



CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

CEDAR CREEK AND BELLE GROVE NATIONAL HISTORICAL PARK



4.1	Introduction	4-1
4.2	Methods and Assumptions for Analyzing Impacts	4-2
4.3	Environmental Consequences of Alternative A (Continuation of Existing Management)	4-15
4.4	Environmental Consequences of Alternative B	4-45
4.5	Environmental Consequences of Alternative C	4-75
4.6	Environmental Consequences of Alternative D	4-111

4.0 Environmental Consequences

4.1 Introduction

The National Environmental Policy Act (NEPA) requires that environmental documents discuss the environmental impacts of a proposed federal action, feasible alternatives to that action, and any adverse environmental impacts that cannot be avoided if a proposed action is implemented. In this case, the proposed federal action would be the adoption of a general management plan (GMP) for Cedar Creek and Belle Grove National Historical Park (NHP).

General management plans are programmatic, long-range documents and the actions described in the alternatives are often general in nature. Consequently, the impacts of these actions are analyzed in qualitative terms.

This “Environmental Consequences” chapter analyzes the environmental impacts of implementing the four alternatives on various topics related to cultural and natural resources, and the socioeconomic environment. The analysis is the basis for comparing the beneficial and adverse impacts of implementing the alternatives. For the purposes of analysis, in the environmental impact statement (EIS) it is assumed that all of the specific actions proposed in the alternatives would occur during the life of the plan. The effects of NPS and partner actions are addressed together. Private lands are analyzed separately as described below.

This EIS generally analyzes several actions, such as the development of a new visitor center, trails, and waysides; and the acquisition of parkland. Following the approval of the GMP, site-specific compliance will be required for any facility development actions included in the alternatives. Appropriate detailed environmental and cultural compliance documentation would be prepared in accordance with the National Environmental Policy Act of 1969 and the National Historic Preservation Act of 1966, both as amended, meeting requirements to identify and analyze each possible impact for the resources affected.

This EIS also generally addresses private lands within the park boundary. Over two-thirds of the park’s total acreage is privately owned land (not owned by the NPS or park partners). Private lands in the park contain important resources and contribute to the significance and integrity of the park. Consequently, impacts on resources on private lands are analyzed in two ways: 1) the potential impacts on private lands of private land use activities are analyzed, and 2) the impacts on private lands of actions contained in this plan, namely land acquisition/protection and technical assistance, are analyzed in detail. This analysis of private lands is included in each of the alternatives under each of the impact topics.

This chapter begins with a description of the methods and assumptions for analyzing impacts, including cumulative impacts and impairment of park resources.

Then, the impact analysis (or environmental consequences) of each alternative is presented. All of the impact topics are assessed for each alternative. The existing conditions for all of the impact topics that are analyzed in detail were identified in the “Affected Environment” chapter.

The analysis of Alternative A: Continuation of Current Management identifies future conditions if no major changes to facilities or park management occurred. The three action alternatives (Alternatives B, C, and D) were then compared to Alternative A to identify the incremental changes that would occur as a result of changes in park facilities, uses, and management. Impacts of recent decisions and/or other approved plans were not evaluated as part of this environmental analysis, except as part of the cumulative impact analysis described below. Although these actions would occur during the life of the general management plan/environmental impact statement, they have been (or would be) evaluated in other environmental documents.

The impacts of each alternative are briefly summarized at the end of Chapter 2 in Table 2.8.

4.2 Methods and Assumptions for Analyzing Impacts

The planning team based the impact analysis and the conclusions in this chapter primarily on the review of existing literature and studies, information provided by experts in the NPS and other agencies, and staff insights and professional judgment. The team’s method of analyzing impacts is further explained below. All impacts have been assessed assuming that mitigating measures have been implemented to minimize or avoid impacts.

The environmental consequences for each impact topic are identified and characterized based on impact type, intensity, context, and duration. Cumulative impacts also are identified.

Impact intensity refers to the degree or magnitude to which a resource would be beneficially or adversely affected. Each impact is identified as negligible, minor, moderate, or major in conformance with the definitions for these classifications provided in Table 4.1. Because this is a programmatic document, the intensities are expressed qualitatively.

Context refers to the setting within which an impact may occur, such as the affected region or locality. In this document, cultural and natural resource impacts are either localized (site-specific) or parkwide. Socioeconomic impacts are either local or regional. Local economic impacts affect businesses or individuals located mostly within or adjacent to the park’s boundary. Regional economic impacts affect businesses or individuals mostly within Frederick, Shenandoah, and Warren

counties, and the city of Winchester. Local economic impacts are also a part of the regional economic impacts.

Impact duration refers to how long an impact would last. The planning horizon for this general management plan/environmental impact statement is approximately 20 years. Unless otherwise specified, in this document the following terms are used to describe the duration of the impacts:

Short-term: The impact would be temporary in nature, lasting one year or less, such as impacts associated with construction. For the purposes of the socioeconomic analysis, short-term impacts would last less than three years.

Long-term: The impact would last more than one year and could be permanent in nature, such as the loss of soil due to the construction of a new facility. Although an impact may only occur for a short duration at one time, if it occurs regularly over time the impact may be considered to be a long-term impact (e.g., the noise from a vehicle driving on a road would be heard for a short time and intermittently, but because vehicles would be driving the same road throughout the 20-year life of the plan, the impact to the natural soundscape would be considered to be long-term). For the purposes of the socioeconomic analysis, long-term impacts would last more than three years and may be permanent.

Impacts also can be direct or indirect. Direct impacts are caused by an action and occur at the same time and place as the action. Indirect impacts are caused by the action and occur later or farther away, but are still reasonably foreseeable. This document discloses and analyzes both direct and indirect impacts, but does not differentiate between them in the discussions.

The impacts of the action alternatives describe the *difference between* the continuation of current management (Alternative A) and the implementation of the action alternatives. To understand a complete “picture” of the impacts of implementing any of the action alternatives, the reader must also take into consideration the impacts that would occur under Alternative A (Continuation of Current Management), so an accurate comparison can be made.

4.2.1 Cultural Resources

■ Section 106 of the National Historic Preservation Act and Impacts on Cultural Resources

In this environmental impact statement, impacts on cultural resources are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality (CEQ) that implement the National Environmental Policy Act (NEPA). These impact analyses are intended, however, to comply with the requirements of both NEPA and Sections 106 and 110

of the National Historic Preservation Act (NHPA), while considering the differences between NEPA and NHPA language. In accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 of the NHPA (36 CFR Part 800, *Protection of Historic Properties*), impacts on cultural resources were also identified and evaluated by (1) determining the area of potential impacts; (2) identifying cultural resources present in the area of potential impacts that are either listed in or eligible to be listed in the National Register of Historic Places; (3) applying the criteria of adverse effect to affected National Register-eligible or National Register-listed cultural resources; and (4) considering ways to avoid, minimize, or mitigate adverse impacts.

