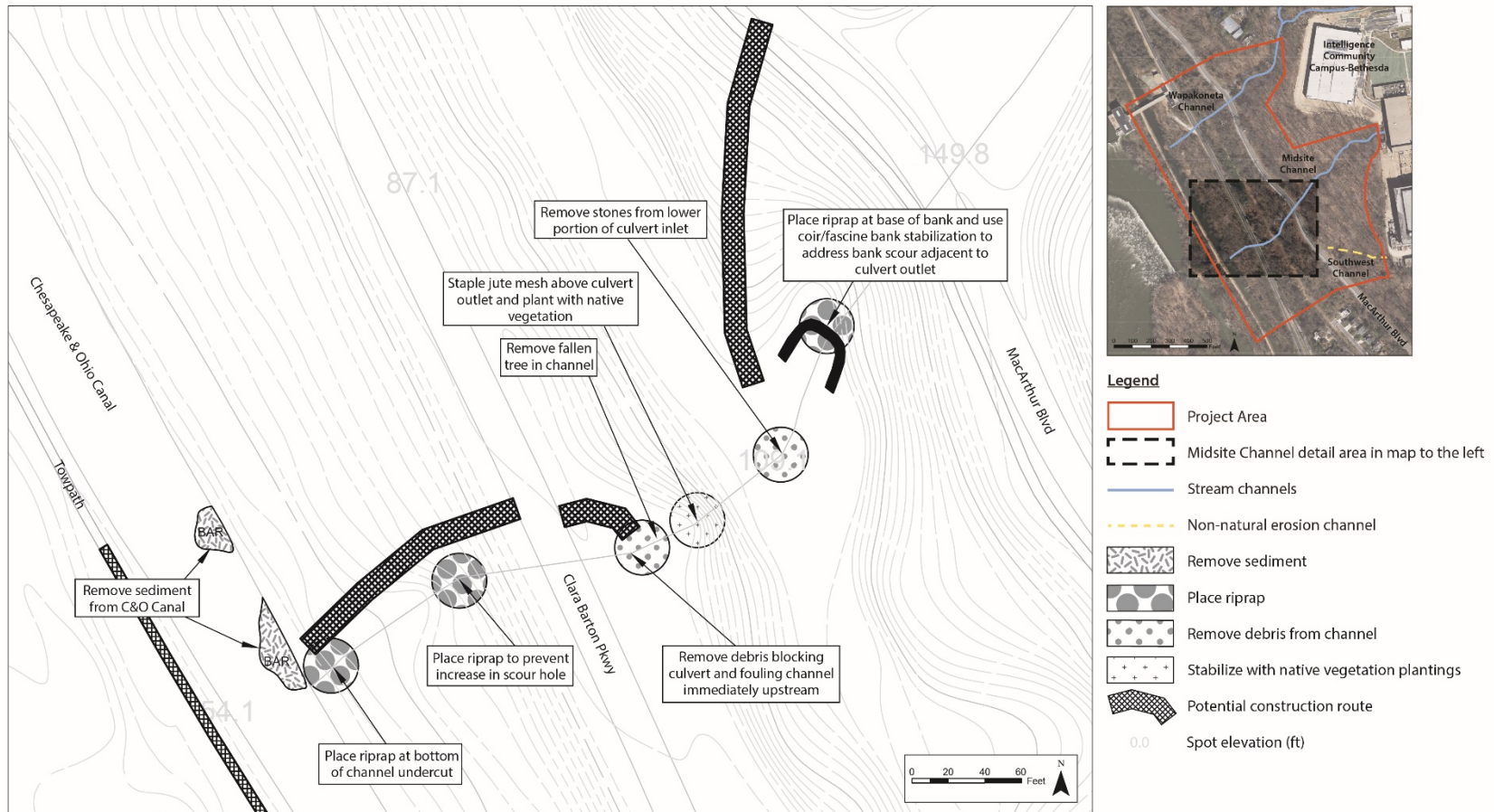
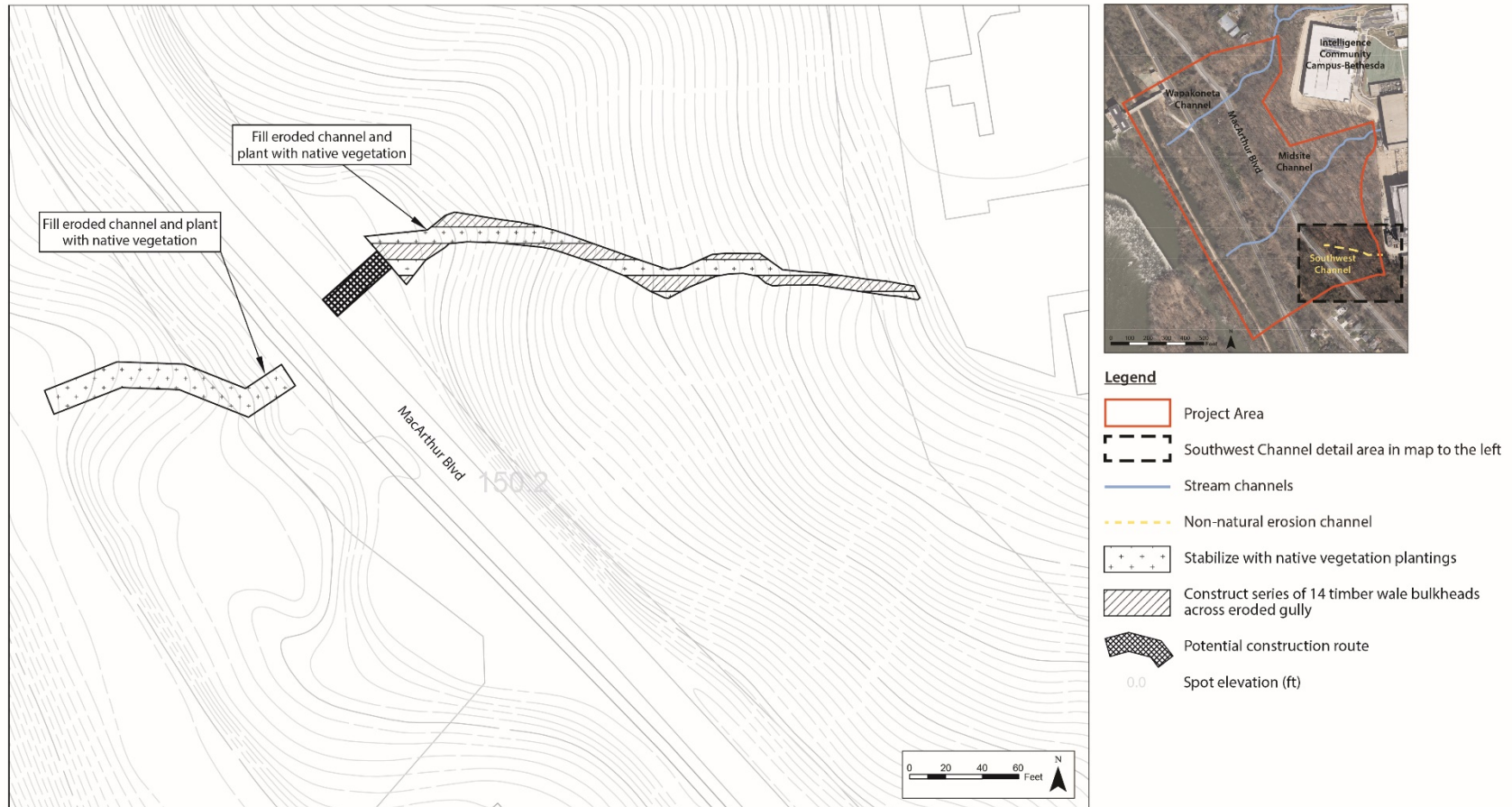
Figure 7: Midsite Channel Stabilization (southwest of MacArthur Boulevard)

