CHAPTER 4.0 ENVIRONMENTAL CONSEQUENCES

This chapter describes the potential environmental impacts of the two management alternatives prepared for Great Falls Park. As discussed in Chapter 2 of this document, these are:

- Alternative A – Status Quo/Continuation of Current Conditions
- Alternative B – Preferred Alternative

The resource areas assessed in the analysis of environmental consequences were identified based on legislative requirements, resource knowledge and information, and concerns identified by the public and governmental agencies during scoping.

Environmental Consequences discussed in this GMP/EIS are formatted in accordance with the NPS Director's Order 12 – NEPA Policy Manual. Since the EIS considers management alternatives, many of the potential impacts to individual resource areas are common to both alternatives. These are identified in the environmental consequences discussion.

The discussion in this chapter follows the "tiered" approach recommended in 40 C.F.R. Section 1502.14 that encourages agencies to tier their EISs, working from broad, general NEPA environmental impact analysis documents to more site-specific ones in decision making. The Great Falls Park GMP/EIS is a large-scale plan that identifies a broad direction. Therefore, some of the discussions in this chapter are generalized. In the future, additional environmental analysis may be conducted pursuant to NEPA, in instances where a specific action or activity, consistent with the goals and objectives of the GMP/EIS, is proposed.

This section also presents analyses of potential cumulative impacts that could result from a proposed action when considered together with any reasonably foreseeable projects that may affect the natural and human environment in the study area.

4.1 ALTERNATIVE A – STATUS QUO/CONTINUE CURRENT CONDITIONS

This section of the document identifies potential impacts on resources that could result under Alternative A (Continue Current Conditions).

4.1.1 Impacts on Land Use and Socio-Economic Conditions

Land Use, Property Boundaries, and Land Protection

Under Alternative A, there would be no impacts to the surrounding uses. Land uses within the park would continue to function similar to existing conditions.

There are no boundary changes proposed under Alternative A. In the future, the park may undertake establishing a revised boundary based on the criteria identified in Chapter 2 of this document. At that time, in accordance with NEPA, the park may undertake additional environmental analysis to determine impacts resulting from the boundary change.

Establishing boundaries does not necessarily constitute a proposal to purchase the land within those boundaries. A variety of land protection methods are available within the authorized boundaries of the park units. In addition to fee simple acquisition, scenic, conservation, and access easements might be acquired, or local zoning and cooperative planning and management could be employed.

Visitation and Visitor Activities

Under Alternative A, there would be no changes to visitation in the short-term. In the long-term, the projected growth in the region, including Fairfax and Montgomery Counties, would likely result in increasing the number of visitors to the park. Currently, the availability of parking is the biggest determinant to the number of people who can visit the park at a given time. This condition is not anticipated to change in the future, since a majority of visitors to the park would visit in a vehicle. Under existing conditions, visitors experience delays entering the park on an average of 10 to 15 times per year. Technological improvements at the entrance station are anticipated to alleviate some of this delay. If visitation increases considerably in the future, there may be additional days when delays are experienced along Old Dominion Drive and potentially Georgetown Pike, resulting in an adverse impact to visitation.

Connecting the park to regional trails could mitigate some of this potential pressure, since visitors could access the park via non-motorized modes of transportation. However, depending on the increase in visitation demand, NPS could explore alternative means of providing access to the park in the future, including connecting Great Falls Park to a potential regional shuttle system.

Connecting the park to regional trails would also provide visitors additional recreational opportunities. Visitors could arrive at the park on these trails, or start at the park and explore the larger region. The additional recreational opportunities would result in a positive impact on visitor experience.

In addition, the following measures would result in potential impacts on the experience of visitors to the park as described:

- *Improve visitor center to enhance its appearance including the courtyard, use interior space more efficiently, modify one of the entrance ramps to meet ADA requirements, rehabilitate existing restroom facilities at the visitor center and comfort facility:* During renovations to the visitor center and comfort facility, there would be minor, short-term adverse impacts on visitor experience of these facilities. However, over the long-term, once these renovations are completed, visitors would benefit from the improved facilities.

- *Improve signage to identify allowable uses on trails:* This improvement would help with visitor orientation as well as reduce conflicts between various user groups on the park's trail system. Provided these signs are designed to ensure that they are compatible with the park's natural condition and do not add visual clutter, this measure would result in a positive impact on visitor experience at the park.

Community Facilities - Police, Fire, and Rescue Services

Under Alternative A, during vehicular traffic back-ups along Old Dominion Drive, police, fire, and rescue services would continue to experience delays in accessing the park during emergencies. Technological improvements at the entrance station are anticipated to alleviate some of the delay and could improve emergency access.

Neighboring Population and Socio-Economic Conditions

The socio-economic characteristics of the area surrounding the park primarily includes established residential communities, with institutions interspersed within. Changes in the management and operations of the park in accordance with Alternative A are not anticipated to result in a change in population characteristics in the study area, or result in the addition or elimination of large number of jobs. Therefore, impacts anticipated on the neighboring population and socio-economic conditions would be negligible under the Alternative A.

Cumulative Impacts

Under Alternative A, no cumulative land use and socio-economic impacts are anticipated.