Under the Advisory Council's regulations, a determination of either *adverse effect* or *no adverse effect* must also be made for affected cultural resources that are listed or eligible for listing in the National Register. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the National Register, e.g., diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association. Adverse impacts also include reasonably foreseeable impacts caused by the alternatives that would occur later in time, be farther removed in distance or be cumulative (36 CFR 800.5, *Assessment of Adverse Effects*). A determination of *no adverse effect* means there is an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the National Register.

CEQ regulations and the NPS's *Conservation Planning, Environmental Impact Analysis and Decision Making* (Director's Order 12) also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g., reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of impact as defined by Section 106 is similarly reduced. Cultural resources are non-renewable resources and adverse impacts generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse impact under Section 106 may be mitigated, the impact remains adverse.

A Section 106 summary is included in the impact analysis sections. The Section 106 summary is an assessment of the effect of the undertaking (implementation of the alternative) on National Register-eligible or National Register-listed cultural resources only, based upon the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations. Museum collections (prehistoric and historic objects, artifacts, works of art, archival documents, and natural history

specimens) are generally ineligible for listing in the National Register. As such, Section 106 determinations of effect are not provided.

The definitions of impact intensity for the selected impact topics (archeological resources, ethnographic resources, historic structures, cultural landscapes, and museum collections) are included in Table 4.1. Definitions for beneficial impacts for cultural resources that require Section 106 determinations of effect (archeological resources, historic structures, and cultural landscapes) are characterized by recognizing that although some actions may be beneficial under NEPA, they may still be technically categorized as an *adverse effect* under NHPA.

4.2.2 Natural Resources

Analysis of natural resources was based on research, knowledge of the area's resources, and the best professional judgment of planners and ecologists who have experience with similar types of projects. Information on the area's natural resources was gathered from several sources, including the U.S. Fish and Wildlife Service, Virginia Department of Conservation and Recreation, Virginia Department of Environmental Quality, Virginia Department of Game and Inland Fisheries, and the park's *Data Review and Synthesis of Natural Resource Information* completed by the Pennsylvania State University (Donaldson 2005).

4.2.3 Visitor Use and Experience

Analysis of visitor use and experience was based on research and best professional judgment of planners and staff who have experience with similar types of projects. Information on park visitors and Shenandoah Valley tourists is based on the *Cedar Creek and Belle Grove National Historical Park Transportation Synthesis* (U.S. Dept. of Transportation, 2006); interviews with park staff, advisory commissioners, and Key Partners; and published sources on the internet.

4.2.4 Socioeconomic Environment

Determinations of socioeconomic impacts were based on professional expertise and judgment. The factors used to identify and discuss potential impacts were economic data, historic visitor use data, expected future visitor use, and future developments within the park by the NPS or the partners. A mostly qualitative analysis is sufficient to compare the impacts of alternatives for decision-making purposes. However, the estimated costs of development projects do provide basic quantitative measures of the direct economic impacts on the region. Estimated changes in the park's base budget and staffing levels also provide quantitative data to consider.

The socioeconomic impact analysis considers direct and indirect impacts within the local and regional economies. The focus of the analysis is on the direct impacts. Direct impacts are generally those that occur when 1) the NPS and its Key Partners purchase goods and services, and 2) park visitors from outside the region spend

money in the local and regional economies. Indirect impacts occur when funds spent by the NPS, its Key Partners, and visitors re-circulate within the economy – this is referred to as the multiplier effect. It is likely that these indirect impacts occur; however, they are not quantifiable with the currently available data and are not used for decision-making purposes.

4.2.5 Cumulative Impact Analysis

A cumulative impact is described in the Council on Environmental Quality's regulation 1508.7 as follows:

Cumulative impacts are incremental impacts of the action when added to other current and reasonably foreseeable actions, regardless of what agency (federal or nonfederal) or person undertakes such other action. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over time.

To determine potential cumulative impacts, non-NPS projects within and surrounding Cedar Creek and Belle Grove NHP were identified. The area included Frederick, Shenandoah, and Warren counties, Virginia. Projects were identified by discussions with the NPS staff, park advisory commission, the park's Key Partners, and representatives of county and town governments. Potential projects identified as cumulative actions included any planning or development activity that was currently being implemented, or would be implemented in the future.

These actions are evaluated in conjunction with the impacts of each alternative to determine if they have any cumulative impacts on a particular cultural, natural, or socioeconomic resource. Because most of these cumulative actions are in the early planning stages, the qualitative evaluation of cumulative impacts was based on a general description of the project.

Potential cumulative impacts were considered in about a 10-mile area surrounding Cedar Creek and Belle Grove NHP. This area includes the communities of Winchester, Stephens City, Middletown, Strasburg, and Front Royal. Projects and actions that could contribute to cumulative impacts include ongoing and planned actions and projects in the park and on adjacent public and private lands, and activities in unincorporated areas of Frederick, Shenandoah, and Warren counties. These actions and projects are listed below.

■ I-81 Corridor Expansion

The Virginia Department of Transportation, in cooperation with the Federal Highway Administration, is planning to increase capacity on I-81 through the park. Approximately two miles of the interstate pass through the park. Various alternatives are being explored, including expansion of the number of lanes and

Table 4.1 Impact Threshold Definitions

Impact Topic	Negligible	Minor	Moderate	Major
CULTURAL RESOURCES				
Archeological Resources	Impact is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for Section 106 would be <i>no adverse effect</i> .	<p>Adverse impact – Disturbance of a site(s) results in little, if any, loss of integrity. The determination of effect for Section 106 would be <i>no adverse effect</i>.</p> <p>Beneficial impact – Site would only be minimally disturbed. Action would contribute to maintenance or preservation of a site.</p>	<p>Adverse impact – Disturbance of a site(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i>. A memorandum of agreement is executed among the NPS and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement minimize or mitigate adverse impacts and reduce the intensity of impact under NEPA from major to moderate.</p> <p>Beneficial impact – Action would result in a mitigation procedure and a comprehensive site condition assessment and data recovery. Action would result in stabilization of a site.</p>	<p>Adverse impact – Disturbance of a site(s) results in loss of integrity. The determination of effect for Section 106 would be <i>adverse effect</i>. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the NPS and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).</p> <p>Beneficial impact – Action would result in a mitigation procedure and a comprehensive site condition assessment and data recovery. Action would result in active intervention to preserve a site(s).</p>
Ethnographic Resources	Impact(s) would be barely perceptible and would neither alter resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group’s body of practices and beliefs. The determination of effect for Section 106 would be <i>no adverse effect</i> .	<p>Adverse impact – would be slight but noticeable but would neither appreciably alter resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group’s body of practices and beliefs. The determination of effect for Section 106 would be <i>no adverse effect</i>.</p> <p>Beneficial impact – would allow access to and/or accommodate a group’s traditional practices or beliefs.</p>	<p>Adverse impact – would be apparent and would alter resource conditions. Something would interfere with traditional access, site preservation, or the relationship between the resource and the affiliated group’s practices and beliefs, even though the group’s practices and beliefs would survive. The determination of effect for Section 106 would be <i>adverse effect</i>.</p> <p>Beneficial impact – would facilitate traditional access and/or accommodate a group’s practices or beliefs.</p>	<p>Adverse impact – would alter resource conditions. Something would block or greatly affect traditional access, site preservation, or the relationship between the resource and the affiliated group’s body of practices and beliefs, to the extent that the survival of a group’s practices and/or beliefs would be jeopardized. The determination of effect for Section 106 would be <i>adverse effect</i>.</p> <p>Beneficial impact – would encourage traditional access and/or accommodate a group’s practices or beliefs.</p>

