

National Park Service
U.S. Department of the Interior

Monocacy National Battlefield
Frederick County, Maryland



MONOCACY NATIONAL BATTLEFIELD PUBLIC ACCESS PLAN
ENVIRONMENTAL ASSESSMENT
JANUARY 2017

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Note to reviewers and respondents

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Purpose and Need

Introduction

The National Park Service (NPS) is developing a Public Access Plan for Monocacy National Battlefield to look comprehensively at the public's access to the battlefield's areas and resources. The park's purpose is to preserve the breastworks, earthworks, walls, and other defenses and shelters used by the Confederate and Union armies on July 9, 1864, as well as the buildings, roads, and outlines of the battlefield; to commemorate the Battle of Monocacy; and to provide opportunities for visitors to understand and appreciate the significance of the Battle of Monocacy within the full context of the Civil War and US history. The Public Access Plan's intent is to increase opportunities for visitors to connect to the park's resources, history, preservation activities, and significance.

This Environmental Assessment (EA) describes two alternatives for the proposed Public Access Plan, an action alternative and the no-action alternative, and analyzes the environmental consequences of implementing the alternatives. The EA was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA); regulations of the Council on Environmental Quality (40 CFR 1500-1508); NPS Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision-Making; and the NPS NEPA Handbook (NPS 2015). In conjunction with this EA, the project is undergoing a review of potential effects on historic resources in compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966. This document is being used for compliance with the National Environmental Policy Act (NEPA) of 1969, as amended. A separate Assessment of Effects has been prepared for compliance with the National Historic Preservation Act of 1966, as amended.

Purpose and Need for the Action

Purpose

The purpose of the Monocacy National Battlefield Public Access Plan and Environmental Assessment is to develop a comprehensive plan that promotes the public's access to and understanding of the battlefield in order to enhance the visitor experience and increase opportunities for visitors to connect with the park's resources, history, commemorative aspects, preservation activities, and significance, while minimizing impacts to cultural and natural resources.

Need

The Plan is needed to develop strategies aimed at addressing the fragmented nature of the battlefield's visitor access and trail system. Various areas of the park are disconnected due to road, railroad, and river systems; river access facilities are informal and unofficial; the trail and access network has not been planned in a comprehensive manner; and the use of trails for recreation has increased. Improvements are needed to

increase accessibility of park resources, provide connections between disparate areas, and enhance opportunities for visitor education and interpretation.

Project Objectives

To fulfill the purpose and need of the project, several objectives have been developed for the Public Access Plan. These include:

- Develop strategies that enhance internal circulation and expand public access to park areas and resources.
- Enhance interpretive programs and improve the visitor experience by identifying, incorporating, and connecting with key viewsheds, vistas, and sites of historical importance.
- Increase universal accessibility using the Architectural Barriers Act Accessibility Standard (ABAAS) and Outdoor Developed Area Guidelines to guide location and design of trails and visitor access areas and amenities.
- Identify strategies, alternatives, and potential expanded opportunities for public access that are balanced with the capacity of the park's facilities and infrastructure, while maintaining safety and minimizing impacts to cultural and natural resources.
- Utilize new methods of engagement, promote increased educational opportunities and allow for appropriate recreation that preserves the character of the park.

Project Area

The 1,647-acre Monocacy National Battlefield, located in Frederick County, Maryland, encompasses a large portion of the lands upon which the Battle of Monocacy was fought during the Civil War. The park lies in an unincorporated area approximately 3 miles south of the City of Frederick. Although this area of the county is growing rapidly, the park's historic rural landscape is remarkably free of intrusive elements. The modern Interstate Highway 270 (I-270) and the widened MD 355, while following the historic Georgetown Pike, bisect the historic battlefield landscape. The Monocacy River and railroad tracks, extant during the battle, also run through the park.

Monocacy National Battlefield commemorates the Battle of Monocacy, where on July 9, 1864, a small Union army successfully delayed a larger Confederate army's advance on Washington, D.C., thereby providing sufficient time for General Ulysses S. Grant to send Federal reinforcements to the U.S. capital and prevent its capture. The park provides a national battlefield where visitors can experience a historic landscape, structures, and transportation corridors that have changed little since the Battle of Monocacy. As a result, it offers many opportunities for understanding the evolution of settlement in the region and the Civil War within the broader context of American history.

The battlefield is listed on the National Register of Historic Places and is designated as a National Historic Landmark. Six properties or farmsteads that existed during the battle – the Thomas Farm, the Worthington Farm, the Best Farm, Gambrell Mill, the Lewis Farm and the Baker Farm – and surrounding agricultural fields retain essentially the feel of the Civil War era landscape (see Figures 1-9). Agricultural practices have gradually changed over the years from small grains and corn to activities that support dairy operations in addition to crop production, but the overall agricultural appearance of the landscape remains generally intact.

Forested areas include Brooks Hill and lands along the Monocacy River and Bush Creek. These form a buffer against views of development outside the park boundaries. Approximately 7 miles of trails provide visitors with walking routes to experience the battlefield.

Approximately two miles of the Monocacy River runs through the national battlefield. Interstate I-270 bisects the national battlefield, and Maryland Highway 355 (Historic Georgetown Pike) runs north–south through the eastern part of the national battlefield. The CSX Railroad also extends through the national battlefield, paralleling the Monocacy River and Bush Creek. MD 355 serves as the primary vehicular access route to important features, including the Visitor Center located at the north end of the park.



Figure 1: Thomas House



Figure 2: Worthington House

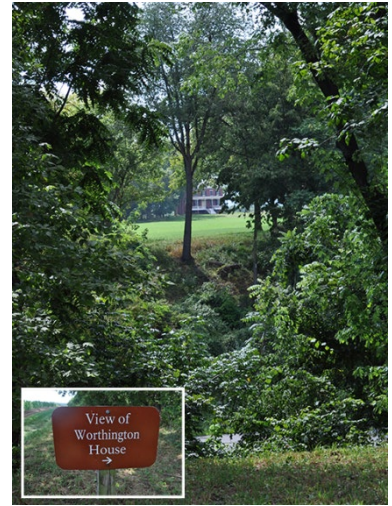


Figure 3: Worthington House View

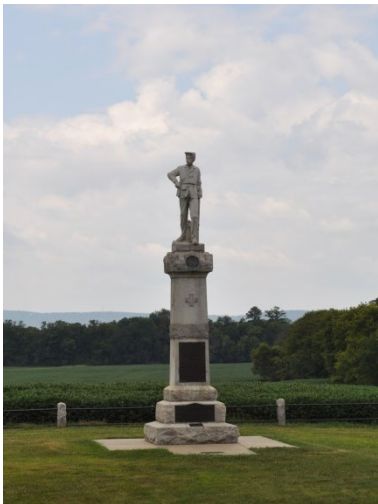


Figure 4: 14th New Jersey Monument



Figure 5: Visitor Center Trail Head

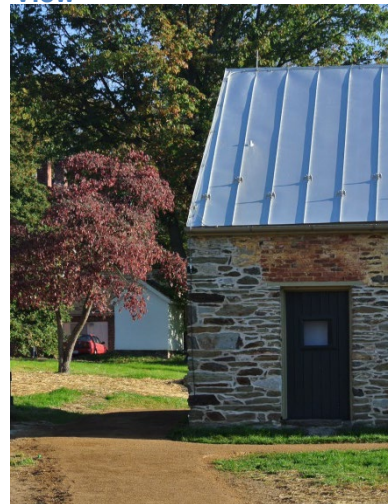


Figure 6: Thomas Farm Tenant House



Figure 7: Gambrill Mill Boardwalk



Figure 8: Best Farm



Figure 9: Brooks Hill Trail Head

Planning Issues and Concerns Retained for Detailed Analysis

Through the internal and public scoping process, 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.

The proposed project could introduce or change elements of the documented historic properties and landscapes within the National Register and National Historic Landmark properties. Monocacy National Battlefield is listed in the National Register and is a National Historic Landmark; within it, the Best Farm, Thomas Farm, and Worthington Farm have been identified as significant cultural landscapes. Monocacy National Battlefield is a major site within the nationally recognized Journey Through Hallowed Ground National Heritage Area and the Heart of the Civil War Heritage Area. Because it is a designated National Historic Landmark (NHL), federal undertakings that may affect Monocacy National Battlefield are subject to a more intensive level of review than is required for National Register-only properties. As per the National Historic Preservation Act [54 U.S.C. 306107] and its implementing regulations [36 CFR 800.10], before approving an action that may "directly and adversely affect any NHL, the responsible Federal agency shall to the maximum extent possible... minimize harm to the landmark." The agency must also invite the Advisory Council on Historic Preservation and the Secretary of the Interior (represented by the NPS Regional NHL Program Office) to consult on the resolution of any adverse effects to an NHL. The project's potential impacts to historic properties and districts are analyzed in detail under the Historic Buildings and Structures and Cultural Landscapes in this EA.

The battlefield landscape has significant archeological resources. A complete archeological survey of the park has not been undertaken; however, a National Register-listed archeological site (L'Hermitage Slave Village) is located within the park, and based on documented archeological sites and known history, there is a high probability of undocumented archeological resources throughout the park. The project's potential impacts due to proposed ground disturbance are analyzed in detail under Archeological Resources in this EA.

The park has areas that contain wetlands and vegetative cover. Wetlands are located across the park, primarily near the Monocacy River and streams, and some of these locations coincide with key sites for visitor interpretation and access. The project's potential impacts due to proposed ground disturbance are analyzed in detail under Wetlands and Vegetation sections of this EA.

Existing pedestrian facilities do not connect visitors to the entire park nor its interpretive resources in a cohesive way. The park's General Management Plan and scoping for the Public Access Plan noted that the visitor experience is fragmented by a number of physical barriers within the park and by areas of the park that aren't open to visitors. The project's potential impacts to visitor access, experience, opportunities, and connectivity are analyzed in detail under the Visitor Use and Experience section of this EA.

The proposed project could increase facility management and operations requirements. The proposed project could increase the number of park facilities and areas open to the public. The increases in visitor access and facilities could increase facility management and operations requirements, and the project's potential impacts are analyzed in the NPS Operations 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.

Potential for the project to disproportionately impact minority or low-income populations. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, directs federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority or low-income populations.

There are no residents within the park, although the communities in the vicinity of the park contain both minority and low-income populations. However, no populations were identified as disproportionately impacted by the Public Access Plan. The topic was dismissed from further study in this EA because:

- As part of the planning process, public participation was actively sought by the NPS and gave equal consideration to all input from all persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- The proposed actions would not result in any identifiable adverse human health effects; therefore, there would be no direct or indirect effects on any minority or low income population.
- The impacts associated with the proposed actions would not disproportionately affect any minority or low income population.
- The impacts associated with the proposed actions would not result in any identified effects that would be specific to any minority or low income population.

Potential for the project to impact lands held in trust by the Secretary of the Interior for the benefit of Indians.

Indian trust resources are “those natural resources reserved by or for Indian tribes through treaties, statutes, judicial decisions, and executive orders, which are protected by a fiduciary obligation on the part of the United States” (NPS 2006). There are no Indian trust resources within Monocacy National Battlefield and no lands are held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore the topic was dismissed from detailed analysis.

Potential for the project to impact vehicular, bus, and transit operations

Neither of the alternatives analyzed in the EA would involve the modification of the local or regional road network in the vicinity of Monocacy National Battlefield, nor would they create amenities that would generate additional demand for bus transportation or parking at the battlefield. Although the establishment of additional trails and other amenities included in Alternative B is anticipated to attract additional visitors and result in a corresponding increase in vehicles traveling to the battlefield, such increases would be minimal within the context of the local and regional transportation network and would remain well within the capacity of that network. It is likely that the number of additional visitors traveling to Monocacy by transit would constitute a small percentage of the overall number of additional visitors. Any such increases in the number of visitors traveling to the battlefield by transit would be expected to remain well within the capacity of transit systems in the vicinity of Monocacy. Thus, these topics were dismissed from further analysis.

Potential for the project to impact threatened and endangered species and common species of wildlife

Although limited construction activities associated with the proposed action could have the potential to damage or remove vegetation or other features providing habitat for common species of wildlife and displace or destroy specimens of common wildlife species, it is anticipated that displaced specimens would relocate to similar areas of habitat near the project sites and would return to the disturbed areas as construction activities cease and vegetation and other features providing habitat regenerates or is restored. NPS biologists or other qualified personnel would develop best management practices (BMP) applicable to each project site to minimize impacts on wildlife. The inadvertent destruction of individual specimens of wildlife during construction activities is not anticipated to result in population-level impacts on any particular species. The implementation of the projects over a period of 10 to 20 years would further minimize impacts. In the long term, impacts on common species of wildlife at Monocacy National Battlefield would be barely noticeable.

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 Monocacy National Battlefield. This consultation indicated the potential for the federally threatened northern long-eared bat (*Myotis septentrionalis*) and endangered Indiana bat (*Myotis sodalis*), and state-listed threatened Allegheny Pearl Dace (*Margariscus margarita*) (a small freshwater fish) to be present at the battlefield.

The proposed action avoids the area where 2005 acoustic detection of the northern long-eared bat was documented, north of the Brooks Hill trail. NPS conducted bat surveys from mid-May through late August 2016. Preliminary results of the surveys did not detect the presence of the northern long-eared bat, but did potentially detect the presence of the Indiana bat. Ongoing survey work will provide the park data on the presence of the Indiana bat and the northern long-eared bat, and the information will be incorporated into ongoing park planning and management decisions.

Adherence to applicable BMP for all ground-disturbing activities will ensure that the proposed action would have no adverse impacts on the state-listed threatened Allegheny Pearl Dace. Prior to and during the implementation period of the proposed projects, the NPS will continue to consult with the USFWS and MDNR to identify activities included in the proposed action that would have the potential to affect federally and state listed threatened and endangered species. To avoid adverse effects on the northern long-eared bat, the NPS would incorporate new survey information and adhere to a time of year restriction between June 1 and July 31 in any year on the removal of known occupied maternity roost trees or trees within 150 feet of known occupied maternity roost trees, and between April 1 to October 31 of any year for the removal of known roost trees. Further, the NPS would not remove trees within 0.25 mile of a known hibernaculum at any time of year without first obtaining a permit to do so from the USFWS. If specimens of the Indiana bat are documented within the park prior to implementing activities associated with Alternative B, the NPS would develop and implement BMP in consultation with the USFWS to avoid adverse effects on the Indiana bat.

While the northern long-eared bat and Indiana bat are known to occur in the project vicinity, there no known occurrences of northern long-eared bat maternity roost habitat or hibernacula in the project area. Therefore the USFWS concurred that the project is not likely to adversely affect the northern long-eared bat. In addition, the USFWS concurred that the project is not likely to adversely affect the Indiana bat because no forest clearing would occur between April 1 and October 31 (see Appendix A). Through ongoing consultation with

the USFWS and MDNR, as needed, and adherence to applicable minimization or mitigation measures identified during the consultation process, it is anticipated that the proposed action would have no adverse impacts on federally or state-listed threatened and endangered species occurring at Monocacy National Battlefield. For these reasons, threatened and endangered species and wildlife were dismissed from further analysis in the EA.

Potential for the project to impact 100-year floodplains

While some projects included in the proposed action would be entirely or partially implemented within the 100-year floodplain at Monocacy National Battlefield, the majority of those projects would provide amenities such as walking trails or areas for designated activities (e.g., kayak launch) that would consist of no more than mown paths or similarly-maintained spaces. As such, these projects would not involve the removal of vegetation or soil compaction and would not affect the capacity of the 100-year floodplain to store or convey floodwaters.

For the proposed projects that would involve more extensive disturbance of the 100-year floodplain, such as the proposed pedestrian bridges over the Monocacy River at the MD 355 and I-270 bridges and over Bush Creek, 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 NPS would also obtain all necessary federal and state permits for projects occurring in the 100-year floodplain and adhere to applicable requirements set forth in the permits to avoid, mitigate or otherwise minimize floodplain impacts. Overall, it is estimated that the proposed projects occurring entirely or partially within the floodplain would disturb an exceedingly small portion (2.6 acres, or less than 1 percent) of the 310 acres of the 100-year floodplain within the boundaries of Monocacy National Battlefield.

Adherence to the requirements of Procedural Manual 77-2 and applicable federal and state permits, in consideration with the relatively small area of the floodplain that would be disturbed at Monocacy National Battlefield, would ensure that the proposed projects would have minimal potential to affect the capacity of the 100-year floodplain to store or convey floodwaters, or to result in the displacement of floodwaters further downstream. Thus, this topic was dismissed from further analysis in the EA.

Alternatives

The EA documents the analysis of 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, several concepts were dismissed from further consideration. These concepts are described in this chapter under “Alternatives Considered but Dismissed.”

Alternative A: No-Action

Alternative A would maintain existing visitor access (vehicular, pedestrian, and bicycle) at the park. No new pedestrian or bicycle connections would be constructed. Alternative A would maintain the current trails and paths, approximately: 1 mile at the Visitor Center, 0.5 miles at Gambrill Mill, 2 miles at the Thomas Farm, and 3.5 miles at the Worthington Farm and Brooks Hill. Existing interpretive elements would be maintained and visitor access to the Thomas House, Worthington House, Gambrill Mill, the Best Farm and the Visitor Center would remain unchanged (Figure 10). The park’s ongoing work to stabilize and/or rehabilitate historic structures to ensure their preservation would continue. Visitor improvements and landscape enhancements identified in the park’s General Management Plan and Cultural Landscape Reports could be implemented as funding and operational constraints permit.

Visitors would continue to arrive at the park in their personal vehicles. The existing series of vehicular stops off MD 355, Araby Church Road, and Baker Valley Road would continue to enable visitors to park and access the trails and historic structures. It would continue to be difficult to move between disconnected areas of the park. Orientation of visitors would continue to take place at the Visitor Center, with additional interpretive space available at the Thomas Farm Tenant House. The interior of all other structures within the park would continue to be closed to visitation. The Lewis Farm, the railroad junction, and the Baker Farm would remain closed to visitation.

I-270 would continue to physically and visually separate the Worthington and Thomas Farms. This condition would continue to make it difficult for visitors to orient themselves to the landscape and understand the battle.

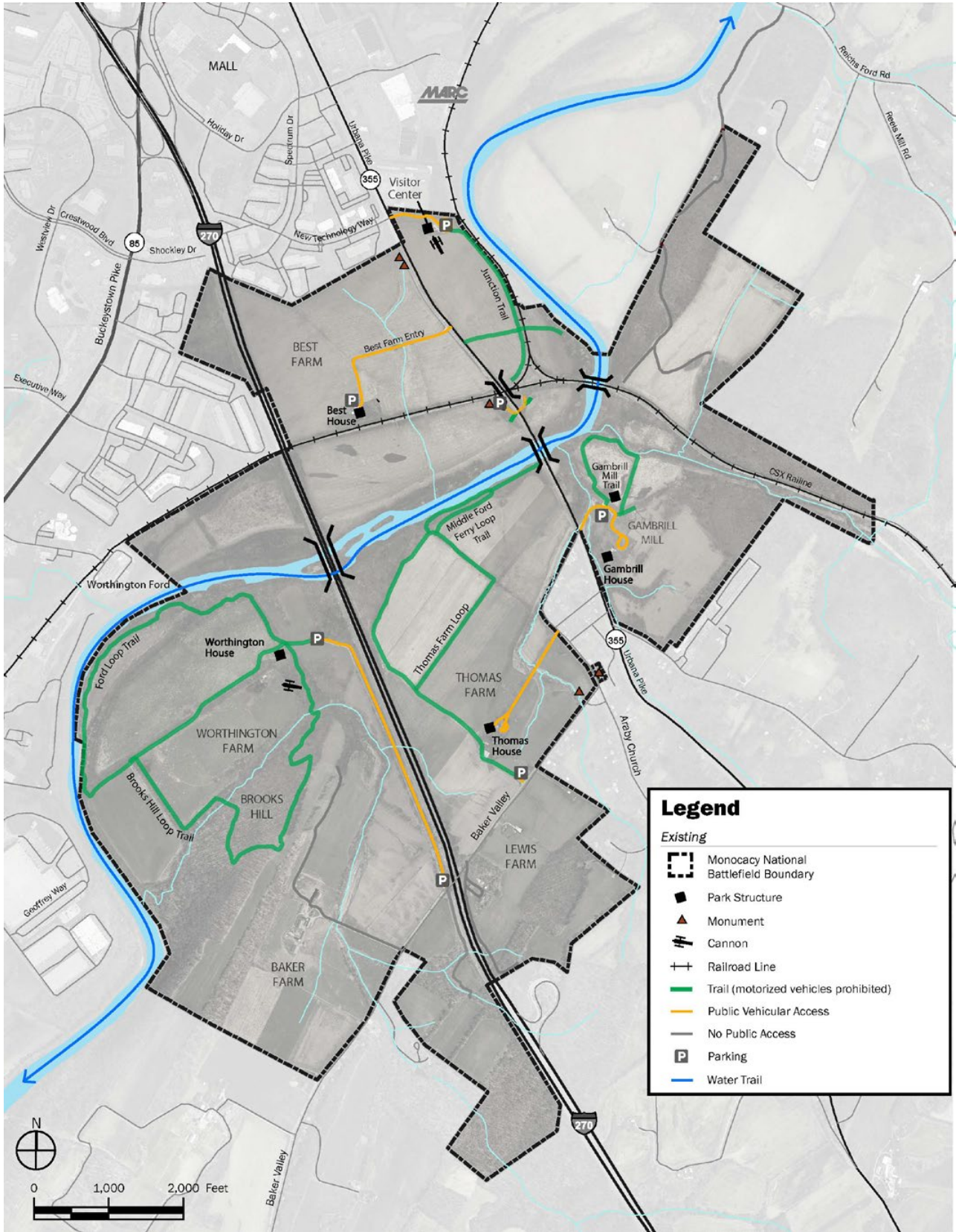


Figure 10: Alternative A: No-Action Alternative

Alternative B: Action Alternative

Alternative B would provide approximately 8 miles of new pedestrian trails, additional interpretive and recreation elements, new visual and pedestrian connections between currently disconnected areas of the park, and increased access to areas previously closed to the public. Both large and small trail loops would provide different trail lengths and a variety of visitor experiences. Trail surfaces would primarily be comprised of mown grass and dirt paths, with limited application of pervious gravel or rubber composite.

