

**National Park Service
U.S. Department of the Interior**

**Fletcher's Boathouse Transportation Upgrades Environmental Assessment
Washington, DC**



**FLETCHER'S BOATHOUSE TRANSPORTATION UPGRADES
ENVIRONMENTAL ASSESSMENT
NOVEMBER 2019**

Fletcher's Boathouse Transportation Upgrades Environmental Assessment

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PURPOSE AND NEED

The National Park Service (NPS) is proposing transportation upgrades (the proposed project) for the Fletcher's Boathouse area (Fletcher's Cove) in Washington, DC.

The purpose of the proposed project is to provide more direct and safer transportation connections between Canal Road and the Fletcher's Boathouse, the Chesapeake & Ohio (C&O) Canal towpath, and the Capital Crescent Trail.

The transportation upgrades are needed to address the following concerns and ongoing issues affecting the Fletcher's Boathouse area:

- The single-lane entrance ramp provides the only access between the area and Canal Road for entering and exiting traffic, which can result in unsafe traffic situations
- Safe access from Canal Road's eastbound/inbound traffic is nearly impossible due to the entrance ramp's configuration immediately adjacent and parallel to Canal Road
- The geometry and grade differential between the entrance ramp and Canal Road creates inadequate sight distances for entering and exiting traffic
- A one-lane road culvert (tunnel) with low clearance and poor sight distance provides the only vehicle access to the larger, lower parking lot west of the C&O Canal
- Large fire trucks, ambulances, and river rescue crews are severely challenged in gaining unfettered access to the area during an emergency
- Large equipment and trucks have very limited access to the area to perform repair and maintenance to park facilities and the DC Water Odor Abatement Facility
- Existing pedestrian access routes to the project area from outside the park are unsafe and cause pedestrian/vehicular conflicts
- Some portions of the area are not fully compliant with accessibility standards

PROJECT AREA

The approximately 15-acre project area is located on federal land between Canal Road and the Potomac River, adjacent to the intersection of Canal and Reservoir Roads. The Chesapeake & Ohio Canal National Historical Park administers the project area (see **Figure 1** and **Figure 2**).

The C&O Canal is a 184.5-mile route of manmade waterway that follows the DC/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, DC, to Cumberland in western Maryland, is listed in the National Register of Historic Places (NRHP).

PLANNING ISSUES AND CONCERNS FOR DETAILED ANALYSIS

The NPS, participating agencies and stakeholders, and the public identified issues and concerns for detailed analysis during the internal and public scoping processes. These issues and concerns are included in the impact topics that are discussed in the "Affected Environment and Environmental Consequences" section of this Environmental Assessment (EA). The proposed project includes a new ramp or a new ramp and bridge for vehicle access between Canal Road and the Fletcher's Boathouse side; a relocated or reconfigured upper parking lot; a reconfigured lower parking lot; resurfacing of all vehicle circulation areas, except the towpath; a new, unpaved route for maintenance vehicle and overflow parking access; an

updated fully-accessible landing area by the boathouse and concessions; new sets of steps and accessible ramps; and multiple small-scale improvements.

The proposed project could introduce or change elements of the documented historic properties listed in the National Register. The C&O Canal National Historical Park is listed in the NRHP. The addition of new transportation elements, including a ramp or ramp and bridge from Canal Road, could alter views and spatial relationships within the site. Additionally, the site improvements would have the potential to disturb below-ground archeological resources. The project's potential impacts on historic properties and districts are analyzed in detail in the Historic Buildings and Structures and Archeological Resources sections of this EA.

The proposed project would alter circulation patterns within the project site. The Fletcher's Boathouse transportation upgrades project would change vehicular, pedestrian, and bicycle access to the site, including the types of vehicles able to reach the lower parking lot. The project's potential impacts on circulation within the site are analyzed in detail in the Visitor Use and Experience section of this EA.

The proposed project would alter impervious surface at the project site. The proposed project would decrease impervious surface by approximately 0.1 acres (2.9 percent) under Action Alternative B or would increase the impervious surface of the site by approximately 0.3 acres (9.1 percent) under Action Alternative C. Therefore, Action Alternative C would increase the potential for stormwater runoff, resulting in the potential for impacts on water resources. The project potential impacts on water resources are documented in the Water Resources 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 not of critical importance. This section will provide brief descriptions of the issues and concerns determined to not warrant further consideration, as well as a summary 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) to determine the potential for federally protected species to be present at the project site. The consultation indicated the potential 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 40 percent (6.04 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 Capital Crescent Trail and adjacent to the Potomac River is located in the 500-year or 100-year floodplain (FEMA 2017). The project would not add structures that could alter flood flows. The NPS would adhere to procedures set forth in Procedural Manual 77-2: Floodplain Management to eliminate or minimize impacts on the 100-year floodplain to the extent possible. The project would adhere to the requirements of Executive Order 11988, Procedural Manual 77-2, and applicable federal and District permits. Therefore, this topic was dismissed from detailed analysis.

Potential for the project to impact vegetation. The project site contains an estimated 11 acres of vegetation, much of which is open turf grass. The southernmost portion of the site includes approximately 0.8 acres classified by the District of Columbia as Extremely or Highly Significant for Biodiversity (Government of the District of Columbia 2015). Although the action alternatives would remove existing vegetation along the ramp connections to Canal Road and an expanded towpath connection to the lower lot under Alternative B, the removal of trees would avoid tree loss to the extent practicable. The action

alternatives would avoid this classified area. During construction, the dripline of trees would be protected to preserve tree health. Therefore, vegetation was dismissed from further analysis in the EA.