Table 4.1 Impact Threshold Definitions (continued)

Impact Topic	Negligible	Minor	Moderate	Major
Historic Structures	Impact is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for Section 106 would be <i>no adverse effect</i> .	<p>Adverse impact – Alteration of a feature(s) would not diminish the overall integrity of the resource. The determination of effect for Section 106 would be <i>no adverse effect</i>.</p> <p>Beneficial impact – Structure is altered in accordance with the <i>Secretary of the Interior’s Standards for the Treatment of Historic Properties</i>. Integrity of a feature would be maintained.</p>	<p>Adverse impact – Alteration of a feature(s) would diminish the overall integrity of the resource. The determination of effect for Section 106 would be <i>adverse effect</i>. A memorandum of agreement is executed among the NPS and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement minimize or mitigate adverse impacts and reduce the intensity of impact under NEPA from major to moderate.</p> <p>Beneficial impact – Action would result in the alteration of a structure; however, all mitigation measures would be accomplished in accordance with the <i>Secretary of the Interior’s Standards for the Treatment of Historic Properties</i>. Integrity of the structure would be enhanced.</p>	<p>Adverse impact – Alteration of a feature(s) would diminish the overall integrity of the resource. The determination of effect for Section 106 would be <i>adverse effect</i>. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the NPS and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).</p> <p>Beneficial impact – Action would result in the alteration of a structure; however, all mitigation measures would be accomplished in accordance with the <i>Secretary of the Interior’s Standards for the Treatment of Historic Properties</i>. Integrity and character of the structure would be restored.</p>
Cultural Landscapes	Impact(s) is (are) at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for Section 106 would be <i>no adverse effect</i> .	<p>Adverse impact – Alteration of a pattern(s) or feature(s) of the landscape would not diminish the overall integrity of the landscape. The determination of effect for Section 106 would be <i>no adverse effect</i>.</p>	<p>Adverse impact – Alteration of a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the landscape. The determination of effect for Section 106 would be <i>adverse effect</i>. A memorandum of agreement is executed among the NPS and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement minimize or mitigate adverse impacts and reduce the intensity of impact under NEPA from major to moderate.</p>	<p>Adverse impact – Alteration of a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the landscape. The determination of effect for Section 106 would be <i>adverse effect</i>. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the NPS and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).</p>

Table 4.1 Impact Threshold Definitions (continued)

Impact Topic	Negligible	Minor	Moderate	Major
Cultural Landscapes (continued)		Beneficial impact – Action would result in slight alteration of landscape patterns and features in accordance with <i>the Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i> .	Beneficial impact – Landscape patterns and features are altered; however, a treatment plan would be put in place in accordance with <i>the Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i> . Integrity of the landscape would be enhanced.	Beneficial impact – Landscape patterns and features are altered; however, a treatment plan would be put in place in accordance with <i>the Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i> . Integrity of the landscape would be restored.
Museum Collections	Impact on museum collections is at the lowest levels of detection – barely measurable, with no perceptible consequences, either adverse or beneficial.	Adverse impact – would affect the integrity of a few items in the museum collection but would not degrade the usefulness of the collection for future research and interpretation. Beneficial impact – would stabilize the current condition of the collection or its constituent components to minimize degradation.	Adverse impact – would affect the integrity of many items in the museum collection and diminish the usefulness of the collection for future research and interpretation. Beneficial impact – would improve the condition of the collection or protect its constituent parts from the threat of degradation.	Adverse impact – would affect the integrity of most items in the museum collection and destroy the usefulness of the collection for future research and interpretation. Beneficial impact – would secure the condition of the collection as a whole or its constituent components from the threat of further degradation.
NATURAL RESOURCES				
Scenic/Visual Resources/ Viewshed	Changes would be either barely detectable or would have impacts that would be considered slight and localized.	Adverse impact – would have measurable impacts on scenic resources. Small changes could occur to the park’s cultural and natural landscapes that would contribute to the deterioration of scenic resources and viewsheds. Beneficial impact – would have measurable impacts that would maintain or preserve scenic resources and viewsheds.	Adverse impact – would have clearly detectable impacts on scenic resources. Noticeable changes could occur to the park’s cultural and natural landscapes that would deteriorate scenic and visual resources and could be detected by visitors. Beneficial impact – would have clearly detectable impacts that would maintain, enhance, or preserve scenic resources and viewsheds.	Adverse impact – would have substantial impacts on scenic resources. Highly noticeable changes could occur to the park’s cultural and natural landscapes that would result in the loss of fundamental scenic resources and viewsheds that could be easily detected by visitors. Beneficial impact – would have substantial impacts that would preserve and/or enhance the park’s fundamental scenic resources and viewsheds.
Soils	The action would result in a change in a soil, but the change would be at the lowest level of detection, or not measurable.	Adverse impact – would result in a detectable change, but the change would be slight and local. There could be changes in a soil’s profile in a relatively small area, but the change would not increase the potential for erosion.	Adverse impact – would result in a clearly detectable change in a soil. There could be a loss or alteration of the topsoil in a small area, or the potential for erosion to remove small quantities of additional soil would increase.	Adverse impact – would result in the permanent loss or alteration of soils in a relatively large area, or there would be a strong likelihood for erosion to remove large quantities of additional soil as a result of the action.

Table 4.1 Impact Threshold Definitions (continued)