The proposed new trails would provide history-focused trails for visitors seeking interpretation of the Battle of Monocacy, including Union and Confederate battle movements; artillery placements; and connections to key battle points with trails, views, and artillery placement based on approximate battle movements. The proposed new trails would also provide recreation-focused trails for visitors seeking hiking, biking and water trail experiences with interpretive elements (Figure 11). Wayfinding and waysides would be added along trails.

Alternative B would add trails accessible for all visitors to the park's trail system. New accessible trails would include the replaced Gambrill Mill Boardwalk, an accessible path from the Worthington House parking lot to relocated waysides on the north side of the farm access road, and an accessible path from the Thomas Farm parking lot on Baker Valley Road to the Thomas Farm Tenant House. These accessible trails would be constructed with pervious gravel or rubber composite surface.

The addition of designated turf overflow parking areas at each existing parking location would address parking capacity in order to accommodate additional visitors at extended or new trails. The existing paved and gravel access roads within the park that are designated for vehicles would continue to provide bicycle access. In the future, new bicycle connections to areas outside of the park boundaries could be explored as plans are developed by other agencies.

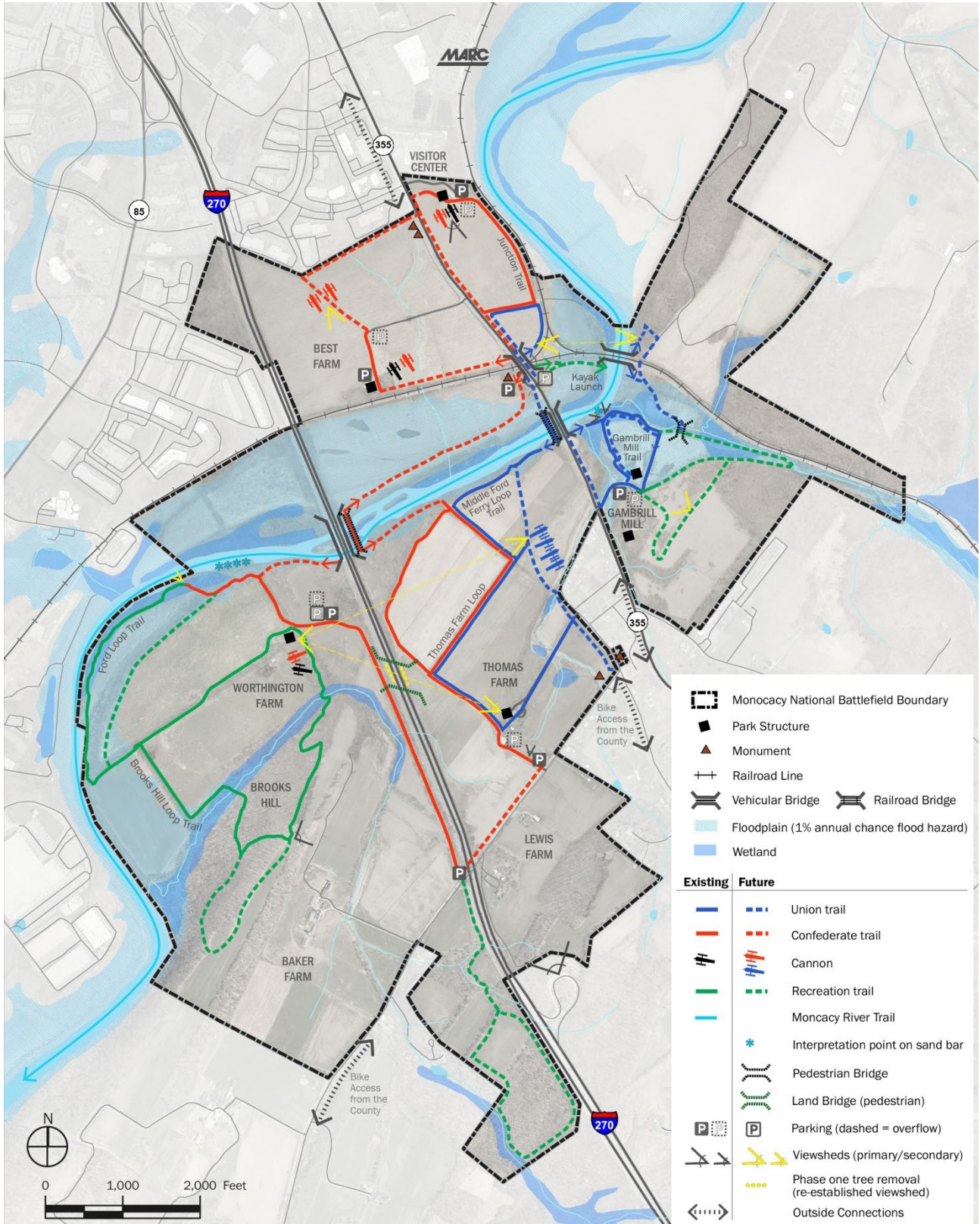


Figure 11: Alternative B Action Alternative

Visitor Center and Best Farm

Visitor Center

Under Alternative B, the existing Junction Trail at the Visitor Center would extend along MD 355 to create a loop trail. The Junction Trail would also connect to the sidewalk over the proposed MD 355 bridge over the CSX tracks, which is to be constructed by SHA (see Cumulative Impacts section). An approximately 1-mile trail loop would be added near the Visitor Center, with a mown grass surface.

The Visitor Center parking lot would be re-striped to accommodate additional vehicular spaces, while retaining several double parking spots for buses.

South of the CSX tracks on the east side of MD 355, visitors would access a proposed kayak launch. The kayak launch footprint would be sited with input from the Maryland Department of Natural Resources. Vehicular access would be provided via the existing access road and parking lot, located outside of the floodplain, and trailers would not be accommodated. The kayak launch would connect visitors to the existing Monocacy Scenic River Water Trail, and allow for tubing access.

Along MD 355, a proposed freestanding pedestrian bridge over the Monocacy River would be constructed on the west side of the existing steel truss bridge as a 11'-4" wide structure supported by one pier in the river, one pier on the south shore, two piers on the north shore and an abutment at each end. The structure would utilize steel girders with a concrete deck and would include a 10-foot pedestrian pathway with a metal handrail. The river pier would be positioned in-line with the existing pier and the piers nearest each shore would be in-line with existing abutments. The pedestrian bridge would end approximately 100 feet from the south river bank and 250 feet from the north river bank (see Figure 12, Figure 13, and Figure 14). Signage would direct bicycles to dismount in order to utilize the pedestrian bridge.



Figure 12: Plan View of Pedestrian Bridge Concept Location



Figure 13: Perspective View of Pedestrian Bridge Concept, looking east

Bridge 10085
(F-7-117 MD Historic Trust)
Maryland Route 355 (Urbana Pike) over Monocacy River

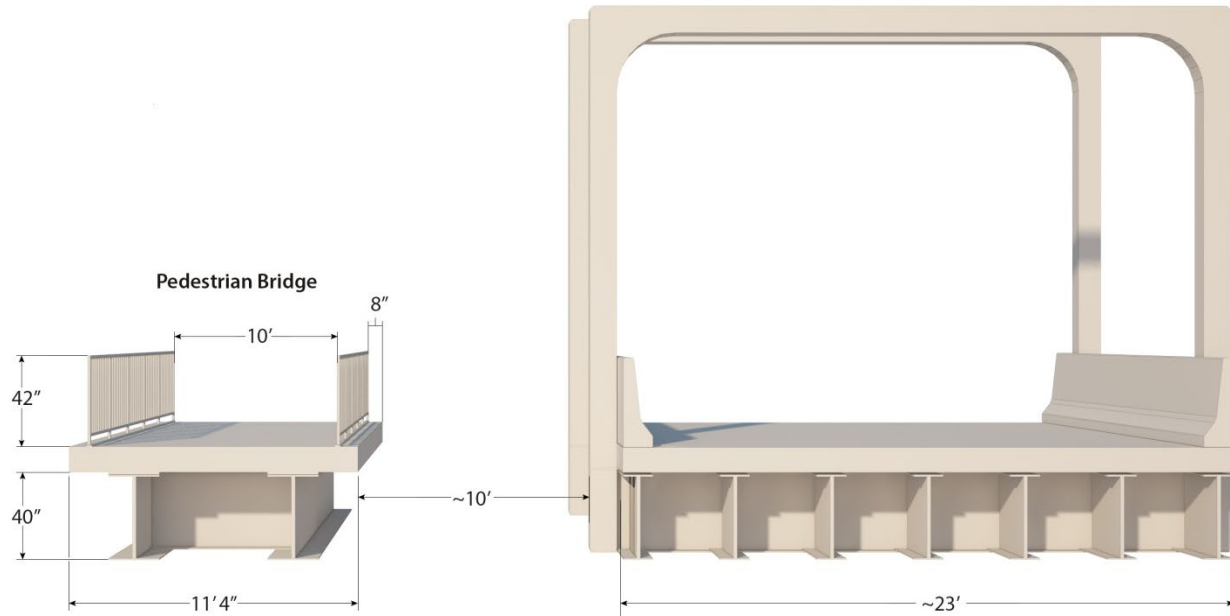


Figure 14: Section View of Pedestrian Bridge Concept

Best Farm

The trail from the Visitor Center would extend west, across MD 355, to a high point north of the Best farmhouse, creating a viewing location with cannons to guide visitors' view direction looking out onto the battlefield. The new trail loop, comprised of a mown path, would then follow a historic road trace south to connect with the existing Best Farm entry road. The trail loop would continue in an easterly direction, utilizing an existing farm road and avoiding the preserved road trace near the well house before heading east to follow the line of the CSX tracks and connect to the new pedestrian connections that would be installed with SHA's proposed MD 355 bridge replacement, both underneath and along the MD 355 bridge, to connect to the 14th New Jersey Monument.

A new trail would run parallel to the river on its north side between the 14th New Jersey Monument and I-270. The mown or dirt path would be located within the 100 year floodplain, but outside of wetland areas. Running east-west between MD 355 and I-270, the trail would lead to a potential pedestrian-only crossing of the Monocacy River, appended to the existing I-270 bridge. The location of pedestrian bridge footings, the techniques to append to the existing bridge, and the elevation of the pedestrian bridge would require further exploration.

New trails and paths at the Best Farm would comprise an additional approximately 1.5 miles. Parking at the Best Farm would be expanded by two to three spaces at the existing lot, and spaces designated for overflow would be added.

Gambrill Mill

A new pedestrian path would cross underneath the proposed pedestrian bridge and the existing steel truss bridge, linking Gambrill Mill and the Thomas Farm. The 8-foot permeable path with a 2-foot shoulder on each side would provide pedestrian access between the Gambrill Mill trail and the Middle Ford Ferry Loop trail (see Figure 15).

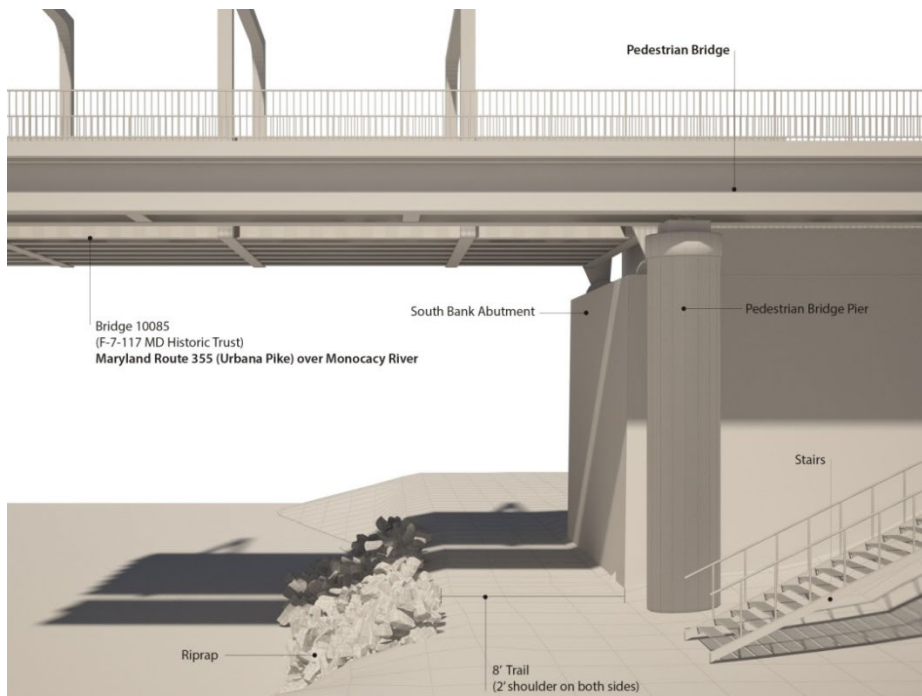


Figure 15: Section View of Pedestrian Connection Concept below MD 355

The boardwalk at Gambrill Mill would be removed and replaced to the east of its existing location to minimize the threat to the boardwalk posed by erosion issues from a nearby creek. The new boardwalk, a universally accessible trail, would be constructed with similar materials to the existing wooden boardwalk and would be sited so that it does not require a railing.

New recreational and historic trails at Gambrill Mill could connect visitors to the Wallace Headquarters area and provide two trail loops with a recreational focus. A small pedestrian bridge would be constructed to provide a crossing over Bush Creek. On the south side of the pedestrian bridge, there would be a connection to the existing mown meadow path. On the north side of Bush Creek, a new trail would lead to the CSX bridge over the Monocacy River.

A cantilevered crossing underneath the CSX bridge would be considered to route visitors around the CSX bridge and provide access to the Wallace Headquarters area. The crossing would be constructed as an approximately 30-foot long boardwalk adjacent to the existing bridge abutments, with a shield over the boardwalk for protection from railroad activity overhead (see Figure 16). The concept would require further coordination and design investigation. At the Wallace Headquarters area, a short trail would provide a unique vantage point looking back towards the battlefield that is currently unavailable to visitors, and would allow the park to interpret extant breastworks in the area.



Figure 16: Rendering of Cantilevered CSX Pedestrian Connection Concept

Source: NPS (2004)

Two additional loop trails south and east of Gambrill Mill would link back to the Gambrill Mill parking area, utilizing existing farm access roads and adding dirt path connections. These trails would have a more recreational focus, as well as provide a view back towards the Gambrill Mill. Overall, approximately 2 miles of

trails would be added at Gambrill Mill. In addition, informal use of the Gambrill Mill sandbar would remain. New interpretive signage would promote visitor understanding of the views from the sandbar and of the Monocacy River Trail. The existing parking lot would be repaved to create several additional spaces within the existing footprint, and the existing overflow parking lot would be signed to permit ongoing use, as needed.

Thomas and Worthington Farms

The Thomas and Worthington farms would be connected by two new trails and a new visual connection would be created between the farms. In the long-term, there could also be a potential new pedestrian land bridge over I-270 to reconnect the two farms.

On the south bank of the Monocacy River, Alternative B would add an earthen foot trail, guiding visitors from the proposed pedestrian bridge over the Monocacy River and down to the river along an existing historic carriage road, leading to the Middle Ford Ferry Loop trail on the Thomas Farm.

A new trail connecting the Worthington Farm and Thomas Farm parking lots would be added along or near Baker Valley Road. A pedestrian connection would be established between the Ford Loop trail at the Worthington Farm and the Middle Ford Ferry Loop trail at the Thomas farm via a pedestrian crossing underneath the I-270 bridge abutment on the south side of the Monocacy River. The 8-foot wide pervious surface trail would run between the stabilized slope and the I-270 bridge abutment (see Figure 17).



Figure 17: Perspective View of Pedestrian Connection Concept Below I-270

A visual connection would be reestablished between the Worthington and Thomas houses by removing trees that have grown into the historically open viewshed. As a first phase, a limited number of obstructing trees would be removed along the I-270 corridor, and some recent trees would be removed from areas

surrounding the two farms in accordance with the CLR for the two farms (see Figure 18). The ground between the two houses would be revegetated using appropriate ground cover such as a native grass meadow and shrub mixes to retain an open and uninterrupted view to the adjacent fields (see Figure 19, Figure 20, and Figure 21).

In the longer term, tree removal northeast of the Worthington House would also occur to reestablish the view to the Union Battery proposed along the old Georgetown Pike roadbed north of Thomas House. Overall, approximately 33 acres of trees would be removed to reestablish the viewshed between the two farms (see Figure 22). As noted in the park's CLR for the farms, tree removal would require field survey and inspection to identify individual trees or groups of trees for retention. The open viewshed would require periodic maintenance to remove regenerating woody vegetation, except where land is cultivated seasonally by farmers.

In the long-term, as proposed in the park's General Management Plan, a pedestrian deck, or land bridge, could be constructed to provide a direct physical and visual connection between the two farm houses, re-establishing a linkage that recalls the connection between the properties that existed during the Battle of Monocacy. Soil and appropriate vegetation would cover the deck to help visitors visualize the area's historic appearance without the interstate highway, as well as provide a comfortable pedestrian interpretive connection between the two farms. The concept would require further coordination and design investigation.