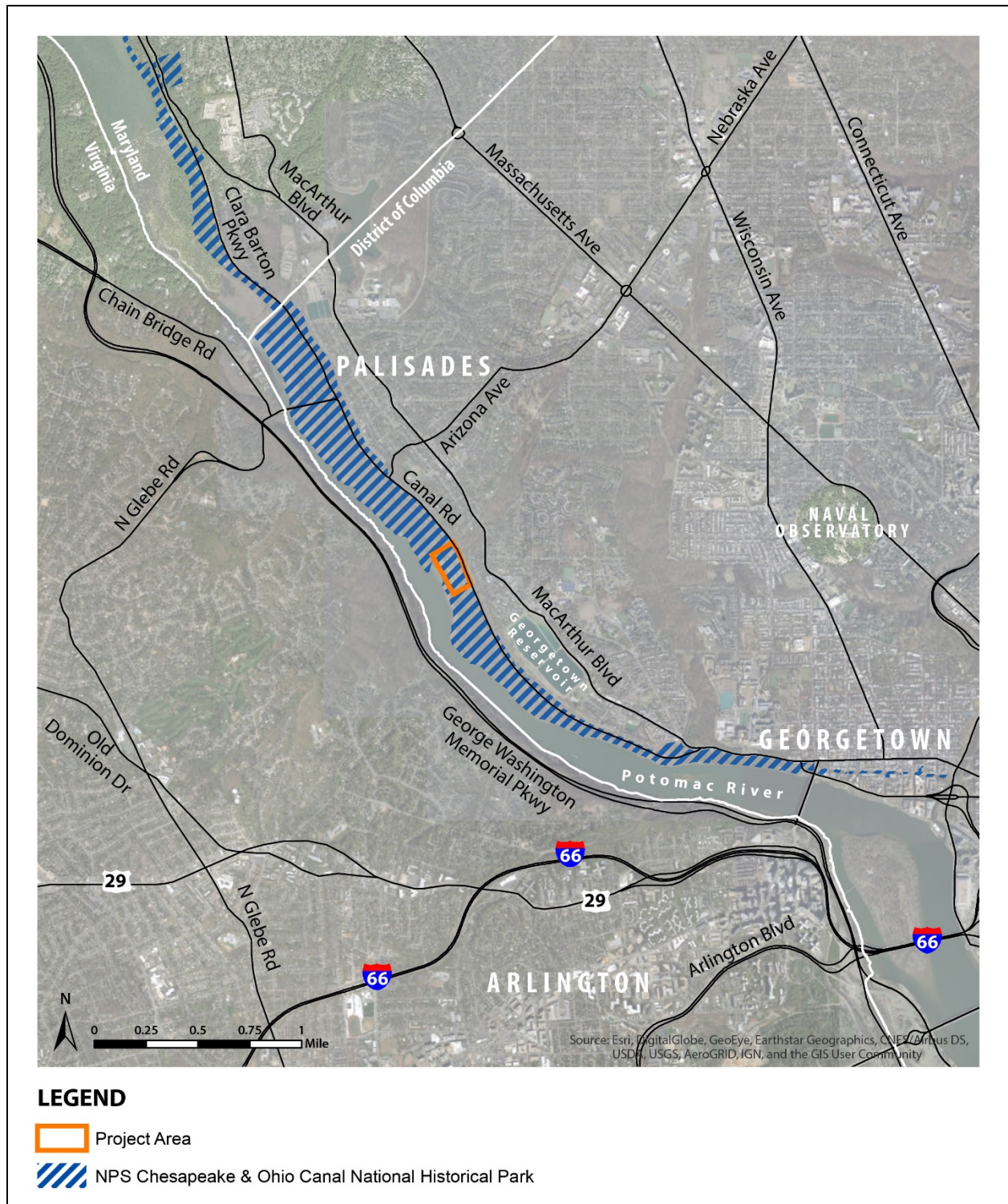


Figure 1: Project Area Map

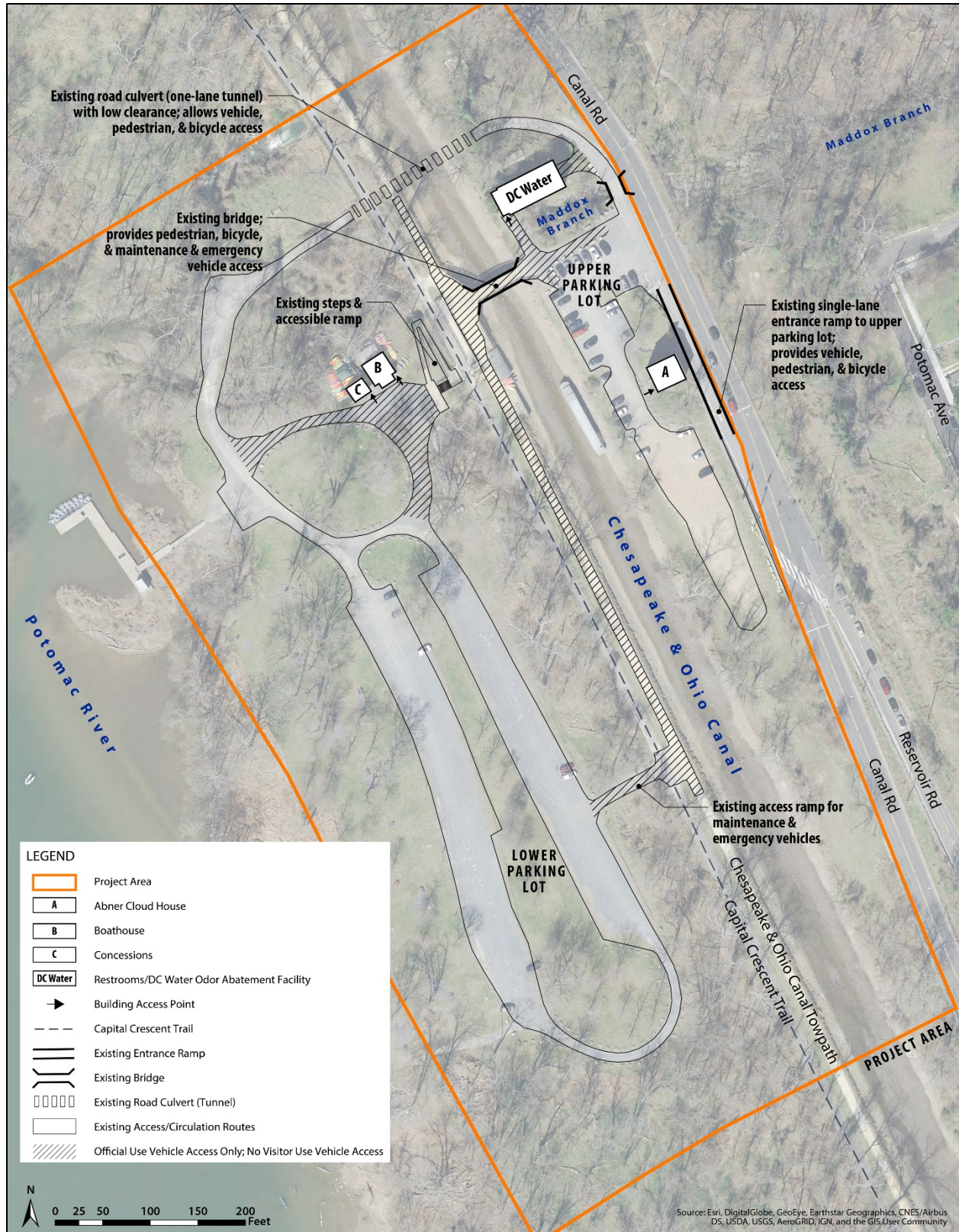


Figure 2: Project Area Detail Map

ALTERNATIVES

This EA analyzes the potential environmental consequences of three alternatives, including two action alternatives and a no action alternative. 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 this EA. In addition, several transportation upgrades at Fletcher's Boathouse were dismissed from further consideration. These transportation upgrades are described in this chapter under "Alternatives Considered but Dismissed."

ALTERNATIVE A: NO ACTION

Vehicle Circulation

Under Alternative A: No Action, a single-lane ramp connecting to Canal Road would continue to provide visitor and official use vehicle, pedestrian, and bicycle access to and from the project area (official use vehicles include emergency, maintenance, and other authorized vehicles). A traffic signal at the bottom of the ramp would continue to facilitate two-way traffic movement on the one-lane ramp.

The upper and lower parking lots would continue to provide visitor and official use vehicle parking on both sides of the C&O Canal (see Table 1). A road culvert would continue to provide vehicle access to and from the lower parking lot, boathouse, concessions, and Potomac River west of the canal. The unsignalized one-lane road culvert would continue to provide vehicle circulation in both directions.

Large official use vehicles would continue to access the project area west of the canal via the existing pedestrian bridge over the canal to the towpath, and then use an access ramp to the lower lot.

No changes to the bridge over the Maddox Branch would occur. Other elements within the site would remain. The parking lot surface and configuration would remain in place. No small-scale improvements, including security, signage, and signalization, would be implemented.

Pedestrian and Bicycle Circulation

The existing ramp, towpath, and Capital Crescent Trail would continue to provide pedestrian and bicycle access to and from the project area. A crosswalk at the signalized intersection of Canal Road, Reservoir Road, and the ramp would continue to connect the project area and a sidewalk on the west side of Reservoir Road.

Pedestrians and bicycles would continue to circulate between the east and west sides of the C&O Canal through 1) the existing road culvert and/or 2) the existing bridge over the canal. Steps and accessible ramps would continue to connect the boathouse and concessions area with the Capital Crescent Trail, towpath, and bridge over the canal. The landing area by the boathouse and concessions would continue to not fully meet accessibility standards.

ELEMENTS COMMON TO ACTION ALTERNATIVES

Vehicle Circulation

The Action Alternatives propose to separate the modes of traffic for visitors entering or exiting the project area. The Action Alternatives would add a new vehicular ramp between Canal Road and the Fletcher's Boathouse site; pedestrians and bicyclists would be prohibited from using the new entrance ramp. The existing ramp would be retained for pedestrian and bicycle access but closed to most vehicle access, except in cases where emergency vehicles require access. The existing bridge over the Maddox Branch would be updated in its current location to meet the most recent applicable engineering standards.

Table 1: Number of Parking Spaces Available by Alternative

	Alternative A: No Action Alternative	Alternative B: Upper Parking Lot Access Alternative	Alternative C: Upper and Lower Parking Lot Access Alternative
Upper Parking Lot	77	14	11
Overflow Parking Lot	N/A	16	16
Lower Parking Lot	188	181	188
Total	265	211	215

The upper and lower parking lots would be resurfaced. The upper parking lot would be either relocated to an area south of the Abner Cloud House or reconfigured west of the Abner Cloud House. Both of these options would provide a development buffer for the historic building. A new, unpaved access route parallel to the C&O Canal would link to an overflow parking area downstream of the entrance. This unpaved access route would also provide links to overflow parking during high use times. The lower parking lot would be reconfigured to improve parking efficiency and to accommodate large official use vehicles. The existing vehicle circulation loop north of the lower parking lot also would also be modified to accommodate large vehicles.

Official Use Vehicle Circulation

A new, unpaved access route, approximately 10 feet wide and 345 feet long, parallel to the C&O Canal would provide emergency and maintenance vehicle access from the upper parking lot to the area south of the new ramp between the C&O Canal and Canal Road, as well as an overflow parking area. The paved area south of the DC Water Odor Abatement Facility would be expanded to accommodate large official use vehicles.

Pedestrian and Bicycle Circulation

The existing steps and accessible ramp connecting the towpath, Capital Crescent Trail, boathouse, and concessions area would be retained. The landing area by the boathouse and concessions would be updated to meet accessibility standards, which would require modifications to the existing grade. To account for these grade modifications, two new sets of steps and accessible ramps would connect the landing area, boathouse, and the existing set of steps and ramp. Crosswalks and pedestrian pathways would be installed to facilitate safe pedestrian circulation.

Small-Scale Improvements

The Action Alternatives would also include multiple small-scale improvements, including the following:

- NPS would work with the District of Columbia Department of Transportation to enable improvement of the pedestrian and bicycle access routes at the intersection of Canal Road, Reservoir Road, and the new ramp (see **Appendix A**); NPS would design project site's access point so as not to limit future improvements to Canal Road
- Protective safety measures would be installed near the top of the existing ramp to separate pedestrians and bicycles from Canal Road vehicle traffic and prevent vehicle access to the ramp from Canal Road
- Signage would be installed to direct safe circulation on site

ALTERNATIVE B: UPPER PARKING LOT ACCESS ALTERNATIVE (PREFERRED ALTERNATIVE)**Vehicle Circulation**

The new entrance ramp for vehicle access between Canal Road and the project site would connect to the upper parking lot. The upper parking lot would be reconfigured west of the Abner Cloud House, with overflow parking available downstream of the entrance ramp (see **Table 1**); the reconfigured parking would increase the buffer around the Abner Cloud House. In order to provide circulation between the upper and lower parking lots, the existing road culvert would be retained for visitors arriving by personal vehicle, bicycle, or on foot (see **Figure 3**). Alternative B is the preferred alternative.

Official Use Vehicle Circulation

The existing pedestrian bridge over the C&O Canal, which also serves official use vehicles (including emergency vehicles), would be replaced with a wider bridge. The bridge landing to the west of the canal would be modified to accommodate official use vehicles traveling to and from the towpath. The existing ramp for official use vehicle access between the towpath and lower parking lot would be improved to provide better sight lines between vehicles on the ramp and pedestrians and bicycles on the towpath and Capital Crescent Trail. The ramp approach up to the towpath from the lower parking lot would be widened and vegetation obstructing sight lines would be removed.

Small-Scale Improvements

An access gate would be installed along the approach road to the east entrance of the existing road culvert to prevent vehicle access during floods. The existing road culvert would also be signalized, i.e. use a traffic signal or other indicator, to safely accommodate two-way traffic.

ALTERNATIVE C: UPPER AND LOWER PARKING LOT ACCESS ALTERNATIVE**Vehicle and Official Use Vehicle Circulation**

A new ramp for vehicle access would provide direct connections to both the upper parking lot and to the lower parking lot via a bridge. The bridge to the lower parking lot would cross over the C&O Canal, towpath, and the Capital Crescent Trail. Official use vehicles would access areas of the site via the ramp from Canal Road. The upper parking lot would be moved south of the Abner Cloud House, with overflow parking available downstream of the entrance ramp (see **Table 1**). The relocation of the upper parking lot would increase the buffer around the Abner Cloud House. Both parking lots would be paved and striped. All vehicle circulation areas, except the towpath, would be resurfaced (see **Figure 4**).

Pedestrian and Bicycle Circulation

The existing road culvert would be converted to accommodate pedestrian and bicycle circulation only. The existing road culvert would be closed to vehicles.

Small-Scale Improvements

Access gates or other barriers would be installed to prevent visitor use vehicle entry to circulation areas for official use vehicles only.

ALTERNATIVES CONSIDERED BUT DISMISSED

The NPS considered a wide range of transportation upgrades at Fletcher's Boathouse during scoping. Some transportation upgrades were ultimately dismissed from further consideration. A description of these concepts is provided in **Appendix B**.