Impact Topic	Negligible	Minor	Moderate	Major
<p>Soils (continued)</p>		<p>Beneficial impact – would preserve or restore soil resources in a small area.</p>	<p>Beneficial impact – would preserve or restore soil resources in a moderately sized area.</p>	<p>Beneficial impact – would preserve or restore soil resources in a relatively large area.</p>
<p>Groundwater</p>	<p>Impacts on groundwater levels and quality would be imperceptible or, if detected, would be considered slight and localized.</p>	<p>Adverse impact – Measurable changes in groundwater levels and quality would occur, although the changes would be small and impacts would be localized.</p> <p>Beneficial impact – would preserve groundwater resources, but the impacts would be localized.</p>	<p>Adverse impact – Changes in groundwater levels and quality would be apparent, and have the potential to become larger, although the changes still would be fairly localized in area</p> <p>Beneficial impact – would preserve groundwater resources and the impacts would be widespread.</p>	<p>Adverse impact – Substantial changes in groundwater levels and quality would be evident, which could be regional in scope. Highly noticeable changes could occur to the area’s aquifer.</p> <p>Beneficial impact – would preserve groundwater resources and the impacts would be realized by the region.</p>
<p>Surface Water Quality</p>	<p>Changes would be either barely detectable or would have impacts that would be considered slight and localized.</p>	<p>Adverse impact – would have measurable impacts on surface water quality. Water quality impacts could include increased loads of sediment, debris, chemical or toxic substances, or pathogenic organisms. The impacts would be localized and would not affect organisms outside the immediate area of influence.</p> <p>Beneficial impact – would include decreased loads of sediment, debris, chemical or toxic substances, or pathogenic organisms and the impacts would be localized.</p>	<p>Adverse impact – would have clearly detectable impacts on surface water quality and potentially would affect organisms or natural ecological processes. An impact could be visible to visitors.</p> <p>Beneficial impact – would improve or preserve surface water quality and the impacts would be widespread.</p>	<p>Adverse impact – would have substantial impacts on surface water quality and would affect organisms or natural ecological processes. An impact could be easily visible to visitors.</p> <p>Beneficial impact – would improve or preserve surface water quality and the impacts would extend beyond park boundaries and have implications to the watershed.</p>
<p>Vegetation</p>	<p>The action might result in a change in vegetation, but the change would not be measurable or would be at the lowest level of detection.</p>	<p>Adverse impact – might result in a detectable change, but the change would be slight and have a local effect on a vegetation community. This could include changes in the abundance, distribution, or composition of individual species in a local area, but not changes that would affect the viability of vegetation communities. Changes to local ecological processes would be minimal.</p>	<p>Adverse impact – would result in a clearly detectable change in a vegetation community and could have an appreciable effect. This could include changes in the abundance, distribution, or composition of local vegetation communities, but not changes that would affect the viability of regional plant populations. Changes to local ecological processes would be of limited extent.</p>	<p>Adverse impact – would be severely adverse to a vegetation community. The impacts would be substantial and highly noticeable, and they could result in widespread change. This could include changes in the abundance, distribution, or composition of a local vegetation community or regional plant population to the extent that the population would not be likely to recover. Significant ecological processes would be altered, and “landscape-level” (regional) changes would be expected.</p>

Table 4.1 Impact Threshold Definitions (continued)

Impact Topic	Negligible	Minor	Moderate	Major
Vegetation (continued)		Beneficial impact – would restore or preserve vegetation in a relatively small area.	Beneficial impact – would restore or preserve vegetation in a substantial portion of the park.	Beneficial impact – would restore or preserve vegetation in large portions of the park. This could include changes in the abundance, distribution, or composition of a local vegetation community or regional plant population to the extent that the population would return to a sustainable level and/or contribute to the protection and enhancement of the park’s fundamental natural and cultural landscapes.
VISITOR USE AND EXPERIENCE				
Visitor Use and Experience	Impacts would be barely detectable, or would occasionally affect the experience of few visitors in the applicable setting.	Adverse impact – Impacts would be slight but detectable; could be perceived as negative by visitors or would inhibit the achievement of visitor experience. Would negatively affect the experience of some visitors in the applicable setting. Beneficial impact – The action would positively affect the experience of some visitors in the applicable setting.	Adverse impact – Impacts would be readily apparent and perceived as somewhat negative. Would affect the experience of many visitors in the applicable setting. Beneficial impact – The action would positively affect the experience of many visitors in the applicable setting.	Adverse impact – Impacts would be highly negative, affecting the experience of a majority of visitors in the applicable setting. Beneficial impact – The action would positively affect the experience of a majority of visitors in the applicable setting.
SOCIOECONOMIC ENVIRONMENT				
Regional and Local Economy	The action would produce no impacts on socioeconomic conditions or it would be at or below the lowest level of detection.	Adverse impact – The action would result in small, but detectable, changes to socioeconomic conditions. Only a small number of firms and/or a small portion of the population would be affected. The impact is slight and not detectable outside the affected area. Beneficial impact - The action would result in small, but detectable, positive changes to socioeconomic conditions. Only a localized area would be affected.	Adverse impact - The action would result in readily apparent changes to socioeconomic conditions. Any impacts would be localized within the affected area, such as impacts on a gateway community. Beneficial impact - The action would result in readily apparent, positive changes to socioeconomic conditions. Impacts would be confined to the local area and gateway communities.	Adverse impact – The action would result in readily apparent changes to socioeconomic conditions. Measurable changes in social or economic conditions at the county or three-county regional level would occur. The impact is severely adverse or within the affected area. Beneficial impact - The action would result in readily apparent, positive changes to socioeconomic conditions. Impacts would occur throughout the three-county area.

reconfiguration of the I-81/I-66 interchange. The project could affect the park's natural, cultural, and scenic resources, as well as visitor experience.

■ **Carmeuse Lime & Stone (Chemstone) Quarry Expansion**

Much of the land that lies immediately adjacent to the park's western boundary is owned by O-N Minerals Company, operator of the Chemstone rock quarry. In May 2008, the Frederick County Board of Supervisors on a 4-3 vote approved a rezoning and special use permit to allow for a major expansion of this limestone quarry operation. Specifically, the approval is to rezone 394 acres adjacent to the park from "Rural Area" (RA) to "Extractive Manufacturing" (EA) to allow for the operation of three new quarries. According to an analysis conducted by the NPS's Geologic Resources Division, the mine expansion would result in potential impacts on air quality, groundwater and surface water, traffic conditions, public safety, rural character and the historical scene, and local property values (NPS 2006c). Additionally, NPS's American Battlefield Protection Program provided an analysis of the potential impacts to historic and battlefield resources, concluding that, "Such a drastic change in land use will destroy significant portions of the Cedar Creek Battlefield landscape. Expanded mining will also intensify the existing adverse effects of quarry operations on the setting and viewshed of the protected, intact portions of the battlefield" (NPS 2008).

■ **Upgrades of Power Transmission Lines**

Upgrades of electric power transmission lines are planned for the project area. Two separate projects are currently in the planning stages, both of which will connect to the Meadow Brook power substation located near Middletown, about one mile north of the park's northern boundary. Dominion Virginia Power is planning to construct a new 500,000-volt electric transmission line to connect the Meadow Brook substation to the Loudon substation in Loudoun County. The Dominion line will be an overhead line that will use an existing power line corridor running southeast of the park.

Allegheny Power is planning to construct a new 500,000-volt electric transmission line from the Meadow Brook substation into southwestern Pennsylvania (known as the Trans-Allegheny Interstate Line). The selected route of the Allegheny line is not known at this time; however, the route alternatives run in a northwesterly direction from the Meadow Brook substation. Although the proposed routes in both of these projects neither cross the park nor intersect the park boundary, the transmission lines could impact the park's scenic viewshed and rural character.