Conclusion

Under Alternative A, there would be temporary and short-term impacts on land use resources, including visitation and visitor activities, which would be related to renovation activities. Over the long-term, the proposed measures are anticipated to result in positive impacts as park facilities would be improved consistent with NPS management policies. Also, in the long-term, increasing growth in the region could result in increasing visitor demand at the park. Since there is no proposal to increase parking within the park, added demand could increase the number of times when visitors experience delays in accessing the park. While technological improvements at the entrance station and connection to regional trails is anticipated to reduce the number of

times visitors experience delays in entering the park, the park would consider new measures, if delays to enter the park do increase due to increased demand in the future.

The proposed measures would not impact the socio-economic characteristics of the neighboring areas, nor are there any adverse impacts anticipated from boundary changes based on the criteria that would be used to acquire more land. Therefore, there would be no impairment of land use and socio-economic resources under Alternative A.

4.1.2 Impacts on Cultural Resources

Archaeological and Historic Resources

Their potential impacts on cultural resources within the park would be as follows:

- *Develop an Integrated Resource Management Plan (IRMP) to protect sensitive cultural resources from potential vegetation damage and adopt best management practices (BMP) to protect cultural resources that are either listed, or eligible for listing, on the National Register:* These measures are anticipated to result in a beneficial impact since the IRMP and BMPs would seek to minimize potential damage from trees and other vegetation on cultural resources, including the Patowmack Canal and Matildaville.

- *Provide additional protection to natural and cultural resources by implementing practices such as fences adjacent to trails to reduce conflicts with visitors:* These measures would result in a positive impact on archaeological and historical resources in the park. Visitors would be guided away from sensitive areas due to addition of protection measures in areas where trails conflict with natural and cultural resources.

- *Evaluate existing undesignated trails and eliminate those that adversely impact natural or cultural resources:* Eliminating undesignated trails in areas of conflict with cultural resources would result in a positive impact.

The use of trails for horseback riding in the vicinity of sensitive resources (such as along Matildaville Trail in the vicinity of the Matildaville ruins) would continue the potential for damage to these resources. Also, in the future, connecting to the regional trail network would increase the usage of trails within the park. Increased usage would increase the potential for damage to sensitive cultural resources such as the historic road traces that comprise some of the trail routes.

Viewsheds

Under Alternative A, there would be no changes to existing viewsheds.

Cumulative Impacts

Under Alternative A, no cumulative impacts on cultural resources are anticipated.

Conclusion

The measures proposed under Alternative A are anticipated to benefit the protection and preservation of cultural resources within the park, consistent with NPS management policies. However, the continued use of portions of existing trails that are either part of sensitive resources or adjacent to such resources would continue the potential for impairment of these resources.

4.1.3 Impacts on Natural Resources

Their potential impacts on natural resources within the park would be as described below:

Geophysical Resources

Under Alternative A, no impacts are anticipated on geophysical resources.

Water Resources

Under Alternative A, there would be no new impacts on water resources. The lower level of the visitor center and the two northern parking lots would continue to function within the 100-year floodplain, similar to existing conditions. The potential for flooding at the lower level of the visitor center, that includes staff offices and the food concession stand, would continue.

Also, trail erosion would continue due to regular use, and could impact surface and ground water resources. This would include the use of trails for horseback riding in the vicinity of sensitive water resources (such as near Clay Pond). In addition, in the future, connecting to the regional trail network would increase the usage of trails within the park. Increased usage would increase the potential for damage to sensitive natural resources such as the Difficult Run and Mine Run. To minimize potential impacts, the park would continue to monitor trails and make necessary repairs.

Biological Resources

Under Alternative A, the following measures would affect biological resources in the park:

- *Develop an Integrated Resource Management Plan (IRMP) to protect sensitive cultural resources from potential vegetation damage and adopt BMPs to protect cultural resources, especially those that are listed on the National Register:* An IRMP and BMPs are typically developed to reduce or eliminate potential environmental impacts. During the preparation of the IRMP and BMPs, the park would seek to protect sensitive cultural resources without adversely impacting biological resources. Therefore, this measure is not anticipated to result in an adverse impact.

- *Provide additional protection to natural and cultural resources by reducing conflicts with users on trails:* Such measures would reduce potential damage to natural resources (such as the rare species in terrace communities along the River Trail) by focusing on resource protection, and are anticipated to result in a positive impact on biological resources.

- *Evaluate existing undesignated trails and eliminate those that adversely impact natural or cultural resources:* Eliminating undesignated trails in areas of conflict with natural resources would result in a positive impact.

Air Quality

- *Introduce technology that expedites payment and other operational functions at the entrance station:* This measure would result in a negligible benefit to local air quality. Technological improvements are anticipated to result in an improved rate of traffic flow at the entrance station, which would reduce vehicle queues and localized engine idling-related vehicular emissions.

Noise Levels

Under Alternative A, there would be temporary construction-related noise generated during the renovation of the visitor center and maintenance facility, the impact of which would be negligible.

Cumulative Impacts

Under Alternative A, the anticipated growth in the region's population could result in increased visitation to the park. This could result in a considerable increase in vehicles waiting to access the park, resulting in a minor adverse impact on localized air quality. Also, the existing natural habitats within the park could be further burdened if the area around the park is developed in response to some of this anticipated regional growth.