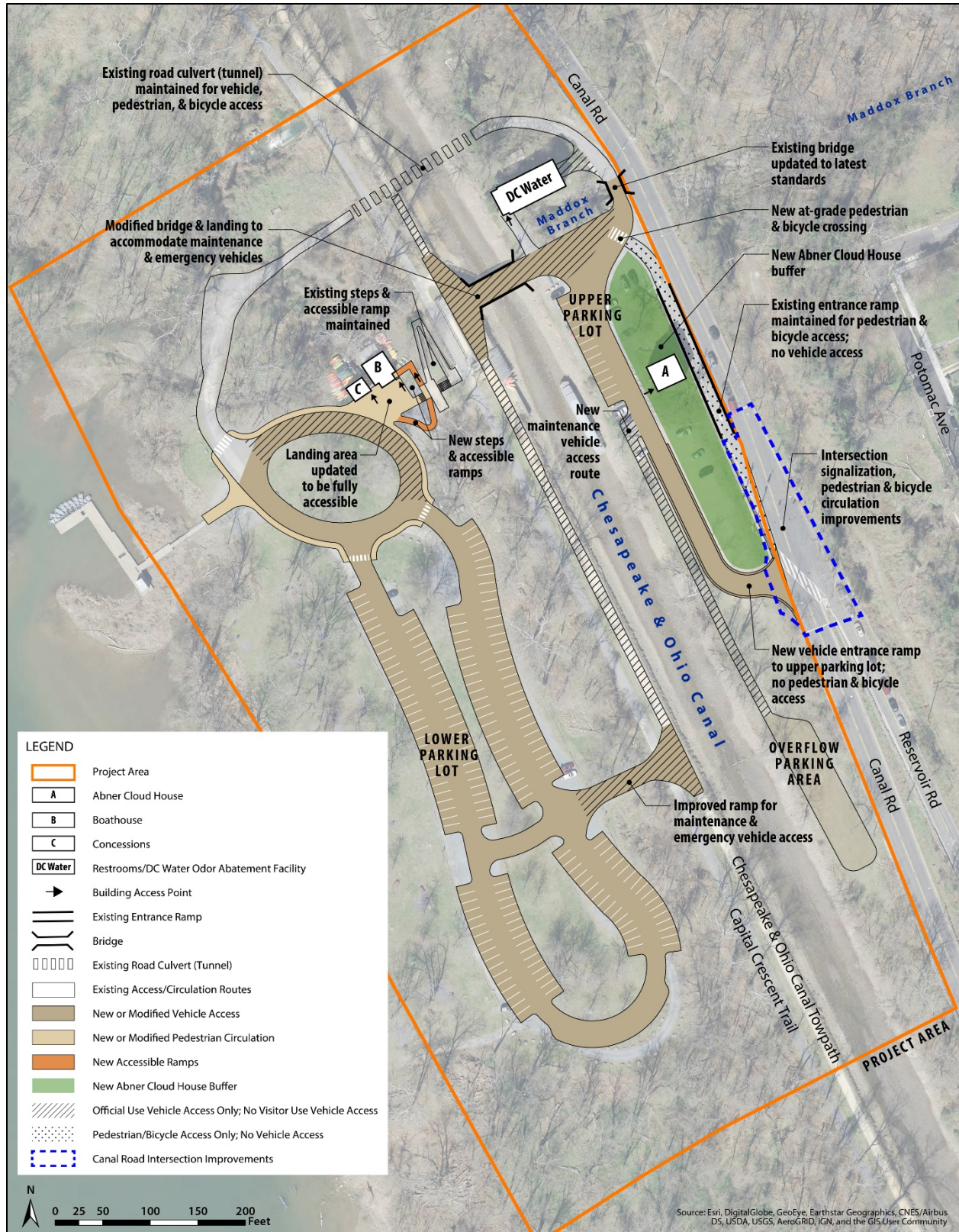


Figure 3: Alternative B: Upper Parking Lot Access Alternative

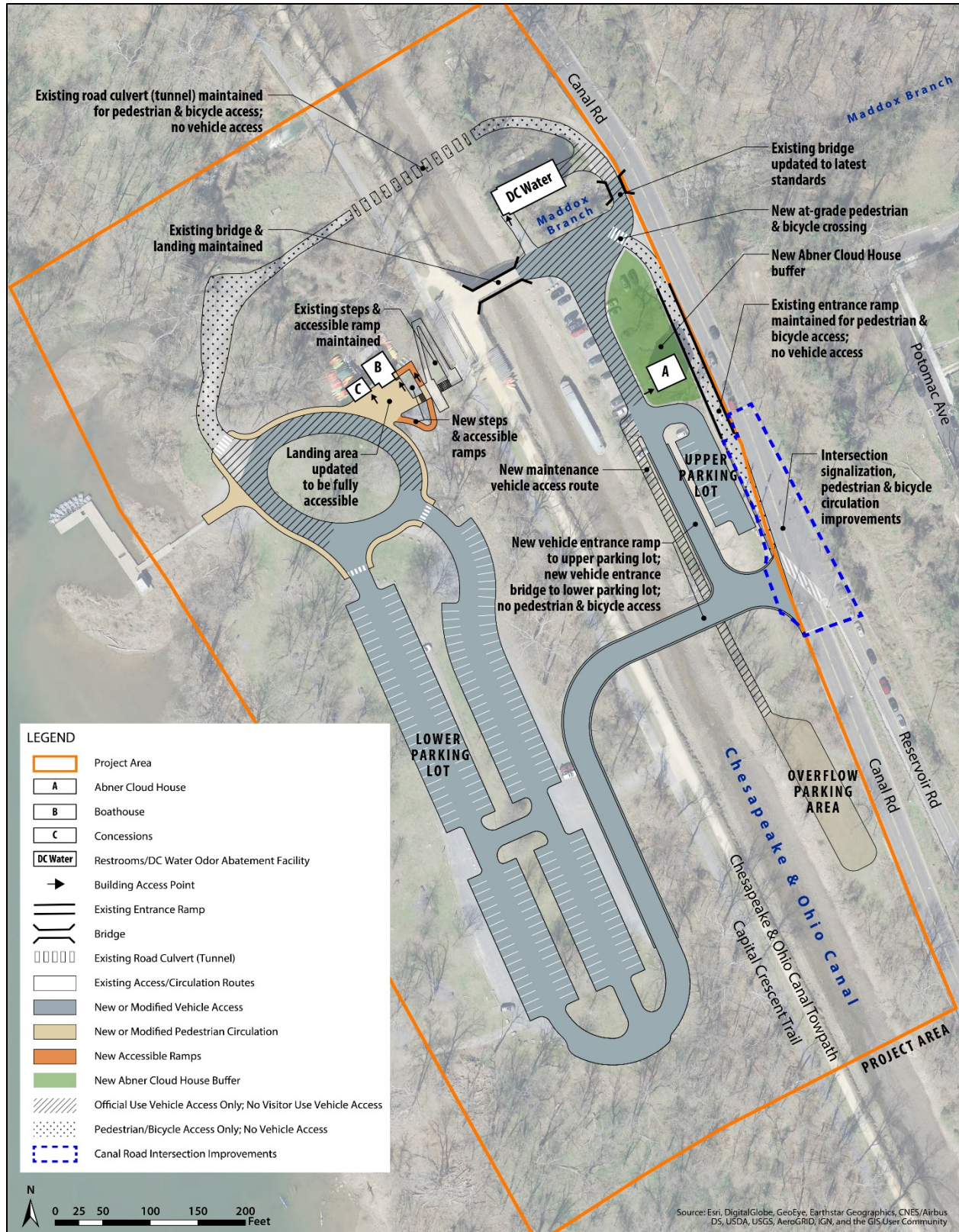


Figure 4: Alternative C: Upper and Lower Parking Lot Access Alternative

RATIONALE FOR THE PREFERRED ALTERNATIVE

The preferred alternative is the alternative that “would best accomplish the purpose and need of the proposed action while fulfilling [the NPS] statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors” (46.420(d)). The NPS has identified Alternative B as the preferred alternative because Alternative B would result in fewer resource impacts while meeting the project purpose and need. Alternative B would improve access to Fletcher's Boathouse from Canal Road and would improve official use vehicle, including emergency vehicle, circulation across the site. Alternative B would avoid adding a new visual element across the C&O Canal, create a larger buffer around the Abner Cloud House, result in less ground disturbance, and decrease total impervious surface at the site.

Affected Environment and Environmental Consequences

This chapter describes current environmental conditions in and around 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. This section also includes an analysis of the environmental consequences, or “impacts,” of the No Action and Action Alternatives.

The Affected Environment description is followed by the Environmental Consequences analysis for each resource topic. The resource topics analyzed here correspond to the planning issues and concerns described in the Purpose and Need section of this EA.

In accordance with the Council on Environmental Quality (CEQ) regulations, the environmental consequences analysis includes the direct, indirect, and cumulative impacts potentially resulting from the proposed alternatives (40 CFR 1502.16). The intensity of the impacts is assessed in the context of the park's purpose and significance, and any resource-specific context that may be applicable (40 CFR 1508.27). Where appropriate, mitigating measures for adverse impacts are described and their effect on the severity of the impact is noted. The methods used to assess impacts vary depending on the resource being considered but are generally based on a review of pertinent literature and park studies, information provided by on-site experts and other agencies, professional judgment, and park staff knowledge and insight.