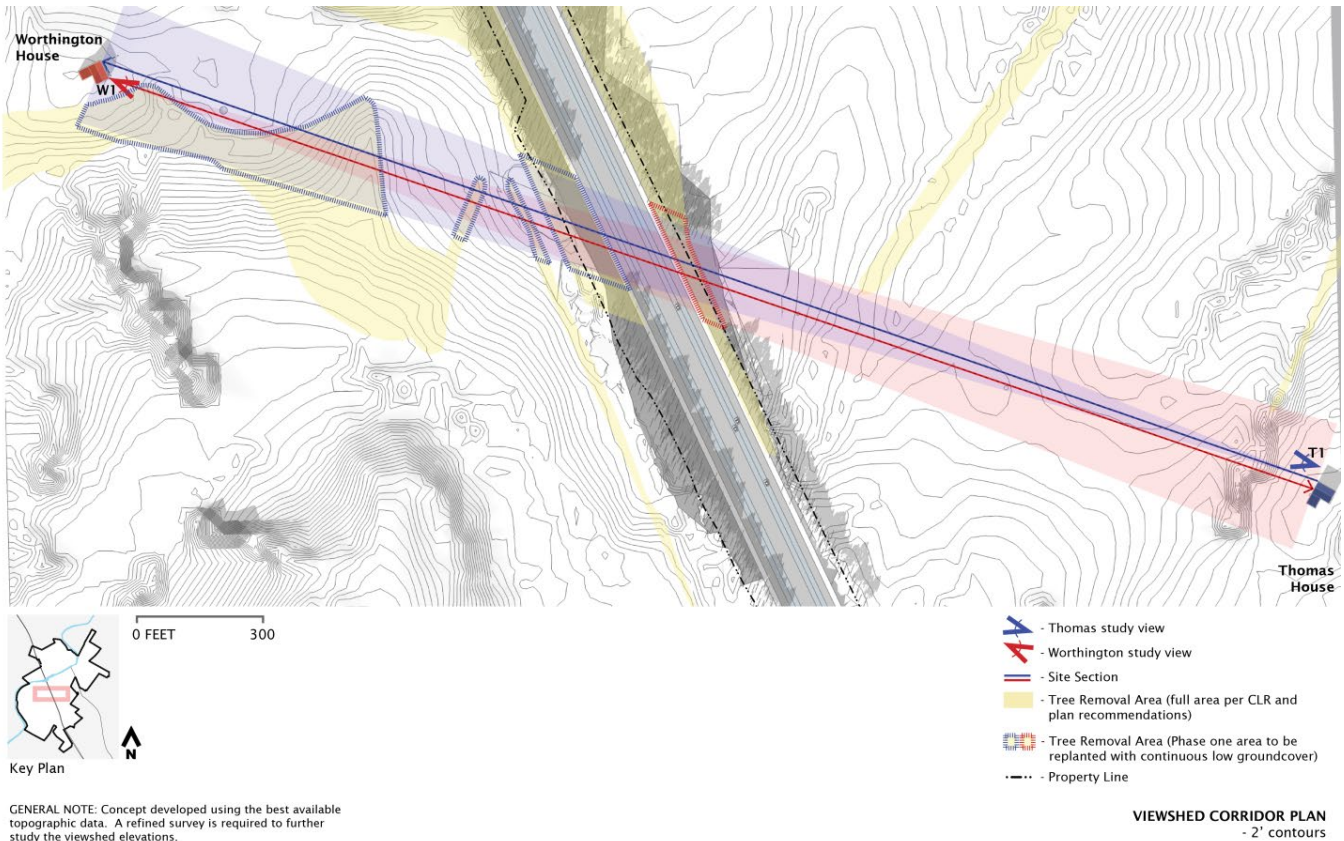


Figure 18: Thomas and Worthington Viewshed Corridor Plan

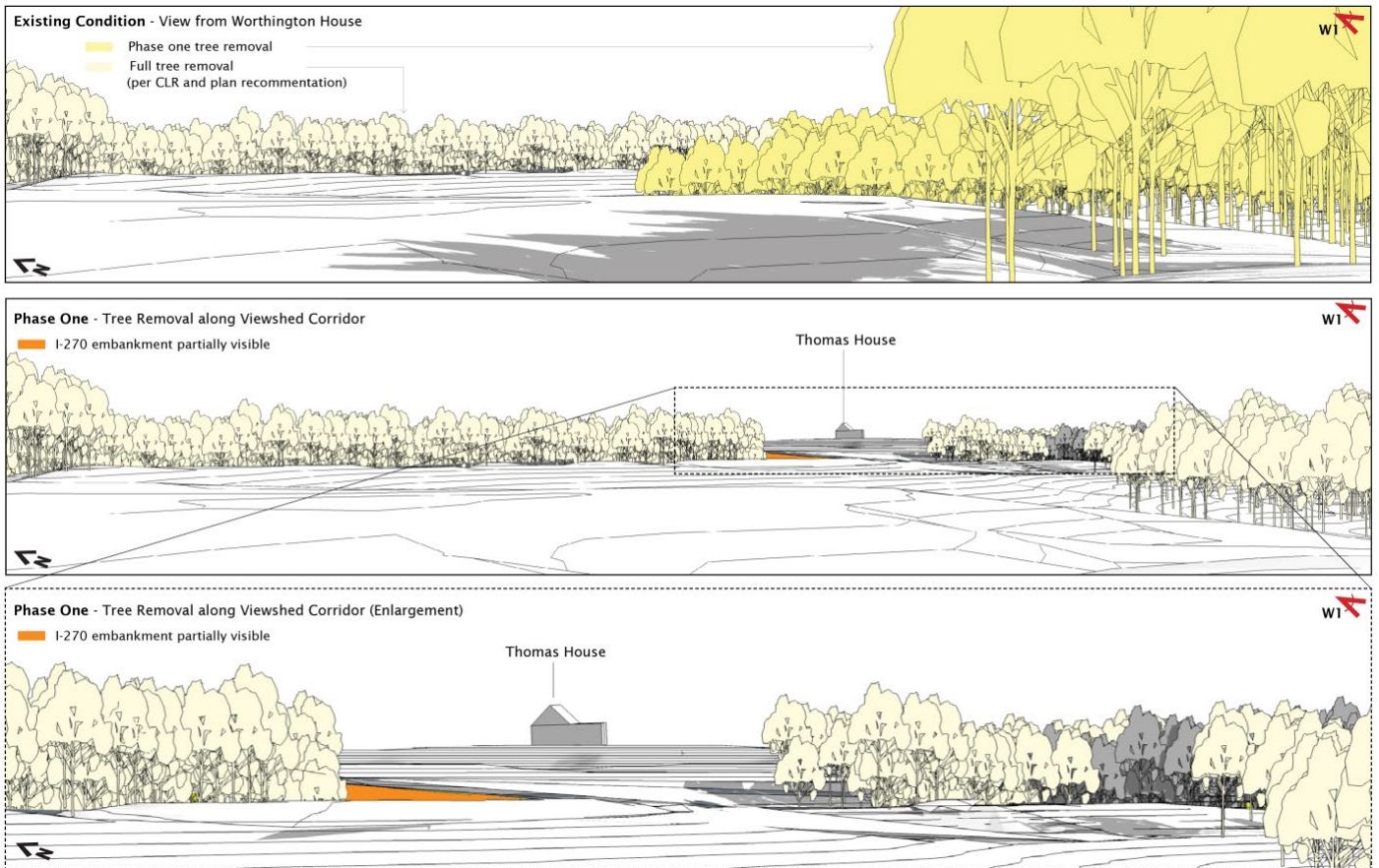


Figure 19: Vegetation Clearing Diagram – View to Thomas House

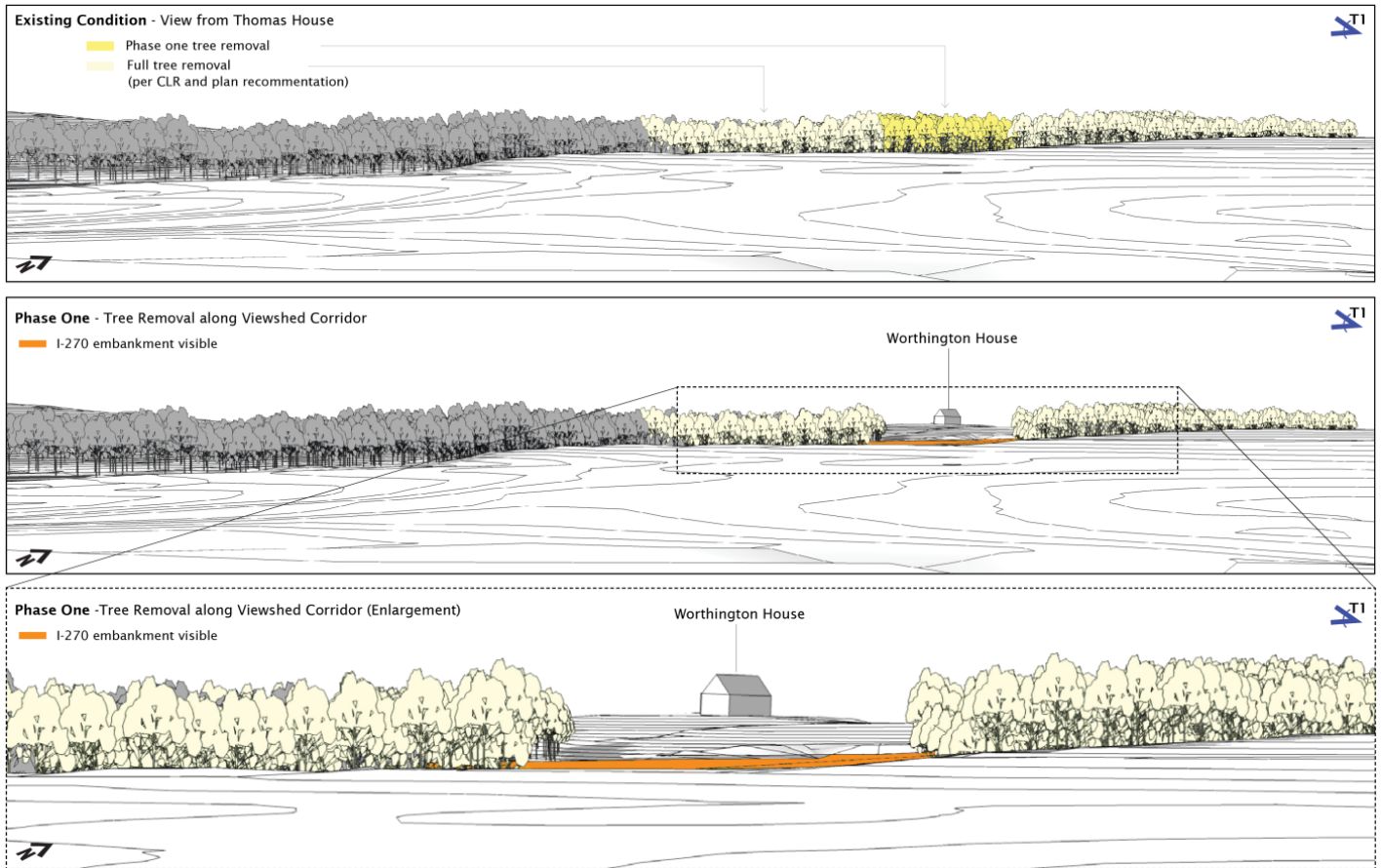


Figure 20: Vegetation Clearing Diagram – View to Worthington House

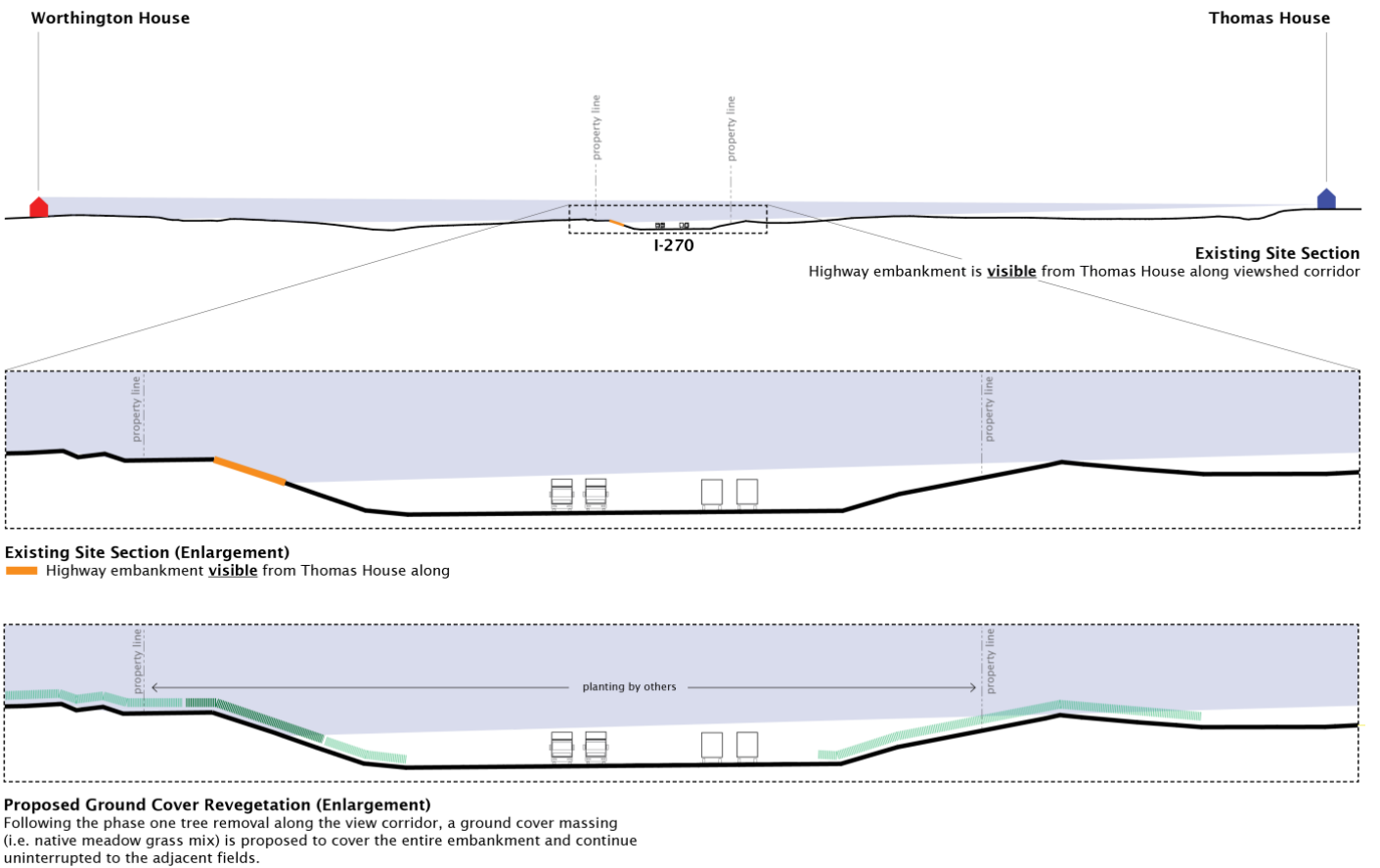


Figure 21: Ground Cover Revegetation Diagram - Thomas to Worthington View

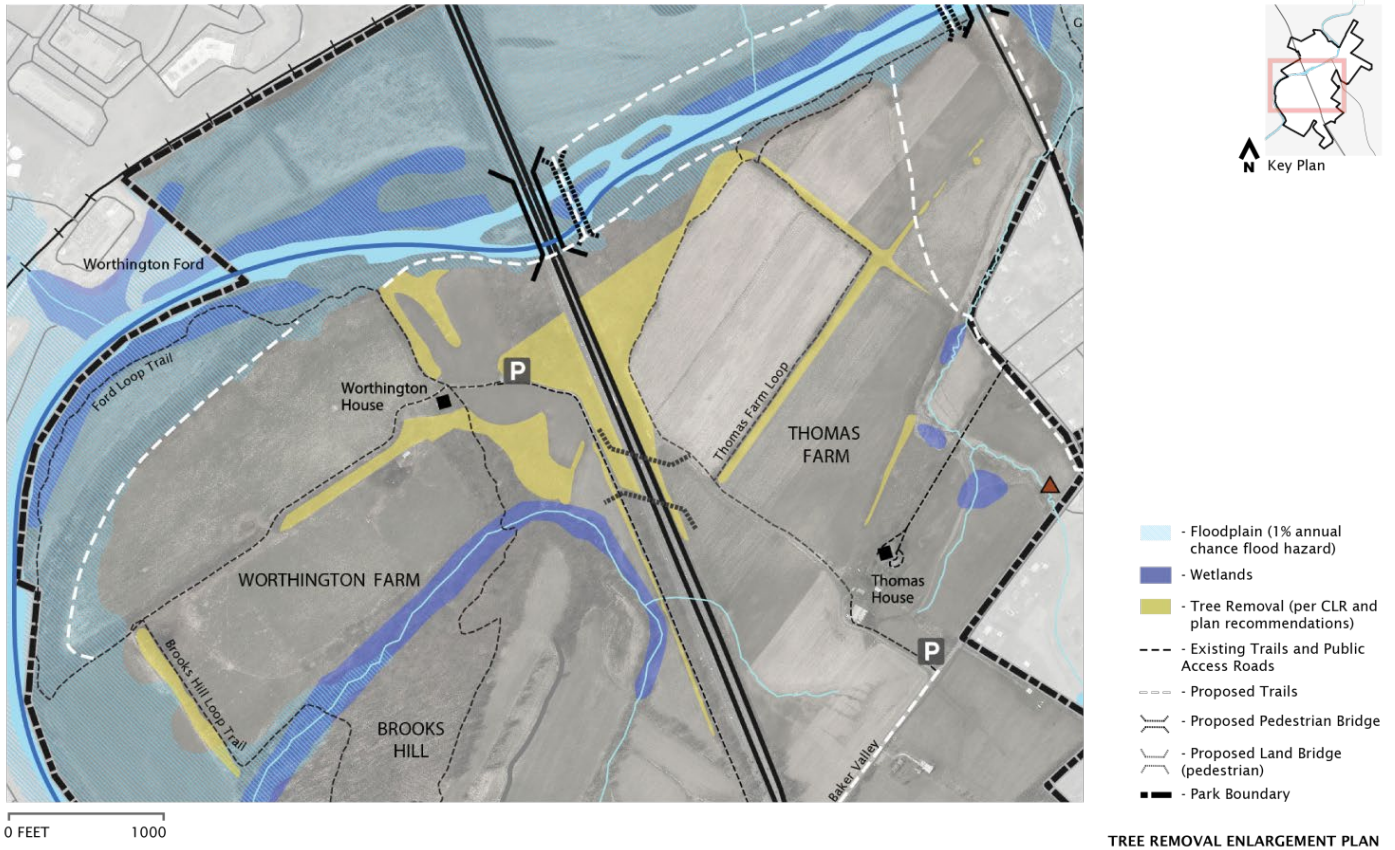


Figure 22: Viewshed Reestablishment Tree Removal

Thomas Farm

At the Thomas Farm, the addition of a trail running along the old road bed between the Thomas Farm Loop and MD 355 would help to preserve the old road bed of the former Georgetown Pike by taking it out of cultivation and adding a mown trail. The Baker Valley Road parking lot at the Thomas Farm would expand to 14 parking spaces, including two designated accessible parking spaces, surfaced with crushed stone or permeable surface material. Approximately 1 mile of new trails would be added at the Thomas Farm under Alternative B, including an accessible path from the parking area to the Tenant House.

Worthington Farm

Alternative B would construct a universally accessible path constructed of permeable gravel/rubber composite along the entrance drive from the existing visitor parking lot to new a circular pad that would host waysides and a bench across from the Worthington House. A mown path would be added to augment the Ford Loop Trail by providing a parallel connection outside of the floodplain so that it could be used during the wet season. An interpretive kayak pull-off, in conjunction with the Monocacy Scenic River Water Trail, could be added at the bump out along the Ford Loop to interpret the general view to the Worthington Ford where Confederate troops forded the river. Approximately ¾ miles of new trails would be added at the Worthington Farm under Alternative B. The existing gravel parking lot would be expanded by approximately 4-5 parking spaces. Overflow parking would occur on turf north of the existing lot.

Brooks Hill and Lewis Farm

The Brooks Hill and Lewis Farms would add trails with a more recreational focus due to their locations outside the main battle area. The addition to the Brooks Hill Loop Trail would climb in elevation, adding to the more arduous existing trail at Brooks Hill (approximately ¾ mile loop addition). The trail could use an existing logging road and switchbacks, and a new dirt path could climb around bluffs, interesting topography and large trees, but would require further design explorations to develop a stable trail that avoids sensitive plant material. The new trail at Lewis Farm would open access to this area of the park, adding just over 1 mile of new trail access. The trail would begin on an existing service road that runs south into the Lewis Farm, and extend with mown and dirt paths to create a large, hilly loop through wooded areas. Parking for the Lewis Farm trail would be at the existing Worthington Farm parking lot near Baker Valley Road.

Alternatives Considered But Dismissed

NPS considered a wide range of concepts to expand public access to, and understanding of, park areas and resources during scoping, including trail locations, crossings, and recreational elements. Some elements were ultimately dismissed from further consideration.

Worthington Ford Low Flow Crossing

A low flow crossing of the Monocacy River at the Worthington Ford was considered to provide visitors with the opportunity to experience the approximate movement of Confederate troops across the river. The concept was dismissed from further consideration because a low flow crossing could become an impediment to boat traffic along the Monocacy River.

Bush Creek Low Flow Crossing

A low flow crossing of Bush Creek was considered to help create a pedestrian connection to the Wallace Headquarters area. The low flow crossing at this location would require excavation within the creek bed and was determined to require more disturbance during construction than a pedestrian bridge, another concept considered to create the crossing. Therefore, the low flow concept was dismissed from further consideration.

Trail from the Worthington Ford to I-270

NPS considered a trail from the Worthington Ford to I-270 on the north side of the Monocacy River; however, the concept was dismissed due to operational constraints of creating trail connections to the Worthington Ford below I-270 and across the Worthington Ford on the Monocacy River. In addition, the trail would run through a wetlands area, and the Worthington Ford can be interpreted from the existing Ford Loop Trail.

Pedestrian Bridge Appended to MD 355

To create a pedestrian connection across the Monocacy River and link the Visitor Center and Best Farm with the rest of the park, NPS considered appending a pedestrian bridge to the existing footings of the MD 355 bridge. The bridge, a steel truss structure that rests upon earlier stone abutments that may date to an earlier bridge (the earliest bridge in this location was circa 1828), is individually listed on the National Register. As such, the concept to append a new structure to the historic abutments was dismissed from further consideration.

Campground at Lewis Farm

NPS considered the addition of a small campground at Lewis Farm, but determined the concept to be infeasible due to the resources that would be required for security, facility management, and operations. In addition, the campground concept is not supportive of the park's purpose.

Lookout Tower

NPS considered the addition of a lookout tower to provide views of the battlefield; however, viewsheds are available to visitors at the existing Visitor Center balcony and opportunities to experience new views from vantage points utilizing existing topography without introducing a non-historic element into the landscape were incorporated into concepts carried forward for analysis. Therefore, a lookout tower was dismissed from further consideration.

Environmentally Preferable Alternative

In accordance with Department of Interior regulations implementing NEPA, NPS is required to identify the environmentally preferable alternative, which is as the alternative "that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historic, cultural, and natural resources" (43 CFR Part 46.30).

The no-action alternative (Alternative A) would do little damage to the biological and physical environment. Alternative B would have some limited adverse impacts on natural resources, primarily from construction-related activities and tree clearing. Alternative B could also cause adverse impacts to cultural resources and undisturbed archeological resources. While these impacts would be avoided, minimized or mitigated to the extent feasible, such impacts would not occur under Alternative A. As a result, the NPS has identified Alternative A as the environmentally preferable alternative.

Affected Environment and Environmental Consequences

This section describes the existing environment at Monocacy National Battlefield. 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.

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 (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.

As required by the CEQ regulations implementing NEPA, a summary of the environmental consequences for each alternative is provided in Table 3: at the end of this section.

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, existing and anticipated future projects within the park and in the surrounding area were identified. Projects identified as cumulative actions are provided in Table 1 below.