Conclusion

Under Alternative A, there would be potential positive impacts to natural resources due to the proposed elimination of undesignated trails in areas where these conflict with sensitive resources. However, the continued use of portions of existing trails that are adjacent to sensitive resources would continue the potential for impairment of these resources. Also, the anticipated population growth in the region has the potential to result in a minor adverse impact on localized air quality, as well as burden the natural habitats within the park. Depending upon the pressures that may be experienced due to regional growth, the park would address this issue further in the future.

4.1.4 Impacts on Transportation Systems

Vehicular Access

The following actions are aimed to support these policies. Their potential impacts on transportation systems within and adjacent to the park would be as follows:

- *Introduce technology that expedites payment and other operational functions at the entrance station:* Potential technological improvements, such as where pass holders would swipe their cards to gain access, are anticipated to increase the processing rate, and reduce the waiting time at the gate for all visitors. Provided the parking lots are not full, queues that currently form during peak arrival periods would be reduced or potentially eliminated. This would result in a positive impact on visitor access to the park.

- *During severe crowding, initiate a one vehicle out, one vehicle in policy:* When this occurs, visitors waiting in line would be informed to expect delays. Vehicle crowding would continue to result in a minor adverse impact on visitor access to the park.

Parking

Under Alternative A, there would be no change to existing parking conditions. Long delays and large queues that are experienced on peak days would continue when the parking lots are full. These delays and queues could be more frequent than the current 10 to 15 times per year, if visitor demand increases in the future. Access to homes along Old Dominion Drive would continue to be blocked during these conditions on peak days. Also, visitors arriving after the lots fill would continue to wait in the queue along Old Dominion Drive due to the one vehicle out, one vehicle in policy and the lack of locations to turn around.

Cumulative Impacts

Over the long-term, the projected growth in the region could increase visitation to the park. This could result in additional days when delays are experienced along Old Dominion Drive and potentially Georgetown Pike, resulting in a minor adverse impact on the area's transportation systems.

Conclusion

Under Alternative A, the one vehicle out, one vehicle in policy would continue to result in delays in accessing the park, affecting visitor experience. Also, in the future, increasing growth in the region could result in increased visitation at the park, potentially increasing the number of times when visitors experience delays in accessing the park. While technological improvements at the entrance station are anticipated to reduce the number of times visitors experience delays in entering the park, the park would consider new measures, if delays to enter the park do increase due to increased demand in the future. Therefore, under Alternative A there would be no impairment of transportation systems within or near the park.

4.1.5 Impacts on Site Utilities

Under Alternative A, there could be negligible impacts on water supply and sanitary sewer systems due to the proposed improvements to existing restroom facilities, which may result in a slight increase in the use of potable water and create more wastewater. No other impacts are anticipated on site utilities.

Cumulative Impacts

Under Alternative A, no cumulative impacts are anticipated on site utilities.

Conclusion

The measures proposed under Alternative A would not result in the impairment of the park's utility system.

4.1.6 Sustainability and Long-Term Management

Short-Term Use of the Environment versus Long-Term Productivity

Under Alternative A, the impacts of back-ups along Old Dominion Drive, use of a flood-prone space in the visitor center by park staff, and inadequate space for park staff are not likely to be sustainable as the Washington DC metropolitan region continues to spread and demand for recreation in the park grows. These conditions could adversely affect long-term protection and enjoyment of park resources.

Irreversible and Irretrievable Commitments of Resources

Under Alternative A, there would be a potential for irreversible or irretrievable damage to cultural resources, especially to the Matildaville ruins, due to the park's inability to commit enough resources to mitigate natural and visitor-related impacts on these resources.

Unavoidable Adverse Impacts

Deterioration and eventual loss of some of the park's cultural resources may be considered an unavoidable adverse impact. Even if visitation does not increase considerably, the heavy use of the trails within vicinity of the visitor center, and the movement of visitors away from formal trails, would continue to impact sensitive cultural and natural resources.

4.2 ALTERNATIVE B – PREFERRED ALTERNATIVE

This section of the document identifies potential impacts on resources that could result under Alternative B (Preferred Alternative).

4.2.1 Impacts on Land Use and Socio-Economic Conditions

Land Use, Property Boundaries, and Land Protection

Under the Preferred Alternative, there would be temporary, minor impacts on the surrounding uses from construction-related activities at the park. The demolition of the maintenance facility, construction of the replacement operations (including maintenance) facility at the same location, and improvements at the visitor center, would result in temporary, construction-related traffic. No long-term impacts are anticipated on surrounding uses.

There are no boundary changes proposed under the Preferred Alternative. In the future, the park may undertake establishing a revised boundary based on the criteria identified in Chapter 2 of this document. At that time, in accordance with NEPA, the park may undertake additional environmental analysis to determine impacts resulting from the boundary change.

Establishing boundaries does not necessarily constitute a proposal to purchase the land within those boundaries. A variety of land protection methods are available within the authorized boundaries of the park units. In addition to fee simple acquisition, scenic, conservation, and access easements might be acquired, or local zoning and cooperative planning and management could be employed.