Figure 8: Southwest Channel Parkland Restoration

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes current environmental conditions in and surrounding the project area. The discussion is focused on resources that could potentially be affected by the implementation of the proposed project and provides a baseline for understanding the current condition of the resources. The section also includes an analysis of the environmental consequences, or “impacts,” of the no action and action alternatives.

Cumulative Impacts Methodology: The EA also considers cumulative impacts – defined as the impact on the environment which 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 (40 CFR 1508.7). Cumulative impacts are addressed in this EA by resource topic for both the action and no-action alternatives. To determine the potential cumulative impacts, past, current, and anticipated future projects within the project site, the ICC-B, and in the surrounding area were identified. These cumulative projects are summarized in **Table 1**.

Table 1: Anticipated Cumulative Projects in and around the Project Site

Past, Present or Future	Cumulative Impact Project	Description
Future	C&O Canal Sediment Removal	The C&O Canal Sediment Removal project would remove sediment buildup from the C&O Canal prism outside of the project area.
Future	C&O Canal Georgetown Canal Plan	The C&O Canal Georgetown Canal Plan will focus on addressing deferred maintenance issues and related safety and accessibility concerns associated with the towpath; improving connections between Georgetown and the C&O Canal towpath; enhancing visitor experience through increased signage; and optimizing underutilized areas.
Present/Future	Washington Suburban Sanitary Commission (WSSC) Exposed Pipe Maintenance and Repair	WSSC will review the maintenance, and repair if necessary, the exposed pipe located northeast of the MacArthur Boulevard culvert for the Wapakoneta Channel.
Present/Future	ICC-B Campus Master Plan Implementation	The implementation of the ICC-B Campus Master Plan includes the redevelopment of the Sumner Site at the ICC-B by connecting some of the existing structures with construction of a new structure, “The Centrum.” Each of the existing structures will also receive renovations and upgrades designed to mitigate anti-terrorism and force protection (AT/FP) threat conditions and unify the exterior appearance as one contiguous facility.

HISTORIC BUILDINGS AND STRUCTURES

Historic properties at the project site are documented in the NRHP nominations for George Washington Memorial Parkway (1995 and Draft Update 2017), the C&O Canal National Historical Park (2015), and the Washington Aqueduct (1973); in a Cultural Landscapes Inventory (CLI) for the Clara Barton Parkway

(2015); and in a Maryland Historical Trust (MHT) Determination of Eligibility for the Army Map Service Historic District (MHT 2004). Historic properties were identified within the project's area of potential effect (APE) (see **Figure 9**). As defined by 36 CFR 800.16(d), the APE represents "the geographic area within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist."

Figure 9: Area of Potential Effect



LEGEND

- | | | |
|--------------------------------|--|------------------------------------|
| Project Site | Clara Barton Parkway | Washington Aqueduct |
| Area of Potential Effect (APE) | Chesapeake & Ohio Canal National Historical Park Historic District | Army Map Service Historic District |

Affected Environment

This section of the EA addresses historic buildings and structures within the APE, which contains sections of three historic districts and includes contributing buildings, sites, and structures. NPS defines structures as constructions made usually for purposes other than creating human shelter. In some cases, historic structures are also contributing resources for historic districts or sites. The George Washington Memorial Parkway NRHP nomination as an historic district includes the character-defining features of the Clara Barton Parkway identified in the CLI. In order to avoid repetition, the Clara Barton Parkway is addressed under Historic Buildings and Structures, which encompasses historic districts. Similarly, the C&O Canal National Historical Park does not have a separately documented cultural landscape for the area within the APE; as a result and in order to avoid repetition, the C&O Canal National Historical Park is addressed under Historic Buildings and Structures.

George Washington Memorial Parkway (including the Clara Barton Parkway) - The Clara Barton Parkway, a component landscape of the overall George Washington Memorial Parkway, passes through the APE. The Clara Barton Parkway follows a 6.8 mile length of the Potomac River on the Maryland side, of which 0.3 miles are within the APE. The George Washington Memorial Parkway is a scenic roadway dedicated to commemorating the life of George Washington and preserving the natural and historic character of the Potomac River. The George Washington Memorial Parkway was listed as an historic district in 1995 under multiple criteria; the nomination was updated in 2017 under the following criteria:

- Criterion A for association with broader planning of Washington, DC and commemoration of the life of George Washington
- Criterion B for its association with George Washington
- Criterion C for parkway construction, engineering and transportation innovations, and landscape architecture

The scenic driving experiences provided along the parkway are achieved through the maintenance and protection of a series of natural areas and carefully designed and maintained landscape spaces and features that provide a green backdrop and scenic buffer in the urban corridor. George Washington Memorial Parkway was designed to offer selected views of the Potomac River Gorge, C&O Canal, monuments in Washington, D.C., and historic and commemorative features that line the parkway from Mount Vernon to the Great Falls of the Potomac. The Clara Barton Parkway features intimate views of the locks and lock houses of the C&O Canal, rather than sweeping views of the Potomac River. The NRHP nomination identifies the following character-defining features of the historic district within the APE:

- **Spatial Organization.** The Clara Barton Parkway is characterized by a narrow two-lane roadway framed by wooded areas. MacArthur Boulevard traffic is occasionally visible, particularly during the winter months when foliage is not as dense.
- **Land Use.** Transportation is the primary land use identified by the Clara Barton Parkway CLI within the APE. The roadway is used for commutes, local traffic for residents, and recreation purposes. The roadway also offers access to recreation resources.
- **Topography.** The topography of the Clara Barton Parkway within the APE is characterized to the north by steep terraces with bluffs above and the C&O Canal to the south below.
- **Vegetation.** Vegetation within much of the Clara Barton Parkway appears as a mature forest along the roadway edge. This is also the case within the APE, with very little separation between the forest and the roadway. However, the presence of non-native species somewhat diminishes the character and the integrity of the wooded natural character of vegetation within the APE.
- **Circulation.** The roadway is the primary circulation feature of the Clara Barton Parkway within the APE.