Table 1: Cumulative Impact Projects

Past, Present or Future	Project	Description
Past / Present / Future	Utility Projects	<p>Water and sewer lines have been constructed through the park with easements that allow for added or enlarged lines within the right-of-way. A water transmission main was constructed by Frederick County in 2005 across the Best Farm parallel to an existing sewer line and within the existing easement.</p> <p>Multiple utility easements existed within the present boundaries of park prior to the NPS's acquisition of the properties. Continued population growth in the area surrounding the battlefield may require the future expansion of utility infrastructure underlying the park.</p>
Present / Future	Replacement of MD 355 Bridge over CSX Tracks	<p>The Maryland SHA is planning to replace the MD 355 bridge that spans the CSX railroad tracks at Monocacy National Battlefield. The bridge and the area of disturbance associated with its replacement are located entirely within park boundaries. An EA analyzing the impacts of the project will be completed in 2016.</p> <p>The Preferred Alternative is to replace the existing bridge while providing a temporary bridge to the west to maintain traffic flows. The project would include an 8-foot-wide path for pedestrians and bicyclists along the east side of the new bridge and the permanent closure of the access road to the 14th New Jersey Monument along the west side of MD 355 to address existing safety issues. Parking for the monument would be provided in the parking lot along the east side of MD 355, and the entrance to the parking lot would be reconfigured to a right-turn-in/right-turn-out movement only to improve safety. Pedestrians would access the 14th New Jersey Monument from the east parking lot via a new pedestrian trail that would be provided under the new bridge along the south side of the CSX tracks. A new pedestrian trail would also be provided under the bridge along the north side of the tracks; both trails would connect in the future to planned trails within the battlefield to be built by the NPS. The construction of the new bridge would also include 6-foot-wide shoulders along MD 355 within the limits of the project area; stormwater management facilities; and the relocation of utilities as applicable (FHWA-MD 2016).</p>
Present / Future	Ongoing Development in the Surrounding Area	<p>Development has occurred on all but the southwest side of the park. To the north are offices, large retail structures, and an enclosed shopping mall; on the east are parcels of subdivided land containing homes and home sites. The unincorporated community of Araby is adjacent to the south boundary, and somewhat farther south is the town of Urbana.</p>

Past, Present or Future	Project	Description
		Additional development brings increased traffic congestion on MD 355, Araby Church and Baker Valley Roads.
Present / Future	NPS Antietam-Monocacy-Manassas Deer Management Plan	The NPS prepared a Final Deer Management Plan and EIS for Antietam and Monocacy National Battlefields in Maryland and Manassas National Battlefield Park in Virginia in 2014 to support preservation of the cultural landscape through the protection and restoration of native vegetation and other natural and cultural resources. The NPS's Preferred Alternative includes the use of sharpshooting and limited capture/euthanasia to quickly reduce deer herds followed by population maintenance through nonsurgical reproductive control methods or by sharpshooting. In addition, the Preferred Alternative would include the fencing of crops and woodlots, changing crop configurations or selection, and using aversive conditioning techniques. A long-term management plan for Chronic Wasting Disease (CWD), which would involve the lethal removal of deer to substantially reduce population density, is also included in the Preferred Alternative (NPS 2014).
Present / Future	NPS National Capital Regional Invasive Plant Management Plan	The NPS is preparing an invasive plant management plan (IPMP) and EA to ensure that the 15 parks in the National Capital Region (NCR) would have access to a range of chemical, biological, manual, mechanical, physical and cultural treatment methods to protect and restore natural and cultural resources by controlling, containing, or substantially minimizing populations of non-native invasive plant species through targeted treatment (NPS 2016).
Future	Frederick County, Maryland Bikeways & Trails Plan	Frederick County's Bikeways and Trails Plan and accompanying map dated May 22, 2013 identify multiple multi-use trails and a natural-surface trail within and in the vicinity of Monocacy National Battlefield. Multi-use trails are identified in a proposed transitway paralleling I-270; through a portion of the battlefield north of the Monocacy River; and along the western side of the river. These trails would generally connect the battlefield with points to the north, west and south, while a natural-surface trail would originate/terminate in the vicinity of Gambrill Mill and connect to eastern portions of the county.
Future	Frederick County waste treatment facility	Frederick County plans to construct a waste treatment digester near its current waste treatment facility on the banks of the Monocacy River, west of the park. Up to four egg-shaped digesters are planned, with two programmed for the initial phase and two in a later phase. Depending upon which of three designs is chosen, the height from the floor slab to the top of each digester would be up to approximately 100 feet. The lower ring wall could be partially below grade, possibly reducing the height above grade to 75 feet. The

Past, Present or Future	Project	Description
		location of these facilities across the Monocacy River from the park would introduce these elements into the viewshed.
Future	NPS Monocacy National Battlefield Wildland Fire Management Plan	This is an update of the park's fire management plan in consideration of cultural and natural resource management objectives. Resource areas affected by the plan include historic structures and districts (FHWA-MD 2016).
Past/Present	NPS Solar Panel Installation at Monocacy National Battlefield	The NPS installed solar panels are on the roofs of the battlefield's maintenance shop in the Gambrill Mill area, and the Visitor Center. Resources affected by the project include historic structures and districts, cultural landscapes, and visitor use and experience (FHWA-MD 2016).

Historic Buildings and Structures

Historic buildings and structures at Monocacy National Battlefield are documented in the Monocacy Battlefield National Historic Landmark (NHL) (1973), the Monocacy Battlefield National Register nomination (1973) and National Register Update (2003), the Gambrill House National Register nomination (1985), Cultural Resources Study (2004), and L'Hermitage Slave Village Archeological Site National Register nomination (2007). Section 106 of the NHPA requires that federal agencies consider the effects of their actions on historic properties which are defined by the implementing regulations of the NHPA (36 CFR 800), as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP. Compliance with Section 106 of the NHPA is being conducted concurrently with the NEPA process for this project. NPS, in consultation with the Maryland State Historic Preservation Office (SHPO), identified any historic properties within the project's area of potential effect (APE), defined by the boundaries of the park. 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."

In this EA, the different types of historic properties are addressed by resource type to best describe the impacts of the proposed action on the park's physical resources. This section specifically addresses historic buildings and structures, including earthworks, roads, and bridges; these are described in greater detail below. Historic districts are addressed as part of the Cultural Landscapes section that follows. Archeological sites are discussed in the Archeological Resources section later in this chapter. No historic objects have been identified at Monocacy National Battlefield.

Affected Environment

The APE—the affected area in which the park's historic buildings and structures stand—is the Monocacy Battlefield historic district. The district includes a variety of contributing buildings, sites, structures, and objects (the district as a whole is addressed in the Cultural Landscapes section). The landscape setting of the park's buildings and structures are addressed in the Cultural Landscapes section, including landscape features such as views and vistas, some of which relate to the buildings and structures within the district. For additional detail about these resources, see the source documents noted at the beginning of this section. Historic buildings and structures within the APE include, in brief:

- Best Farm buildings and structures;
- Thomas Farm buildings and structures (including 7 buildings, silos, road traces);
- Lewis Farm buildings and structures (including 4 buildings);
- Gambrill House and Mill (including 2 buildings, mill race and dam);
- Wallace Headquarters area earthworks (inventoried as 5 structures);
- Baker Farm complex (including 6 buildings, 4 structures);
- Worthington Farm house
- Monuments (5)
- MD 355 Bridge, a steel truss structure from 1930 that rests upon earlier stone abutments, which may date to an earlier bridge (the earliest bridge in this location was c. 1828)

According to Maryland SHPO definitions, roads may be listed as "structures" for National Register purposes, and where they are identified as such in National Register documents, roads are addressed in this section. Several roads and road traces are identified as historic in the CLIs and CLRs and are addressed in this section.

The earthworks at the Wallace Headquarters area include visible remnant earthworks, a road trace, and an earthen powder magazine site. These are the only known Civil War earthworks documented in the park, and they are currently inaccessible to visitors.

There are several historic road traces identified in the NRHP district nomination within the park. The road traces at Best Farm and Thomas Farm are particularly notable. One of the road traces at the Best Farm and one at the Thomas Farm are currently within a cultivated field and have been degraded by plowing and agricultural activities.

The MD 355 bridge over the Monocacy River is considered historic, although it is not NRHP listed. It was recommended eligible for NRHP listing in 2001 by the Maryland Historical Trust after being documented in SHA's Historic Bridge Inventory. The truss dates to 1930 but the piers are believed to be older and in the same location as the former pre-Civil War-era bridge. The bridge is not listed as contributing to the district, although it is within the district boundary.

About the Analysis

Potential impacts to historic buildings and structures affect the historic character and integrity of the resources as defined by the National Register of Historic Places (NRHP). The impacts are analyzed in consideration of additional regulations and guidance provided in NEPA, Section 106 of the NHPA, the *Secretary of Interior's Standards for the Treatment of Historic Properties*, and *DO-28*.

The analysis takes into account whether the proposed action would result in a change that detracts from or destroys the historic character-defining features or integrity of a building or structure. Such an impact would be considered adverse. Actions that improve or enhance the historic character and integrity of a building or structure – for example, through restoring lost historic features or repairing damaged historic materials – would be considered a beneficial impact.

Direct impacts are those changes that result in physical impacts to the building or structure, such as demolition or physical rehabilitation to accommodate a new use. Indirect impacts result in changes to the building or structure through actions in its vicinity, such as adding new features in its historic setting that alter views from the building or structure; or increased visitor traffic on adjacent roads or parking areas. Because indirect impacts to historic buildings and structures overlap with impacts on the cultural landscape, and typically are the same as direct impacts to the cultural landscape, these are addressed in the Cultural Landscapes section that follows.

The alternatives are considered to identify the proposed actions that would result in physical changes, alterations in use, or changes in visitation level that could change the conditions of historic buildings and structures. The subsequent impacts to the condition, historic character, and integrity of the historic property (as defined in National Register documentation and other park studies) are weighed to identify whether they are detectable, and if so, whether they are adverse or beneficial.

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

Direct impacts of the no-action alternative to buildings and structures are minimal. The current uses of all historic buildings and structures would remain the same, requiring no planned changes to access or building

material to accommodate new interpretation or uses. The park's ongoing work to stabilize and/or rehabilitate historic structures to ensure their preservation would continue according to the GMP and other NPS policy and planning. Building rehabilitation and maintenance would remain dependent on future project funding and operational constraints, but would not be directly coordinated with visitor access. No changes would occur to the buildings and structures at the Best Farm, Thomas Farm, Worthington Farm, Lewis Farm, Baker Farm, Gambrill House and Mill, Wallace Headquarters area earthworks, monuments, MD 355 bridge, and road traces.

Direct impacts to historic buildings and structures are neither adverse nor beneficial under Alternative A, the no-action alternative.

Cumulative impacts: Alternative A would have no impacts to historic buildings and structures. 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 Monocacy National Battlefield.

Conclusion: Alternative A would result in undetectable, neither adverse nor beneficial impacts on historic buildings and structures at the Best Farm, Thomas Farm, Lewis Farm, Gambrill House and Mill, Wallace Headquarters area, Baker Farm, Worthington Farm, and monuments. Alternative A would not contribute beneficial or adverse impacts to historic buildings and structures.

Impacts of Alternative B – Action Alternative

Several historic features of the park that are classified as structures could be directly affected by the proposed action alternative. These include the Wallace Headquarters area earthworks and several road traces documented as structures. The plan's proposed actions do not include changes to or near the majority of historic buildings and structures at the park. For example, no notable physical or programmatic alterations to historic buildings or their access are proposed at the Best Farm, Worthington Farm, Thomas Farm, Lewis Farm, Baker Farm, Gambrill House and Mill, or monuments.

A new pedestrian interpretive route would be added in proximity to the earthworks at the Wallace Headquarters area, allowing for controlled visitor access to the earthworks area for the first time. The earthworks are currently inaccessible to visitors, located across Bush Creek and the railroad tracks from other visitor areas. The addition of a pedestrian route could have adverse impacts due to construction of a trail in the earthworks vicinity, with the potential for immediate physical adverse impacts from trail construction such as ground disturbance of surrounding areas where earthwork-related cultural resources may exist on or under the ground surface. Over the longer term, adverse impacts from visitors climbing or walking on the earthworks may occur. These impacts could be mitigated or minimized through sensitive trail design (no cut, field documentation of resource before design, place trail away from the earthwork but within view of it); and visitor education and enforcement of resource protection (signage, staff presence, barriers such as railings or vegetation). Preparation of an earthworks management plan could provide detailed documentation and guidance for balancing sensitive trail design, resource protection, and effective interpretation.

Portions of the new pedestrian interpretive path routes would be located along historic road traces at the Best Farm and Thomas Farm. Adverse impacts to the road traces could occur in an immediate physical manner from trail construction that adds highly visible surfacing materials, or earthmoving on or adjacent to the road trace. Grading and drainage improvements, if not minimally and carefully designed to preserve the profile and character of the road trace, could result in a change to the historic trace's character. Longer-term,

incremental adverse impacts could occur from increased visitor use, resulting in wear and tear, compaction, and erosion from foot traffic. These potential adverse impacts could be minimized or mitigated through compliance with CLR guidance for trails and road trace treatment; use of earthen or grass surfacing; and minimal grading or surface alteration; as well as monitoring for condition problems such as erosion from visitor foot traffic, followed by repair in keeping with CLR guidance for historic character.

Indirect impacts of Alternative B to buildings and structures would be primarily changes to the settings surrounding these historic properties within the park. Because the changes, such as modifications to parking areas and the addition of paths and signage, directly affect the landscape but not the buildings and structures, they are addressed as associated historic properties forming a part of the park cultural landscape, and described in the Cultural Landscapes section that follows.

The pedestrian bridge adjacent to the MD 355 bridge would have an indirect, adverse impact to the historic structure due to adding a new, non-historic structure directly beside it. The design concept for the pedestrian bridge as described in Alternative B aims to minimize impacts to the historic bridge and views to/from it by being free-standing and not changing the bridge materially, aligning the trusses and piers with the existing bridge trusses and piers, and using materials that are harmonious with the existing bridge materials. These design actions are in keeping with NPS policy and the Secretary of Interior standards for the treatment of historic structures, and are expected to effectively mitigate impacts of the new structure on the historic bridge.

Cumulative impacts: Other past, present, and reasonably foreseeable future actions would result in adverse impacts to historic buildings and structures. Planned addition of PV panels to the roof of the maintenance building near Gambrill Mill could have an adverse impact on views from the Gambrill House and Mill; those on the Visitor Center would not be visible from any of the park's historic buildings or structures.

NPS past, present, and future planning actions are expected to have a beneficial impact on historic buildings and structures, including the park Wildland Fire Management Plan, which coordinates fire management with cultural resource goals, including protection of historic buildings and structures from wildfire. Under Alternative B, there would be a slight but detectable adverse impact over the long-term. This includes potential for immediate impacts to earthworks and road traces from construction of visitor pedestrian access routes in proximity to them; and impacts to the MD 355 bridge from construction of a pedestrian bridge beside it. Other long-term incremental impacts, such as compaction and erosion from visitor foot traffic on earthen surfaces, could arise from increased visitor access to sensitive landscape structures such as earthworks and road traces. When the adverse impacts of Alternative B are combined with the impacts of these other projects, an overall adverse cumulative impact would result. For many of these projects, adverse impacts could be mitigated through consultation with the MD SHPO for the projects to identify and address impacts to historic buildings and structures and minimize them.

Conclusion: Alternative B would contribute an adverse incremental impact to the overall adverse cumulative impacts of other projects, in addition to a cumulative beneficial impact, when considered with past, present and reasonably foreseeable future projects at and in the vicinity of Monocacy National Battlefield. .

Cultural Landscapes

Affected Environment

Cultural landscapes consist of “a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein) associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values” (NPS 1992). Cultural landscapes at the park include the battlefield as a whole and specific farmsteads in particular. These are described in detail within NPS documents including Cultural Landscape Inventories and Reports for the Best Farm (2005), Thomas Farm (2009 and 2014), and Worthington Farm (2014); the Historic Resource Study (2004), the Monocacy Battlefield National Register nomination form (1973) and the National Historic Landmark (NHL) documentation (1973).

Cultural landscapes include the features and systems that compose the existing landscape and convey the historic character of the landscape associated with a historic period of significance. Landscapes provide a setting for historic buildings and structures. Cultural landscape characteristics include natural systems and features, topography, spatial organization, vegetation, land use, circulation, views and vistas, buildings and structures, and small-scale features that contribute to the historic character of the battlefield. The affected historic property or APE is the Monocacy Battlefield NRHP historic district, which includes a variety of contributing buildings, sites, structures, and objects. Historic buildings and structures are addressed in the previous section. The various buildings, sites, structures, objects and landscape features and characteristics together add up to form the eligible district. Impacts to the cultural landscape are addressed here, including consideration of the battlefield NRHP historic district and the component landscapes described in CLRs and CLIs (and noted in more detail below).

The APE—the affected cultural landscape—is the land within the Monocacy National Battlefield boundary, including the Monocacy Battlefield historic district. The district’s resources include the views, topography, and other cultural and landscape features that contribute to the historic character of the battlefield. Buildings and structures within the district are surrounded by landscape settings within the district. The rural battlefield character of the landscape is an essential part of the visitor experience at the park.

Cultural landscapes include component landscapes as documented in CLIs and CLRs, and landscape elements (sites) that contribute to districts located within the APE are as follows:

- The Best Farm landscape as documented in the NR Nomination and the Best Farm CLR, including the house and farm complex; Civil War monuments; entrance drive, road traces and farm road; remnant stone walls, culverts, and nearby river bridge footings and piers; trees in the yard and drainage along entrance road; fields, fencelines, garden site, yards; and archaeological sites in the farm landscape.
- The Thomas Farm landscape as documented in the NR Nomination and Thomas Farm CLI (2009) and CLR, encompassing the 240-acre area bounded by the Monocacy River, I-270, MD 355 and Araby Church Road. The CLI identifies its period of significance as 1724-1915. Notable cultural landscape features include roads and road traces, and Middle Ford location; the farm building and house complex, agricultural land use; sycamore trees and an Osage orange fencerow; views to Georgetown Pike and Worthington Farm; a ferry site; and the Vermont monument. Refer to the CLI and CLR for detailed descriptions of the contributing landscape features. The NR Nomination form update also identifies a tavern site, ruins, and sites associated with the 1864 battle.

- The Worthington Farm landscape as documented in the CLI, CLR and NR Nomination, including the main house; agricultural land use; part of the farm lane and the lane to the Worthington/McKinney ford; Osage orange fencerows, historic white oaks; fencepost; and associated archeological sites.
- Other landscapes that have not been documented and inventoried as separate component landscapes but are considered part of the overall battlefield landscape associated with the 1864 engagement, including:
 - the Lewis Farm;
 - Gambrill House and Mill (including mill landscape features, house environs, and Civil War associated hospital/action site);
 - Wallace Headquarters area (including structures and 4 sites);
 - Baker Farm complex (including farm complex and Civil War associated site);
 - The former ferry crossing and associated vicinity as described in the Monocacy Crossing NR nomination form (2003).

About the Analysis

Potential impacts to cultural landscapes affect the historic character and integrity of the landscape as defined in the park's CLIs, CLR's, and NRHP district and site nominations. The impacts are analyzed based upon guidance provided in Section 106 of the NHPA and the *Secretary of Interior's Standards for the Treatment of Historic Properties*, as well as *A Guide to Cultural Landscape Reports, DO-28* and other NPS guidance for the treatment of cultural landscapes.

A proposed action that results in a change that detracts from or destroys the historic character-defining features of park cultural landscapes would be considered adverse. Likewise, any action that destroys or diminishes the landscape's integrity, in particular for setting, location, association, or feeling (the four aspects of integrity defined in the NRHP Bulletin 40 as most critical for battlefields and vernacular landscapes) would result in an adverse impact. Actions that improve or enhance the historic character and integrity of the landscape – for example, through restoring lost historic features, such as views or vegetation patterns – would be a beneficial impact. A primary goal of cultural landscape management noted in the Thomas and Worthington Farms CLR is to “provide visitors with a better understanding of the evolution of settlement in the region and the Civil War through the properties surviving historic features and quiet rural setting.” Impacts to cultural landscapes are considered with this goal in mind.

Direct impacts are those changes that result in noticeable physical impacts to the landscape's historic character, such as major earthmoving or construction of new buildings and structures. Indirect impacts result in impacts to the landscape that do not directly alter its physical character, but are noticeable, such as changes to views or noise levels due to increased visitor traffic on the landscape's roads or parking areas.

The alternatives are considered to identify the proposed actions that would result in physical changes or alterations in use that could modify the conditions of the landscape. The subsequent impacts to the condition, historic character, and integrity of park cultural landscapes are weighed to identify whether they are detectable, and if so, whether they are adverse or beneficial.

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

Under Alternative A, there would be no noticeable changes to the visitor access at the park. Pedestrians would continue to use the existing paths and trails. Vehicular access would continue to use the existing park and county roads. Informal access along the river would continue to result in erosion in areas where pedestrian and boat access occurs along the riverbank. Interpretive opportunities identified in the CLRs and GMP would continue to be missed in areas lacking the addition of formal visitor access and historic road traces currently in cultivation would remain, thus keeping them obscured.