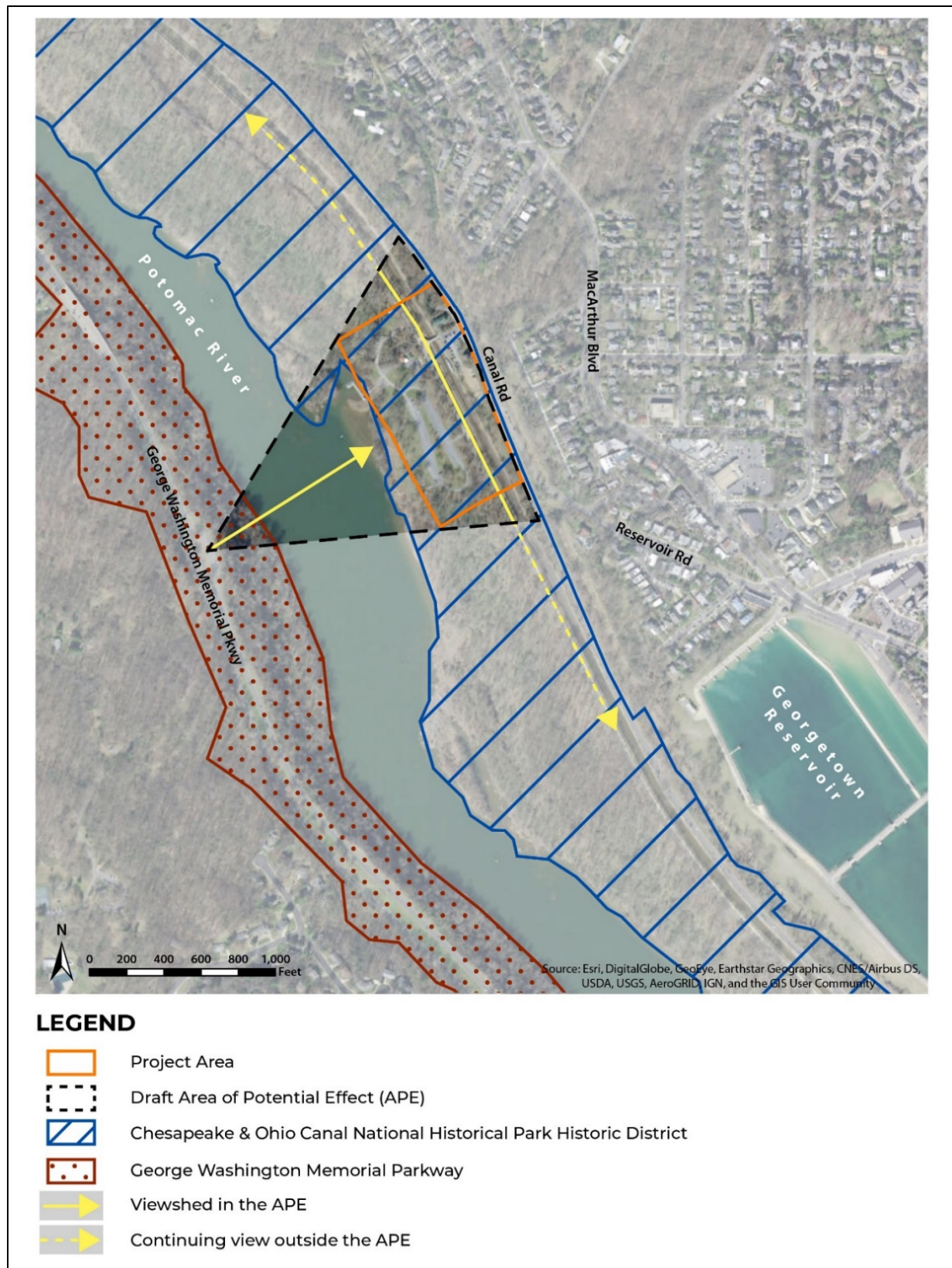
Cumulative Impacts Methodology: The EA also considers cumulative impacts – defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or 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 and the surrounding area were identified. These cumulative projects are summarized in **Table 2**.

Table 2: Anticipated Cumulative Projects in and Around the Project Site

Past, Present, or Future	Cumulative Impact Project	Description
Future	Dredging of Fletcher's Cove	The NPS and the District Department of Energy and the Environment is exploring the potential removal of sediment at Fletcher's Cove to improve access to the Potomac River.
Future	Palisades Trolley Trail	The District Department of Transportation is conducting a feasibility study of developing a multi-use trail for pedestrians and bicyclists on the former Glen Echo Trolley line corridor, an area commonly referred to as the Palisades Trolley Trail, between St. Mary's Place NW and Galena Place NW in the Georgetown and Palisades neighborhoods, respectively.

HISTORIC BUILDINGS AND STRUCTURES

Historic properties were identified within the project's Area of Potential Effect (APE) (see **Figure 5**). 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.” Historic properties in the APE are documented in the NRHP nominations for the C&O Canal National Historical Park (1979, boundary expansion 2015) and George Washington Memorial Parkway (1995, updated 2017).

**Figure 5: Area of Potential Effect**

In this EA, the different types of historic properties are addressed by resource type to best describe the impacts of the proposed project on the APE. The NPS evaluates historic buildings and structures, cultural landscapes, and archeological resources as different resource categories. This section specifically addresses historic structures that have been included in or have been determined eligible for the NRHP, all of which are encompassed by at least one historic district or multiple property listing. Archeological resources are addressed in the Archeological Resources section that follows.

Affected Environment

C&O Canal National Historical Park - The C&O Canal National Historical Park is a linear historic district and cultural landscape that extends from Georgetown in Washington, DC, to Cumberland in western Maryland. The district encompasses approximately 20,500 acres, of which 7.8 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 historic district was listed in the NRHP 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 archeological significance.

The C&O Canal features a linear canal prism primarily bordered by a towpath and natural vegetation, with adjacent structures and open lots. The canal's character was primarily utilitarian and rustic, with little ornamental vegetation. Paving was generally packed soil or gravel.

The district contains many canal-related resources including a canal prism, towpath, lift locks, dams, bypass flumes, culverts, wasteweirs, and lockhouses. Contributing elements to the historic district present within the APE include the following, shown in **Figure 6** and described in the Assessment of Effect (**Appendix C**):

- | | |
|--------------------------|---------------------------|
| ▪ Canal Prism | ▪ Fletcher's Road Culvert |
| ▪ Towpath | ▪ Wasteweer #3 |
| ▪ Abner Cloud House | ▪ Archeological sites |
| ▪ Battery Kemble Culvert | |

Resources within the APE potentially contributing to the C&O Canal National Historical Park include the Fletcher's Boat House Office and Snack Bar (1962), Bike Shop (1972), and Metal Shed (1963) (**Figure 6**) (NPS 1979, 2015).

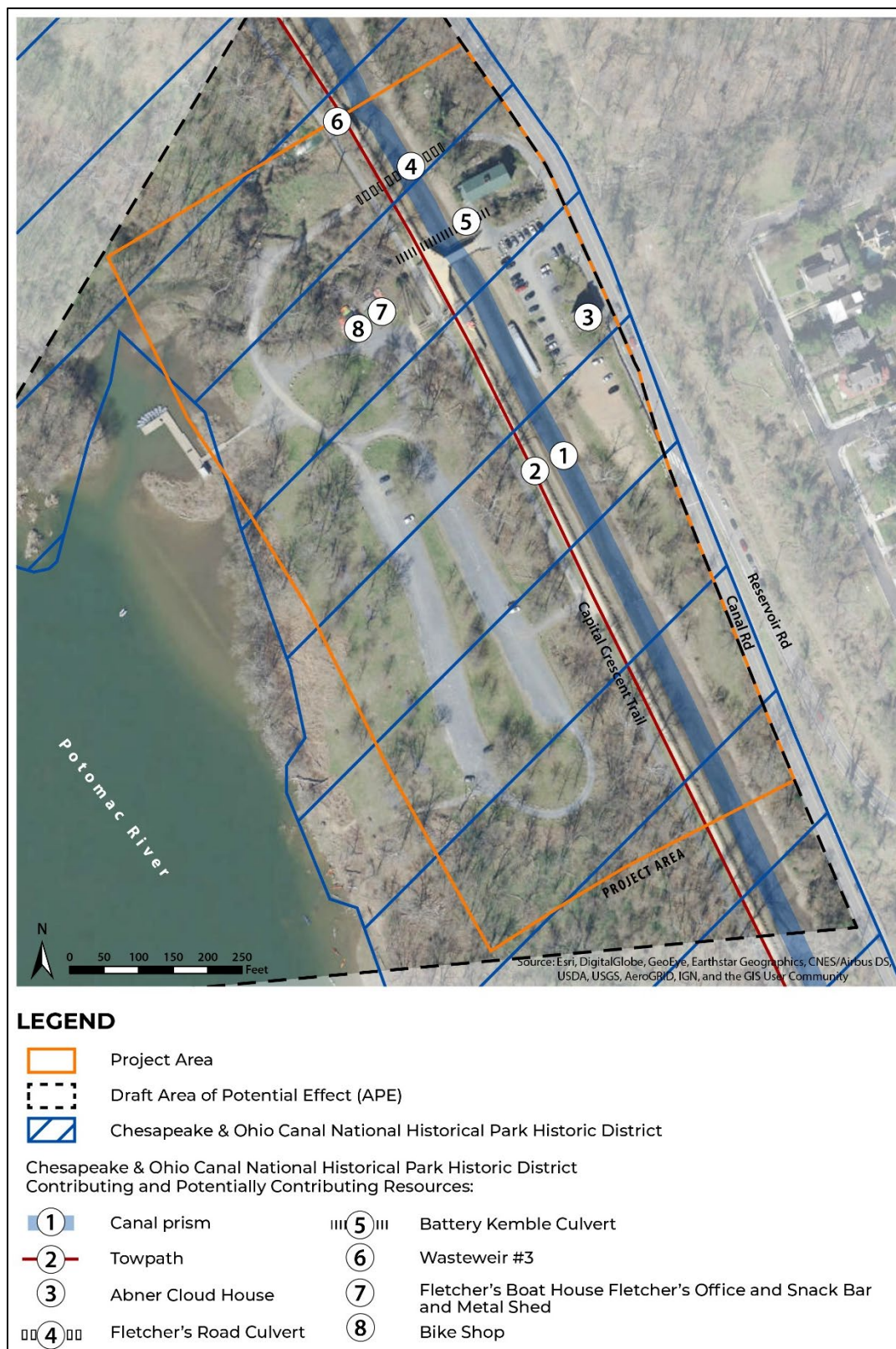


Figure 6: Contributing and Potentially Contributing Resources in the C&O Canal National Historical Park Historic District

George Washington Memorial Parkway - The George Washington Memorial Parkway was listed as a historic district in the NRHP in 1995 and is a designed roadway system and cultural landscape that extends 38.3 miles along the Potomac River in Virginia, Maryland, and the District of Columbia. The George Washington Memorial Parkway is a scenic roadway that commemorates the life of George Washington and preserves the natural and historic character of the Potomac River (see **Figure 7**). The NRHP nomination, which was updated in 2017, noted the following significance criteria:

- Criterion A for association with the 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



Figure 7: View from South Donaldson Scenic Overlook

About the Analysis

Potential impacts on historic buildings and structures affect the historic character and integrity of the property as defined by the NRHP. The impacts, direct or indirect, adverse or beneficial, are analyzed in consideration of additional regulations and guidance provided by NEPA, Section 106 of the National Historic Preservation Act (NHPA), and the *Secretary of Interior's Standards for the Treatment of Historic Properties*, *NPS Management Policies 2006*, and *Director's Order 28*.