- **Buildings and Structures.** Although multiple types of buildings and structures are present within the historic district, only one lies within the APE. A box culvert (Culvert 9) runs under the Clara Barton Parkway to the C&O Canal to pass the intermittent stream, just east of the Little Falls Pumping Station.
- **Small-Scale Features.** Four-inch concrete curbs line the edge of the Clara Barton Parkway roadway to define a clean distinct edge that distinguishes this parkway from other highways. The curb is present within the APE.

C&O Canal National Historical Park - The C&O Canal National Historical Park is a linear historic district listed in the NRHP that extends from Georgetown in Washington, D.C. to Cumberland in western Maryland.¹ The district encompasses approximately 20,500 acres, of which 7.3 acres are within the APE. The 184.5-mile route of the constructed waterway follows the District of Columbia/Maryland side of the Potomac River.

The C&O Canal retains the canal structure (or “prism”), towpath, and locks, as well as numerous aqueducts, extant lock houses, and other historic resources (see **Figure 3** for flow of Wapakoneta Channel into prism). It was listed as an historic district in 1979 (with a boundary expansion in 2015) under multiple criteria:

- Criterion A for transportation; industry and commerce; military; ethnic heritage; conservation and recreation; agriculture; community development; and recreation.
- Criterion C for engineering and architecture.
- Criterion D for its prehistoric and historic archaeological significance.

The C&O Canal prism forms the constructed waterway. Below Harpers Ferry, the prism approximately measures 60 feet wide at the top, 48 feet at the bottom, and six feet deep. On one side of the prism, a berm stabilizes the adjacent earth slope, and on the other side an approximately 12-foot wide towpath historically allowed mules to pull boats through the canal. Its surface is smooth and hard, made of crushed rock or other material available in the immediate area. The canal prism and towpath run along the western portion of the project site and are contributing elements to the historic district present within the APE (NPS 2015a).

Canal construction on the D.C. and Maryland river banks blocked the natural passage of inland drainages into the Potomac River; therefore, the canal company built culverts to drain watercourses of varying sizes under the canal. One such culvert is Culvert 2, located at mile 5.74 along the canal and within the APE. The culvert was built in 1830 and is a contributing element of the historic district.

Two structures within the APE were identified as non-contributing elements within the historic district: (1) Dam #1- Little Falls is largely ruined with little remaining, and therefore does not qualify as a structure; and (2) The Little Falls Dam and Pumping Station, which was built in 1959, after the period of significance.

Washington Aqueduct - The APE includes portions of the Washington Aqueduct, which is both a contributing resource to the C&O Canal National Historical Park and a National Historic Landmark. The property is significant under the themes of military and transportation. The Washington Aqueduct was built to supply water to Washington, D.C. Construction of the aqueduct began in 1853. MacArthur Boulevard was built atop the aqueduct to allow service access for the utility. Within the APE, the nine-foot diameter mortared brick and stone aqueduct runs through a tunnel. The aqueduct still supplies water to the city, pulling water from Little Falls and transporting it downstream within the APE. While most of

¹ The C&O Canal National Historical Park is both an historic district and cultural landscape. For the purposes of this document, the C&O Canal National Historical Park is only described in the Historic District section in order to reduce repetition in the document.

the resource is below ground, culverts and brick vents can be found along the aqueduct; one historic culvert has been previously documented within the project area.

Army Map Service Historic District - The Army Map Service (AMS) Historic District was determined eligible for listing in the NRHP in 2004 and is historically significant at the national level because it is related to the history of military involvement in World War II. The district includes resources on two discontinuous parcels, the Dalecarlia Site and the Sumner Site. The APE includes a portion of the Sumner Site.

The Sumner Site consists of one contributing building, Erskine Hall, located partially within the APE, and one contributing structure, Flagpole/Globe Memorial, located outside of the APE. Erskine Hall, completed in 1946, is a five-story brick building with multi-pane windows designed by the U.S. Engineers Office. The building functioned as the headquarters of the AMS, U.S. Army Topographic Command, and Defense Mapping Agency Hydrographic/Topographic Command after World War II. Original plans for the building indicate an exterior stairway was constructed on the building's west façade and extended down to a trolley line located east of MacArthur Boulevard. This stairway indicates that many employees used the trolley line to commute to work. Additional information about this stairway is provided in the Archeological Resources section (MHT 2004).

About the Analysis

The impacts, direct or indirect, adverse or beneficial, are analyzed in consideration of additional regulations and guidance provided by NEPA, Section 106 of the NHPA, the *Secretary of Interior's Standards for the Treatment of Historic Properties*, and DO-28.

As part of the Section 106 process, an Assessment of Effects has been prepared for the project and will be submitted to the Maryland State Historic Preservation Office, MHT, for review and approval in conjunction with this EA.

Impacts of Alternative A – No Action

Under Alternative A, no improvements to the stream channels, vegetation, or structures within the APE would occur. Non-native species would remain along the Clara Barton Parkway, and would continue to diminish the character and integrity of the wooded vegetation within the APE. No changes would occur to the spatial organization, land use, topography, circulation, buildings and structures, or small-scale features of the Clara Barton Parkway.

Under Alternative A, no stabilization of stream channels, replanting of vegetation, removal of sediment, or clearing of culverts within the APE would occur. Alternative A would not alter the C&O Canal National Historical Park, the Washington Aqueduct, or the AMS Historic District within the APE. Because no new changes within the APE would occur, there would be no new impacts on historic districts in the APE.

Cumulative Impacts: Alternative A would have no impacts on historic districts. Thus, it would have no potential to contribute to cumulative impacts when considered with past, present, and reasonably foreseeable future projects occurring at and in the vicinity of the project site.

Conclusion: Alternative A would have no new impacts on historic districts and would not contribute to cumulative impacts on historic districts within the APE.

Impacts of Alternatives B – Action Alternative

Under Alternative B, the stabilization and replanting of stream channels with native vegetation within an area of approximately 3.5 acres of the Wapakoneta and Midsite Channels would help re-establish the wooded vegetative character of Clara Barton Parkway by removing or stabilizing approximately eleven trees that have died or been undercut. The filling and replanting of approximately 0.3 acres of the Southwest Channel would also help to re-establish the wooded vegetative character of the Clara Barton

Parkway. Under Alternative B, the filling of the Southwest Channel would provide a more consistent topographic condition and vegetative landscape without the stream channel that would no longer function as such. Site-wide removal of non-native species, which have diminished the woodland character of the Clara Barton Parkway, would improve the landscape's condition by removing these invasive elements. Culvert 9 would be cleared of debris to facilitate the flow of water under the Clara Barton Parkway as originally intended by the design.