Direct adverse impacts to cultural landscapes under Alternative A would not be detectable due to the existing planning documents such as the GMP and CLR/CLIs providing guidance for the management of the landscapes. The Best, Worthington, and Thomas Farm landscapes would remain similar in appearance and would gain some changes such as trails, interpretation, and other enhancements called for in the GMP and CLRs incrementally, as funding and operational constraints permit.

Cumulative impacts: Under Alternative A, there would be no detectable adverse impact to cultural landscapes. 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 park.

Conclusion: Under Alternative A, changes to cultural landscapes at Monocacy National Battlefield would occur incrementally through implementation of existing plans. Such changes would be difficult to detect in the short term, but would be recognizable in the long term. Ongoing park planning and policy implementation would result in beneficial impacts through their continuing recommendations for cultural landscape preservation and the reduction of threats to cultural landscapes such as fire. Alternative A would not contribute beneficial or adverse impacts to the overall adverse cumulative impacts on cultural landscapes.

Impacts of Alternative B – Action Alternative

The actions that are part of Alternative B primarily affect the following cultural landscape characteristics: circulation, vegetation, and views, including the settings of historic buildings and structures. Alternative B acknowledges and follows the guidance provided in the park's Cultural Landscape Reports for the Best, Thomas, and Worthington Farm cultural landscapes.

Indirect impacts of Alternative B include changes to the settings surrounding historic buildings and structures within the park. The alternative's proposed new trails, parking areas, pedestrian bridges, and interpretive features would in some cases be within view of historic buildings and structures. If designed to be minimally visually intrusive, it is not expected that these changes would have a noticeable impact on cultural landscapes for the most part. New circulation features would comply with the Secretary of Interior's Standards related to cultural landscapes and with CLR guidance. They would use materials and forms that are differentiated from the historic, but that are unobtrusive and harmonious with the existing historic landscape's rural character. For example, paths would use mown grass or earthen surfaces or stabilized earthen-colored surfacing, minimal grading, and a low profile. They would avoid changes that would alter historic features such as earthworks or be noticeable in battlefield views. Therefore, it is not expected that these changes would have a noticeable impact on cultural landscapes.

Planned changes to park circulation to increase visitor access include the introduction of new parking, trails, and paths to increase pedestrian connections and access interpretive opportunities. The new trails and paths would involve physical construction including some minor grading and paving, addition of boardwalks, and waysides and signage. These changes are spread throughout the park, but there is a concentration of

new circulation features in the MD 355 – CSX bridge – Monocacy River confluence area in the northeastern part of the park. In this area, connectivity would be improved with the addition of a small pedestrian bridge over Bush Creek near Gambrill Mill, trails on the northeastern riverbank at the Wallace Headquarters area, a pedestrian bridge adjacent to the Route 355 bridge, additional parking near the northeastern side of the MD 355 bridge, and the addition of recreational trails along the riverbank. These changes would mostly be low in profile along the wooded streambanks, and would not be highly noticeable in views across the landscape. However, the pedestrian bridge alongside MD 355 would likely be visible from a distance, creating a noticeable adverse impact within that area of the landscape. By locating the bridge downstream of the MD 355 truss bridge, the project would minimize its visibility from the Wallace Headquarters area to the north, and from the interpretive overlook at Gambrill Mill.

Existing historic circulation features would not be removed, but the addition of the new circulation would increase visitor use of some existing routes and introduce non-historic circulation features into the historic district. This could result in a need for increased facility management, drainage improvements, and grading. Within a historic landscape, the addition of circulation features and changes to existing circulation features have the potential to change the character of the landscape, intrude on views, or destroy existing historic materials. However, because some of the proposed alterations in Alternative B include implementing the CLR recommendations for trails and paths, it is expected that the action would result in a beneficial impact through rehabilitation of existing circulation and careful implementation of new features. These actions would be undertaken using forms, materials, and workmanship that are in keeping with the historic character of cultural landscapes at the Best, Worthington, and Thomas farms. Within the overall battlefield landscape, the proposed new circulation features are “light” enough in location and design that they are not expected to have a noticeable adverse impact on the cultural landscape.

The alternative’s proposed new trails, parking areas, pedestrian bridges, and interpretive features would add minor alterations to the park, some of which would lie within view of the cultural landscape and associated historic properties, contributing a slightly detectable adverse impact to the cultural landscape and to views from/to and settings of some historic properties. For example, at the Best Farm, addition of an interpretive path to the top of the rise at the northern edge of the property would likely be visible from the cluster of farm buildings, adding a non-historic element in their setting and on the landscape. This new trail, together with slight changes to parking and new interpretive signage, would create a set of intrusions that would be visibly non-historic, resulting in an adverse impact. Because these elements would be designed to be minimally visually intrusive in keeping with CLR recommendations, it is not expected that they would have a noticeable impact on cultural landscapes and related historic properties.

The reopened view corridor across I-270 would be a beneficial impact to the Thomas and Worthington farm cultural landscape and the setting of and views to/from associated historic properties, as it would restore an important historic view linking the two properties, and would minimize the dividing effect of the interstate highway corridor on the landscape through this visible interpretive linkage. The land bridge in the GMP would also be a beneficial long-term impact for the cultural landscape by covering and restoring a similar topographic appearance in this area to the pre-I-270 landscape, making the major intrusion of the highway less visible and restoring a physical link between the farmsteads.

Changes proposed to vegetation under Alternative B include the removal of successional woods that have grown since the construction of I-270 in the early 1950s to reopen the view between the Thomas and Worthington properties and between the Worthington House and the location of the Union battery along the

Old Georgetown Pike roadbed. Alternative B represents a beneficial impact to the cultural landscape, as these trees were not present historically, their removal re-opens a critical historic view, and this proposed change is in keeping with the intent of the component landscape's CLR. This action would represent a movement towards rehabilitation of historic vegetation patterns from the Civil War period. The vegetation removal along I-270 would also be a beneficial, direct impact to historic views that contribute to the cultural landscape, rehabilitating a view important to the battle that has since been lost due to vegetation growth and other factors.

Cumulative impacts: Other past, present, and reasonably foreseeable future actions would result in adverse impacts to cultural landscapes. The Frederick County waste treatment plant would represent an adverse impact to the cultural landscape due to the introduction of these facilities into the park's viewshed. Indirect visual impacts are expected to be the greatest impact to the battlefield landscape within the NRHP district as a whole.

Construction of the MD 355 bridge replacement over the CSX tracks based on SHA's Preferred Alternative would result in noticeable long- and short-term adverse impacts to the cultural landscape due to alterations to views, circulation, and historic structures as well as historically present natural features and systems such as vegetation and waterways. The addition of a pedestrian bridge alongside the MD 355 bridge under Alternative B, when combined with the CSX bridge replacement to the north, would have a greater adverse impact on the visual quality of the battlefield's cultural landscape in this area, due to the increased number of visible changes occurring within the historic viewshed. This impact could be mitigated through design that adheres to the Secretary of Interior's Standards for the Treatment of Historic Properties, with the goal of minimizing the visibility of the pedestrian bridge and highway bridge replacement.

NPS past, present, and future planning actions that are expected to have a beneficial impact on the cultural landscape include the NPS National Capital Regional Invasive Plant Management Plan, which removes non-historic invasive plant species from the battlefield landscape; and the park Wildland Fire Management Plan, which coordinates fire management with cultural resource goals. Another NPS project with the potential for noticeable, but localized adverse impacts is the solar panel installation at the park Visitor Center and maintenance shop, which could affect limited areas of the views within the battlefield landscape.

Other actions that have and will continue to result in adverse impacts to cultural landscapes at the park include ongoing development in the surrounding area. These have an incremental adverse impact that is both direct (widening of roads, removal of vegetation, addition of poles and lines along utility corridors, excavation to replace underground utilities) and indirect (changes in views to historically rural areas outside the boundary of the park as development occurs).

Under Alternative B, there would be noticeable beneficial and incremental, noticeable adverse impacts to cultural landscapes. When the beneficial and adverse impacts of Alternative B are combined with the impacts of these other projects, an overall adverse cumulative impact would result. For many of these projects, adverse impacts could be mitigated and minimized through consultation with the MD SHPO for each of the projects to identify and address impacts to historic resources and diminish and offset them.

Conclusion: Overall, Alternative B would have a noticeable beneficial impact and incremental adverse impact on the cultural landscapes of Monocacy National Battlefield. The proposed minimally intrusive new circulation features are intended to be sensitively sited and designed; therefore, these trails are anticipated to be minimally intrusive in the cultural landscape, including the views to/from and settings of associated historic

buildings and structures. Furthermore, the trail improvements proposed in Alternative B include implementing the CLR recommendations for pedestrian circulation at the Best, Worthington, and Thomas farms. Removal of non-historic vegetation in selected areas of the park would result in beneficial impacts, as would removal of non-native invasive plants as part of related plan implementation.

The addition of the pedestrian bridge alongside the MD 355 bridge under Alternative B, when combined with the CSX bridge replacement, would result in a variety of changes occurring in a relatively small area of the landscape, constituting a noticeable adverse impact.

Ongoing park plan and policy implementation would result in beneficial impacts to park cultural landscapes through their ongoing recommendations for resource preservation and the reduction of threats to cultural landscapes, such as fire. In the long term, the pedestrian land bridge over I-270 could lessen the adverse impact of the separation of the Thomas and Worthington Farms.

Alternative B would contribute a noticeable beneficial impact and an adverse incremental impact to the overall adverse cumulative impacts of other projects.

Archeological Resources

Affected Environment

Unless otherwise noted, the following information is drawn from the *General Management Plan / Environmental Impact Statement, Monocacy National Battlefield* (NPS 2009).

Archeological resources in the park are those associated with both temporary and permanent settlements (historic and prehistoric), and with short- and long-term military uses. A complete archeological survey of the park has not been undertaken; however, there is a National Register-listed archeological site, L'Hermitage, within the park, and various sites have been identified as part of CLIs, CLRs, and other studies in the past. While there are several documented archeological sites within the park, the studies completed are not considered comprehensive.

Native Americans were present in the area from the earliest human occupation of North America, particularly along the Monocacy River. It is likely that areas of the park reflect this settlement pattern (Kavanaugh 1982 in NPS 2009). Prehistoric occupations of the park have been documented archeologically at the Best, Thomas, and Worthington farms, and there is probably evidence of such occupations in other areas.

At the Best and Thomas farms, 18th century historic occupations have been documented in the form of previously unrecorded structures, features, and activity areas. At the Thomas Farm, the site of a mid-18th century tavern associated with the Middle Ford ferry has been documented. At the Best Farm, an archeological footprint of the slave village associated with the L'Hermitage plantation has been documented.

Civil War-era archeological resources in the form of features associated with no longer extant 19th century properties have been documented at the park in a number of locations, including at the Lewis, Worthington, and Baker Farms, and at the Gambrill Mill. Civil War-era features documented at the Best Farm include a cistern and a midden, or refuse deposit. The Camp Hooker Civil War encampment has been identified archeologically, as have more short-term campsites at the Best Farm. Subsurface remains from the battle have also been documented on the Best Farm. It should be noted that beyond these documented areas, the potential for the presence of military artifacts exists throughout the park due to the military use across the park's boundaries during the Civil War.

There is also a potential for post-Civil War archeological resources at the park. Gambrill Mill has the highest probability of post-Civil War archeological resources. In addition, the occupation of the Wallace Headquarters area continued into the early 20th century.

About the Analysis

Archeological resources exist essentially in subsurface contexts. Therefore, potential impacts to archeological resources are assessed according to the extent to which the proposed alternatives would involve ground disturbing activities such as excavation or grading. Analysis of possible impacts to archeological resources was based on a review of previous archeological studies, consideration of the proposed design concepts, and other information available on the archeological context of the area. The APE for archeological resources is the entire Monocacy National Battlefield park boundary.

This EA utilizes the definition of archeological resources under 43CFR7.3a, the implementing regulations for the Archaeological Resources Protection Act of 1979 (ARPA). The definition is designed to ensure that any resources within the APE that meet that 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. The Act is designed 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 construct new facilities nor alter circulation within the park. There would be no changes to current facility management and operation procedures. Because no new construction would occur, there would be no new earth disturbances and therefore no 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 park.

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

Impacts of Alternative B – Action Alternative

Alternative B would add new trails in a number of locations throughout the park. New trail locations would avoid known, documented archeological sites; however due to the possibility of undocumented archeological resources throughout the park, there is potential for adverse impacts to archeological resources due to the ground disturbance required to develop proposed elements in Alternative B. New trails, a pedestrian bridge over the Monocacy River, at MD 355 and at I-270, a pedestrian bridge over Bush Creek, a cantilevered bridge under the CSX Railroad, the replacement of Gambrill Mill Boardwalk, and pedestrian paths below I-270 and MD 355 along the river would require excavation and grading in areas that may be previously undisturbed. Proposed vegetation clearance, including the removal of trees to reestablish historic viewsheds, would cause ground disturbance primarily in previously disturbed areas. The pedestrian land bridge that could be constructed in the long-term would require extensive excavation and grading, in part in areas likely already disturbed by the construction of I-270. These activities could disturb as-yet unidentified archeological

resources. Over the long-term, as new mown and/or earthen paths are established, continued use could cause incremental adverse impacts to undocumented archeological resources due to erosion issues. These impacts would be mitigated through sensitive trail design and erosion control measures.

Ground disturbances related to the project elements could disrupt or displace unknown archeological resources and result in a loss of integrity of the archeological resource, and therefore result in an adverse impact. Some ground disturbances would be relatively surficial, such as those to create additional trail access, while other project elements would likely use heavy equipment and machinery, such as to remove vegetation and construct the pedestrian bridge over the Monocacy River. In order to minimize or mitigate the potential for adverse impacts, NPS would conduct an archeological survey for undocumented areas where ground disturbance is proposed after exact project footprints are identified and prior to any site work. The survey would determine the presence or absence of archeological deposits in the footprint of disturbance. If NRHP-eligible archeological resources are present, NPS would define appropriate avoidance, minimization, or mitigation measures to be taken. Therefore, while Alternative B has the potential to disturb currently undocumented archeological resources that would result in adverse impacts, mitigation measures would be taken to ensure impacts are minimized to the greatest extent practicable.

Cumulative Impacts: Other past, present and reasonably foreseeable future projects that have or will likely have cumulative impacts on archeological resources at the park include; ongoing development projects at and in the vicinity of the battlefield; the replacement of the MD 355 bridge over the CSX railroad tracks; and the Frederick County waste treatment plant. Most if not all of the construction- and development-related projects listed above have or could potentially result in the disturbance of undocumented archeological resources. Therefore, adverse impacts to archeological resources could occur from Alternative B and could contribute cumulatively to adverse impacts on archeological resources when considered with other past, present and reasonably foreseeable future actions occurring at and in the vicinity of Monocacy National Battlefield.

Conclusion: The construction of new elements within the park could potentially disturb unknown archeological resources and result in a loss of integrity of the archeological resource, and therefore result in an adverse impact under Alternative B. NPS would implement mitigation measures to ensure impacts are avoided or minimized to the greatest extent practicable. Alternative B could contribute to cumulatively adverse impacts on undocumented archeological resources.

Wetlands and Streams

Affected Environment

Activities that would potentially disturb wetlands and streams are regulated under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Such activities may require a permit from regulatory agencies including the U.S. Army Corps of Engineers. Within the boundaries of Monocacy National Battlefield, wetlands and streams comprise approximately 113 acres and include the Monocacy River, Bush Creek and Harding's Run as well as their associated wetlands.

The approximate extent of wetlands and streams at the battlefield are based on data produced by U.S. Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI). The locations of wetlands on NWI maps are based on the analysis of satellite imagery and other remote sensing techniques; thus, their extents and composition are approximate. The NWI depicts the Monocacy River as Riverine habitat (lower perennial). NWI wetlands within the park boundaries are predominantly classified as freshwater forested/shrub wetlands occurring in floodplain and riparian areas adjacent to the Monocacy River, Bush Creek and Harding's Run.

Where available, field verified wetland and stream delineation boundaries in the park's current inventory were used for analysis in place of NWI data. While NWI maps depicted wetlands in the vicinity of Bush Creek, the park's current inventory does not identify any wetlands in this area, and depicted only riverine (stream) habitat in the vicinity of the Bush Creek Crossing and Gambrell Mill Boardwalk project areas.

About the Analysis

Impacts on wetlands and streams at and in the vicinity of the park 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 battlefield, the requirements of DO 77-1 and other applicable regulations, and professional judgment.

Impacts of Alternative A – No Action

The implementation of Alternative A would have no impacts on wetlands and streams at or in the vicinity of Monocacy National Battlefield, as none of the proposed projects would be implemented, and existing conditions would continue.

Cumulative impacts: Alternative A would have no impacts on wetlands and streams. Therefore, it would have no potential to contribute to cumulative impacts on wetlands and streams resulting from past, present and reasonably foreseeable future projects occurring at and in the vicinity of Monocacy National Battlefield.

Conclusion: Alternative A would have no impacts on wetlands and streams and would not contribute to cumulative impacts on wetlands and streams resulting from other past, present and reasonably foreseeable future projects occurring in the vicinity of Monocacy National Battlefield.

Impacts of Alternative B – Action Alternative

The following projects included in Alternative B would be entirely or partially implemented in wetlands or streams at Monocacy National Battlefield:

- Pedestrian bridge over Monocacy River at MD 355 overpass
- Pedestrian bridge over Monocacy River at I-270 overpass
- Gambrell Mill Boardwalk
- Pedestrian bridge over Bush Creek

The locations of the projects listed above in relation to NWI wetlands and streams at the battlefield are shown on Figure 11. Geographic information systems (GIS) software was used to analyze the project footprints and develop estimates of impacts on wetlands and streams that would occur during construction activities (i.e., temporary impacts) and those that would continue following the completion of construction (i.e., permanent impacts). Geographic data from the park’s current inventory were not available for inclusion on Figure 11. However, the areas of wetland and streams in the park’s current inventory are factored into the disturbance estimates presented in Table 2 for the Gambrill Mill boardwalk and Bush Creek pedestrian bridge projects. Note that disturbance estimates presented in Table 2 are based on conceptual project footprints and planning level information developed for this EA. Estimates of disturbance resulting from the proposed projects will be recalculated as design and engineering of the projects advances.

Table 2: Temporary and Permanent Impacts on Wetlands and Streams

Project	Wetland Impacts (square feet)		Stream Impacts (square feet)	
	Temporary	Permanent	Temporary	Permanent
Pedestrian bridge at MD 355 overpass	0	0	50	1,380
Pedestrian bridge at I-270 overpass	100	4,500	0	0
Gambrill Mill Boardwalk	0	0	0	0
Pedestrian bridge over Bush Creek	0	0	420	1,450
Total (square feet / acres)	100 / < 0.1	4,500 / 0.1	470 / < 0.1	2,830 / 0.1

As shown in Table 2, projects included in Alternative B would temporarily impact less than 0.1 acre of wetlands and streams at Monocacy National Battlefield, or less than one percent of all wetlands and streams within the park. Temporary impacts would include the clearing of vegetation and the installation of mats, planks or timbers to enable the access of workers, vehicles and equipment to the project sites. Following the completion of construction activities, an estimated 0.2 acre of wetlands and streams would be permanently impacted from the installation of footings, pilings and/or other structural elements associated with the proposed pedestrian bridges as well as trails, ramps, staircases and/or other approach elements that pedestrians would use to access the bridges. Wetlands and streams permanently impacted by projects included in Alternative B would constitute less than one percent of all wetlands and streams within the boundaries of Monocacy National Battlefield.

As planning and design for each project advances, the NPS would avoid suspected wetland areas to the extent possible. In areas where wetland avoidance is not possible, the NPS would delineate wetland boundaries and establish limits of disturbance to minimize impacts on wetlands. The NPS would coordinate with applicable regulatory agencies, including the U.S. Army Corps of Engineers and the Maryland Department of Natural Resources to develop a site-specific mitigation plan identifying how areas disturbed during construction would be restored to pre-construction conditions, as well as any other applicable avoidance, minimization and compensation measures. Further, the NPS and/or its contractors would adhere to best management practices (BMP) to minimize vegetation disturbance, erosion and runoff that could result in the sedimentation and pollution of downstream watercourses. All BMP and mitigation measures pertaining to construction in wetlands would be in accordance with DO 77-1 and the *Maryland Soil Stormwater Management and Erosion and Sediment Control Guidelines for State and Federal Projects*. As each project is

completed during the 10-20 year project phasing, disturbed areas would be restored to pre-project conditions through a combination of re-grading, planting of new vegetation and the resumption of hydrologic flows.

Through adherence to avoidance, minimization and compensation measures that will be identified for each of the projects that would disturb wetlands at Monocacy National Battlefield, Alternative B would not result in noticeable long-term impacts on wetlands. Due to the anticipated limited nature of the project disturbance and water dependent nature of the activities, the proposed project elements were determined to be excepted actions under DO 77-1. Excepted actions do not require a Statement of Findings; however, DO 77-1 requirements to avoid wetlands and minimize unavoidable wetland impacts, to the extent practicable, still apply, along with the BMPs described in Appendix 2 of DO 77-1, and incorporated within this EA.