Visitation and Visitor Activities

Under the Preferred Alternative, it is unlikely that visitation would significantly increase or decrease in the short-term. Similar to Alternative A, in the long-term, the projected growth in the region would likely result in an increase in visitation at the park. Under existing conditions, visitors experience delays entering the park an average of 10 to 15 times per year. Technological improvements at the entrance station are anticipated to alleviate some of this delay. Also, the proposed electronic message boards and the radio signal would help to reduce some of the delays by conveying the traffic conditions to visitors, giving them an opportunity to visit other parks in the region. If the visitation increases considerably in the future, the number of days when delays are experienced along Old Dominion Drive and potentially Georgetown Pike could increase, resulting in an adverse impact.

Similar to Alternative A, connecting the park to regional trails could mitigate some of this potential pressure, since visitors could access the park via non-motorized modes of transportation. However, depending on the increase in visitation demand, NPS could explore alternative means of providing access to the park in the future, including connecting Great Falls Park to a potential regional shuttle system.

Also, similar to Alternative A, connecting the park to regional trails would provide visitors additional recreational opportunities and would result in a positive impact on visitor experience.

The demolition of the maintenance facility, removal of the USPP trailer, construction of the replacement operations facility, and improvements at the visitor center would result in a temporary, moderate adverse impact on visitor experience of the park's visitor facilities. However, over the long-term, visitors are anticipated to benefit from enhanced interpretive and educational opportunities that would be offered at the visitor center to provide a better understanding of the park's resources.

Overall, there would be a positive impact on visitor experience due to an increase in interpretive and educational programs. As identified in Chapter 3, approximately 73 percent of the visitors surveyed (in 1996) indicated that *viewing the Great Falls* was their predominant activity at the park; 41 percent of visitors surveyed indicated that *viewing wildlife* was their predominant activity; while 31 percent indicated *visiting the Potomac Canal* as their predominant activity. The visitors participating in these and other activities would benefit from an enhancement in exhibits and interpretive material, as well as access to cultural resources at the park, as proposed in the following actions:

- *Expand interpretive programs including promoting safety and providing guidance on how to recreate in a manner that minimizes impacts on park's resources:* This would include converting the space currently occupied by park staff in the visitor center (VC) to spaces for visitors. These measures would expand opportunities for resource interpretation at the park, while minimizing adverse impacts from visitor use on sensitive resources.

- *Preserve unexposed cultural resources by leaving them buried below the surface except in a few locations where uncovering them would significantly benefit interpretation at the park and not have an adverse impact on the resource:* Where cultural resources are uncovered, visitors would benefit from added resources that would become available for them to understand the significance of the park's cultural resources.

- *Stabilize and protect Matildaville:* A plan to stabilize and protect Matildaville, that would include increasing interpretation of the resource, would also benefit visitor experience.

The Preferred Alternative would include several actions that would result in potential adverse impacts on visitation and visitor experience, as identified below:

- *Issue an 'access pass', on a trial basis, to visitors seeking to engage in climbing, fishing, or scientific research in the area between the southern end of Overlook #3 and the Sand Box climbing area:* Since the park would provide this pass on a seasonal basis, in unlimited quantities, and free-of-charge, and since this would be a temporary condition until a Climbing Management Plan (CMP) is prepared, no adverse impacts are anticipated for visitors engaging in these activities. However, this measure would result in a temporary adverse impact on casual visitors since they would not be able to access this area.

- *Prepare a Climbing Management Plan that could potentially close specific areas on a temporary, periodic or permanent basis:* The park is currently engaged in a study to assess any impacts climbing activities may have on cliff habitat and rare plant species. If

adverse impacts are determined from climbing activities in the vicinity of sensitive resources, the park would develop measures to reduce such impacts. These measures could include limited use of anchors, access pass for certain areas, temporary or periodic closures, or under extreme conditions, permanent closures. These measures could modify the existing pattern of use for climbers and if a route is closed permanently, result in an adverse impact. The park will work with the public during the preparation of the CMP to address these concerns further and to develop measures that result in minimal impacts on the climbing community.

- *Prepare a Trails Management Plan that could require the realignment or closure of horse access to portions of Matildaville Trail and Mine Run Trail to minimize potential damage to resources:* During the preparation of the Trails Management Plan (TMP), the park would undertake a study to evaluate impacts of trail activities on sensitive natural and cultural resources. If adverse impacts are determined from horseback riding in the vicinity of sensitive resources such as the Mine Run or Matildaville, the park would develop measures to reduce such impacts. These measures could include fencing off areas, realigning trail segments or, under extreme conditions, closing routes. These measures could modify the existing pattern of use for horseback riders and if trails are closed, result in an adverse impact on these users. However, if the trails are realigned, there would be minimal impact on these users. The park will work with the public during the preparation of the TMP to address these concerns further and to develop measures that result in minimal impacts on the horseback riding community.

Community Facilities - Police, Fire, and Rescue Services

Under Alternative B, message boards would be provided along Georgetown Pike, and a radio announcement would inform visitors of the traffic and parking conditions within the park. These measures are anticipated to reduce vehicular traffic back-ups along Old Dominion Drive, which would help to improve police, fire, and rescue service access to the park during emergencies. Also, similar to Alternative A, technological improvements at the entrance station are anticipated to improve emergency access at the entrance station.