As part of the Section 106 process, an Assessment of Effects (AOE) has been prepared for the proposed project and will be submitted to the District of Columbia State Historic Preservation Office (DC SHPO), Virginia Department of Historic Resources (DHR) (Virginia's State Historic Preservation Office),

Delaware Tribe of Indians Historic Preservation Office (DTHPO), Delaware Nation Historic Preservation Office (DNHPO), and the Pamunkey Indian Tribe for consultation and concurrence in conjunction with this EA.

Impacts of Alternative A: No Action

Under Alternative A, no changes would occur to the C&O Canal National Historical Park and George Washington Memorial Parkway within the APE.

Cumulative Impacts: Alternative A would have no new impact on the C&O Canal National Historical Park and George Washington Memorial Parkway within the APE. Therefore, Alternative A would not contribute to cumulative impacts on these historic districts.

Conclusion: Alternative A would result in no new impacts on the C&O Canal National Historical Park and George Washington Memorial Parkway within the APE and would not contribute to cumulative impacts on these historic districts.

Impacts of Alternative B: Upper Parking Lot Access Alternative

C&O Canal National Historical Park - Alternative B would install a new ramp connecting to Canal Road, replace an existing pedestrian bridge across the canal and expand the landing at the towpath, reconfigure and resurface parking, install new pedestrian ramps connecting the towpath to the lower lot and replace the landing at the boathouse, and install multiple small-scale improvements.

Alternative B would alter the linear view corridor of the canal prism and towpath within the APE. The new replacement pedestrian bridge and modified bridge landing would be directly within the linear line of sight along the canal. To the east of the canal, the new entrance ramp for vehicle access between Canal Road and the upper parking lot would block views from the south to the Abner Cloud House and introduce a new vertical structure in the background of views from the north to the Abner Cloud House. The resurfaced vehicle circulation areas and new access route for official use vehicles would also be visible.

During the summer, vegetation would largely screen proposed upgrades to the west (Potomac River side) of the canal from the canal prism and towpath, including the accessibility improvements and landing area by the Fletcher's Boat House Fletcher's Office and Snack Bar and Bike Shop and the resurfaced lower parking lot. During the winter, views from the canal prism and towpath to these upgrades would be partially filtered through vegetation. Both views would be similar to existing conditions.

Alternative B would retain the Abner Cloud House and the open character of its directly adjacent setting by limiting the parking at the upper lot to an area along the canal. The ground surface would be replaced with a historically compatible paving material. The new entrance ramp and relocated parking on the downstream side of the house would reduce the area of open landscape south of the house, introduce a new vertical structure in the surrounding landscape, and block open views to the house from the south.

The Fletcher's Road Culvert would continue to provide vehicle circulation between the east and west sides of the canal, consistent with the culvert's original purpose. However, the culvert would be signalized to better accommodate two-way traffic, and the road within the culvert and approach roads on either side of the culvert would be resurfaced. No changes to the culvert structure, including its stonework or arch, would occur.

Alternative B would maintain the open, utilitarian setting of the downstream side of both the Fletcher's Boat House Office and Snack Bar and the Bike Shop. The landing area in front of the buildings would be updated to be fully accessible, requiring modifications to the existing grade and surface material. Two

new sets of steps and two new accessible ramps would be added to account for the required grade modifications, including a new set of steps and a new accessible ramp connecting the covered wood porch of the Fletcher's Boat House Fletcher's Office and Snack Bar to the fully accessible landing area and the bottom of the existing set of steps and accessible ramp, respectively. No changes would occur to the Battery Kemble Culvert or Wasteweir #3.

Alternative B would have direct, adverse impacts on the C&O Canal National Historical Park as a result of the new entrance ramp and modifications to parking lots (including the overflow lot) and vehicle circulation areas through the changes in the setting, circulation, vistas and views, and spatial relationships within the site. The alternative would mitigate adverse impacts on the historic district by using materials (e.g., wood, stone) and a design that are compatible with the historic character of the landscape. The bridge replacement, surface materials for the updated fully accessible landing area and associated new sets of steps and accessible ramps, small-scale features associated with proposed upgrades throughout the project area (e.g., railings), and small-scale improvements (i.e., signalization at the Fletcher's Road Culvert, access gates, and signage) would be undertaken in a manner that is consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. NPS would also help screen the parking area and ramp to upper parking lot from view of the canal using natural materials. These could include wood fences, stone walls, stones, or natural vegetation. Consultation with DC SHPO would occur to develop strategies to ensure historic features of the C&O Canal National Historical Park are not damaged during construction.

George Washington Memorial Parkway - The project area is visible from the South Donaldson Scenic Overlook of the George Washington Memorial Parkway. Alternative B proposes multiple transportation upgrades to the project area, including a new entrance ramp for vehicle access between Canal Road and the upper parking lot, relocation and reconfiguration of parking lots, replacement of the existing bridge over the C&O Canal, modified official vehicular access to the towpath, and improved access to the boathouse and concessions.

During the summer, most of the transportation upgrades between Canal Road and the C&O Canal would not be visible from the South Donaldson Scenic Overlook, because trees would screen this section of the project area from view. The top of the new ramp at Canal Road may be visible from the overlook. Transportation upgrades between the C&O Canal and Potomac River may be visible from the overlook.

During the winter, transportation upgrades within the overall project area would be visible from the South Donaldson Scenic Overlook. Views from the overlook to the project area would be partially filtered through trees.

Although the implementation of the transportation upgrades may require some vegetation removal, vegetation removal would be minimal, and the overall natural, vegetated character of the broad view from the South Donaldson Scenic Overlook across the Potomac River Gorge would be retained. As a result, Alternative B would not result in adverse impacts on the George Washington Memorial Parkway.

Cumulative Impacts: Other past, present, and reasonably foreseeable future projects that have or will likely have cumulative impacts on historic buildings and structures include the dredging of Fletcher's Cove. The removal of sediment at Fletcher's Cove could have no detectable, adverse, or beneficial impacts on the historic districts depending on how and where sediment is removed. Therefore, when the adverse impacts of Alternative B are combined with the impacts of the dredging project, an overall adverse cumulative impact would result.

Conclusion: Alternative B would result in detectable, adverse impacts on the C&O Canal National Historical Park and would contribute to an overall adverse cumulative impact on historic buildings and structures. Alternative B would minimize impacts on historic buildings and structures by avoiding

disturbance of known historic resources during design and construction to the extent practicable and using materials and a design for the bridge replacement, surface materials, small-scale features, and small-scale improvements that are compatible with the historic character of the landscape. These design actions would be undertaken in a manner that is consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Natural materials would help screen the parking area and ramp to the upper parking lot from view. NPS would also consult with DC SHPO to develop strategies to ensure historic features of the C&O Canal National Historical Park are not damaged during construction. Overall, changes to the historic buildings and structures would be noticeable but would not result in their delisting from the NRHP or their eligibility for NRHP listing.

Impacts of Alternative C: Upper and Lower Parking Lot Access Alternative

C&O Canal National Historical Park - Alternative C would have similar impacts on the Abner Cloud House, Fletcher's Boat House Office and Snack Bar and Bike Shop as described for Alternative B. No changes would occur to the Battery Kemble Culvert and Wasteweir #3.

In addition to those impacts similar to those described for Alternative B, Alternative C would retain the linear structure of the canal prism and towpath. The towpath and an earth-stabilizing berm would continue to parallel the prism. However, the new entrance bridge for vehicle access to the lower parking lot would shorten the linear view corridor of the canal prism and towpath due to the introduction of a new overhead structure.

To the east of the canal, the new bridge and ramp for vehicle access to the upper parking lot would block views from the south to the Abner Cloud House and introduce new vertical structures in the background of views from the north to the Abner Cloud House. The paved vehicle circulation areas and new, unpaved access route for official use vehicles and overflow parking would also be visible. To the west of the canal, the new bridge could require the removal of existing vegetation resulting in less filtered views from the canal prism and towpath to the new bridge and reconfigured, paved, and striped lower parking lot. During the summer, vegetation would screen most of the updated landing area and new sets of steps and ramps from the canal prism and towpath. During the winter, views from the canal prism and towpath to these upgrades would be partially filtered through vegetation.

The Fletcher's Road Culvert would be closed to vehicle access between the east and west sides of the C&O Canal. Other than the road within the culvert and approach roads on either side of the culvert would be resurfaced, no changes to the culvert structure would occur and the culvert would remain open to pedestrians and cyclists.

Alternative C would have direct, adverse impacts on the C&O Canal National Historical Park as a result of the new ramp and bridge, re-located upper parking lot and overflow lot, and paved parking lots and vehicle circulation areas. The new entrance bridge over the canal would mitigate adverse impacts on the historic district by using a design that avoids using support piers in the canal prism and on the towpath. Surface materials for the updated landing area and associated steps and ramps, small-scale features associated with proposed upgrades throughout the project area (e.g., railings), and small-scale improvements (e.g., access gates and signage) would further minimize adverse impacts on the historic district by using materials (e.g., wood, stone) and a design that are compatible with the historic character of the landscape. These design actions would be undertaken in a manner that is consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. NPS would also help screen the parking area and ramp to the upper parking lot from view of the canal using natural materials. These could include wood fences, stone walls, stones, or natural vegetation. Consultation with DC SHPO would occur to develop strategies to ensure historic features of the C&O Canal National Historical Park are not damaged during construction.

George Washington Memorial Parkway - Alternative C proposes several transportation upgrades to the project area, including a new entrance ramp for vehicle access between Canal Road and the upper parking lot and lower parking lot via a bridge, relocation and reconfiguration of parking lots, replacement of the existing bridge over the C&O Canal, modified official vehicular access to the towpath, and improved access to the boathouse and concessions.

The new bridge providing vehicular access to the lower parking lot would be visible from the South Donaldson Scenic Overlook during the summer and winter. Trees would partially screen the bridge from view during the summer. During the winter, views of the bridge from the overlook would be partially filtered through trees. The remaining proposed upgrades to the project area under Alternative C would have similar visibility from the South Donaldson Scenic Overlook as described for Alternative B.

Although the implementation of the proposed upgrades may require some vegetation removal, vegetation removal would be minimal and the overall natural, vegetated character of the broad view from the South Donaldson Scenic Overlook of the Potomac River Gorge would be retained. As a result, Alternative C would not result in adverse impacts on the George Washington Memorial Parkway.