The construction required for the replanting and filling of the channels could have direct and detectable temporary adverse impacts during the construction phases, when approximately 0.5 acres of the 23 vegetated acres within the site would be disturbed in order to access the affected area. These impacts would be minimized or avoided by careful planning of the construction route to minimize changes to the vegetated landscape and avoid canopy trees. Over the longer term, the reestablishment of the wooded character of the Clara Barton Parkway would result in direct beneficial impacts.

Alternative B would clear blockages of debris from Culvert 2 leading under the C&O Canal. The removal of debris and sediment would facilitate the flow of water from the Wapakoneta Channel under the C&O Canal prism, which would help return the culvert's function to its original drainage pattern. No changes to the culvert structure, including stonework, would occur. Alternative B would also remove sediment deposits from locations within the canal prism in the vicinity of the confluence with the Midsite Channel. The removal of the sediment would help restore the original drainage pattern and function of the C&O Canal. These changes would result in beneficial impacts on the C&O Canal National Historical Park by helping to restore the original engineered drainage system of the canal.

During the sediment removal and drainage improvements, work would occur adjacent to and within the canal and towpath. In order to ensure the C&O Canal National Historical Park is not damaged, NPS would develop strategies in consultation with the MHT.

Alternative B would not result in changes to the Washington Aqueduct or the AMS Historic District within the APE and would have no impact on these resources.

Cumulative Impacts: Alternative B would have long-term beneficial and temporary detectable adverse impacts on the historic districts. Alternative B would have beneficial impacts on the C&O Canal and no impacts on the Washington Aqueduct or the AMS Historic District within the APE. The C&O Canal Sediment Removal project would remove sediment within portions of the C&O Canal outside the project area in order to improve the drainage within the canal prism, resulting in beneficial impacts on the C&O Canal National Historical Park. The C&O Canal Georgetown Canal Plan would address deferred maintenance issues and related safety and accessibility concerns associated with the towpath. The project would likely have beneficial impacts on the C&O Canal as a result of maintenance repairs, and potential adverse impacts as a result of changes to the towpath and accessibility connections.

None of the other past, present, and reasonably foreseeable future projects addressed in this EA would result in impacts on historic districts within the APE. Thus, when considered with these projects, Alternative B would result in an overall beneficial impact.

Conclusion: Alternative B would have long-term beneficial impacts through the revegetation of the wooded landscape, removal of non-native species, and the clearing of blockages of Culverts 2 and 9. Temporary detectable adverse impacts on historic districts would occur during construction, but would be minimized through planning of routes. Alternative B would have beneficial impacts on the C&O Canal National Historical Park as a result of drainage improvements, but could have adverse impacts on the C&O Canal National Historical Park during the construction phase. Alternative B would contribute a beneficial incremental impact on the overall cumulative impacts of other projects, when considered with past, present and reasonably foreseeable future projects at and in the vicinity of the project site. Alternative B would contribute cumulatively to beneficial impacts on the historic districts.

ARCHEOLOGICAL RESOURCES

Affected Environment

This section of the EA addresses archeological resources with the APE. A Phase IA Archeological Assessment for the APE was conducted in 2018 in conjunction with the preparation of this EA (AECOM 2018). The assessment reviewed historic maps, previous investigations and recorded sites, topography, and existing conditions, and conducted a brief pedestrian-level inspection in an effort to identify the archeological potential within the APE. A Phase I archeological survey has not been conducted for the entirety of the APE. However, seven cultural resource surveys previously conducted included portions of the APE (see **Table 2**). The following section summarizes the findings from the Phase IA Archeological Assessment and the one archeological survey (MO043) that resulted in the identification of archeological sites within the APE.

Table 2: Previous Maryland Cultural Resource Surveys within the APE

Survey #	Title	Authors/Date
MO041	A Survey of Historic and Prehistoric Archeological Sites along the Chesapeake & Ohio Canal National Monument 1961-1962	Edward M. Larrabee - 1962
MO043	Report on a Reconnaissance Archeological Survey of Park Service Property Affected By the Rock Run WSSC Alternate Points of Discharge	Katherine Franklin and Sarah Gregory -1980
MO094	Cultural Reconnaissance, Abert Hall Addition at the Hydrographic/Topographic Center, Montgomery County, MD	Stephen S. Israel - 1983
MO167	Phase I Cultural Resource Investigation; Proposed Little Falls Dam Fish Passage New Access Road Alignment Glen Echo, Montgomery County, Maryland	U.S. Army Corps of Engineers -1998
MO195	Cultural Resources Survey: Potomac Interceptor Long-Term Odor Abatement Program Montgomery County, Maryland, and Washington, D.C	Charles D. Cheek and Kerri Culhane -2002
MO212	Cultural Resources Survey of National Geospatial-Intelligence Agency-Bethesda Montgomery County, Maryland	TAMS Consultants, Inc.-2004
MO243	Cohongorooto: The Potomac Above the Falls Archeological Identification and Evaluation study of C&O Canal National Historical Park Rock Creek to Sandy Hook (MM 0 to 59)	Fiedel Stuart, John Bedell, Charles LeeDecker - 2005

Prehistoric Archeological Resources - In general, the project area has low potential to contain prehistoric archeological sites (AECOM 2018). In addition, the less sloped portion of the project area west of MacArthur Boulevard has been subject to prior Phase I archeological survey (MO041, MO043, MO167, MO195, and MO243), which did not identify significant prehistoric archeological resources (AECOM 2018).

Historic Archeological Resources - No development is shown within the APE on seventeenth or eighteenth century maps. However, archeological resources associated with three historic features – the C&O Canal, a portion of the Washington Aqueduct, and the West Washington and Great Falls Electric Railway trolley bed – may be present within the APE. Maryland cultural resource survey MO043 resulted in the identification of two archeological sites: 1) a Washington Aqueduct culvert and 2) the electric railway bed. In addition, maps from the late nineteenth and twentieth centuries suggest residences were present along the roads through the area (AECOM 2018). Maps show early- and mid-nineteenth century

improvements in transportation and utilities, including the C&O Canal and the Washington Aqueduct, and the first depiction of MacArthur Boulevard in the project area in 1865 (Hutton 1855, War Department 1865). Several Civil War fortifications were present in upland areas near the project area.

By 1896, the West Washington and Great Falls Electric Railway trolley line was built through the project area parallel to and southwest of MacArthur Boulevard. It remained in operation until the 1960s. The tracks have since been removed; however, the berm remains and some track ties remain along portions of the former trolley line (NPS 2017). The trolley line right-of-way within the APE is significantly overgrown, and no rail ties are immediately apparent (AECOM 2018).