■ **Encroaching Residential and Commercial Development**

Increased growth and development in the region is rapidly changing the look and feel of the area. The growth of surrounding towns and counties is changing the park's setting. The agrarian and rural landscapes of the park and its surroundings

are giving way to increased residential and commercial development. Large lot development (single-family homes on 1-acre lots), commercial development (chain restaurants), and development related to suburbanization (townhouses and lighted baseball fields) has affected the park's resources and would likely continue to pose threats to the preservation of resources, particularly viewsheds.

4.2.6 Impairment of Park Resources

In addition to determining the environmental consequences of implementing the alternatives, *NPS Management Policies 2006* (section 1.4) requires analysis of potential impacts on determine whether proposed actions would impair the park's resources and values.

The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve resources and values. Whether an impact meets this mandate depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on resources and values. However, the laws give the NPS the management discretion to allow impacts on resources and values when necessary and appropriate to fulfill the purposes of the area, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS the management discretion to allow certain impacts within a unit, that discretion is limited by the statutory requirement that the NPS must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of resources and values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (*NPS Management Policies 2006*, section 1.4.5). An impact to any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment if it

- affects a resource or value whose preservation is necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- is key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- is identified in the park's general management plan or other relevant NPS planning documents as being of significance

An impact would be less likely to constitute impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

An impact that may, but would not necessarily, lead to impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessionaires, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park.

A determination on impairment is made in the "Conclusion" section of the impact analysis for each impact topic related to the park's resources and values. An impairment determination is not made for topics related to visitor use and experience, the socioeconomic environment, or park operations, because impairment determinations are resource-based. If, for example, visitor use was found to be impairing soils, the determination would be associated with "soils" and not with "visitor use."

4.3 Environmental Consequences of Alternative A (Continuation of Current Management)

4.3.1 Cultural Resources

■ Archeological Resources

Direct and Indirect Impacts. Under Alternative A, archeological resources on NPS- and partner-owned lands would continue to be surveyed, inventoried, and evaluated under National Register of Historic Places criteria to determine their eligibility for listing in the National Register, a beneficial impact. This will be done as NPS and partner staffing and funding permit. All ground-disturbing activities would be preceded by site-specific archeological surveys and, where appropriate, subsurface testing to determine the existence of archeological resources and how best to preserve them. Known archeological resources would be avoided whenever possible and few, if any, adverse impacts would be anticipated. If, however, National Register-listed or National Register-eligible archeological resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the Virginia State Historic Preservation Officer (if the project was a federal undertaking). If previously undiscovered archeological resources were uncovered during construction (i.e., a federal undertaking), all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the Virginia State Historic Preservation Officer. Large special events would continue to have the potential to adversely impact archeological resources because visitors, vehicles, ground fires, and horses would likely continue to affect archeological resources. Thus, implementation of Alternative A would result in potentially adverse, minor to moderate, long-term impacts on archeological resources on NPS- and partner-owned lands.

Additionally, under Alternative A, the integrity of archeological resources on privately owned lands, which constitute approximately two-thirds of the park, would likely continue to be adversely impacted by increasing residential, commercial, and industrial development; agricultural operations and other human activities; inadvertent disturbance; and natural processes. Although the NPS and its Key Partners would encourage and promote the protection of archeological resources on private lands and technical assistance would be available to private landowners to help them protect their lands, archeological resource preservation efforts on private lands would ultimately be subject to the discretion of landowners. In most cases, adverse impacts would be realized only when private lands are developed. Thus, implementation of Alternative A would result in potential adverse, minor to moderate, long-term impacts on archeological resources on privately owned lands.

Archeological resources adjacent to or easily accessible from trails, roads, and developed areas could be vulnerable to surface disturbance, inadvertent damage,

and vandalism. A loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence could result. However, visitor education would discourage vandalism and inadvertent destruction of cultural remains, and any adverse impacts, although long-term or permanent, would be expected to be minimal if they do occur.

Cumulative Impacts. In the past, human activities, lack of sufficient resource monitoring and protection programs, and climatic and natural processes have resulted in the loss or disturbance of archeological resources. Because much of the park was not surveyed and inventoried for archeological resources until recent years, some decisions about site development and permitted activities, such as large special events, have been made that, in hindsight, may have resulted in the loss or disturbance to an unknown number of archeological sites on lands in the park. Although ongoing and expanded archeological site monitoring programs would be initiated and efforts would be undertaken to minimize or mitigate potential impacts from human activities and natural causes, an unknown number of archeological sites on NPS- and partner-owned lands in the park would likely continue to be adversely impacted by current and ongoing human activities such as large special events; weather and climatic conditions; and natural processes such as erosion and the shifting and cutting of river channels.

Other recent, current, and reasonably foreseeable planning endeavors and undertakings on or near park lands, such as the expansion of the I-81 corridor through the park; encroaching residential, commercial, and industrial development on lands within the park boundaries resulting from regional growth; expansion of the O-N Minerals rock quarry adjacent to the park's western boundary; and construction of power transmission lines near the park, would likely contribute to disturbance or destruction of archeological resources. Thus, such undertakings would potentially have adverse impacts on archeological resources.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to contribute adverse, minor to moderate, long-term impacts on any overall cumulative impact on archeological resources. The adverse impacts on such resources associated with Alternative A, however, would constitute a relatively small component of any overall cumulative impact.

Section 106 Summary. The Section 106 determination of effect on archeological resources on NPS- and partner-owned lands in the park would likely be *adverse effect*; the determination would be a potential *adverse effect* on archeological resources on privately owned lands.

Conclusion. Overall, implementation of Alternative A would result in potential adverse, minor to moderate, long-term impacts on archeological resources on NPS-

and partner-owned lands; and would result in potentially adverse, minor to moderate, long-term impacts on archeological resources on privately owned lands.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have cumulative adverse, minor to moderate, long-term impacts on archeological resources; however, this alternative's contribution to these impacts would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of archeological resources in the park.

■ **Ethnographic Resources**

Direct and Indirect Impacts. Comprehensive studies that identify ethnographic resources have not been completed in the park area. However, a draft *Ethnographic Overview and Assessment*, prepared for the NPS in 2006, indicated the likelihood of resources within the park boundaries that have "great significance" in association with American Indians, African-Americans, Germans, Scots-Irish, non-conformist religious practitioners, and commemorators of the South's Lost Cause. Thus, while it is not known at present if ethnographic resources exist in the park, it is likely that some will be identified as a result of further research and future studies.

Under Alternative A, the NPS and its Key Partners will consult with concerned Indian tribes and other groups (once potentially affected tribes and groups are identified) to learn about and develop strategies for preserving and providing access to ethnographic resources on NPS- and partner-owned lands. The NPS and its Key Partners will 1) encourage archeologists, anthropologists, and researchers to consult with tribes and other groups regarding areas of interest that could be included in research efforts and 2) promote ethnographic involvement in excavations and anthropological research. Thus, implementation of this alternative would result in beneficial, minor to moderate, long-term impacts on ethnographic resources that were identified on NPS- and partner-owned lands.