Under Alternative B, the holding tank off Jackson Lane would be expanded. This would provide additional water for use during fire emergencies and would result in a positive impact.

Neighboring Population and Socio-Economic Conditions

The socio-economic characteristics of the area surrounding the park primarily includes established residential communities, with institutions interspersed within. Similar to Alternative A, changes in the management and operations of the park in accordance with Alternative B are not anticipated to result in a change in population characteristics in the study area, or result in the addition or elimination of large number of jobs. Therefore, impacts anticipated on the neighboring population and socio-economic conditions would be negligible under the Alternative B.

Cumulative Impacts

Under the Preferred Alternative, there may be temporary cumulative impacts when activities within the park are examined in conjunction with anticipated activities outside the park. If the duration of demolition/construction at the park occurs simultaneously with construction of the proposed Cross County Trail (CCT), Potomac Heritage National Scenic Trail (PHNST), or the Georgetown Pike Trail (GPT), there would be temporary and minor adverse impacts on surrounding land uses due to these construction activities.

Conclusion

Under the Preferred Alternative, short-term adverse impacts on visitor experience would include potential delays in entering the park, renovation activities at the visitor facility, and demolition and construction activities at the maintenance facility site. Also, depending on the strategies developed as part of the TMP, potential realigning or closing portions of Matildaville and Mine Run Trails could affect horseback riders. Similarly, depending on the strategies developed as part of the CMP, potential closure of climbing sites on a temporary, periodic or permanent basis could affect climbers. In the long-term, connections to regional trails would expand recreational opportunities for visitors at the park, resulting in a beneficial impact. Also, in the future, increasing growth in the region could result in increasing visitor demand to access the park. Since there is no proposal to increase parking within the park, added demand could increase the number of times when visitors experience delays in accessing the park. If that happens, the park would consider new measures to reduce the periods when visitors experience delays in accessing the park. Overall, while visitor experience may be modified for some users, the Preferred Alternative is not anticipated to result in the impairment of park resources or visitor experience of the park.

4.2.2 Impacts on Cultural Resources

Archaeological and Historic Resources

The following actions are aimed to support these policies. Their potential impacts on cultural resources within the park would be as follows:

- *Prepare a Trail Management Plan, eliminate most undesignated trails, restrict new undesignated trails from developing, and recommend best practices such as potentially fencing areas where trails are located adjacent to sensitive areas:* Under these measures, visitor access near sensitive resources would be managed to a greater degree compared to current conditions. During the preparation of the TMP, the park would examine undesignated trails on a case-by-case basis and eliminate most that adversely affect sensitive cultural resources. The park would also examine each designated trail on a case-by-case basis and adopt measures that could include potential realignment or, under extreme circumstances, potential closures on a temporary, periodic or permanent basis of trail segments that result in adversely affecting sensitive cultural resources. Since these measures would be aimed at reducing the potential damage to historic and archaeological resources, including the Patowmack Canal, a designated National Historic Landmark, they would result in a positive impact.

- *Rehabilitate the visitor center to improve exhibits and establish an educational component that would focus on resource interpretation:* Additional interpretive exhibits and educational programs are anticipated to strengthen a visitor's understanding of the park's exceptional resources, as well as the benefits of protecting and preserving these resources. This measure is anticipated to result in a positive impact on the park's archaeological and historical resources.

- *Preserve unexposed cultural resources by leaving them buried below the surface except in a few locations where uncovering them would significantly benefit interpretation without adversely impacting the resource:* This measure would allow for the continued preservation of most buried ruins. While uncovering selective sites for professional historical and archaeological research would be a positive impact as it would help to increase knowledge and expand interpretation, the sites would be exposed to the natural environment and could be adversely impacted in the long-term. Adequate measures should be adopted to ensure the continued preservation of the selective sites that would be uncovered.

- *Develop a plan to stabilize and protect Matildaville:* Under this alternative, the park would increase active management of Matildaville. This resource contributes to the Patowmack Canal's cultural landscape and improving interpretation of this linkage, as well as adopting measures to prevent further damage of this resource, would result in a positive impact.

- *Develop an Integrated Resource Management Plan (IRMP) to protect sensitive cultural resources from potential vegetation damage and adopt best management practices (BMP) to protect cultural resources that are either listed, or eligible for listing, on the National Register:* As described under Alternative A, these measures are anticipated to result in a beneficial impact since the IRMP and BMPs would seek to minimize potential damage from trees and other vegetation on cultural resources, including the Patowmack Canal and Matildaville.

Viewsheds

Under the Preferred Alternative, the preparation of a Viewshed Management Plan would result in a beneficial impact since it would identify policies for preservation, maintenance, and restoration of important scenic views from vantage points within the park and adjacent areas. Also, the following changes would influence the existing viewsheds within and outside the park:

- *View of the maintenance facility:* The existing maintenance facility would be replaced by a replacement operations facility. This would be located immediately north of the entrance station and would be visible to visitors entering/exiting the park. The design of this replacement facility would influence a visitor's entrance experience at the park. Therefore, to result in a positive visual impact, the design of the facility should be sensitive to its highly visible location.