A 1945 topographic map depicts numerous buildings or structures within the project area, primarily along the south side of the trolley line (USGS 1945). Additional buildings are shown on the south side of MacArthur Boulevard, and north side of an unpaved road shown along the canal. These buildings are also shown on a 1951 map, but they had been removed by 1956. No evidence of these buildings is currently visible within the APE (AECOM 2018).

Concrete stairs with overgrown vegetation and lighting leading down from the ICC-B campus are present near the Midsite Channel. The steps led from the ICC-B, across MacArthur Boulevard, and toward the former trolley line. These features were likely built in the 1950s, after the Defense Mapping Agency began operation in 1951 at what is now the ICC-B campus, while the former trolley was in operation. The access feature intersected with the trolley line just southeast of the project area (USGS 1951). The remains of the trolley station may be present along the trolley right-of-way (AECOM 2018).

A stone-faced outfall is present adjacent to the steps uphill from MacArthur Boulevard. The association of this feature is not readily apparent; while it may have been added at the same time as the steps (as it seems to carry the drainage under the steps), the materials suggest it may be older (AECOM 2018, USGS 1965).

About the Analysis

Archeological resources typically exist in subsurface contexts. Archeological resource surface finds are also possible. Archeological structural ruins, such as stairs, can also occur above ground. Therefore, 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. Analysis of possible impacts on archeological resources is based on a review of previous archeological studies, consideration of the proposed design concepts, and other information available on the archeological context of the area. The APE for archeological resources is the project area.

As defined in the implementing regulations of the Archaeological Resources Protection Act of 1979 (ARPA) at 43 CFR 7.3a, archeological resources are any material remains of human life or activities which are at least 100 years of age, and which are of archaeological interest. Any resources within the APE that meet this definition and are, or may be, defined as significant under Criterion D of NHPA (having the potential to provide information important to history or prehistory) are granted protection as required under ARPA. ARPA is intended to protect archeological resources on public lands for the present and future benefit of the American people.

As part of the Section 106 process, an Assessment of Effects has been prepared for the project and will be submitted to the MD SHPO for review and approval in conjunction with this EA.

Impacts of Alternative A – No Action

Alternative A would not restore the streambanks, drainage, or vegetation within the APE. Because no new repairs to the channels or parkland would occur, there would be no new earth disturbances and therefore no new impacts on archeological resources in the APE.

Cumulative Impacts: Alternative A would have no impacts on archeological resources. Thus, it would have no potential to contribute to cumulative impacts when considered with past, present, and reasonably foreseeable future projects occurring at and in the vicinity of the project site.

Conclusion: Alternative A would have no new impacts on archeological resources, and would not contribute to cumulative impacts on archeological resources within the APE.

Impacts of Alternatives B – Action Alternative

Portions of the APE contain or may contain potentially significant historic features, including features related to culverts on the drainages, the trolley line, and twentieth century buildings and structures. Alternative B would retain the previously recorded stone culvert associated with the Washington Aqueduct (18MO160) along the northern drainage path. The aqueduct itself is below ground under MacArthur Boulevard, and would not be affected by the drainage improvements. Sediment removal and clearing of drainage outfalls would not disturb the structure of the C&O Canal and would help return the function of the original drainage pattern.

During the sediment removal and drainage improvements, work would occur adjacent to and within the canal and towpath. In order to ensure historic features related to the C&O Canal are not damaged, NPS would develop strategies in consultation with the MHT.

Much of the stream restoration work and the filling of the Southwest Channel would take place within disturbed channels that have little to no archeological potential. Invasive vegetation removal, vegetation restoration, grading, and clearance of pathways for construction access would disturb portions of the APE that have greater potential for archeological resources, such as near no longer extant structures depicted on 1945 mapping. These efforts would be concentrated adjacent to the existing channels. A Phase IB survey would include systematic pedestrian survey, mapping, and judgmental shovel testing within areas of less than 15 percent slope and within proposed construction access and staging areas rather than along the channels themselves, which are steeply sloped and previously disturbed. If determined appropriate, archeological monitoring would take place during construction. Alternative B would have beneficial impacts on the C&O Canal National Historical Park as a result of drainage improvements, but could have adverse impacts on the C&O Canal National Historical Park during the construction phase.

The trolley bed and concrete stairs have not been evaluated for the NRHP. However, the proposed drainage improvements would not alter these potential resources because they are not included within the limits of disturbance of Alternative B. The stone outfall identified would remain in place under Alternative B, but would be cleared. No changes to the structure of the outfall would occur.

Cumulative Impacts: Alternative B would have long-term beneficial impacts on the C&O Canal, but would have the potential to result in adverse impacts on archeological resources during construction. The C&O Canal Sediment Removal project would remove sediment from portion within the C&O Canal that are outside the project area in order to improve the drainage within the canal prism, resulting in beneficial impacts on the C&O Canal National Historical Park. The C&O Canal Georgetown Canal Plan would address deferred maintenance issues and related safety and accessibility concerns associated with the towpath. The project would likely have beneficial impacts on the C&O Canal as a result of maintenance repairs, and potential adverse impacts as a result of changes to the towpath and accessibility connections. In both cases, adverse impacts on the C&O Canal could occur during the construction phase. When considered with past, present, and reasonably foreseeable future projects occurring at and in the vicinity of the project site, Alternative B would have beneficial cumulative impacts on archeological resources.

Conclusion: Alternative B would have beneficial impacts on the C&O Canal National Historical Park as a result of drainage improvements, but could have adverse impacts on the C&O Canal National Historical Park during the construction phase. Alternative B would contribute a beneficial incremental impact on the overall cumulative impacts of other projects, when considered with past, present and reasonably foreseeable future projects at and in the vicinity of the project site.

WETLANDS

Affected Environment

Executive Order 11990, “Protection of Wetlands,” requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential impacts if an activity affecting a wetland cannot be avoided (FEMA 2017a). Activities that would potentially disturb wetlands and streams are regulated under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act of 1899. Such activities may require a permit from regulatory agencies including the USACE. Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States, including wetlands (US EPA 2017). Section 10 of the Rivers and Harbors Appropriation Act of 1899 prohibits the unauthorized construction of any structure in or over any navigable water of the United States, or any other work affecting the course, location, condition, or physical capacity of such waters (USACE 2017).

NPS Director’s Order (DO) #77-1: Wetland Protection outlines procedures to preserve and avoid construction in wetlands. It identifies standards for defining, classifying, and inventorying wetlands (NPS 2002). DO 77-1 also directs proposed actions to avoid, minimize, and compensate for adverse impacts on wetlands. Such compensation for wetland degradation or loss is required to occur at a one-to-one ratio, at a minimum.