Cumulative Impacts: Other past, present, and reasonably foreseeable future projects that have or will likely have cumulative impacts on historic buildings and structures include the dredging of Fletcher's Cove. The removal of sediment at Fletcher's Cove could have no detectable, adverse, or beneficial impacts on the historic districts depending on how and where sediment is removed. Therefore, when the adverse impacts of Alternative C are combined with the impacts of the dredging project, an overall adverse cumulative impact would result.

Conclusion: Alternative C would result in detectable adverse impacts on the C&O Canal National Historical Park and would contribute adverse impacts on the overall adverse cumulative impact on historic buildings and structures. Alternative C would minimize impacts on historic buildings and structures by avoiding disturbing known historic resources during design and construction to the extent practicable, avoiding the use of support piers in the canal prism and on the towpath, and using materials and a design for surface materials, small-scale features, and small-scale improvements that are compatible with the historic character of the landscape. These design actions would be undertaken in a manner that is consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Natural materials would help screen the parking area and ramp to the upper parking lot from view. NPS would also consult with DC SHPO to develop strategies to ensure historic features of the C&O Canal National Historical Park are not damaged during construction. Overall, changes to the historic buildings and structures would be noticeable but would not result in their delisting from the NRHP or their eligibility for NRHP listing.

ARCHEOLOGICAL RESOURCES

Affected Environment

This section of the EA addresses archeological resources within the APE. A Phase IA Archeological Assessment for the APE was conducted in 2019 in conjunction with the preparation of this EA (Seibel and Regan 2019). The assessment reviewed historic maps and previous investigations and recorded sites, topography, and existing conditions in an effort to identify the archeological potential within the APE. The following section summarizes the findings from the Phase IA Archeological Assessment.

The APE has a moderate to high potential to contain undocumented archeological resources: the only areas with a low potential for such deposits are those that have been impacted by deep ground disturbances, such as those associated with the construction of the C&O Canal, the mainline of the Potomac Interceptor east of the canal, and the related odor abatement building. Previous investigations have provided evidence for intensive prehistoric occupations within relatively deeply buried soils in

various locations throughout the APE. This evidence suggests that other, untested portions of the APE have a high potential to contain intact prehistoric archeological resources.

Previous investigations have revealed intact deposits near the Abner Cloud House, and a review of historic mapping indicates that the APE once included numerous historic buildings and structures that are no longer extant. Many former historic building locations were not subsequently redeveloped, suggesting there is a moderate to high potential for intact historic archeological deposits nearby. Elsewhere within the APE, particularly around the lower parking lot near the Potomac River, there is little evidence for intensive historic occupation and thus a low potential for associated archeological resources.

Three archeological sites registered with DC SHPO are located within or directly adjacent to the northern portion of the APE. Despite containing archeological remains, the Abner Cloud House is not recorded as a formal archeological site with DC SHPO. The registered sites include the following, which are described in **Appendix C**:

- Edes Mill Complex Archeological Site (19th century)
- Fletchers Boat House Archeological Site (8000 BCE-1600 CE)
- Civil War Battery Archeological Site (19th century)

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 identical with that defined for historic properties.

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 NRHP Criterion D (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 DC SHPO, Virginia DHR, DTHPO, DNHPO, and the Pamunkey Indian Tribe for review and approval in conjunction with this EA.

Impacts of Alternative A: No Action

Alternative A would not implement any transportation upgrades within the APE. Because no new structures would be added and no modifications would be made to the existing parking lots, bridges, or other structures, there would be no new ground disturbance 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 area.

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 Alternative B: Upper Parking Lot Access Alternative

Alternative B proposes several transportation upgrades throughout the project area, including upgrades near the Abner Cloud House and in the northern portion of the project area. The Abner Cloud House would be retained in its current location, but Alternative B would reconfigure the upper parking lot west of the Abner Cloud House and add a new ramp for vehicle access, resurface vehicle circulation areas, and add a new unpaved route for maintenance vehicle access near the house. Transportation upgrades in the northern area include resurfaced vehicle circulation areas, a new replacement bridge over the C&O Canal and modified bridge landing, updated landing area, and new sets of steps and ramps by the boathouse and concessions. Alternative B would retain the C&O Canal.

In general, the APE has a high potential to contain undocumented prehistoric and historic archeological deposits, with the exception of those locations impacted by the installation of the Potomac Interceptor sewer system corridor and its associated odor abatement facility. Any ground-disturbing activities planned outside of areas previously subject to intensive archeological excavation or deep mechanical disturbance have a high potential to encounter undocumented archeological sites or archeological deposits associated with known archeological resources (i.e., Abner Cloud House, Fletchers Boat House Archeological Site).

Ground disturbance related to the proposed project elements could disrupt or displace unknown archeological resources and result in a loss of integrity of the archeological resource, resulting in an adverse impact. In order to avoid and minimize potential adverse impacts, the NPS would undertake archeological investigation for any areas of potential ground disturbance with moderate to high archeological potential. Such investigations would include, at a minimum, pedestrian inspection, close-interval shovel testing, and/or mechanical removal of thick fill overburdens to test potential stable, buried surfaces, and associated geoarcheological investigation to identify areas with the greatest chance of containing buried paleosols. All proposed archeological investigations would be planned in consultation with NPS and DC SHPO.

The potential for encountering historic burials or cemeteries is considered low, while the potential for encountering prehistoric burials or cemeteries is considered moderate. Therefore, a protocol for the unanticipated discovery of cemeteries or human remains should be developed for the construction contractor. If any Native American burials, cemeteries, or funerary objects are encountered, NPS would contact federally recognized Tribes with affiliation in Washington, DC, in accordance with the Native American Graves Repatriation Act (NAGPRA).

NPS would also avoid disturbing known archeological resources during design and construction to the extent practicable. During the construction phase, NPS would also minimize ground-disturbing activities to the extent practicable, including using existing vehicle circulation areas and construction methods that minimize land disturbance.

Cumulative Impacts: Other past, present, and reasonably foreseeable future projects that have or will likely have cumulative impacts on archeological resources include the dredging of Fletcher's Cove. The removal of sediment at Fletcher's Cove could have no detectable, adverse, or beneficial impacts on archeological resources depending on how and where sediment is removed. Therefore, when the adverse impacts of Alternative B are combined with the impacts of the dredging project, an overall adverse cumulative impact would result.

Conclusion: Alternative B would result in detectable adverse impacts on archeological resources and would contribute adverse impacts on the overall cumulative impact on archeological resources. In order to

avoid and minimize potential adverse impacts, NPS would conduct archeological investigation for any areas of potential ground disturbance with moderate to high archeological potential, avoid disturbing known archeological resources during design and construction to the extent practicable, and minimize ground-disturbing activities to the extent practicable during the construction phase. NPS would also develop a protocol for the unanticipated discovery of cemeteries or human remains for the construction contractor and would contact federally recognized Tribes with affiliation in Washington, DC, if any Native American burials, cemeteries, or funerary objects are encountered.

Impacts of Alternative C: Upper and Lower Parking Lot Access Alternative

Alternative C proposes several transportation upgrades throughout the project area. Therefore, Alternative C would have impacts on known and unknown archeological resources similar to those described for Alternative B. In addition, Alternative C would result in potential impacts on known and unknown archeological resources due to ground disturbance from the reconfiguration of parking and the introduction of a bridge over the C&O Canal from Canal Road to the lower parking lot. In order to avoid and minimize potential adverse impacts, the NPS would undertake archeological investigation for any areas of potential ground disturbance with moderate to high archeological potential. Such investigations would include, at a minimum, pedestrian inspection, close-interval shovel testing, and/or mechanical removal of thick fill overburdens to test potential stable, buried surfaces as well as associated geoarcheological investigation to better identify areas with the greatest chance of containing buried paleosols. All proposed archeological investigations would be planned in consultation with NPS and DC SHPO.

The potential for encountering historic burials or cemeteries is considered low, while the potential for encountering prehistoric burials or cemeteries is considered moderate. Therefore, a protocol for the unanticipated discovery of cemeteries or human remains should be developed for the construction contractor. Should any Native American burials, cemeteries, or funerary objects be encountered, NPS would contact federally recognized Tribes with affiliation in Washington, DC.

NPS would also avoid disturbing known archeological resources during design and construction to the extent practicable. During the construction phase, NPS would also minimize ground-disturbing activities to the extent practicable, including using existing vehicle circulation areas and construction methods that minimize land disturbance.

Cumulative Impacts: Other past, present, and reasonably foreseeable future projects that have or will likely have cumulative impacts on archeological resources include the dredging of Fletcher's Cove. The removal of sediment at Fletcher's Cove could have no detectable, adverse, or beneficial impacts on archeological resources depending on how and where sediment is removed. Therefore, when the adverse impacts of Alternative C are combined with the impacts of the dredging project, an overall adverse cumulative impact would result.

Conclusion: Alternative C would result in detectable adverse impacts on archeological resources and would contribute adverse impacts on the overall cumulative impact on archeological resources. In order to avoid and minimize potential adverse impacts, NPS would conduct archeological investigation for any areas of potential ground disturbance with moderate to high archeological potential, avoid disturbing known archeological resources during design and construction to the extent practicable, and minimize ground-disturbing activities to the extent practicable during the construction phase. NPS would also develop a protocol for the unanticipated discovery of cemeteries or human remains for the construction contractor and would contact federally recognized Tribes with affiliation in Washington, DC, if any Native American burials, cemeteries, or funerary objects are encountered.

WATER RESOURCES

Affected Environment

The project site is located directly adjacent to the Potomac River and contains the C&O Canal. The project site contains approximately 3.1 acres of impervious surfaces, including buildings, bridge structures, and paved circulation routes. Although parking areas and unpaved circulation routes are of packed stone or other materials, they still function as impervious surfaces. During rainstorms, water generally flows from the northwest to the southeast of the site. The result is that the primary flow of stormwater from the upper lot is into the C&O Canal, while the flow from the lower lot is into the Potomac River.

Groundwater measurements at the site indicate groundwater at depths of between 9 feet to 18 feet below existing grades (AECOM 2019). Fluctuations in groundwater levels may occur as a result of seasonal variations in rainfall, proximity of the site to the large bodies of water, tidal fluctuations, evaporation, construction activity, pump tests, surface runoff, and other site-specific factors.