- *Views from C & O Canal NHP:* The proposed operations facility, to be located at the site of the existing maintenance building, is unlikely to be visible from the C&O Canal NHP, due to the existing vegetative buffer along the river's edge. However, if a tall

structure is constructed as part of the proposed facility, it has the potential to be observed from across the river. The park should ensure that appropriate visual analysis is conducted during the design of this facility to confirm that no adverse impacts result to views from C&O Canal NHP.

Cumulative Impacts

Under the Preferred Alternative, no cumulative impacts are anticipated on cultural resources, when activities within the park are examined in conjunction with anticipated activities outside the park.

Conclusion

Under the Preferred Alternative, protection of cultural resources at the park would be enhanced due to the proposed development of a TMP that would include elimination of most undesignated trails, preparation of a IRMP, establishment of an education component that would focus on resource interpretation, and developing a plan to stabilize and protect Matildaville. Leaving most ruins buried would also benefit those resources; however, if some ruins are uncovered for interpretation purposes, the park would adopt adequate measures to ensure that these are not impaired. Therefore, the Preferred Alternative would not result in the impairment of cultural resources.

4.2.3 Impacts on Natural Resources

Their potential impacts on natural resources within the park would be as described below:

Geophysical Resources

Under the Preferred Alternative, no impacts are anticipated on geological resources, topography, or soils.

Water Resources

Watersheds and Resource Protection Areas

Under the Preferred Alternative, the park would provide technical assistance to neighbors on water resource management techniques. In addition, the park would demonstrate the use of these techniques when improving the visitor center or during the construction of the replacement operations facility. These measures would raise awareness, as well as identify measures to reduce the impacts of stormwater runoff on the area's watershed, and therefore are anticipated to result in a positive impact on water resources.

Surface and Groundwater

Under the Preferred Alternative, preparation of the TMP that would include eliminating existing undesignated trails and prohibiting new undesignated trails could have an indirect positive impact, as visitors would be guided away from sensitive areas along the edges of existing streams, water bodies and groundwater recharge areas or seeps. In addition, best practices such

as fencing around sensitive areas, realigning, or closure under extreme circumstance of horse access to portions of trails (such as Mine Run Trail in the vicinity of Clay Pond) would reduce potential erosion-related impacts, as well as potential impacts related to horse manure, resulting in a positive impact. The park would continue to monitor trail use and make necessary repairs and trail improvements to minimize other erosion-related impacts prior to realigning or closing segments of trails.

Wetlands and Waters of the United States

Under the Preferred Alternative, no direct impacts are anticipated on existing wetlands within the park. However, eliminating existing undesignated trails and prohibiting new undesignated trails could have an indirect positive impact as visitors would be guided away from sensitive areas such as those adjacent to the Potomac River. Also, an effort to educate visitors through increased interpretive programs regarding benefits of preserving wetlands could result in an indirect positive impact. During the preparation of the TMP, in case the park develops a new trail alignment or a new trail, the park would conduct a wetland delineation to ensure that the new segment does not impact such areas.

Floodplains

Under the Preferred Alternative, the park would relocate staff offices from the lower level of the visitor center to a replacement facility to be constructed at the site of the maintenance facility. The visitor center is located within Potomac River's 100-year floodplain. Under the Preferred Alternative, the lower portion of the visitor center would be used to support the proposed educational function. Since this area would still be prone to flooding, the park should use this space for non-habitable uses with removable furniture and equipment to prevent flood-related damage.

The existing maintenance facility borders the western edge of the Potomac River's 100-year floodplain, with a portion of the facility possibly within the floodplain. The area within the 100-year floodplain is also designated as a resource protection area, in Virginia, under the Chesapeake Bay Preservation Act (CBPA). Under the Preferred Alternative, the park would construct a replacement facility at this location. In accordance with DO #77-2 (Floodplain Management), the park would undertake a detailed study of this site to identify the extent of the floodplain. If possible, the replacement facility would be located outside the floodplain. However, if the floodplain covers most of this site such that portions of the replacement facility would be within the 100-year floodplain, the replacement facility would be designed such that the amount of impervious surface within the floodplain would be kept the same as current conditions. This would be in accordance with the CBPA. Further, the facility would be sustainably designed such that habitable space would be located above the flood zone, and mitigation measures would be identified to minimize potential loss of property during a flood event. Consistent with DO #77-2, a Statement of Findings would be prepared as part of further analysis if portions of this facility are located within the floodplain.

Water Quality

Under the Preferred Alternative, no water quality impacts are anticipated within or adjacent to the park. Difficult Run would continue to remain impaired since the park's contribution to this watershed is extremely small. However, the park would work with its neighbors and other regional agencies to adopt measures that would help to improve this water body.

Biological Resources

Vegetation

Under the Preferred Alternative, there are several proposed changes that would impact existing vegetation within the park. These include the following:

- *Explore the development of USPP stables off Jackson Lane:* The area off Jackson Lane consists of approximately seven acres, the majority of which is wooded. Developing stables and a paddock area for horses may require clearing some of the existing vegetation in this area and could result in a minor adverse impact. Prior to pursuing this option in the future, the park would undertake further studies of the site including additional environmental documentation and a survey for potential archaeological resources. Also, prior to pursuing this option, the park would engage in a discussion with neighbors to determine any potential concerns. Therefore, no impacts are anticipated at this time.