Wetland Delineation Results

Palustrine wetlands are generally defined as nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per thousand (ppt), or that exhibit a series of other characteristics (see **Appendix A**). Palustrine wetlands were documented within and adjacent to the project area during a wetland delineation performed in January 2018. These wetlands are herein referred to as Palustrine Wetlands D and F, respectively (see **Table 3** and **Figure 10**). Palustrine Wetland D is a palustrine emergent *Phragmites australis* seasonally flooded (PEM5C) wetland located between the C&O Canal and the NPS Little Falls Pumping Station. This wetland is adjacent to the C&O Canal and partially extends under the bridge to the Little Falls Pumping Station. Palustrine Wetland D covers approximately 0.01 acre.

Palustrine Wetland F is a palustrine emergent persistent temporarily flooded (PEM1A) wetland located between the C&O Canal and the Potomac River. This wetland is not located within the project area; however, MDE administers a 25-foot regulatory buffer around non-tidal wetlands in the state. The 25-foot buffer around Palustrine Wetland F extends into project area. Restoration activities associated with the proposed project could occur within the MDE-designated 25-foot buffer around Palustrine Wetland F.

Wetlands D and F are adjacent to the C&O Canal, a perennial waterway. As a result, Wetlands D and F are identified as waters of the U.S., subject to the USACE regulatory program under Section 404 of the CWA. Palustrine Wetlands D and F are also classified as wetlands according to the Federal Geographic Data Committee (FGDC) Wetlands Classification Standard and therefore, are subject to NPS Director’s Order #77-1: Wetland Protection ().

Water Feature Investigation Results

Four water features were delineated within the project area (see **Table 3** and **Figure 10**). These water features qualify as Riverine Wetlands according to the FGDC Wetlands Classification Standard, and they are therefore subject to DO 77-1.

The first and largest water feature delineated within the project area is the C&O Canal, identified for the purposes of this delineation as Riverine Wetland CA/CB. The C&O Canal is a perennial waterway, subject to USACE jurisdiction. Riverine Wetland CA/CB drains southeast along the western edge of the project area. Riverine Wetland CA/CB ranges from 45 to 55- foot wide within the project area. Ordinary high water mark indicators include a clear, natural line impressed on the bank, matted vegetation, disturbed leaf litter, sediment deposition, water staining, and presence of flood litter/debris. Riverine

Wetland CA/CB is designated as riverine lower perennial unconsolidated permanently flooded excavated (R2UBHx) wetland.

Two perennial streams were delineated within the project area and are identified as Riverine Wetland AA/AB and BA/BB. These riverine wetlands are relatively permanent non-navigable tributaries of the C&O Canal, a perennial waterway, and are therefore subject to USACE jurisdiction.

Riverine Wetland AA/AB (Wapakoneta Channel) originates off-site, northeast of Wapakoneta Road, and flows southwest where it enters a six-foot diameter culvert and continues to flow under MacArthur Boulevard. Riverine Wetland AA/AB continues to the southwest of MacArthur Boulevard for approximately 125 feet and flows through a seven-foot wide box culvert beneath the Clara Barton Parkway. Riverine Wetland AA/AB continues to flow southwest for approximately 110 feet to the channel underneath the C&O Canal. The width of Riverine Wetland AA/AB varies from approximately five to 20 feet. Ordinary high water mark indicators include a clear, natural line impressed on the bank, leaf litter disturbed, water staining, and presence of flood litter/debris. Riverine Wetland AA/AB is designated as riverine upper perennial rock bottom rubble (R3RB2) stream.

Riverine Wetland BA/BB (Midsite Channel) originates just off-site at stormwater outfalls on ICC-B property and flows southwest where it enters a four-foot diameter culvert and continues to flow under MacArthur Boulevard. Riverine Wetland BA/BB continues to the southwest of MacArthur Boulevard for approximately 200 feet and flows through a 3.5-foot wide box culvert beneath the Clara Barton Parkway. Riverine Wetland BA/BB continues to flow southwest for approximately 85 feet and confluences with the C&O Canal. The width of Riverine Wetland BA/BB varies from approximately three to 17 feet. Ordinary high water mark indicators include a clear, natural line impressed on the bank, leaf litter disturbed, water staining, and presence of flood litter/debris. Riverine Wetland BA/BB is designated as riverine upper perennial rock bottom rubble (R3RB2) stream.

The fourth perennial stream delineated within the project area is identified as Riverine Wetland FA/FB. This riverine wetland is a relatively permanent non-navigable tributary of the Potomac River, a traditionally navigable waterway, and it is therefore subject to USACE jurisdiction. Riverine Wetland FA/FB originates on-site on the Potomac River side of the C&O Canal, where water is discharged from a channel running underneath the C&O Canal and flows southwest from a seven-foot wide headwall with no observable culvert or pipe. This stream appears to originate from an underground seep, or buried pipe, and flows for approximately 100 feet and confluences with the Potomac River. The width of Riverine Wetland FA/FB varies from approximately four to seven feet wide. Ordinary high water mark indicators include a clear, natural line impressed on the bank, leaf litter disturbed, and water staining. This small, perennial seep channel is designated as riverine lower perennial stream bed sand (R2SB4) stream ().

Table 3: Waters of the United States, Including Wetlands, Inside the Project Area

Feature ID	Cowardin Classification	Area (SF)	Acres	Linear Feet
Palustrine Wetland D	PEM5C	400	0.009	NA
Palustrine Wetland F	PEM1A	1,400	0.032	NA
Riverine Wetland AA/AB	R3RB2	9,465	0.217	914
Riverine Wetland BA/BB	R3RB2	11,359	0.261	1,124
Riverine Wetland CA/CB	R2UBHx	481	0.011	83
Riverine Wetland FA/FB	R2SB4	78,382	1.799	1,552

Feature ID	Cowardin Classification	Area (SF)	Acres	Linear Feet
Sum	All Features	101,487	2.3	3,673

Water Feature Functions and Values

Functions and values of the water features proposed for restoration within the study area depend on their physical, geographic, and environmental characteristics. Functions relate to ecological significance without regard to subjective human values. They are considered to be the result of the biologic, geologic, hydrologic, biogeochemical and/or physical processes that take place within a wetland/water feature.

Values are the perceived benefits to society that can be derived from the ecosystem functions and/or other characteristics of a wetland/water feature. These values may depend on considerations such as the location of the water feature, accessibility, human disturbance or pressures, economics, surrounding land uses, and cultural or historic information.

Figure 10: Overview of Waters of the United States, Including Wetlands, Inside the Project Area



Six of the eight wetland functions are performed by one or more of the water features within the study area. In addition, four of the five values are associated with one or more of the water features within the study area. **Table 4** summarizes each of the water features proposed for restoration, along with the functions and values that may be provided by the water feature. For details, see Appendix B.