If ethnographic resources were identified on privately owned lands in the park, protection and preservation of such resources would be subject to the discretion of landowners. In most cases, adverse impacts would be realized only when private lands are developed. The NPS and its Key Partners would encourage preservation of identified ethnographic resources and technical assistance would be available to private landowners to enable them to protect such resources, but ultimate decisions regarding preservation and use would rest with the landowners. Thus, implementation of this alternative would result in potential adverse, minor to moderate, long-term impacts on ethnographic resources on privately owned lands.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and establishment of the NHP, ethnographic resources were likely subjected to minor to moderate adverse impacts by a variety of human activities, such as large special events and agricultural operations, inadvertent disturbance, and vandalism; and by natural processes. Many of these activities and processes have continued to the present and would likely continue if Alternative A were implemented.

Current, ongoing, and reasonably foreseeable projects and developments on or adjacent to park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, industrial, and commercial development within the park due to regional growth, would result in potential adverse, minor to moderate, short-term impacts on any identified ethnographic resources during periods of construction.

Additionally, these developments would likely contribute to an increase in park visitation and thus potentially disturb, or disrupt access to, ethnographic resources. Therefore, they would also result in potential adverse, minor to moderate, long-term impacts on identified ethnographic resources.

These developments, along with major expansion of the O-N Minerals rock quarry adjacent to the park's western boundary and construction of overhead power transmission lines near the park, would also result in potential adverse, minor to moderate, long-term impacts on ethnographic resources.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to contribute minor to moderate, long-term adverse impacts on any overall cumulative impact on ethnographic resources. The adverse impacts on such resources associated with Alternative A, however, would constitute a relatively small component of any overall cumulative impact.

Conclusion. Overall, implementation of Alternative A would result in beneficial, minor to moderate, long-term effects on ethnographic resources on NPS- and partner-owned lands in the park; and would result in potentially adverse, minor to moderate, long-term effects on ethnographic resources on privately owned lands. Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to result in adverse, minor to moderate, long-term cumulative impacts on ethnographic resources; however, this alternative's contribution to these impacts would be a relatively small component of any overall cumulative effect.

Impacts from actions contained in this alternative would not likely result in impairment of ethnographic resources in the park.

■ Historic Structures

Direct and Indirect Impacts. Under Alternative A, historic structures on NPS- and partner-owned lands would continue to be surveyed, inventoried, and evaluated under National Register of Historic Places criteria to determine their eligibility for listing in the National Register. This would be done as NPS and partner staffing and funding permit. To appropriately preserve and protect National Register-listed or National Register-eligible historic structures (i.e., Belle Grove Manor House, Harmony Hall, Solomon Heater House, and Hite-Whitham property) on NPS- and partner-owned lands, all preservation and rehabilitation efforts would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995) and ongoing Section 106 consultation with the Virginia State Historic Preservation Officer. Any materials removed during rehabilitation efforts would be evaluated to determine their value to the park's museum collections and/or for their comparative use in future preservation work at the sites. Stabilization, preservation, and rehabilitation would have *no adverse effect* on historic structures.

Nevertheless, some negligible to minor, adverse impacts on historic fabric in historic structures could result from climatic conditions and other natural processes as well as from anticipated increases in visitation levels and continued use of structures for residential, administrative, and interpretive activities. However, these impacts would be minimized to the extent possible by public education efforts as well as by preservation treatment and regular cyclic maintenance as NPS and partner funding and personnel permit. Few, if any, adverse impacts would be anticipated.

Protection and preservation of historic structures on privately owned property would continue to be subject to the discretion of private landowners. The NPS and its Key Partners would encourage preservation of historic structures on private lands and technical assistance would be available to private landowners to enable them to preserve such resources; however actions regarding preservation of such resources would ultimately be subject to the discretion of landowners. While some National Register-listed privately owned properties would continue to maintain their historic integrity as a result of landowner preservation activities, other listed properties on private lands would likely continue to deteriorate from lack of preservation treatment. This variable level of facility and resource management could contribute to the deterioration of historic structures in the park. In most cases, adverse impacts would be realized only when private lands are developed.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and the establishment of the NHP, historic structures were adversely impacted by a variety of human activities, such as large special events, inadvertent disturbance, and vandalism; and by natural processes, such as erosion, weathering, and other climatic conditions. Many of these activities and processes have continued to the present and would likely continue if Alternative A were implemented.

Current, ongoing, and reasonably foreseeable projects and developments on or adjacent to park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, industrial, and commercial development within the park boundaries due to regional growth, would have potentially adverse, minor to moderate, long-term impacts on historic structures because they would likely result in increasing park visitation and the potential for some loss of historic fabric from historic structures.

As described above, implementation of Alternative A would result in both beneficial and adverse impacts on historic structures. Yet, due to the adverse impacts of other current or reasonably foreseeable actions the cumulative impact would be adverse. Alternative A, however, would contribute only minimally to the adverse cumulative impact.

Section 106 Summary. The Section 106 determination of effect on historic structures on NPS- and partner-owned lands would be *no adverse effect*; on privately owned land the determination would be potential *adverse effect*.

Conclusion. Overall, implementation of Alternative A would result in beneficial, minor to moderate, long-term impacts on historic structures on NPS- and partner-owned lands in the park; and would result in potentially adverse, minor to moderate, long-term impacts on historic structures on privately owned lands.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to result in cumulative adverse, minor to moderate, long-term impacts on historic structures; however, this alternative's contribution to these effects would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of historic structures in the park.

■ Cultural Landscapes

Direct and Indirect Impacts. Comprehensive cultural landscape studies have not been completed for all NPS- and partner-owned lands in the park. A draft cultural landscape inventory (CLI) has been completed for the Hite-Whitham Farmstead, which is the only NPS-owned property within the park. Under Alternative A cultural landscapes on NPS- and partner-owned lands would continue to be surveyed, inventoried, and evaluated under National Register of Historic Places criteria to determine their eligibility for listing in the National Register as NPS and partner staffing and funding permit. To appropriately preserve and protect National Register-listed or National Register-eligible cultural landscapes on NPS- and partner-owned lands, all stabilization, preservation, and rehabilitation efforts would be

undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995) and ongoing Section 106 consultation with the Virginia State Historic Preservation Officer. Stabilization, preservation, and rehabilitation would have *no adverse effect* on cultural landscape resources.

Careful design would ensure that the expansion or development of trails would minimally affect the scale and visual relationships among landscape features. In addition, the topography, vegetation, circulation features, and land use patterns of cultural landscapes would remain largely unaltered. Few, if any, adverse impacts would be anticipated.

Nevertheless, some negligible to minor, adverse impacts on significant elements of cultural landscapes (such as vegetation, land use, building and settlement patterns, and views and vistas), could result from climatic conditions and other natural processes, as well as from anticipated increases in visitation levels, continued use of structures for residential, administrative, and interpretive activities, and encroaching highway, residential, and commercial development. However, these impacts would be minimized to the extent possible by public education efforts, as well as from preservation treatment as NPS and partner funding and personnel permit. Few, if any, adverse impacts would be anticipated. Thus, implementation of Alternative A would result in beneficial, minor to moderate, long-term impacts on cultural landscape resources on NPS- and partner-owned lands.