- *Eliminate most existing undesignated trails and prohibit new undesignated trails:* These changes may result in a minor positive impact as visitors would be guided away from sensitive vegetation along highly managed trails, and overlook areas adjacent to the River Trail.

- *Develop an Integrated Resource Management Plan (IRMP) to protect sensitive cultural resources from potential vegetation damage and adopt BMPs to protect cultural resources, especially those that are listed on the National Register:* An IRMP and BMPs are typically developed to reduce or eliminate potential environmental impacts. During the preparation of the IRMP and BMPs, the park would seek to protect sensitive cultural resources without adversely impacting biological resources. Therefore, this measure is not anticipated to result in an adverse impact.

Wildlife Habitat

Under the Preferred Alternative, no impacts are anticipated on wildlife habitat within and adjacent to the park.

Rare, Threatened, and Endangered Species

Under the Preferred Alternative, several changes are proposed that have the potential to impact rare, threatened, and endangered species within the park. The proposed changes include the following:

- *Eliminate most undesignated trails, and prohibit additional undesignated trails:* These efforts would reduce potential damage to sensitive areas as visitor movement would predominantly be restricted to designated trails. This would reduce potential damage to rare, threatened, and endangered species within the park, resulting in a positive impact.
- *Designate a trail to access the area between the southern end of Overlook #3 and the Sand Box climbing area, and issue an 'access pass', on a trial basis, to visitors seeking to engage in climbing, fishing, or scientific research in this area:* This measure would limit casual visitors from accessing an area that includes the globally rare Central Appalachian/ Piedmont riverside prairie and several State listed rare plant species. By requiring visitors with access passes to stay on a designated trail, the park would minimize the potential of impacts on this sensitive resource. During the preparation of the CMP, the park would examine whether to continue the access pass policy.

- *Prepare a Climbing Management Plan that could potentially close specific areas on a temporary, periodic or permanent basis:* The park is currently engaged in a study to assess any impacts climbing activities may have on cliff habitat and rare plant species. If adverse impacts are determined from climbing activities in the vicinity of sensitive resources, the park would develop measures to reduce such impacts which would result in a beneficial impact. These measures could include limited use of anchors, access pass for certain areas, temporary or periodic closures, or under extreme conditions, permanent closures. The park will work with the public during the preparation of the CMP to address these concerns further and to develop measures that result in minimal impacts on the climbing community.

Air Quality

Under the Preferred Alternative, there would be minor, short-term construction-related, adverse impacts to air quality as a result of demolition of the maintenance facility, and construction of the replacement operations facility. Emissions produced during construction would vary daily depending on the type of activity. However, it is the total annual emissions by which the conformity exemption is calculated, and these are not anticipated to exceed the minimum thresholds. During demolition and construction activities, the park would take reasonable precautions to minimize release of polluting elements. Such precautions could include covering open equipment that convey construction materials, or watering construction areas to minimize the release of dust particles.

Potential reduction in vehicular traffic back-ups along Old Dominion Drive due to improved signage would reduce localized vehicular emissions, resulting in a positive impact.

Noise Levels

Under the Preferred Alternative, there would be minor, construction-related, adverse impacts on park visitors during demolition of the maintenance facility, construction of the replacement operations facility, and renovation of the visitor center. Visitors would be subject to construction noise as they drive or walk by the location of the maintenance facility or when they visit the visitor center. These impacts would be temporary, lasting through the duration of construction.

The movement of heavy trucks hauling demolition waste, excavated soil, and construction materials would generate noise that could result in a temporary adverse impact on residences along Old Dominion Drive and Georgetown Pike.

There would be no anticipated increase in operational noise impacts.

Hazardous Materials

Under the Preferred Alternative, building materials removed during the demolition of the maintenance facility and renovations at the visitor center could potentially contain asbestos, lead, or other hazardous materials. Also, any excavation at the maintenance facility site could potentially disturb soils that may contain contaminants. During excavation and demolition activities, soils that are suspected of contamination and wastes that are generated will be tested and disposed according to all applicable federal, state, and local laws and regulations. These include, but are not limited to, the Virginia Waste Management Act, the Virginia Hazardous Waste Management Regulations, and the Virginia Solid Waste Management Regulations.

Cumulative Impacts

Under the Preferred Alternative, several potential cumulative impacts could affect natural resources. These include the following:

- There would be temporary construction-related impacts on local air quality and noise, depending upon the duration of demolition/construction activities within the park, and the proposed CCT, PHNST, and GPT.

- Similar to Alternative A, the anticipated growth in the region's population could result in increasing visitation to the park. This could result in a considerable increase in vehicles waiting to access the park, resulting in a minor adverse impact on localized air quality. Also, the existing natural habitats within the park could be further burdened if the area around the park is developed in response to some of this anticipated regional growth.