Cumulative Impacts: Alternative B would not result in noticeable long-term impacts on wetlands. Other past, present and reasonably foreseeable future projects with the potential to impact wetlands includes ongoing utility and/or development projects at and in the vicinity of Monocacy National Battlefield, some of which would likely occur in or adjacent to wetlands and have the potential to degrade water quality. While such projects would be required to avoid, minimize and compensate for impacts on wetlands in accordance with applicable federal and/or state regulations, they would likely have an overall adverse effect on the quantity and quality of wetlands in the area. Thus, these projects would result in incrementally long-term cumulative impacts on wetlands.

As Alternative B would not have noticeable long-term impacts on wetlands, it would not contribute to incrementally adverse impacts on wetlands when considered with past, present and reasonably foreseeable future projects occurring at and in the vicinity of Monocacy National Battlefield.

Conclusion: Through adherence to applicable avoidance, minimization and compensation measures, Alternative B would not have noticeable long-term impacts on wetlands. As such, Alternative B would not contribute to incrementally long-term cumulative impacts on wetlands when considered with other past, present and reasonably foreseeable future projects occurring in the vicinity of Monocacy National Battlefield.

Water Resources and Stormwater

Affected Environment

An approximately 2-mile-long segment of the Monocacy River flows through and adjacent to portions of Monocacy National Battlefield. The Monocacy River originates near the Maryland-Pennsylvania border before flowing approximately 58 miles to its confluence with the Potomac River about 9 miles south of the battlefield. The largest tributary of the Potomac River in Maryland, the Monocacy River is non-tidal throughout its length and drains an area encompassing approximately 970 square miles. Notable tributaries of the Monocacy River within the boundaries of the battlefield include Bush Creek, Harding Run and the unnamed tributary running through Gambrill Mill area.

The park is located in the Lower Monocacy River watershed, which drains approximately 314 square miles and includes the City of Frederick and portions of Frederick, Carroll and Montgomery Counties in Maryland. Total maximum daily loads (TMDL) for a number of pollutants have been approved for the Lower Monocacy River. A TMDL is a regulatory tool that is developed when a water body fails to meet water quality standards, and establishes the maximum amount of a pollutant that a water body can assimilate and still meet those standards. TMDLs applicable to the Lower Monocacy River regulate discharges of sediment (approved March 2009), fecal coliform (approved December 2009), and phosphorus (approved May 2013).

Stormwater generated at the park percolates into the ground through permeable surfaces or drains into the Monocacy River via conveyances such as gullies and/or human-built ditches and culverts from paved or otherwise impermeable areas. Further downstream, stormwater runoff from Monocacy National Battlefield is discharged to the Potomac River and ultimately, the Chesapeake Bay.

About the Analysis

Impacts on water resources and stormwater in and in the vicinity of the park potentially resulting from the implementation of the proposed alternatives were analyzed in consideration of the types of projects included in the alternatives and where they would occur, the requirements of TMDLs applicable to the Monocacy River, and professional judgment.

Impacts of Alternative A – No Action

Under Alternative A, informal access along the river would continue to result in erosion in the limited areas where pedestrian and boat access occurs along the approximately 2-mile-long segment of the Monocacy River within and adjacent to the battlefield. While this would have an adverse impact on water quality, it would be small in the context of the approximately 9-mile-long segment of the river between the battlefield and its confluence with the Potomac River. In addition, erosion issues along the bank of a nearby creek would continue from the existing location of the Gambrill Mill Boardwalk. Thus, continued erosion and sedimentation resulting from Alternative A would have incremental but barely noticeable long-term impacts on water quality in the Monocacy River and, further downstream, the Potomac River.

Cumulative Impacts: Alternative A would have incremental but barely noticeable long-term impacts on water quality in the vicinity of the park. None of the other past, present or reasonably foreseeable future projects addressed in this EA would result in long-term sedimentation and erosion of exposed soils, as land disturbed during construction activities would be developed or otherwise re-vegetated or restored to a pre-project condition following the completion of land-disturbing activities. Thus, when considered with these projects,

Alternative A would not contribute to cumulative adverse impacts on water quality at or in the vicinity of Monocacy National Battlefield.

Conclusion: Alternative A would have adverse but barely noticeable long-term impacts on water quality in the Monocacy River and, further downstream, the Potomac River. Alternative A would not contribute to cumulative adverse impacts on water quality when considered with past, present and reasonably foreseeable future projects occurring at and in the vicinity of the park.

Impacts of Alternative B – Action Alternative

The construction of new pedestrian trails and pedestrian bridges over the Monocacy River and Bush Creek; the relocation of the Gambrill Mill Boardwalk; the installation of interpretive elements along the river; and the removal of vegetation to restore the viewshed between the Thomas and Worthington Farms would disturb soils and/or remove vegetation. It is anticipated that the implementation of Alternative B would disturb approximately 41 acres of soils and/or vegetation (these estimates are further discussed, respectively, in the Vegetation and Geology and Soils sections of this EA). The majority of the disturbance would be due to the removal of trees and other vegetation between the Thomas and Worthington Farms to re-establish the viewshed (approximately 33 acres). This 33-acre area would be revegetated with appropriate low ground cover, such as native grass meadow and shrub mixes.

Much of the trail disturbance would be limited to mown and earthen paths created with little excavation and no additional impermeable surfaces. Overall, Alternative B would create an estimated 9,125 square feet (0.21 acre) of new impermeable surface within the park from the construction of the pedestrian bridges over the Monocacy River and Bush Creek as well as the I-270 pedestrian underpass.

Such disturbance and vegetation removal would increase the vulnerability of soils to erosion by water and wind and potentially result in the corresponding sedimentation and pollution of downstream water bodies during construction. In addition, erosion issues along the bank of a creek near Gambrill Mill would continue. The NPS and/or its contractors would adhere to applicable best management practices during the construction of the projects included in Alternative B to minimize the runoff of sediments and pollutants to the Monocacy River and other bodies of surface water at and in the vicinity of the battlefield. For projects involving 5,000 square feet or more of earth disturbance, the NPS would obtain coverage under Maryland's General Permit for Stormwater Associated with Construction Activity (General Permit), which would require the preparation of an erosion and sediment control plan. Such projects would also adhere to the requirements of EO 13508, *Strategy for Protecting and Restoring the Chesapeake Bay Watershed* which requires federal projects to comply with Section 438 of the Energy Independence and Security Act (EISA). Under Section 438 of the EISA, federal projects involving 5,000 square feet or more of earth disturbance must incorporate low impact development (LID) techniques to the extent technically feasible to maintain the pre-development hydrology of the project site. Adherence the requirements of EO 13508 and Section 438 of the EISA, as well as the General Permit and corresponding erosion and sediment control plans would minimize runoff from project sites and consequential sedimentation and pollution of downstream watercourses.

The construction of the pedestrian bridges over the Monocacy River would involve in-water construction to install support piles, which would potentially disturb bottom sediments and increase turbidity in the river during construction. The NPS and/or its contractors would use applicable best management practices to minimize the disturbance of sediments and increased turbidity of the water. Any such disturbance or increase

in turbidity would cease upon the completion of each project and neither of the two bridges would be built concurrently, further minimizing impacts.

Specific best management practices to minimize soil erosion, sediment disturbance and/or turbidity would be developed as the planning and design stage of each project continues. Soils exposed during construction would be re-vegetated or otherwise stabilized following the completion of each project, at which time construction-related erosion and sedimentation would cease. In areas where tree and vegetation removal would occur (approximately 33 acres) to reopen viewsheds, the areas would be revegetated using appropriate ground cover such as a native grass meadow and shrub mixes. The phasing of the projects included in Alternative B over a period of 10 to 20 years would minimize impacts on water quality from construction-related soil erosion. Thus, adverse construction-related impacts on water quality from the erosion of exposed soils and corresponding downstream sedimentation would be minimally noticeable, and there would be no long-term impacts from erosion and sedimentation.

Alternative B would not increase the volume of stormwater generated at Monocacy National Battlefield. New trails would either consist of mown or earthen paths or would be constructed of permeable materials that would facilitate the percolation of stormwater into the ground, and no substantial areas of new impervious surface would be created. The re-vegetation of areas disturbed during construction and adherence to the requirements of EO 13508 and Section 438 of the EISA as applicable would accommodate the volume of runoff generated on each project site. While the replacement of tree cover with a grass meadow and shrub mix could increase sediment loading, the implementation of Alternative B would not create conditions that would contribute to exceedances of pollutant thresholds established in the TMDLs applicable to the Lower Monocacy River. None of the projects would create a new source of fecal coliform or phosphorus.

For these reasons, Alternative B would have minimally noticeable short-term and long-term adverse impacts on water resources and stormwater at and in the vicinity of Monocacy National Battlefield.

Cumulative Impacts: Alternative B would have minimally noticeable long-term impacts on water resources and stormwater at and in the vicinity of Monocacy National Battlefield. Thus, it would contribute to noticeable cumulative impacts on water resources and stormwater when considered with past, present and reasonably foreseeable future projects occurring at and within the vicinity of Monocacy National Battlefield.

Conclusion: Alternative B would have minimally noticeable short-term and long term impacts on water resources and stormwater and would contribute to noticeable cumulative impacts on water resources and stormwater when considered with past, present and reasonably foreseeable future projects at and in the vicinity of Monocacy National Battlefield.

Vegetation

Affected Environment

Unless otherwise noted, the following information is drawn from *Abbreviated Final General Management Plan / Environmental Impact Statement, Monocacy National Battlefield* (NPS 2009 in NPS 2014).

Vegetation composition and patterns at the park are representative of the open natural and agricultural landscape in Maryland's Piedmont region. Approximately 346 acres, or 21 percent of the battlefield is forested, with wooded areas consisting of Deciduous Forest (324 acres), Evergreen Forest (5 acres) and Mixed Forest (13 acres). Agricultural lands cover about 800 acres or 49 percent of the park and include crop and pastures for grazing livestock. Generally, upland and riparian forested areas are interspersed with agricultural lands and open fields throughout the battlefield. Upland areas of the battlefield contain associated dry site species such as oak (*Quercus* spp.), hickory (*Carya* spp.) and American beech (*Fagus grandifolia*). Lowland riparian forests in the floodplain of the river and along streams are dominated by maple (*Acer* spp.), American sycamore (*Platanus occidentalis*), hackberry (*Celtis occidentalis*), and ash (*Fraxinus* spp.). Recently disturbed areas are characterized by generalist tree species such as tulip poplar (*Liriodendron tulipifera*), black cherry (*Prunus serotina*), black locust (*Robinia pseudoacacia*), boxelder (*Acer negundo*), and tree-of-heaven (*Ailanthus altissima*).

It is estimated that one-third of plants at the park are non-native, particularly in non-agricultural areas of the battlefield. Common non-native invasive plants occurring at the park include multiflora rose (*Rosa multiflora*), tree-of-heaven (*Ailanthus altissima*), Japanese honeysuckle (*Lonicera japonica*), garlic mustard (*Alliaria petiolata*), and Japanese stiltgrass (*Microstegium vimineum*). Non-native invasive plants occurring in agricultural areas of the battlefield include Johnson grass (*Sorghum halepense*), Canada thistle (*Cirsium arvense*) and bull thistle (*Cirsium vulgare*).

On the Thomas and Worthington Farm properties vegetation composition is a mix of crops, native species, and non-native invasive species. Substantial stands of Osage orange (*Madura pomifera*) trees, which were used extensively in the 19th century as hedges, occur in multiple locations on the Thomas and Worthington Farms. Two sycamores known to date to the 18th century are located on the Thomas Farm; one of these trees has been documented by the Historic American Landscape Survey (HALS) as a historic witness tree (HALS No. MD-10). Two white oaks (*Quercus alba*) documented as HALS No. MD-12, are located on the Worthington Farm near the northwestern base of Brooks Hill (NPS 2013).

Riparian vegetation and wooded slopes on the Thomas and Worthington Farms substantially consist of native trees and understory, such as tulip poplar (*Liriodendron tulipifera*), sycamore, sassafras (*Sassafras albidum*), maple (*Acer* sp.), and ash (*Fraxinus* sp.). However, areas along I-270 and in the vegetated fence lines separating farm fields contain a variety of non-native and invasive vegetation, including common buckthorn (*Rhamnus cathartica*), Japanese honeysuckle (*Lonicera tartarica*), garlic mustard (*Alliaria petiolata*), Japanese stilt grass (*Microstegium vimineum*), and tree-of-heaven (NPS 2013).

With the exception of the sycamore and white oak trees and the stands of Osage orange described above, none of the remaining trees on the Thomas and Worthington Farms contribute to the historic character of the cultural landscape. Some of the other vegetation on the farm grounds—particularly trees located along the entrance lane to Thomas Farm and throughout the house grounds, and vegetation along the field boundaries, on wooded slopes and along the river—are non-contributing but compatible with the farms' historic character (NPS 2013).

Crops grown at the park include a variety of grains, corn, soybeans and pasture and hay grasses. Common grains include winter wheat (*Triticum aestivum*) and barley (*Hordeum vulgare*), while pasture and hay grasses include orchardgrass (*Dactylis glomerata*) and timothy grass (*Phleum pratense*). Other plantings around the park include lines of Osage orange trees (*Maclura pomifera*) intended to act as "living fences," as well as stands of white pine (*Pinus strobus*) trees. Ornamental plantings near Gambrill Mill include perennial and annual flower beds and plants such as crab apple (*Malus* sp.) and serviceberry (*Amelanchier arborea*).

Monocacy National Battlefield contains approximately 96 acres of managed warm-season grasslands and 172 acres of cool-season grasslands (NPS 2011). These areas are managed to maintain historic landscapes and land use patterns that existed at the time of the battle. Warm-season grasslands provide important habitat for birds and other wildlife, and consist of species native to the Mid-Atlantic region such as switchgrass (*Panicum virgatum*), big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and Indian grass (*Sorghastrum nutans*). Among cool-season grasses occurring at the park, some species of bluegrass (*Poa* spp.), brome (*Bromus* spp.), fescue (*Festuca* spp.) are non-native to the Mid-Atlantic region, as are the previously-mentioned timothy and orchard grass (Peterjohn 2006 in NPS 2011). Warm-season grasslands predominantly occur in the vicinity of Gambrill Mill, while cool-season grasslands occur extensively on Worthington Farm and in somewhat smaller areas of Best Farm, Thomas Farm and Baker Farm.

About the Analysis

Impacts on vegetation in and in the vicinity of Monocacy National Battlefield potentially resulting from the implementation of the proposed alternatives were analyzed in consideration of the types of projects included in the alternatives, the context and setting of where they would occur, and professional knowledge and judgment.

Impacts of Alternative A – No Action

Alternative A would have no impacts on vegetation, as none of the proposed projects would be implemented at Monocacy National Battlefield. Existing conditions at the battlefield would continue. Vegetation at Monocacy would continue to be maintained in accordance with current management protocols.

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

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

Impacts of Alternative B – Action Alternative

The construction of new pedestrian trails included in Alternative B would be located within a total area of approximately 348,640 square feet (8 acres), the majority of which is vegetated. The vegetation disturbance area estimate is conservatively based on an 8-foot-wide area along the total linear distance of the proposed trails included in Alternative B (43,580 feet [8 miles]) and assuming 25% (10,895 square feet) of the area would result in a change in ground cover, but very little tree loss, because many of the new trails would consist of mown paths through areas of existing grass and lawn, as discussed in additional detail below.

A total of approximately 8,610 square feet (0.2 acre) of vegetation would be permanently disturbed by the construction of footings for new pedestrian bridges over the Monocacy River at the MD 355 and I-270

bridges. The construction of the pedestrian bridge over Bush Creek would also likely require the permanent disturbance and/or removal of approximately 515 square feet (less than 0.1 acre) of vegetation along the banks of that water body. Vegetation in areas that would be temporarily disturbed by bridge construction (e.g., to provide access for construction equipment) would be restored to pre-project conditions following the completion of each project; thus, there would be no permanent impacts on vegetation in these areas.

The restoration of the viewshed between the Thomas and Worthington Farms would include the removal of an estimated 1,437,480 square feet (33.3 acres) of vegetation, including trees. Alternative B would have no impact on vegetation contributing to the historic character of the farms, as trees documented by HALS and the contributing stands of Osage orange are not located within the areas targeted for removal. Generally, vegetation removal on the Thomas and Worthington Farms would occur in vegetated areas that have developed since the end of the farms' historic period in 1915 and would include the extensive removal of specimens of non-native invasive species and other low-quality vegetation. The removal of vegetation in these areas would occur in phases over a 10 to 20 year period, and areas where vegetation is removed would be replanted with appropriate ground cover such as a native grass meadow and shrub mixes. Once cleared, the areas would be periodically maintained to prevent the regeneration of woody vegetation, except where land is seasonally cultivated by farmers. The removal and management of vegetation in these areas and their restoration with period-appropriate vegetation would be consistent with NPS policies to maintain cultural and historic properties on its lands.

Precise estimates of the number of trees that would be removed to facilitate projects included in Alternative B are not available at the current stage of planning. However, the establishment of many trails and other projects included in Alternative B, such as the kayak launch and associated parking area, the trail on Thomas Farm along the former Georgetown Pike alignment, trails within Best and Worthington Farms, and Gambrill Mill trails would avoid tree removal and would be limited to maintaining a mowed path through areas of existing lawn and grass to the extent practicable and feasible. With the exceptions of the trail on the Best Farm linking the Confederate battery with the Best Farm entrance lane and the Union trail along the former Georgetown Pike, it is anticipated that all projects would be established outside areas of the park currently used for agricultural purposes.

As determined necessary by the NPS, additional analysis of vegetation disturbance and removal would be conducted as project planning and design advances. All tree removals necessitated by projects included in Alternative B would be conducted under the supervision of an NPS or other qualified arborist. Vegetated areas disturbed by the projects but not developed or otherwise built on would be restored to pre-construction conditions following the completion of each project. All vegetation disturbance and removal would be mitigated by the planting or restoration of vegetation in accordance with applicable NPS policies.

The mowing of small portions of agricultural fields to maintain the proposed Union trail along the former Georgetown Pike and the trail on the Best Farm linking the Confederate battery with the Best Farm entrance lane would be in accordance with NPS policies to maintain cultural and historic properties on its lands. Overall, Alternative B would disturb or remove approximately 10 percent of forested areas within the park. However, vegetation disturbance and removal totaling 41 acres that would result from Alternative B would constitute a small proportion—approximately 3 percent—of the battlefield's 1,647 acres. Further, implementation of the individual projects over a period of 10 to 20 years would further minimize impacts, as vegetation planted to mitigate impacts from earlier projects would have ample time to establish as other projects occur later in the implementation period. As noted above, vegetation removal included in Alternative B would include the

clearing of substantial quantities of non-native invasive plant specimens and other low-quality vegetation. Tree removal could be mitigated in part by adding appropriate native tree plantings to enhance the riparian buffer areas within the park, but only after consideration of the cultural landscape and further Section 106 consultation.

Construction-related disturbance, the presence and operation of construction vehicles and equipment as well as the storage and installation of construction materials would have the potential to introduce new or additional specimens of non-native invasive plants at Monocacy National Battlefield. To minimize this risk, the NPS and its contractors would adhere to the following best management practices as applicable:

- Construction vehicles and equipment would be power washed and/or vacuumed regularly to reduce the potential for accidentally introducing invasive plants from another area.
- Construction vehicles and equipment would use existing roads and trails to the extent possible.
- Construction equipment and materials would be transported by trailer from park entry points to the project sites, and between various portions of the project sites, to the extent possible.
- Staff and contractors would be educated on the importance of invasive plant species prevention, including the power washing of vehicles and equipment prior to entering parks, cleaning clothes and footwear, and cleaning power and hand tools.

Adherence to these procedures would ensure that adverse impacts resulting from the introduction of non-native species would remain minimal.

For the reasons presented above, Alternative B would have noticeable adverse construction-related and long-term noticeable impacts on vegetation. However, such impacts would be somewhat offset by noticeable beneficial impacts resulting from the removal of non-native invasive plants and the restoration of period-specific vegetation within the park.

Cumulative Impacts: Alternative B would have noticeable impacts on vegetation at Monocacy National Battlefield. Other past, present and reasonably foreseeable future projects that have or will likely have cumulative impacts on vegetation at and in the vicinity of Monocacy National Battlefield include ongoing development projects at and in the vicinity of the battlefield; the replacement of the MD 355 bridge over the CSX railroad tracks; the NPS Antietam-Monocacy-Manassas Deer Management Plan; the NPS National Capital Region Invasive Plant Management Plan; and the NPS Monocacy National Battlefield Wildland Fire Management Plan. Most if not all of the construction- and development-related projects listed above have or would potentially result in net losses of vegetation; however, it is likely that such losses would be mitigated to some degree by federal, state and/or local requirements for vegetation restoration.

The NPS deer, invasive plant, and fire management plans would likely result in beneficial impacts on vegetation by removing invasive species and/or other stressors that would enable native species to thrive. However, such beneficial impacts would be limited to relatively small areas of the region and collectively would likely not be enough to offset vegetation loss from other projects. Therefore, because impacts on vegetation from Alternative B would be noticeable, it would contribute to cumulatively adverse impacts on vegetation when considered with other past, present and reasonably foreseeable future actions occurring at and in the vicinity of Monocacy National Battlefield.

Conclusion: Alternative B would have noticeable adverse impacts and some beneficial, noticeable impacts on vegetation and would contribute to cumulatively adverse impacts on vegetation when considered with other past, present and reasonably foreseeable future projects occurring at and in the vicinity of Monocacy National Battlefield.