Table 4: Functions and Values of Water Features Proposed for Restoration

Feature ID	Character of Water Features	Functions and Values
AA/AB	<ul style="list-style-type: none"> ▪ High-gradient, incised, perennial stream adjacent to Wapakoneta Road and upland forest ▪ Riffle-pool sequences, sediment deposits, woody debris, and detritus present ▪ Crayfish and passerine birds observed ▪ Flows through historic culverts and discharges to C&O Canal (CA/CB) 	<ul style="list-style-type: none"> ▪ Groundwater recharge/discharge ▪ Sediment/toxicant retention ▪ Nutrient removal ▪ Production export ▪ Wildlife habitat ▪ Recreation ▪ Education/scientific value ▪ Uniqueness/heritage ▪ Visual quality/aesthetics
BA/BB	<ul style="list-style-type: none"> ▪ High-gradient, incised, perennial stream adjacent to upland forest ▪ Riffle-pool sequences, sediment deposits, woody debris, and detritus present ▪ Deer tracks, mammal scat, and passerine birds observed ▪ Flows through historic culverts and discharges to C&O Canal (CA/CB) 	<ul style="list-style-type: none"> ▪ Groundwater recharge/discharge ▪ Sediment/toxicant retention ▪ Nutrient removal ▪ Production export ▪ Wildlife habitat ▪ Recreation ▪ Education/scientific value ▪ Uniqueness/heritage ▪ Visual quality/aesthetics
CA/CB	<ul style="list-style-type: none"> ▪ Low-gradient, excavated, perennial canal adjacent to towpath and upland forest ▪ Sediment deposits, submergent vegetation, and detritus present ▪ Snails, minnows, water birds, turtles, deer tracks, carp, and bass observed ▪ Minimal flow due to historic locks; discharges to Potomac River 	<ul style="list-style-type: none"> ▪ Groundwater recharge/discharge ▪ Floodflow alteration ▪ Fish and shellfish habitat ▪ Sediment/toxicant retention ▪ Nutrient removal ▪ Production export ▪ Wildlife habitat ▪ Recreation ▪ Education/scientific value ▪ Uniqueness/heritage ▪ Visual quality/aesthetics

About the Analysis

Impacts on wetlands and streams at and in the vicinity of the parkland potentially resulting from the implementation of the proposed alternatives were analyzed in consideration of the types of projects occurring in or over such water bodies, the cultural and historical context of the requirements of DO 77-1 and other applicable regulations, and professional judgment.

The functional assessment is in accordance with the USACE, New England District publication “The Highway Methodology Workbook Supplement: Wetland Functions and Values, A Descriptive Approach” (2015). This assessment addresses uplift to on-site streams by evaluating the potential for the alteration of the functions and values of those water features that currently provide a public benefit. The effects of any changes to these physical characteristics are considered in assessing whether the proposed restoration would have a significant effect on water feature functions and values.

Impacts of Alternative A – No Action

The implementation of Alternative A would have no impacts on wetlands at or in the vicinity of the project site, as none of the proposed project elements would be implemented. Existing conditions would continue.

Cumulative Impacts: Alternative A would have no impacts on wetlands at or in the vicinity of the project site. Thus, it would have no potential to contribute to cumulative impacts when considered with past, present, and reasonably foreseeable future projects occurring at and in the vicinity of the project site.

Conclusion: Alternative A would have no impacts on wetlands and would not contribute to cumulative impacts on wetlands.

Impacts of Alternatives B – Action Alternative

Alternative B would implement a number of improvements throughout the site, including within multiple wetlands, as fully illustrated in Appendix B. Within Riverine AA/AB and BA/BB wetlands, Alternative B would remove debris, stabilize slopes and vegetation, and use stone or riprap to protect outfalls and channels from scour. Within Riverine CA/CB wetlands, Alternative B would remove sediment near the Midsite Channel. Within Riverine FA/FB, riprap would be installed to prevent undermining and enlargement of an existing scour hole. No activities would occur within Palustrine Wetlands D and E.

Alternative B would provide ecological uplift to functions for the three riverine wetlands. Removal of site-wide invasive species, such as bamboo (*Phyllostachys* spp.) and Japanese honeysuckle (*Lonicera japonica*), would aid in the prevention of further colonization. However, the current extent of invasive species onsite within the wetlands is limited; therefore, the potential uplift is minimal. At Riverine Wetlands AA/AB and BA/BB, stabilizing the banks with native vegetation would provide uplift to wildlife habitat by adding forage and cover opportunity. At Riverine Wetland BA/BB, reforming rock step pools would provide additional habitat for invertebrates and breeding insects and amphibians. The reformed rock step pools would also slow water velocity, create pools, and provide opportunity for groundwater recharge.

The removal of sediment from C&O Canal would provide ecological uplift to several functions. Removing sediment from C&O Canal would increase potential storage volume for stormwater and future sediment deposition, create deepwater habitat for fish and other aquatic wildlife, and improve water quality. Overall, Alternative B would result in beneficial impacts on wetlands.

Table 5: Alternative B Changes to Function and Values

Function and Value	AA/AB	BA/BB	CA/CB
Groundwater Recharge/Discharge	No uplift	Potential uplift	No uplift
Floodflow Alteration	No uplift	No uplift	Potential uplift
Fish and Shellfish Habitat	No uplift	No uplift	Uplift
Sediment/Toxicant/ Pathogen Retention	No uplift	No uplift	Potential uplift
Nutrient Removal/Retention/ Transformation	No uplift	No uplift	No uplift
Production (Nutrient) Export	No uplift	No uplift	No uplift
Sediment/Shoreline Stabilization	No uplift	No uplift	Uplift
Wildlife Habitat	Uplift	Uplift	No uplift
Recreation	No uplift	No uplift	Uplift
Education/Scientific Value	Uplift	No uplift	No uplift
Uniqueness/Heritage	Uplift	No uplift	No uplift
Visual Quality/Aesthetics	No uplift	No uplift	No uplift

Temporary adverse impacts could occur during the construction phase of the project. Construction activities would disturb soil, some of which could drain into wetlands during rainfall events and increase sedimentation. In order to minimize the potential impacts, appropriate erosion and sediment control measures, best management practices (BMPs), and stormwater management measures would be implemented throughout the course of construction of the channel improvements, consistent with applicable federal, state, and Montgomery County regulations. Efforts would be made to limit disturbance by mechanical equipment through the placement of construction access routes to avoid large trees or other features. Mechanical equipment would be limited, to the extent practicable, to small duty equipment to minimize disturbance of soil.