About the Analysis

Potential impacts on water resources at and in the project area were analyzed in consideration of the current conditions at the site, the proposed elements included in the alternatives, the estimated increase in visitors that would result from the implementation of each alternatives, and professional knowledge and judgment.

Impacts of Alternative A: No Action

Alternative A would not alter features within the project area, and therefore would result in no new impacts on water resources.

Cumulative Impacts: Alternative A would have no new impacts on water 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 area.

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

Impacts of Alternative B: Upper Parking Lot Access Alternative

Alternative B proposes several transportation upgrades throughout the project area, including upgrades in the northern portion of the project area. Alternative B would reconfigure the upper parking lot west of the Abner Cloud House and add a new ramp for vehicle access, resurface vehicle circulation areas, and add a new unpaved route for maintenance vehicle access near the house. Transportation upgrades in the northern area include resurfaced vehicle circulation areas, a new replacement bridge over the C&O Canal and modified bridge landing, updated landing area, and new sets of steps and ramps by the boathouse and concessions.

Alternative B would disturb over 5,000 square feet of land area, and hence would be considered a “major land disturbing activity” under the Energy Independence and Security Act. In order to address these concerns, Alternative B would include permeable pavers for some parking in the designated upper lot parking areas, portions of the lower lot parking areas, and some pedestrian circulation facilities. Additionally, bioswales and bioretention facilities would be located in in the lower lot (see **Appendix D**). These efforts would not fully meet stormwater retention requirements but would adequately address the total suspended solids (TSS) requirements for the site. In total, the changes described above would decrease the impervious area by approximately 0.1 acres (2.9 percent).

The presence of fill soils throughout the site (AECOM 2019) and the presence of the 100-year floodplain limits other potential strategies to stormwater requirements. In order to mitigate impacts on water resources and to meet retention requirements, off-site facilities, RCS credits, or the combination of the two would be needed. The NPS would participate in early coordination with the U.S. Federal Emergency Management Agency and the District Department Energy and the Environment to address these concerns.

Construction activities, such as the construction of the new entrance ramp, replacement of the bridge over the canal, update of the existing bridge over the Maddox Branch, update of the landing area, construction of new sets of steps and accessible ramps by the boathouse and concessions, and resurfacing activities would increase the vulnerability of soil to water and wind erosion and potentially result in sedimentation of waterways during construction. The NPS and/or its contractors would adhere to applicable Best Management Practices (BMPs) during the construction phases to minimize the erosion of exposed soils and the corresponding pollution and sedimentation. NPS would adhere to the requirements of permits, stormwater management plans, and erosion and sediment control plans.

Cumulative Impacts: Alternative B would have beneficial impacts on water resources at the project site. Other past, present, and reasonably foreseeable future projects that have or will likely have cumulative impacts on water resources at and in the vicinity of the project site include the dredging of Fletcher's Cove and the Palisades Trolley Trail. The removal of sediment at Fletcher's Cove would temporarily disturb soils within the Potomac River. A multi-use trail along the Glen Echo Trolley line corridor could increase stormwater and, therefore, reduce water quality within the Potomac.

Alternative B would result in a beneficial impact associated with access and transportation improvements combined with the installation of bioswales and porous pavement. When the adverse incremental impact of Alternative B is combined with the potentially adverse impacts of these other projects, an overall beneficial cumulative impact would result.

Conclusion: The new entrance ramp, new replacement bridge over the canal and modified bridge landing, updated fully accessible landing area and new sets of steps and accessible ramps near the boathouse and concessions, crosswalks and pedestrian paths, and small-scale improvements would increase impervious surface area, which would be offset by the installation of bioswales and porous pavement at the site; these changes would decrease stormwater runoff into nearby water bodies. Alternative B would result in temporary adverse impacts on water resources during construction; however, the impacts would be short-term. Following the construction period, Alternative B would have beneficial impacts on water resources and would contribute to cumulative beneficial impacts on water resources.

Impacts of Alternative C: Upper and Lower Parking Lot Access Alternative

Alternative C proposes much of the same transportation upgrades as Alternative B but would include a direct connection between Canal Road and the lower lot; Alternative C would not include a replacement and expansion of the pedestrian bridge over the canal. Alternative C would increase the impervious area at the project site 0.3 acres (9.1 percent).

The stormwater management strategy for this alternative would be similar to Alternative B, but would add a bioretention features to the upper lot (**Appendix D**). When the SWM strategy is combined with the transportation upgrades, Alternative C would result in greater potential for untreated and unmanaged stormwater runoff to reach adjacent water bodies. Similar to Alternative B, in order to mitigate impacts on water resources and to meet retention requirements, off-site facilities, RCS credits, or the combination of the two would be needed. In order to avoid and minimize potential adverse impacts, the NPS would participate in early coordination with the U.S. Federal Emergency Management Agency and the District Department Energy and the Environment to address these concerns.

Cumulative Impacts: Alternative C would have detectable adverse impacts on water resources at the project site. Other past, present, and reasonably foreseeable future projects that have or will likely have cumulative impacts on water resources as described under Alternative B.

Alternative C would result in an adverse impact associated with the new entrance ramp and connection to the lower lot, and modified bridge landing, updated fully accessible landing area and new sets of steps and accessible ramps near the boathouse and concessions, crosswalks and pedestrian paths, and small-scale improvements. When the adverse incremental impact of Alternative C is combined with the potentially adverse impacts of these other projects, an overall noticeable adverse cumulative impact would result.

Conclusion: The new entrance ramp and connection to the lower lot, reconfigured parking areas, updated fully accessible landing area and new sets of steps and accessible ramps near the boathouse and concessions, crosswalks and pedestrian paths, and small-scale improvements would increase impervious surface area at the site and therefore increase stormwater runoff into nearby water bodies. Alternative C would result in temporary adverse impact on water resources during construction; however, the impacts would be short-term. Following the construction period, Alternative C would have detectable adverse impacts on water resources and would contribute to cumulative adverse impacts on water resources.

VISITOR USE AND EXPERIENCE

Affected Environment

Vehicle Circulation - A single-lane entrance ramp currently provides visitor and official use vehicle access to and from the project area. A traffic signal at the bottom of the ramp facilitates two-way traffic movement on the ramp. However, vehicles at the bottom of the ramp do not always yield to the traffic signal.

Due to the entrance ramp's configuration immediately adjacent and parallel to Canal Road, vehicles traveling eastbound/inbound on Canal Road access the project area by driving down the ramp in a reverse position. Alternatively, vehicles conduct a hairpin or three-point turn at the Canal Road and ramp intersection to drive down the ramp in a forward position. This vehicle maneuver can block traffic flow along Canal Road.

Within the project area, visitor and official use vehicle parking is provided on both sides of the C&O Canal in the upper and lower parking lots. The existing road culvert provides vehicle access to and from the lower parking lot, boathouse, concessions, and Potomac River located to the west of the canal. The one-lane existing road culvert provides vehicle circulation in both directions but is not currently signalized. The absence of lighting in the existing road culvert and curved orientation of the approach road on either side of the existing road culvert creates poor sight distances for vehicles entering the road culvert. Visitor use vehicle access is restricted to the upper parking lot within the project area when the Potomac River floods and the tunnel is impassable.

The low clearance (approximately 7 to 10 feet) of the existing road culvert also restricts the type of vehicles that can access the project area west of the canal. Large, visitor use vehicles and visitor use vehicles with bicycles, stand up paddle boards, or boats attached to the roof are limited to parking in the upper parking lot. Visitors in these vehicles access the Potomac River by carrying their equipment over the existing canal bridge, down the existing steps or accessible ramp, and across the boathouse, concessions area, and lower parking lot.

Large, official use vehicles cannot use the existing road culvert for circulation because of the existing road culvert's (tunnel) low clearance. These vehicles currently access the project area west of the canal via the existing bridge over the canal to the towpath, and then use an access ramp that connects to the

lower parking lot. The size of the bridge landing to the west of the canal requires longer official use vehicles to conduct multi-point turns to maneuver to/from the towpath. The bridge and towpath also provide pedestrian and bicycle circulation within and through the project area.

Official use vehicle sight lines of pedestrians and bicycles on the towpath are limited near the top of the access ramp due to existing vegetation, topography, and the width of the ramp's landing area at the towpath, especially when vehicles must move in reverse to access and emerge from the lower lot.

Pedestrian and Bicycle Circulation - The existing entrance ramp, towpath, and Capital Crescent Trail currently provide pedestrian and bicycle access to and from the project area. The existing entrance ramp does not define a designated space for pedestrians and bicycles separate from vehicles. A crosswalk at the signalized intersection of Canal Road, Reservoir Road, and the entrance ramp connects the ramp and a sidewalk on the west side of Reservoir Road. No sidewalks are present on Canal Road in the project area vicinity.

Pedestrians and bicycles circulate between the east and west sides of the C&O Canal through 1) using the existing road culvert and/or 2) the existing bridge over the canal. Steps and accessible ramps connect the boathouse and concessions area with the Capital Crescent Trail, towpath, and bridge over the canal. The landing area by the boathouse and concessions does not currently meet full accessibility standards.

Defined pathways for pedestrians and bicycles separate from vehicles are not present elsewhere throughout the project area.

Pedestrian access to the ground floor of the Abner Cloud House is provided on the west side of the building. Pedestrian access to the second floor of the Abner Cloud House is provided on the east side of building adjacent to the existing entrance ramp.

Figures illustrating existing visitor use vehicle, official use vehicle, pedestrian and bicycle circulation at the project area are provided in **Appendix E**.

About the Analysis

Potential impacts on visitor use and experience at and in the project area were analyzed in consideration of the current visitor uses, activities, and circulation, the proposed elements included in the alternatives, the estimated increase in visitors that would result from the implementation of each alternatives, and professional knowledge and judgment.

Impacts of Alternative A: No Action

Alternative A would not change visitor and official use vehicle, pedestrian, or bicycle access to and from the project area or circulation within the project area.

The entrance ramp would continue to provide vehicle access to and from the project area and the existing road culvert would continue to provide vehicle access between the east and west sides of the C&O Canal. Large visitor use vehicles and visitor use vehicles with roof attachments would continue to be limited to the upper parking lot only. Large official use vehicles would continue to use the existing bridge over the canal to the towpath and access ramp connecting to the lower lot to access the project area west of the canal. The upper and lower parking lots would continue to offer visitor and official use vehicle parking.