Geology and Soils

Affected Environment

Geology

Monocacy National Battlefield lies within the Piedmont physiographic province, a landscape characterized by gently rolling hills that become gradually steeper towards the western edge of the province (Thornberry–Ehrlich 2008 in NPS 2011). Within the Piedmont physiographic province, the battlefield is located in the Frederick Valley, a lowland province that extends north from the Potomac River to northern Frederick County (Brezinski and Reger 2002 in NPS 2011). The battlefield’s topography consists of rolling hills and river valleys, and elevations range from 210 to 490 feet above sea level (NPS 2011).

The battlefield is predominantly underlain by the bedrock of the Frederick Formation, which consists of limestone and dolostone intermixed with shale and sandstone. The Araby Formation, consisting of metasiltstone and metashale and the Ijamsville Phyllite Formation, composed of phyllite, slate and quartz underlie the remainder of the park (NPS 2011). These formations are overlain by alluvial sediments mostly consisting of clay, silt, sand, gravel and cobbles on the Monocacy River floodplain, as well as colluvium consisting of chips and cobbles derived from the erosion of Araby Formation bedrock on the lower slopes of ridges (Southworth and Denenny 2006 in NPS 2011).

The Frederick Valley contains the second-largest abundance of karst topography in Maryland. The term karst describes landscapes that have formed from the dissolution of underlying bedrock and are often underlain by carbonate rock such as that comprising the Frederick Formation. Examples of karst landforms include fissures, caverns and sinkholes. Karst landscapes are characterized by underground drainage networks that commonly bypass surface drainage divides. While more than 1,000 karst features have been documented in the southern part of the Frederick Valley, such features around Monocacy National Battlefield have not yet been inventoried (USGS 2002; Thornberry-Ehrlich, T. 2008). However, low-lying areas adjacent to the Monocacy River within the park are known to be underlain by karst features that facilitate groundwater flows that provide immediate recharge to the river (NPS 2008).

Soils

More than 30 soil series have been mapped by the U.S. Department of Agriculture’s Natural Resources Conservation Service (NRCS) at Monocacy National Battlefield. Soils within floodplains at the park generally consist of the Codorus and Lindside series, while soils of the Cardiff and Whiteford series are predominant in upland areas. A number of soil series in flatter areas of the battlefield area classified as prime farmland or Farmland of Statewide Importance, which are designations identifying land that has a favorable combination of physical and chemical characteristics to promote greater production of crops, pasture, or hay (NPS 2011). Soils in upland areas of the park have a low to moderate susceptibility to erosion, while soils with a higher susceptibility to erosion generally occur in lowlands adjacent to rivers and streams.

About the Analysis

Impacts on geology and soils in at Monocacy National Battlefield potentially resulting from the implementation of the proposed alternatives were analyzed in consideration of the types of projects included in the alternatives, their context and setting, and professional knowledge and judgment.

Impacts of Alternative A – No Action

Under Alternative A, none of the proposed projects would be implemented at Monocacy National Battlefield. Existing conditions would continue. This would have no impacts on geology. No decreases in soil permeability or increases in soil erosion or impermeable surface at the park would occur. Also, there would be no impacts on prime farmland or farmland of statewide importance. Thus, Alternative A would have no adverse impacts on soils at Monocacy National Battlefield.

Cumulative Impacts: Alternative A would have no adverse impacts on soils at Monocacy National Battlefield and would have no potential to contribute to cumulative impacts on soils when considered with other past, present and reasonably foreseeable future projects occurring at and in the vicinity of Monocacy National Battlefield.

Conclusion: Alternative A would have no adverse impacts on soils and would not contribute to cumulative impacts on soils when considered with other past, present and reasonably foreseeable future projects occurring at and in the vicinity of Monocacy National Battlefield.

Impacts of Alternative B – Action Alternative

Geology

Excavation associated with the projects included in Alternative B would generally be shallow, as noted above. The only projects included in Alternative B that would involve deeper penetration of underlying soils are the construction of the pedestrian bridges over the Monocacy River and Bush Creek. For the pedestrian bridge over the Monocacy River, it could be necessary to drive piles, including one in the river, to support the construction of the bridge structure and decks. However, it is expected that any pile driving necessitated by these projects would be to a relatively shallow depth (i.e., less than 200 feet), and would have no potential to penetrate the geologic strata underlying the battlefield.

Prior to implementing projects involving more extensive excavation or pile driving, the NPS would survey the project areas to identify karst features that could potentially be disturbed by such activities. As necessary, project design and engineering would incorporate best management practices and/or other avoidance and minimization measures to ensure that disturbance of karst features would be minimized or eliminated, and that the presence of such features would not pose a risk to human life and safety.

For these reasons, Alternative B would have no impacts on geologic features at Monocacy National Battlefield.

Soils

Conservatively, earth disturbance associated with Alternative B would total approximately 1,801,245 square feet (41 acres), which equates to a total of 115,177 cubic yards based on excavation depths between 0.5 and 4 feet depending on the type of project. These totals are discussed in additional detail in the following paragraphs.

Approximately 348,640 square feet (8 acres) of soils would be disturbed to construct an estimated 43,580 linear feet (8 miles) of new pedestrian trails within the park. This would equate to approximately 6,456 cubic yards of soil disturbance, assuming an average excavation depth of one-half foot. In a number of cases, however, the establishment of new trails would be limited to maintaining a mowed path through areas of lawn and grass and would involve little or no earth disturbance. Thus, the total volume of earth disturbance associated with the establishment of trails included in Alternative B is anticipated to be much less than that presented above.

Alternative B would also involve soil disturbance associated with the removal of trees and stumps in an approximately 1,437,480-square-foot (33-acre) area where the viewshed between the Thomas and Worthington Farms would be re-established. The volume of disturbance in this area would equate to approximately 106,480 cubic yards, assuming an average excavation depth of two feet. The construction of the footings for the pedestrian bridges over the Monocacy River at the MD 355 and I-270 bridges, and the construction of the I-270 pedestrian underpass would permanently disturb a total of approximately 15,125 square feet (0.4 acre), which equates to approximately 2,241 cubic yards assuming an average excavation depth of four feet. The construction of the pedestrian bridge over Bush Creek, as well as the replacement of the Gambrell Mill Boardwalk, would also involve soil disturbance. However, the areas disturbed by these projects would be substantially smaller than those described above. Areas temporarily disturbed during construction would be restored to pre-project conditions following the completion of the project; thus, there would be no change in soil permeability or increase in soil erosion in those areas.

During the construction phases of all the projects described above, the NPS and/or its contractors would adhere to applicable best management practices to minimize the erosion of exposed soils and the corresponding pollution and sedimentation of downstream watercourses. Projects involving 5,000 square feet or more of earth disturbance would obtain coverage under Maryland's General Permit for Stormwater Associated with Construction Activity (General Permit), which would require the preparation of an erosion and sediment control plan. Adherence to the requirements of the General Permit and erosion and sediment control plan would minimize construction-related impacts on soils. The phasing of the proposed projects over a period of 10 to 20 years would further minimize impacts on soils resulting from construction activities.

Soils considered not suitable to support construction of one or more of the proposed projects would be supplemented with clean fill soils as necessary. Clean fill soils would meet NPS criteria for such soils, including adherence to weed prevention strategies and would fulfill applicable engineering requirements for each project. Following the completion of each project, soils disturbed during construction but not developed or otherwise built on would be revegetated or otherwise stabilized, thereby ensuring that soils would not remain exposed to erosive forces. Surfaces the proposed paths would consist of either mown paths or permeable materials that would allow the percolation of stormwater into underlying soils; thus, no substantial areas of compacted soils or impermeable surface would be created as a result of Alternative B.

Some of the proposed projects, primarily consisting of various segments of the proposed pedestrian trails, would be built on soils classified as prime farmland or farmland of statewide importance. Such projects would include the proposed Union trail along the former Georgetown Pike and the trail on the Best Farm linking the Confederate battery with the Best Farm entrance lane. However, none of the proposed trails to be built on permeable materials would remove any land from active agriculture at the battlefield. The NPS mission to provide facilities such as trails that enhance visitors' cultural and historic experience of the battlefield would take precedence over providing land for agriculture. Only the proposed Union trail on Thomas Farm, which

would follow the historic Georgetown Pike alignment, would remove existing farmland from agriculture; however, as this trail would consist of a mowed path, it would have no effect on soils and the grass surface would mitigate potential erosion issues.

For these reasons, adverse impacts on soils resulting from Alternative B would be barely noticeable in the long term.

Cumulative Impacts: Impacts on soils resulting from Alternative B would be barely noticeable, and there would be no impacts on geology. Past, present and reasonably foreseeable future projects that could cumulatively impact soils and result in increased soil erosion at and in the vicinity of the park include ongoing utility and development projects at and in the vicinity of Monocacy National Battlefield and the replacement of the MD 355 bridge over the CSX railroad tracks. However, it is likely that these projects would adhere to applicable best management practices to minimize the erosion of soils disturbed by construction activities, and that all areas not developed or built on would be re-vegetated or otherwise restored to a pre-construction condition following the completion of each project, eliminating the potential for long-term soil erosion. Such impacts would be barely noticeable. Soil disturbance resulting from Alternative B would be minimized through adherence to applicable best management practices, revegetation and/or restoration of disturbed areas, and permitting requirements, which would ensure that impacts on soils remain negligible. Thus, although impacts on soils resulting from Alternative B would be adverse, they would contribute to barely noticeable cumulative impacts on soils resulting from other past, present and reasonably foreseeable future projects occurring in the vicinity of Monocacy National Battlefield.

Conclusion: Alternative B would have no impacts on geology and barely noticeable adverse impacts on soils resulting from construction-related disturbance and erosion. When considered with past, present and reasonably foreseeable future projects occurring in the vicinity of Monocacy National Battlefield, Alternative B would contribute to barely noticeable cumulative impacts on soils.

Visitor Use and Experience

Affected Environment

The visitor experience at Monocacy National Battlefield centers around the interpretation of the significance to the Battle of Monocacy within the context of the Civil War and American history. The primary visitor experience within the heart of the battlefield is meant to be a primarily peaceful, contemplative one, with interpretation available from brochures and/or wayside exhibits. Visitors interested in the history of the battlefield often begin their visit at the Visitor Center, where the park's exhibits and interpretive staff are headquartered. Local visitors and those interested in recreation often start their visit at a specific trailhead to walk on the existing trails. There are relatively few bicyclist visits to the park as the busy MD 355 can be difficult to navigate and no trail system connects areas of the battlefield for cyclists. Cycling within the park is permitted only on paved and gravel roadways. Some fishermen visit the park to fish along the Monocacy River, utilizing existing, informal access points. There are several picnic benches at the Visitor Center. There are no designated campgrounds within the park, and horseback riding is not permitted.

There are a number of ways to experience the park – through Visitor Center exhibits, via an auto tour with identified stops, along walking trails at key park sites, by viewing historic structures and monuments within the landscape, and in the near future by visiting interpretive exhibits at the Thomas Farm Tenant House. Visitors can walk the grounds and trails at the Best, Worthington, and Thomas farmsteads and the Gambrell Mill. The Thomas House is open to the public as the administrative headquarters of the park. The Lewis and Baker

farms, as well as the interiors of the Gambrill Mill, the Best, and Worthington houses are closed to the public. Access to the railroad junction and the Wallace Headquarters area is not provided. There are also five commemorative monuments in the park, three erected by Civil War veterans and two that were established on the battlefield during the 50th and 100th anniversaries of the Battle of Monocacy.

Visitation to the park increased steadily since it opened in 1991, from approximately 8,000 annual visitors to almost 64,600 annual visitors in 2015 (NPS 2009; NPS 2016). While the park's 7 miles of trails provide visitors an opportunity to experience the battlefield on foot in a landscape generally consistent with the Civil War era, there are currently a number of physical barriers within the park that limit visitor access, circulation, and interpretation of the battle. As noted previously, the most physically prevalent barriers are I-270, the Monocacy River, MD 355, and the CSX Railroad tracks. Interpretive signs and waysides are located at several disconnected areas of the park. Currently only a portion of the Gambrill Mill trail and the Visitor Center provide universal access for all visitors.

Pedestrian and Bicycle Access

There are no sidewalks, multi-use paths or designated bike lanes connecting Monocacy National Battlefield to surrounding areas of Frederick County. Pedestrians may use informal paths along, and bicyclists may legally ride on, nearby local roads to gain access to the battlefield.

Six walking trails are designated at Monocacy National Battlefield. These trails are shown on Figure 10 (existing conditions) and are described as follows (MNB 2016):

- **Junction Trail:** a 1-mile out-and-back trail that begins and ends at the Visitor Center in the northern portion of the battlefield. The trail provides scenic views of the historic railroad junction as well as interpretive waysides.
- **Gambrill Mill:** a 1/2-mile loop trail in the eastern portion of the battlefield that provides scenic views of the Monocacy River as well as interpretive waysides. A segment of the trail from the parking area to the river shoreline is wheelchair accessible.
- **Worthington-McKinney Ford Loop Trail:** a 1.6-mile trail that encompasses the part of the battlefield where Confederate forces crossed the Monocacy River onto the Worthington farm and prepared to attack Union forces. The trail begins and ends at the Worthington house in the western portion of the battlefield and approximately half of the trail is located adjacent to the Monocacy River shoreline.
- **Brooks Hill Loop Trail:** a 1.9-mile trail adjacent to portion of the Worthington-McKinney Ford Loop Trail that encompasses interior areas of the battlefield where Confederate troops prepared to attack Union forces following their crossing of the Monocacy River. The trail highlights substantive natural resources such as witness trees that were present at the time of the battle as well as upland and successional forests, and features an overlook of much of the battlefield from the top of Brooks Hill.
- **Middle Ford Ferry Loop Trail:** a 0.5-mile trail in the central portion of the battlefield that explores early settlement of the Monocacy region and provides views of the Monocacy River and its surrounding landscape. The Middle Ford Ferry Loop branches off from the Thomas Farm Loop Trail (see below).
- **Thomas Farm Loop Trail:** an approximately 1.8-mile trail to the west and north of the Thomas House site in the central portion of the battlefield. A portion of the trail encompasses the unpaved road that provides access to the Thomas Barn from Baker Valley Road.

As shown on Figure 10 (existing conditions) and described above, the availability of walking trails at the park is limited to discrete areas of the battlefield. The presence of natural and man-made features, such as the

Monocacy River, CSX railroad tracks, and I-270 and MD 355 corridors, inhibit continuous pedestrian circulation between the areas separated by those features and throughout the battlefield.

Water Access

The State of Maryland has designated the Monocacy Water Trail along the lower 41.4 miles of the 58-mile-long Monocacy River. The Monocacy Water Trail is part of the Chesapeake Bay Gateways Network. The Water Trail provides paddlers with an opportunity to experience Civil War-era landscapes and areas once inhabited by Native Americans and early European settlers who were attracted to the fertile, relatively flat valley adjacent to the Monocacy River, which was designated as a state scenic river under the Scenic and Wild Rivers Program in 1974 (Frederick County MD 2016).

The Monocacy Water Trail extends from the MD 77 bridge east of Thurmont to Monocacy River's confluence with the Potomac River at Dickerson, Maryland. Monocacy National Battlefield is located at Mile 25.7 of the Water Trail and borders portions of both the west and east sides of the river for about two miles. Much of the river's shoreline within the boundaries of the battlefield is lined with trees and vegetation, and no formal landings for kayaks or other watercraft are provided. However, boaters may beach their watercraft and access the battlefield at primitive sites where the river's banks are exposed by breaks in the vegetation.

About the Analysis

Potential impacts on visitor use and experience at and in the vicinity of Monocacy National Battlefield were analyzed in consideration of the current visitor uses and activities, types of projects included in the alternatives, the estimated increase in visitors that would result from the implementation of each alternative, and professional knowledge and judgment.

Impacts of Alternative A – No Action

Alternative A would not construct any new facilities, visitor amenities, or circulation elements within the park. No changes would occur to visitor facilities or their operation within the park, maintaining the existing visitor use and experience. The Monocacy Scenic River Water Trail would continue to be available for visitor use. No changes to current visitation levels would occur due to Alternative A. Visitors would continue to experience the park as it is today, and no impacts to visitor use and experience would occur.

Cumulative Impacts: Alternative A would have no impacts on visitor use and experience. 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 Monocacy National Battlefield.

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

Impacts of Alternative B – Action Alternative

Construction activities such as grading and excavation would temporarily close areas of the park to visitors and could limit use of certain trails or locations within the park, such as during the reconstruction of the Gambrill Mill Boardwalk and the addition of trail connections and pedestrian bridges. Construction would be dispersed across the park, phased over time (10-20 years), and construction work would occur during off-peak visitor use periods where possible, minimizing construction impacts.

New visitor circulation elements in the form of trails, pedestrian bridges, and a replaced boardwalk would be added to the park, increasing connectivity to currently disconnected areas of the park and increasing

opportunities for visitors to connect with the battlefield resources over approximately 8 miles of new pedestrian trails. Bicycle and multi-modal connections could be facilitated in the future as other agency planning efforts arise. Additional universally accessible paths, trails, and wayside exhibits would increase access to interpretation and recreation for all park visitors at the Gambrill Mill, Thomas Farm, and Worthington Farm.

Under Alternative B the NPS would construct approximately 43,580 linear feet (8 miles) of new pedestrian trails within the boundaries of Monocacy National Battlefield. The new trails would establish connections for visitors between areas of the park currently separated by natural and man-made features such as the Monocacy River, I-270, MD 355 and the CSX railroad tracks and facilitate continuous pedestrian access from the Visitor Center through nearly all areas of the battlefield. The pedestrian trail connections would be further facilitated by the construction of two new pedestrian bridges over the Monocacy River (at MD 355 and I-270); one over Bush Creek, which would link Gambrill Mill to the currently inaccessible site of the Wallace Headquarters area; and one pedestrian bridge under the CSX railroad tracks to the Wallace Headquarters area. New trails at Brooks Hill, Lewis Farm and Gambrill Mill would also provide access to additional areas of the park that are currently inaccessible to visitors. In addition, new trails in the vicinity of the Visitor Center would be universally accessible, while universal accessibility would be maintained at the reconstructed Gambrill Mill Boardwalk and associated trail. Generally, the new pedestrian trail connections would provide visitors with access to new or additional natural features, historic areas and/or vistas that would enhance visitors' understanding and appreciation of the battlefield, its amenities and the historic events that occurred there. These connections would have a beneficial impact on pedestrian facilities at Monocacy National Battlefield.

Visitors would have access to new and expanded views of and experiences within the battlefield. In some locations, the addition of cannons into the landscape would mark key sites and direct visitors to important views. In the short-term, the visual connection between the Worthington and Thomas Houses would be reestablished through tree removal and revegetation with low ground cover to retain an open and uninterrupted view between the two houses, allowing interpretation of the relationship between the farmhouses during the Battle of Monocacy. In the long-term, the potential land bridge over I-270 would physically reconnect the Worthington and Thomas Houses and would allow visitors to easily traverse the park and visualize the area's historic appearance without the interstate highway. Trails to key interpretive locations including the Wallace Headquarters area, would provide visitor access to sites that tell new elements of the battlefield's story.

Under Alternative B, a kayak launch area would be built along the north side of the Monocacy River near the CSX railroad bridge. This area would provide kayakers and operators of other types of small, non-motorized watercraft with a formally designated and safe area from which to launch or land their boats. The installation of an interpretive element at the sand bar along the river's eastern shoreline near Worthington Farm would further enhance boaters' experience within the battlefield and provide an additional area for rest and relaxation. The kayak launch would increase access to the Monocacy River Trail and the interpretive pull-off along the Ford Loop Trail would provide an opportunity to interpret the Worthington Ford.

New trails would provide both recreational as well as interpretive experiences. Additional areas of the park previously closed to visitor access would be opened, providing access to new opportunities for recreation and exploration at the Lewis Farm, Brooks Hill, and Gambrill Mill. In the long term, the addition of new

amenities, interpretation, and access at the park would cause noticeable beneficial impacts to visitor experience and could increase visitation to the park incrementally over time as a result.

Cumulative Impacts: Other past, present and reasonably foreseeable future projects that have or will likely have cumulative impacts on visitor use and experience within the park include the replacement of the MD 355 bridge over the CSX railroad tracks and the completion of pedestrian and bicycle trails included in the Frederick County Bikeways and Trails Plan in the vicinity of Monocacy National Battlefield. Both of these initiatives would be expected to have beneficial impacts to visitor use and experience. The noticeable beneficial impact of Alternative B, when combined with the adverse and beneficial impacts of other projects, would result in an overall beneficial cumulative impact.

Conclusion: The construction of new elements within the park would improve visitor access and connections to areas of the park, its resources and interpretative potential, but would also temporarily disrupt visitor access certain trails or locations within the park. Alternative B would result in temporary adverse impacts to visitor use and experience during construction; however, the impacts would be short-lived, within a site-specific area of the park, and phased over time. Following the construction period, Alternative B would have noticeable beneficial impacts to visitor use and experience, and would contribute to cumulatively beneficial impacts on visitor use and experience.

Operations

Affected Environment

Monocacy National Battlefield operations are directed by a permanent staff of 14 people. The 1,647-acre park is administered by a superintendent, who is supported by staff across five divisions that handle administration, interpretation, law enforcement, resource management, and facility management. Regional experts, seasonal staff, and a corps of volunteers support the park's operations and full-time staff.