Protection and preservation of significant elements of cultural landscapes (such as vegetation, land use, building and settlement patterns, and views and vistas) on privately owned property would continue to be subject to the discretion of private landowners. The NPS and its Key Partners would encourage preservation of significant elements of cultural landscapes on private lands, and technical assistance would be available to private landowners to enable them to protect such resources; however actions regarding cultural landscape preservation would be subject to the discretion of landowners. While some National Register-listed privately owned properties would continue to maintain their historic integrity as a result of landowner preservation activities, other listed properties on private lands would likely continue to deteriorate from lack of preservation treatment. In most cases, adverse impacts would be realized only when private lands are developed. Thus, implementation of Alternative A would result in potential adverse, minor to moderate, long-term impacts on cultural landscape resources on privately owned lands.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and the establishment of the NHP, cultural landscapes were adversely impacted by a variety of human activities, such as large special events, agricultural operations (which have impacted Civil War-related resources), inadvertent disturbance, and vandalism; and by natural processes, such as erosion, weathering, and other

climatic conditions. Many of these activities and processes have continued to the present and would likely continue if Alternative A were implemented.

Current, ongoing, and reasonably foreseeable projects and developments on or adjacent to park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, industrial, and commercial development within the park boundaries due to regional growth, would have adverse effects on cultural landscape resources because they would likely result in increasing park visitation and the potential for loss of significant cultural landscape features. These developments, along with major expansion of the O-N Minerals rock quarry adjacent to the park's western boundary and construction of overhead power transmission lines near the park, would have adverse, minor to moderate, long-term impacts on cultural landscape resources because they would result in visual intrusions on the historic scene and would contribute to the loss of significant elements of the park's rural and pastoral landscape.

As described above, implementation of Alternative A would result in both beneficial and adverse impacts on cultural landscapes. Yet, due to the adverse impacts of other current or reasonably foreseeable actions, the cumulative impact would be adverse. Alternative A, however, would contribute only minimally to the adverse cumulative impact.

Section 106 Summary. The Section 106 determination of effect would be *no adverse effect* on cultural landscapes on NPS- and partner-owned lands; and the determination of effect would be potential *adverse effect* on cultural landscapes on privately owned lands.

Conclusion. Overall, implementation of Alternative A would result in beneficial, minor to moderate, long-term impacts on cultural landscapes on NPS- and partner-owned lands in the park; and would result in potential adverse, minor to moderate, long-term impacts on privately owned lands.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have cumulative adverse, minor to moderate, long-term impacts on cultural landscapes; however, this alternative's contribution to these effects would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of cultural landscapes in the park.

■ **Museum Collections**

Direct and Indirect Impacts. Under Alternative A, the NPS and its Key Partners would continue to preserve and manage collections of cultural and natural resource

objects, artifacts, and archives relating to the park lands they own within the legislated boundaries of the park. This would be done in compliance with NPS and other professional standards for collecting, managing, and preserving museum collections. As museum collections are acquired, the materials would be accessioned, cataloged, preserved, protected, and made available for access and use according to NPS and other professional standards and guidelines.

Privately owned collections of cultural and natural objects, artifacts, and archival materials would likely continue to remain in private ownership or be deposited with organizations or institutions at the discretion of landowners. As a result, such collections of historical and natural objects, artifacts, and archives could be potentially degraded, lost, or scattered, thus reducing or eliminating their future usefulness for research and interpretation.

Cumulative Impacts. Because conditions would not change, there would be no cumulative effects on museum collections under this alternative.

Conclusion. Overall, actions under this alternative would result in beneficial, minor to moderate, long-term impacts on museum collections possessed by the NPS and its Key Partners. Actions under this alternative would result in potential minor to moderate, long-term, adverse impacts on privately owned collections. There would be no cumulative impacts on museum collections under this alternative.

Impacts from actions contained in this alternative would not likely result in impairment of museum collections in the park.

4.3.2 Natural Resources

■ Scenic/Visual Resources/Viewsheds

Direct and Indirect Impacts. Some of the existing visitor uses and recreational activities that occur in the park, including scenic driving, participation in large special events, and trail use, would continue to affect scenic resources. Visitation to the Cedar Creek Battlefield, Belle Grove Plantation, and other visitor attractions would continue to affect the scenic qualities of these areas. Impacts from scenic driving could include the creation of denuded areas and ruts along road corridors that may affect the scenic quality of the area. Large special events could continue to impact the scenic qualities associated with historic sites and cultural landscapes by affecting vegetation and landscape resources through vegetation trampling or loss. Trail use and general recreation could produce braided trails, denuded areas, and litter that would affect the visual qualities of the park.

Development of the Keister Tract would substantially increase visitor use in the southern portion of the park. Visitation at this site would increase after the area opens to the public and then would likely continue to gradually increase over the life of the plan. This increase in visitation and associated uses also would affect the

scenic and visual qualities of this site. Collectively, these recreational uses and activities would result in long-term, minor to moderate, adverse impacts on scenic resources that would be localized.

Land use and resource management activities in the park would continue to affect the scenic resources of the park. Under Alternative A, the NPS and its Key Partners would continue to manage scenic resources and viewsheds independently according to their own policies. Management of cultural landscapes, including the management of historic structures and natural resources that contribute to the cultural setting, would continue to be variable and could lead to adverse impacts to the scenic character of the park. Coordination between the NPS and its Key Partners on land and resource management in the park would continue to be informal and sporadic. For example, the management of open fields and grasslands could differ among partners and may lead to variations in vegetation patterns that may affect the visual integrity and scenic qualities of the pastoral landscape. Impacts are likely to be long-term and could be beneficial or adverse. The intensity of the impacts is unknown, although it is expected that it would be localized.

The construction of new facilities in the park, such as buildings, trails, and signs, has the potential to affect the scenic resources of the park. Decisions on facility development under Alternative A would continue to be left up to the respective partners and the NPS. Impacts on the rural and scenic character of the park could be realized from development that is either misplaced or out of context, injuring scenic resources and viewsheds. Depending on the nature and scope of facility development, impacts would be expected to be adverse and long-term in localized areas and could range from negligible to moderate intensity. The potential for impacts on scenic resources from facility development on partner- and NPS-owned lands in the park is low, given that the NPS and its Key Partners are committed to the protection and enhancement of scenic resources.