Conclusion

Under the Preferred Alternative, protection of natural resources at the park would be enhanced due to the proposed development of a CMP, a TMP that would include elimination of most undesignated trails, and establishment of an education component that would focus on resource interpretation. The anticipated growth in the area's population could result in increasing visitation and potentially burdening the existing natural habitats within the park. If demand for accessing the park increases substantially, the park would explore additional measures to minimize potential impacts on the existing natural resources. Potentially locating portions of a replacement facility in the 100-year flood zone could result in a negligible impact on the floodplain. Consistent with DO #77-2, a Statement of Findings would be prepared as part of further analysis if portions of the proposed replacement facility are located within the floodplain. Therefore, the Preferred Alternative would not result in the impairment of natural resources.

4.2.4 Impacts on Transportation Systems

The potential impacts under Alternative B on transportation systems within and adjacent to the park would be as follows:

- *Introduce technology that expedites payment and other operational functions at the entrance station:* Similar to Alternative A, potential technological improvements at the entrance station, such as where pass holders would swipe their cards to gain access, would increase the processing rate, and reduce the waiting time at the gate for all visitors. Provided the parking lots are not full, queues that currently form during peak arrival periods would be reduced or potentially eliminated. This would result in a positive impact on visitor access to the park.

- *During severe crowding, initiate a one vehicle out, one vehicle in policy:* Similar to Alternative A, during severe crowding, visitors waiting in line would be informed to expect delays. Vehicle crowding would continue to result in a minor adverse impact on visitor access to the park.

- *Place dynamic message boards (signs) along transportation routes leading to the park (Georgetown Pike and Old Dominion Drive) and add a radio announcement to indicate when the parking lots are full:* Message boards on Georgetown Pike and a radio announcement would alert visitors that the parking lots are full at Great Falls Park. By having dynamically updated information available on signs on Georgetown Pike, and on a particular radio channel, visitors would be provided with an opportunity to make a decision before turning onto Old Dominion Drive – whether to wait in line for parking, or seek to visit other parks in the area. These measures are anticipated to result in a positive impact on visitor access to the park.

Cumulative Impacts

Under the Preferred Alternative, there could be potential temporary adverse cumulative impacts from construction-related traffic on area roadways if demolition/construction activities in the park (demolition of maintenance facility, construction of the replacement operations facility, etc.) occur during the same period as construction of the proposed PHNST, CCT or GPT outside the park.

Also, similar to Alternative A, over the long-term, the projected growth in the region could increase visitation at the park. This could result in additional days when delays are experienced along Old Dominion Drive and potentially Georgetown Pike, resulting in an adverse impact on the area's transportation systems.

Conclusion

Under the Preferred Alternative, the one vehicle out, one vehicle in policy would continue to result in delays in accessing the park. Also, in the future, increasing growth in the region could result in an increase to visitation at the park, potentially increasing the number of times when visitors experience delays in accessing the park. If that happens, the park would consider new measures to reduce such delays. The proposed message boards and radio announcement would

inform visitors about parking and traffic conditions at the park and are anticipated to benefit visitor accessibility. Overall, under the Preferred Alternative, there would be no impairment of the park's resources under transportation systems.

4.2.5 Impacts on Site Utilities

Under the Preferred Alternative, the demolition and construction of a replacement facility at the maintenance facility site would result in construction-related impacts on utilities. Also, while no impacts are anticipated on water and sanitary sewer systems due to the anticipated expansion of restroom facilities, additional water and wastewater system models and a utility capacity study should be performed prior to undertaking these improvements. The expansion of the water tank along Jackson Lane would result in providing additional potable water to the park, resulting in a positive impact.

If public water is extended to the park in the future, the park would coordinate the route and access to the existing water main (located at the intersection of Georgetown Pike and State Route 683) with the Fairfax County Water Authority.

Cumulative Impacts

Under the Preferred Alternative, no cumulative utility impacts are anticipated.

Conclusion

The measures proposed under the Preferred Alternative would not result in the impairment of the park's utility system.

4.2.6 Sustainability and Long-Term Management

Short-Term Use of the Environment versus Long-Term Productivity

Alternative B proposes several actions that would have short-term adverse effects, but would result in improving the long-term productivity of the park, including:

- Improvements at the visitor center would temporarily result in reducing exhibit space and impacting interpretive programs for visitors. However, over the long-term, improvements to exhibits, as well as visitor programs at the visitor center, would benefit the interpretation and long-term productivity of the park's cultural and natural resources.

- Demolition of the maintenance facility and construction of the replacement operations facility would impact management operations at the park over the short-term. However, over the long-term, the management of the park would improve due to improved spaces for the various operations-related uses.

- Removal of existing undesignated trails would result in changing the current pattern of use. Over the long-term, this would help to preserve sensitive natural and cultural resources.

Irreversible and Irretrievable Commitments of Resources

Construction activities under Alternative B would require the use of building materials that are often drawn from natural resources. The materials used at the park would be sought from the existing building construction industry, similar to other construction projects in the region. While using natural and fabricated building materials in the park would be irreversible, none of these materials would be considered limited or scarce resources whose use at Great Falls Park would threaten the continued availability or existence of that resource.

Unavoidable Adverse Impacts

Deterioration and eventual loss of some of the park's cultural resources may be considered an unavoidable adverse impact. The heavy use of the trails within vicinity of the visitor center would continue to impact sensitive cultural and natural resources.