Pedestrians and bicycles would continue to use the existing entrance ramp, towpath, and Capital Crescent Trail to access the project area. The existing road culvert, bridge over the C&O Canal, steps, and accessible ramps would continue to provide pedestrian and bicycle circulation between the east and west sides of the canal.

Cumulative Impacts: Alternative A would have no impacts on visitor use and experience and would not contribute to cumulative impacts on visitor use and experience.

Conclusion: No impacts would occur to visitor use and experience under Alternative A. The alternative would not contribute to cumulative impacts on visitor use and experience.

Impacts of Alternative B: Upper Parking Lot Access Alternative

Alternative B would facilitate safer two-way movement for traffic entering and exiting the project area, allow for easier and safer turn movements for vehicles accessing the project area from Canal Road and official use vehicles traveling between the upper and lower parking lots, regulate two-way traffic movement through the existing road culvert, enable safer pedestrian and bicycle circulation at the Canal Road intersection via a dedicated ramp and throughout the project area, and expand pedestrian access opportunities to the boathouse and concessions.

Vehicle Circulation - The new entrance ramp for vehicle access between Canal Road and the Fletcher's Boathouse site would provide one lane for traffic moving in each direction and allow traffic to enter and exit the project area at the same time. Vehicles traveling eastbound/inbound on Canal Road would be able to make a right turn onto the new entrance ramp and drive down the ramp in a forward position due to the ramp's 90-degree intersection with Canal Road.

The existing road culvert would continue to provide vehicle access between the east and west sides of the canal. The signalization of the road culvert would regulate when traffic moving in each direction may pass through the tunnel.

The upper and lower parking lots would continue to offer visitor and official use vehicle parking. Large visitor use vehicles and visitor use vehicles with roof attachments would continue to be limited to the upper parking lot only.

Large official use vehicles, including emergency vehicles, would continue to use a bridge over the canal to the towpath and access ramp connecting to the lower parking lot to access the project area west of the canal. However, the new, wider replacement bridge over the canal and modified bridge landing would eliminate the need for, or reduce the number of, multi-point turns that large official use vehicles use to maneuver to/from the towpath, thus reducing the amount of time necessary for these vehicles to travel between both sides of the canal, respond to emergency situations, etc. When reaching the towpath from the lower lot using the access ramp, official use vehicles, including emergency vehicles, would have increased visibility of pedestrians and bicycles on the towpath as a result of widening the ramp approach and removing vegetation.

Pedestrian and Bicycle Circulation - Pedestrians and bicycles would continue to use the existing entrance ramp, towpath, and Capital Crescent Trail to access the project area. The closing of the existing entrance ramp to vehicles and installation of protective safety measures near the top of the ramp would reduce potential vehicle, pedestrian, and bicycle conflicts on the ramp and along Canal Road and provide a safer and more comfortable environment for pedestrians and bicycles entering/exiting the project area. Improvements in the functionality of pedestrian and bicycle access routes at the intersection of Canal Road, Reservoir Road, and the new entrance ramp would enable safer pedestrian and bicycle circulation through the intersection.

The existing road culvert, a bridge over the canal, steps, and accessible ramps would continue to provide pedestrian and bicycle circulation between the east and west sides of the canal. The updated fully accessible landing area and new sets of steps and accessible ramps by the boathouse and concessions would provide easier access for visitors and new opportunities to access the boathouse and concessions.

The addition of crosswalks and pedestrian pathways would enable safer pedestrian circulation through the project area.

Visitor use vehicle, official use vehicle, and pedestrian and bicycle circulation under Alternative B are illustrated in **Appendix E**.

Construction activities, such as the construction of the new entrance ramp, replacement of the bridge over the canal, update of the existing bridge over the Maddox Branch, update of the landing area and construction of new sets of steps and accessible ramps by the boathouse and concessions, and resurfacing, would temporarily close areas of the project area to visitors and could limit use of certain locations within the project area. Construction would be phased over time and construction work would occur during off-peak visitor use periods where possible, minimizing construction impacts.

Cumulative Impacts: Alternative B would have noticeable beneficial impacts on visitor use and experience at the project site. Other past, present, and reasonably foreseeable future projects that have or will likely have cumulative impacts on visitor use and experience at and in the vicinity of the project site include the dredging of Fletcher's Cove and the Palisades Trolley Trail. The removal of sediment at Fletcher's Cove would increase access to the Potomac River for pedestrians, fishers, and boaters. A multi-use trail along the Glen Echo Trolley line corridor could create opportunities to connect to the Capital Crescent Trail and towpath.

Alternative B would result in an overall beneficial impact associated with the new entrance ramp, new replacement bridge over the canal and modified bridge landing, updated fully accessible landing area and new sets of steps and accessible ramps near the boathouse and concessions, crosswalks and pedestrian paths, and small-scale improvements. When the beneficial incremental impact of Alternative B is combined with the beneficial impacts of these other projects, an overall noticeable beneficial cumulative impact would result.

Conclusion: The new entrance ramp, new replacement bridge over the canal and modified bridge landing, updated fully accessible landing area and new sets of steps and accessible ramps near the boathouse and concessions, crosswalks and pedestrian paths, and small-scale improvements would provide safer visitor and official use vehicle, pedestrian, and bicycle access to/from the project area and circulation within the project area, and expand pedestrian access opportunities to the boathouse and concessions, but would temporarily disrupt visitor access to certain locations within the project area. Alternative B would result in temporary adverse impacts on visitor use and experience during construction; however, the impacts would be short-term and phased over time. Following the construction period, Alternative B would have noticeable beneficial impacts on visitor use and experience and would contribute to cumulative beneficial impacts on visitor use and experience.

Impacts of Alternative C: Upper and Lower Parking Lot Access Alternative

Alternative C would facilitate safer two-way movement for traffic entering and exiting the project area; provide direct access to the lower parking lot from Canal Road; and allow easier and safer turn movements for vehicles accessing the project area from Canal Road and official use vehicles traveling between the upper and lower parking lots. Alternative C would also enable safer pedestrian and bicycle circulation at the Canal Road intersection and throughout the project area and expand pedestrian access opportunities to the boathouse and concessions.

Vehicle Circulation - The new entrance ramp and bridge for vehicle access between Canal Road and the Fletcher's Boathouse site would provide one lane for traffic moving in each direction and allow traffic to enter and exit the project area at the same time. Vehicles traveling eastbound/inbound on Canal Road would be able to make a right turn onto the new entrance ramp and drive down the ramp in a forward position due to the ramp's 90-degree intersection with Canal Road.

The upper and lower parking lots would continue to offer visitor and official use vehicle parking. The existing road culvert would be closed to vehicular access, but the new entrance bridge would provide direct vehicle access to the lower parking lot from Canal Road. Large visitor use vehicles and visitor use vehicles with roof attachments would have the option to park in the upper or lower parking lot.

The new entrance bridge would also provide official use vehicles direct access from Canal Road and the upper parking lot to the lower parking lot and Potomac River, thus reducing the amount of time necessary for these vehicles to travel between both sides of the canal, respond to emergency situations, etc. To specifically access the towpath, official use vehicles would use the new entrance ramp to the east of the canal and the existing bridge over the canal.

Pedestrian and Bicycle Circulation – Alternative C would have the same impacts on pedestrian and bicycle circulation as described for Alternative B.

Visitor use vehicle, official use vehicle, and pedestrian and bicycle circulation under Alternative C are illustrated in **Appendix E**.

Construction activities, such as the construction of the new entrance ramp and bridge, update of the existing bridge over the Maddox Branch, update of the landing area and construction of new sets of steps and accessible ramps by the boathouse and concessions, and resurfacing would temporarily close areas of the project area to visitors and could limit the use of certain locations within the project area. Construction would be phased over time and construction work would occur during off-peak visitor use periods where possible, minimizing construction impacts.

Cumulative Impacts: Alternative C would have noticeable beneficial impacts on visitor use and experience at the project site. Other past, present, and reasonably foreseeable future projects that have or will likely have cumulative impacts on visitor use and experience at and in the vicinity of the project site include the dredging of Fletcher's Cove and the Palisades Trolley Trail. The removal of sediment at Fletcher's Cove would increase access to the Potomac River for pedestrians, fishers, and boaters. A multi-use trail along the Glen Echo Trolley line corridor could create opportunities to connect to the Capital Crescent Trail and towpath.

Alternative C would result in an overall beneficial impact associated with the new entrance ramp and bridge, updated fully accessible landing area and new sets of steps and accessible ramps near the boathouse and concessions, crosswalks and pedestrian paths, and small-scale improvements. When the beneficial incremental impact of Alternative C is combined with the beneficial impacts of these other projects, an overall noticeable beneficial cumulative impact would result.

Conclusion: The new entrance ramp and bridge, updated fully accessible landing area and new sets of steps and accessible ramps near the boathouse and concessions, crosswalks and pedestrian paths, and small-scale improvements would provide safer visitor and official use vehicle, pedestrian, and bicycle access to/from the project area and circulation within the project area, and expand pedestrian access opportunities to the boathouse and concessions, but would temporarily disrupt visitor access to certain locations within the project area. Alternative C would result in temporary adverse impacts on visitor use and experience during construction; however, the impacts would be short-term and phased over time. Following the construction period, Alternative C would have noticeable beneficial impacts on visitor use and experience and would contribute to cumulative beneficial impacts on visitor use and experience.

CONSULTATION AND COORDINATION

The NPS involved the public during the NEPA process to provide an opportunity for the public to comment on the proposed project. Consultation and coordination with federal and state agencies and other interested parties was also conducted to refine the alternatives 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.

- The NPS held one public scoping meeting during the 45-day public scoping comment period, at which time the public, agencies, and interested parties were invited to submit comments on the proposed project.
- The NPS initiated consultation with the District of Columbia SHPO, Virginia DHR, DTHPO, DNHPO, and the Pamunkey Indian Tribe in letters dated in June and July 2019. The NPS has prepared an AOE report for the proposed project and will send it to these state and tribal historic preservation offices for review in conjunction with this EA.
- NPS has held two Section 106 consulting parties meetings, which occurred in July and October 2019. Consulting parties have reached a consensus that an adverse effect to the C&O Canal National Historical Park will occur; the NPS is working to identify minimization and mitigation strategies and to draft a memorandum of agreement (MOA). NPS will notify and consult with the state and tribal historic preservation offices on any revisions that may be proposed to the project design.
- The NPS initiated Section 7 consultation via the USFWS's online Information for Planning and Consultation (IPaC) system on December 19, 2018. Ongoing consultation would occur during implementation of the proposed action.

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