Cumulative Impacts: Alternative B would have beneficial impacts on wetlands at or in the vicinity of the project site. The ICC-B Campus Master Plan implementation would reduce the amount and velocity of stormwater discharge from the campus, thereby reducing the amount and velocity of flow within the study area. Stormwater management at the ICC-B Campus would no longer discharge at the Southwest Channel. The C&O Canal Georgetown Canal Plan, C&O Canal Sediment Removal, WSSC Exposed Pipe Maintenance and Repair, and the ICC-B Campus Master Plan Implementation projects would have the potential to result in temporary adverse impacts during the construction of the projects, when sediment could be discharged into stream channels and wetlands. It is anticipated that erosion and sediment control measures, BMPs, and stormwater management would be implemented to minimize the potential for sedimentation during construction of the cumulative projects. Alternative B would have beneficial cumulative impacts when considered with past, present, and reasonably foreseeable future projects occurring at and in the vicinity of the project site.

Conclusion: Alternative B would have beneficial impacts, temporary adverse impacts during construction, beneficial cumulative impacts on wetlands.

VEGETATION

Affected Environment

With the exception of roadways and the C&O Canal, the project area is composed of 23 vegetated acres, primarily deciduous forest (MDP 2017). Observed plant species within the project area include northern red oak (*Quercus rubra*), box elder (*Acer negundo*), American beech (*Fagus grandifolia*), tulip poplar (*Liriodendron tulipifera*), black locust (*Robinia pseudoacacia*), sweetgum (*Liquidambar styraciflua*), and American sycamore (*Platanus occidentalis* (). Along stream channels within the site, approximately eleven large trees have experienced severe undercutting, exposing the trees' root systems.

To the east of MacArthur Boulevard, ground vegetation around the Midsite Channel is minimal due to the mature forest canopy and rocky conditions. Ground vegetation around the Southwest Channel is dense with heavy vines and tree cover.

Invasive herbaceous species observed within the study area included Japanese stilt grass (*Microstegium vimineum*), Japanese honeysuckle, Japanese knotweed (*Polygonum cuspidatum*), and English ivy (*Hedera helix*). Woody invasive species observed within the study area included tree-of-heaven (*Ailanthus altissima*), bamboo (*Bambusa* sp.), multiflora rose (*Rosa multiflora*), honeysuckle bush (*Lonicera* sp.), and Oriental bittersweet (*Celastrus orbiculatus*). The invasive species are concentrated along forest edges and areas of previous land disturbance.

About the Analysis

Impacts on vegetation in and in the vicinity of the project site potentially resulting from the implementation of the proposed alternatives were analyzed in consideration of the actions included in the alternatives, the context and setting of where they would occur, and professional knowledge and judgment.

Impacts of Alternative A – No Action

The implementation of Alternative A would have no impacts on vegetation at or in the vicinity of the project site, as none of the proposed project elements would be implemented. Existing conditions would continue.

Cumulative Impacts: Alternative A would have no impacts on vegetation at or in the vicinity of the project site. Thus, it would have no potential to contribute to cumulative impacts when considered with past, present, and reasonably foreseeable future projects occurring at and in the vicinity of the project site.

Conclusion: Alternative A would have no impacts on vegetation and would not contribute to cumulative impacts on vegetation.

Impacts of Alternatives B – Action Alternative

Alternative B would stabilize streambanks, plant native vegetation, and stabilize or remove an estimated 11 undercut trees within approximately 3.5 acres in and along the Wapakoneta and Midsite Channels. The stabilization of undercut trees and the stabilization of streambanks with native vegetation would improve the vegetative health along the Wapakoneta and Midsite Channels. The removal of dead trees would not adversely impact vegetation. The proposed action would fill an estimated 0.3 acres at the Southwest stream channel and cover with native vegetation, both northeast and southwest of MacArthur Boulevard, which would restore the vegetated character of the gully.

Alternative B would remove invasive vegetation site-wide. This removal would encourage the growth of deciduous forest and other native plants. Alternative B would have beneficial impacts through revegetation, stabilization, and non-native species removal.

Approximately 0.5 acres of vegetation could be adversely affected temporarily during construction of the Wapakoneta and Midsite Channel improvements. In order to minimize impacts on vegetation, efforts would be made to limit the disturbance by mechanical equipment. It is anticipated that Wapakoneta Rd. would provide access for equipment to the Wapakoneta Channel. For the Midsite Channel, it is anticipated that access would be directly to the site via MacArthur Boulevard. The exact placement of these routes would avoid large trees or other features. Mechanical equipment would be limited, to the extent practicable, to small duty equipment. At the Southwest Channel, it is anticipated that mechanical equipment would be based along MacArthur Boulevard, with fill materials pumped to the channel. The construction route would be developed to minimize the number and size of trees removed.

Cumulative Impacts: Alternative B would have beneficial impacts on vegetation at or in the vicinity of the project site. The ICC-B Campus Master Plan Implementation would result in long-term beneficial impacts from the creation of green space. The C&O Canal Georgetown Canal Plan, C&O Canal Sediment Removal, WSSC Exposed Pipe Maintenance and Repair, and the ICC-B Campus Master Plan Implementation projects have the potential to result in temporary adverse impacts during the construction of the projects when vegetation could be removed or disturbed. Alternative B would have beneficial cumulative impacts when considered with past, present, and reasonably foreseeable future projects occurring at and in the vicinity of the project site.

Conclusion: Alternative B would have beneficial impacts, temporary adverse impacts during construction, and beneficial cumulative impacts on vegetation.

CONSULTATION AND COORDINATION

NPS conducted public involvement during the National Environmental Policy Act (NEPA) process to provide an opportunity for the public to comment on the proposed action. Consultation and coordination with federal and state agencies and other interested parties were also conducted to refine the action alternative and identify issues and/or concerns related to park resources. This section provides a brief

summary of the public involvement and agency consultation and coordination that occurred during planning.

NPS held one public scoping meeting during planning for the proposed GWMP Park Restoration Plan, is conducting ongoing Section 106 consultation, and conducted Section 7 consultation. The public scoping meeting occurred during the 30-day public scoping comment period at which time, the public, agencies and interested parties were invited to submit comments on the project and the initial conceptual alternatives.

NPS initiated consultation with the MHT, which serves as Maryland's SHPO, in a letter dated January 26, 2018. An Assessment of Effects has been prepared for the project and will be sent to MHT for review in conjunction with this EA.

NPS initiated Section 7 consultation via the online ECOS system on November 6, 2017. At that time, the USFWS indicated that no critical habitats for threatened, endangered, or candidate species, and no refuge lands or fish hatcheries, are located within the project area.

The following agencies and stakeholders were contacted to request input on the project:

- US Fish and Wildlife Service
- US Army Corps of Engineers
- US Environmental Protection Agency Region 3
- Office of the Director of National Intelligence
- Maryland Department of the Environment
- Maryland Department of Natural Resources
- Maryland Historical Trust (SHPO)
- C&O Canal Association
- Community Stormwater Committee
- Glen Echo Heights Citizens Association

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APPENDIX A: WETLANDS CLASSIFICATION

APPENDIX B: FUNCTIONS AND VALUES ANALYSIS

APPENDIX C: AGENCY CORRESPONDENCE