Interpretive staff are located at the Visitor Center to provide visitor orientation, education, and interpretation, and conduct tours for school groups and special events. NPS rangers enforce federal and state laws within park boundaries and monitor activities throughout the park on a daily basis, including patrolling the river and existing trails on foot and by vehicle. Resource management staff are focused on research, planning and stewardship of the park in order to ensure the use and enjoyment of cultural and natural resources minimizes negative effects on them. The facility management staff is charged with maintaining all 52 historic structures in the park (as per the park's list of classified structures), all modern facilities, visitor use area, and circulation systems (trails and internal roads).

About the Analysis

Impacts on Monocacy National Battlefield operations potentially resulting from the implementation of the proposed alternatives were analyzed in consideration of the types of projects included in the alternatives, existing operations requirements and park capacity, the estimated increase in visitors that would result from the implementation of each alternative, and professional knowledge and judgment. Operations and management, in this context, refers to the ability of NPS staff to protect and preserve park resources and facilities, and to provide for an effective visitor experience.

Impacts of Alternative A – No Action

Alternative A would not construct any new facilities or circulation elements within the park, and there would be no changes to current visitation levels, facility management or operation procedures. Because no new

construction would occur, existing staffing levels and park resources would continue to be applied to park operations and management, and no impacts would occur.

Cumulative Impacts: Alternative A would have no impacts on NPS operations. 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 park.

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

Impacts of Alternative B – Action Alternative

Construction activities such as grading and excavation would temporarily alter facility management and disrupt operations in the vicinity of the construction site by potentially limiting access to areas of the park. Construction would be dispersed across the park and phased over time (10-20 years), minimizing construction impacts.

New visitor circulation elements in the form of trails, pedestrian bridges, and a replaced boardwalk would be added to the park, increasing the number of facilities and land area that staff would need to patrol, maintain, preserve, and interpret. In addition, the addition of new circulation would increase visitor use of some of these existing circulation routes and could increase visitation over time, which would result in a need for increased facility management. The new elements, including several bridge structures and 8 miles of new trails, would increase demands on park facility management, law enforcement, interpretive, and resource management staff and would increase facility management costs. These elements would support the park's mission but would also place additional burden on existing budgets and schedules, potentially without an increase in funding or staff.

Cumulative Impacts: Other past, present and reasonably foreseeable future projects that have or will likely have cumulative impacts on NPS operations within the park include the replacement of the MD 355 bridge over the CSX railroad tracks; the NPS Antietam-Monocacy-Manassas Deer Management Plan; the NPS National Capital Region Invasive Plant Management Plan; and the NPS Monocacy National Battlefield Wildland Fire Management Plan. These projects have associated operational requirements and demands; however, the planning documents provide the park with operations support. Therefore, the adverse impact of Alternative B, when combined with the adverse and beneficial impacts of other projects, would result in an overall adverse cumulative impact.

Conclusion: The construction of new elements within the park would improve visitor access, but also temporarily disrupt operations in the vicinity of the construction site and permanently increase NPS staff and budget requirements. Alternative B would result in temporary adverse impacts to NPS operations during construction; however, the impacts would be short-lived, within a site-specific area of the park, and phased over time. Following the construction period, Alternative B would have noticeable adverse impacts to NPS operations due to long-term requirements associated with the additional park facilities, and would contribute to cumulatively adverse impacts on NPS operations.

Summary of Environmental Consequences

A summary of the environmental consequences of each alternative will be presented in a table following the impact analysis.

Table 3: Summary of Environmental Consequences

Park Resource	Alternative A – No Action Alternative	Alternative B – Action Alternative
Historic Buildings and Structures	Alternative A would result in undetectable, neither adverse nor beneficial impacts on historic buildings and structures.	Alternative B would result in direct and indirect detectable, incremental adverse impacts to buildings and structures. .
Cultural Landscapes	No detectable adverse impact to cultural landscapes would occur under Alternative A.	Alternative B would have noticeable beneficial impact and incremental, noticeable adverse impacts to cultural landscapes.
Archeological Resources	No impacts would result, as no ground disturbance would occur.	New trail locations would avoid known, documented archeological sites; however due to the possibility of undocumented archeological resources throughout the park, there is a potential for adverse impacts to archeological resources due to the ground disturbance required to develop proposed elements; however, mitigation measures would be taken to ensure impacts are minimized to the greatest extent practicable.
Wetlands	No impacts would result, as no wetlands would be disturbed.	Through adherence to avoidance, minimization and compensation measures that will be identified for each of the projects that would disturb wetlands at Monocacy National Battlefield, Alternative B would not result in noticeable long-term impacts on wetlands.
Water Resources and Stormwater	Continued erosion and sedimentation would have incremental but barely noticeable long-term impacts on water quality in the Monocacy River and, further downstream, the Potomac River.	With the adherence to best management practices and mitigation measures, there would be minimally noticeable short-term and long term impacts on water resources and stormwater.
Vegetation	No impacts would result, as no vegetation would be disturbed.	Alternative B would have noticeable adverse construction-related and long-term impacts on vegetation, with some beneficial impacts resulting from the possible removal of non-native invasive plants during the construction of the

		proposed projects.
Geology and Soils	There would be no impacts to geology or soils.	<p>Alternative B would have no impacts on geology and barely noticeable adverse impacts on soils resulting from construction-related disturbance and erosion. Short-term adverse impacts on soils would be mitigated through the use of applicable best management practices.</p> <p>There would be no impacts on geologic features in Alternative B.</p>
Visitor Use and Experience	No impacts would occur to visitor use and experience.	Alternative B would result in temporary adverse impacts to visitor use and experience during construction; however, the impacts would be short-lived, within a site-specific area of the park, and phased over time. Following the construction period, Alternative B would have noticeable beneficial impacts to visitor use and experience.
NPS Operations	Alternative A would have no impacts on NPS operations.	Alternative B would result in temporary adverse impacts to NPS operations during construction; however, the impacts would be short-lived, within a site-specific area of the park, and phased over time. Following the construction period, Alternative B would have noticeable adverse impacts to NPS operations due to long-term requirements associated with the additional park facilities.

Mitigation Measures of the Action Alternatives

This section provides a summary of the mitigation measures described throughout the impact analysis to avoid and/or minimize environmental impacts under the action alternatives.

Cultural Resources

- When planning or undertaking any project that could affect cultural landscapes, comply with the recommendations in the relevant CLRs and incorporate the guidance into the project design.
- If no CLR has been completed, consider a project-specific cultural landscape assessment to identify the best approach to preserve and maintain park landscapes (for example, the battlefield at large has not been documented in a CLR, only some of its component landscapes).
- Continue to undertake research and documentation of historic buildings and cultural landscapes in the park and develop comprehensive guidance for their preservation and treatment (reports could include HSRs, CLIs and CLRs).
- For any proposed project that may affect historic buildings or cultural landscapes, consult with MD SHPO and other parties both informally and formally as part of Section 106 compliance.
- All new construction in the vicinity of historic buildings, structures, or landscapes should be undertaken according to NPS policy, in compliance with the *Secretary of Interior Standards for the Treatment of Historic Properties*.
- Conduct an archeological survey for undocumented areas where ground disturbance is proposed after exact project footprints are identified and prior to any site work.
- If NRHP-eligible archeological resources are present, define the appropriate avoidance, minimization and mitigation measures to be taken.
- An earthworks management plan could be completed to document the earthworks and surrounding landscape, which may contain surface or subsurface resources related to the major earthworks, such as artifacts or smaller foxholes, etc. Such a plan would also provide guidance for vegetative cover, erosion management, visitor access strategies, and interpretation that would sustain and protect the earthworks while accommodating visitor access to the area.

Natural Resources

- Avoid suspected wetland areas to the extent possible. In areas where wetland avoidance is not possible, delineate wetland boundaries and establish limits of disturbance to minimize impacts on wetlands.
- Coordinate with applicable regulatory agencies, including the U.S. Army Corps of Engineers and the Maryland Department of Natural Resources to develop a site-specific mitigation plan identifying how areas disturbed during construction would be restored to pre-construction conditions.
- Adhere to best management practices (BMP) to minimize vegetation disturbance, erosion and runoff that could result in the sedimentation and pollution of downstream watercourses.
- Establish limits of disturbance for each project during detailed planning and design to minimize disturbance of the 100-year floodplain to the extent practicable.
- For projects involving one or more acres of earth disturbance, obtain coverage under Maryland's General Permit for Stormwater Associated with Construction Activity (General Permit), which would require the preparation of an erosion and sediment control plan.
- Adhere to BMPs for the state-listed threatened Allegheny Pearl Dace for all ground-disturbing activities.

- Incorporate new northern long-eared bat survey information into park planning and management decisions and adhere to a time of year and distance restrictions for tree removal, updating best practices as guidance evolves.
- Tree removal for the restored view between the Thomas and Worthington farms would have a beneficial impact to the cultural landscape but an adverse impact to natural resources. A potential mitigation action would be adding appropriate native tree plantings to enhance the riparian buffer areas within the park. Tree planting areas should be selected for their natural resource value as well as avoid areas of historically important open fields and views as documented in the CLRs for the park.

Consultation and Coordination

NPS conducted public involvement during the NEPA process to provide an opportunity for the public to comment on the proposed action. Consultation and coordination with federal and state agencies, park partners, and other interested parties was also conducted to develop 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.

NPS held two formal agency and park partner scoping meetings during planning for the proposed Public Access Plan, is conducting ongoing Section 106 consultation, and conducted Section 7 consultation.

NPS initiated consultation with the Maryland Historical Trust (MHT), which serves as Maryland's SHPO, in a later dated September 16, 2015. An Assessment of Effects has been prepared for the project and will be sent to MHT for review in conjunction with this EA. Because the park is part of a National Historic Landmark district and subject to additional review under the National Historic Preservation Act [54 U.S.C. 306107 and 36 CFR 800.10], the NPS consulted with the National Capital Region National Historic Landmark Program Office. Implementation of future projects that fall under this Plan will require consultation with the SHPO and the laws and regulations applicable to National Historic Landmarks will apply (namely 54 U.S.C. 306107 and 36 CFR 800.10).

NPS initiated Section 7 consultation via the online ECOS system on June 18, 2016. NPS provided additional information on the northern long-eared bat and the Indiana bat via a letter and information package submitted August 23 and 24, 2016. In a letter dated October 25, 2016, the USFWS concurred with the NPS determination that the project is not likely to adversely affect the northern long-eared bat or the Indiana bat (see Appendix A). Ongoing USFWS consultation would occur, as needed as projects in the Public Access Plan progress.

NPS also held two public scoping meetings 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.

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
- Maryland Department of the Environment
- Maryland Department of Natural Resources
- Maryland Historical Trust (SHPO)
- State Highway Association - District 7
- Frederick County Executive Office
- Frederick County Planning Department

- Frederick County Division of Utilities and Solid Waste Management
- Frederick County Parks and Recreation
- City of Frederick Planning Department
- Monocacy Scenic River Board
- CSX Transportation
- Heart of the Civil War Heritage Area
- Civil War Trust
- Journey Through Hallowed Ground National Heritage Area
- National Museum of Civil War Medicine
- Potomac Appalachian Trail Club
- Maryland Office of Tourism
- National Parks Conservation Association
- Maryland Office of Tourism Development
- Frederick County Landmarks Foundation
- Tourism Council of Frederick County
- Preservation Maryland
- Frederick Bike Coalition

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Gene Carr, Facilities Management

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Reid Fellenbaum, Landscape Designer

Sean Rousseau, Civil Engineer

Elliott Mandel, Structural Engineer

References

- Brezinski, D.K. and J.P. Reger. 2002. Stratigraphy–karst relationships in the Frederick Valley of Maryland. In: Kuniandy, E.L. (ed). U.S. Geological Survey Karst Interest Group Proceedings, Shepherdstown, West Virginia. August 20–22, 2002. U.S. Geological Survey Water-Resources Investigation Report 02-4174.
- Federal Highway Administration, Maryland Division (FHWA-MD). 2016. *MD 355 Bridge Over CSX; (Bridge No. 1008400) Frederick County, Maryland, Environmental Assessment / Draft 4f Evaluation, March 2016*. Prepared by Stantec Consulting Services, Inc.
- Frederick County, Maryland. 2016. Monocacy Scenic River Water Trail Map & Guide. Accessed on May 17, 2016 at <https://www.frederickcountymd.gov/DocumentCenter/Home/View/1275>.
- Frederick County, Maryland TransIT (TransIT). 2016. Connector Bus Schedules. Available at <https://frederickcountymd.gov/199/Connectors> as accessed on June 13, 2016.
- International Union for Conservation of Nature Red List (IUCN). 2016. *Margariscus margarita*. Available at <http://www.iucnredlist.org/details/summary/202156/0> as accessed on June 22, 2016.
- Maryland Transit Administration (MTA). 2016. Brunswick Line Full Timetable. Available at <https://mta.maryland.gov/marc-train> as accessed on June 13, 2016.
- Monocacy National Battlefield (MNB). 2016. Walking Trails. Accessed on May 17, 2016 at https://www.nps.gov/mono/planyourvisit/foot_trails.htm.
- Monocacy Scenic River Local Advisory Board (MSRLAB). 1990. *The Monocacy Scenic River Study and Management Plan*. Approved May 1990.
- National Park Service (NPS). 2009. *Abbreviated Final General Management Plan / Environmental Impact Statement. Monocacy National Battlefield*. Frederick County, Maryland. October 2009.
- National Park Service (NPS). 2005. Best Farm Monocacy National Battlefield Cultural Landscape Report, Monocacy National Battlefield, Maryland. National Park Service, National Capital Region.
- National Park Service (NPS). 2014 and 2009. Cultural Landscape Inventory: Thomas Farm (Araby) National Park Service. Frederick County, Maryland.
- National Park Service (NPS). 2013. Cultural Landscape Report, Thomas and Worthington Farms, Monocacy National Battlefield, Frederick, Maryland. Prepared by Michael Commisso and Martha Temkin, Resource Stewardship and Science, Division of Cultural Resources, National Capital Region.
- National Park Service (NPS). 2008. Draft General Management Plan and Environmental Impact Statement, Monocacy National Battlefield, Maryland. Prepared by the National Park Service Denver Service Center.
- National Park Service (NPS). 2014. *Final White-tailed Deer Management Plan and Environmental Impact Statement, Antietam National Battlefield, Maryland, Monocacy National Battlefield, Maryland, Manassas National Battlefield, Virginia, Summer 2014*. National Park Service, U.S. Department of the Interior.

- National Park Service (NPS). 2008. *Draft General Management Plan and Environmental Impact Statement, Monocacy National Battlefield, Maryland*. Prepared by the National Park Service Denver Service Center.
- National Park Service (NPS). 2004. Historic Resource Study. Monocacy River National Battlefield: Historic Resource Study, Southeast Region.
- National Park Service (NPS). 2008. Monocacy National Battlefield Geologic Resource Evaluation Report [Natural Resource Report NPS/NRPC/GRD/NRR-2008/051]. Geologic Resource Division, Denver Colorado. September 2008.
- National Park Service (NPS). 2011. *Monocacy National Battlefield Natural Resource Condition Assessment, National Capital Region, Natural Resource Report NPS/NCRN/NRR—2011/415*. Prepared by National Park Service Natural Resource Stewardship and Science, Fort Collins, Colorado.
- National Park Service (NPS). 2006a. Monocacy General Management Plan – Draft – September 2006.
- National Park Service (NPS). 2006b. Monocacy National Battlefield – Nature and Science. Last updated July 25, 2006. Available at: <http://www.nps.gov/mono/naturescience/>. Accessed January 19, 2012.
- National Park Service (NPS). 2016. *National Capital Region Invasive Plant Management Plan and Environmental Assessment*. Prepared by AECOM.
- National Park Service (NPS). 1973. National Register of Historic Places Inventory, Nomination Form: Monocacy Battlefield. Form No. 10-3000 Rev. 6-72. Frederick County, Maryland.
- National Park Service (NPS). 2016. Visitor Use Statistics. Available at: <https://irma.nps.gov>. Accessed June 16, 2016.
- Peterjohn, B. 2006. Conceptual ecological model for management of breeding grassland birds in the Mid-Atlantic region. Technical Report NPS/NER/NRR—2006/005. National Park Service, Philadelphia, PA.
- Scott, W.B. and Crossman, E.J. 1973. Freshwater fishes of Canada. Fisheries Research Board of Canada, Ottawa, Canada.
- Southworth, S. and D. Denenny. 2006. Geologic map of the National Parks in the National Capital Region, Washington DC., Virginia, Maryland and West Virginia. Scale 1:24,000. Open-File Report OF 2005-1331. U.S. Geological Survey, Reston, VA.
- Thorneberry–Ehrlich, T. 2008. Monocacy National Battlefield geologic resource evaluation report. Natural Resource Report NPS/NRPC/GRD/NRR—2008/051. National Park Service, Denver, CO.
- Transportation Planning Information Hub for the National Capital Region (NCR TPIH). 2016. I-270/US15 Widening. Available at <http://www.transportationplanninghub.org/high-profile-projects/i-270us15-widening> as accessed on June 21, 2016.
- U.S. Census Bureau, American Community Survey. 2010-2014. DP:03 Selected Economic Characteristics. Available at <http://factfinder.census.gov>. Accessed June 6, 2016.
- U.S. Census Bureau, American Community Survey. 2010-2014. B02001: Race.. Available at <http://factfinder.census.gov>. Accessed June 6, 2016.

U.S. Fish and Wildlife Service. 2016. Indiana Bat (*Myotis sodalists*) Fact Sheet. Available at <https://www.fws.gov/midwest/endangered/mammals/inba/inbafctsht.html> as accessed on June 18, 2016.

Weeks D, Norris M, & A. Banasik. 2007. Water resources stewardship report: Monocacy National Battlefield. Natural Resource Technical Report NPS/NRPC/WRD/NRTR—2007/048. National Park Service, Fort Collins, CO.

APPENDIX A

Section 7 Consultation



Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Mark Belton, Secretary
Joanne Throwe, Deputy Secretary

February 12, 2016

Mr. Rick Slade
Monocacy National Battlefield
National Park Service
4632 Araby Church Road
Frederick, Maryland 21704

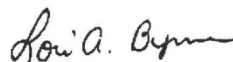
**RE: Environmental Review for EA for Monocacy National Battlefield, Public Access Plan,
Frederick County, Maryland.**

Dear Mr. Slade:

The Wildlife and Heritage Service has determined that there are records for the state-listed threatened Allegheny Pearl Dace (*Margariscus margarita*) documented in several tributaries to the Monocacy River that occur on this project site. In order to reduce the likelihood of adverse impacts to the Allegheny Pearl Dace and to other native aquatics in these tributaries, we would encourage the applicant to adhere stringently to all appropriate best management practices for sediment and erosion control, for any proposed ground disturbance.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,



Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2015.1508.fr
Cc: D. Feller, DNR



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
<http://www.fws.gov/chesapeakebay>



October 25, 2016

Mr. Craig Carver
AECOM
4840 Cox Road
Glen Allen, Virginia 23060

Re: "Not Likely to Adversely Affect" determination for northern long-eared bat and Indiana bat; Monocacy National Battlefield Public Access Plan in Frederick County, Maryland

Dear Mr. Carver:

The U.S. Fish and Wildlife Service (Service) has reviewed your project information from the Service's Information for Planning and Conservation (IPaC) online system dated June 18, 2016, an email from Ms. Susan Bemis of AECOM dated August 23, 2016, and from Mr. Andrew Banasik of the National Park Service's Monocacy National Battlefield dated August 24, 2016. The Service has evaluated the potential effects of this project to the threatened northern long-eared bat (*Myotis septentrionalis*) and endangered Indiana bat (*Myotis sodalis*). The comments provided below are in accordance with Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The proposed action includes a number of projects that would enhance pedestrian connectivity and the visitor experience at the battlefield. All of the proposed projects would be implemented within the boundaries of Monocacy National Battlefield.

A proposed extension and expansion of Brooks Hill Trail is planned. Additionally, there will be clearing of several non-contiguous areas within the battlefield, totaling approximately 33 acres, to restore historic lines of sight between historic farmsteads and other locations where particular events associated with the Battle of Monocacy took place on July 9, 1864.

While the federally threatened northern long-eared bat and endangered Indiana bat are known to occur in the project vicinity, this project as proposed is "not likely to adversely affect" the northern long-eared bat because there is no known maternity roost habitat or hibernacula in the project area. In addition, this project as proposed is "not likely to adversely affect" the Indiana bat because no forest clearing would occur between April 1 and October 31. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, these determinations may be reconsidered.



2

We appreciate the opportunity to provide information relevant to threatened and endangered fish and wildlife resources. This Endangered Species Act determination does not exempt this project from obtaining all permits and approvals that may be required by other state or Federal agencies. If you have any questions or concerns regarding this letter, please contact Trevor Clark of my Endangered Species staff at (410) 573-4527 or by email at Trevor_Clark@fws.gov.

Sincerely,



Genevieve LaRouche
Field Supervisor

cc: Susan Bemis, AECOM, Arlington, VA
Andrew Banasik, National Park Service, Monocacy National Battlefield, Frederick, MD