Land protection activities in the park would continue to affect the park's scenic resources and viewsheds. Land protection and acquisition activities would continue to be primarily driven by the partners with no overall plan. Acquisition of key historic sites within the park would continue to be the focus, in contrast to protecting key views, vistas, and scenic backdrops. Land and interests in land would be acquired by donation or from willing sellers as funds become available. The acquisition of key properties could result in the protection of important scenic resources and would prohibit development that could adversely impact these resources. Under Alternative A, technical assistance to Key Partners, private landowners, and nearby communities on scenic viewshed issues would continue to be limited or nonexistent. Lacking a coordinated land protection approach, the effect on scenic resource/viewshed protection and enhancement would be beneficial, but limited in extent. Continuation of the existing land protection approach would likely result in the protection of a core park area surrounded by a patchwork of

developed private lands. Land protection under Alternative A would be expected to result in long-term, minor, beneficial, localized impacts on scenic resources.

Scenic resources on private lands within the park, which constitute approximately two-thirds of the park's total acreage, would continue to be affected by land-use and land-management activities, development, and land protection. Land-use and land-management activities, including general residential use, agriculture, or other inadvertent human activity, could adversely affect scenic resources by degrading the site conditions of an area. Increased residential and commercial development on private lands would adversely impact scenic resources and viewsheds through the placement of items or structures that may be incompatible with the historic, scenic qualities of an area. Land protection activities and initiatives assumed by private landowners would have a beneficial impact on scenic resources within the park. Although the NPS and its Key Partners would continue to encourage and promote the protection of scenic resources and viewsheds on private lands, resource preservation efforts would be subject to the discretion of individual landowners. Collectively, impacts on scenic resources and viewsheds from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to major depending on the scale of these activities. Adverse impacts would be major only if significant portions of the land are developed.

Cumulative Impacts. All of the actions and projects identified as "cumulative projects" would affect the park's fundamental scenic resources and values. The expansion of I-81 would increase the footprint of the highway corridor and related facilities in the park. The interstate would likely be more visible from more areas of the park. Expansion of the O-N Minerals rock quarry would likely include additional infrastructure and more stockpiles adjacent to the park boundary, which would affect the rural character and setting of the park. The upgrade of the power transmission lines that emanate from the Meadow Brook substation just north of the park would affect the park's rural character and scenic views from within the park. The impacts of increased land conversion and development in the region would continue to increase property values in the park, adding pressure to landowners that could result in increased development and loss of scenic resources. Increases in residential and commercial development near or adjacent to the park could result in impacts on the park's rural setting, scenic qualities, and viewsheds, primarily due to the intensity of land uses and the design of new developments. Collectively, these other actions would result in long-term, moderate to major, adverse impacts. The impacts would be localized, but could affect many sites.

When the likely effects of implementing the actions contained in Alternative A are added to the effects of other current and reasonably foreseeable actions described above, there would be a long-term, moderate to major, adverse cumulative impact

on the park's scenic resources and viewsheds. The actions in Alternative A would contribute a relatively small increment to this cumulative impact.

Conclusion. The park's scenic resources and viewsheds would be affected by the actions under Alternative A, including the continuation of existing policies and practices for visitor use, land use and management, development, and land protection. Activities on private lands would also continue to affect the park's scenic resources and viewsheds.

Visitor use would result in long-term, minor to moderate, adverse impacts on scenic resources that would be localized. Land use and management impacts on scenic resources would be long-term, beneficial or adverse, and localized, with unknown intensities. Development impacts would be long-term, adverse, negligible to moderate, and localized. Land protection would result in long-term, beneficial, minor impacts that would be localized. Private land activities would result in long-term, adverse, localized impacts, with intensities ranging from negligible to major depending on the scale of these activities.

When the impacts of Alternative A are added to the effects of other current and foreseeable future actions, there would be a moderate to major, long-term, adverse cumulative impact on the park's scenic resources and viewsheds. The impacts would be localized, but could affect many sites. The actions in Alternative A would add a small increment to this overall impact.

Impacts from actions contained in this alternative would likely result in potential impairment of scenic/visual resources/viewsheds in the park.

■ Soils

Direct and Indirect Impacts. Under Alternative A, soils in the park would likely continue to be compacted and eroded from visitor use in localized areas, such as along existing trails, parking areas, and at reenactment and interpretive sites. In some areas, new human-created, unofficial social trails may form with increased visitation, particularly at popular sites. In sloped areas, unofficial social trails would result in increased soil erosion from storm water runoff. Large special events would continue to result in concentrated adverse impacts on soils from visitors, horses, and vehicles, especially in sensitive areas such as highly erodible and hydric soils. These long-term, adverse impacts would be of minor to moderate intensity and limited in extent.

Under Alternative A, the NPS and its Key Partners would continue to manage soil resources independently according to their own policies. Soils in the park would continue to be altered in areas that are in agricultural production. This alteration could include compaction and erosion from grazing cattle, as well as cultivation of fields and hay production and harvest. Cattle grazing in stream corridors would

continue to cause soil erosion. Under Alternative A, technical assistance to Key Partners, private landowners, and nearby communities on soil resource issues would continue to be limited to nonexistent. Collectively, these activities would result in long-term adverse minor to moderate impacts that would be limited in extent.

Soils could be altered due to the construction of new visitor facilities, such as buildings, trails, and signs. Soil alteration includes soil erosion and associated soil loss during construction activities (short-term) and long-term disruption of the soil profile at facility sites. Depending on the nature and scope of the development, impacts would be expected to be adverse and long-term in localized areas and could range from negligible to moderate intensity. Maintenance of existing facilities would probably result in some erosion and/or alteration of soil properties, resulting in a negligible to minor, long-term, adverse impact in localized areas.

Land protection activities in the park would continue to affect the park's soils. Land protection and acquisition activities would continue to be primarily driven by the partners with no agreed-to plan. Although acquisition of key historic sites within the park would continue to be the focus, these properties would also contain soil resources. Acquisition of these properties could result in the protection of important soils, including prime farmland or hydric soils, and would prohibit development that could adversely impact these resources, thus resulting in a beneficial impact. Lacking a coordinated land protection approach, the effect on the protection and enhancement of soils in the park would likely be beneficial, but limited in extent. Land protection under Alternative A would be expected to result in long-term, minor, beneficial impacts on soils.

Soils on private lands within the park, which constitute approximately two-thirds of the park's total acreage, would continue to be impacted by land use, management, and development. Land-use and land-management activities, including general residential use, agricultural production, or some inadvertent human activity, could adversely affect soil resources. Land protection activities and initiatives assumed by private landowners would have a beneficial impact on soils within the park. Although the NPS and its Key Partners would continue to encourage and promote the protection of soils on private lands, resource preservation efforts would be subject to the discretion of individual landowners. Collectively, impacts on soils from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to major depending on the scale of these activities.

Cumulative Impacts. The expansion of I-81 through the park would result in the alteration and loss of soils in the park due to roadway construction and the impacts of heavy equipment use. The impacts of increased land conversion and residential and commercial development in the region would continue to increase property values in the park, adding pressure to landowners that could result in increased

development and loss of soil resources in the park. Collectively, these other actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative A are added to the effects of other current and reasonably foreseeable actions, there would be a long-term, minor to moderate, adverse cumulative impact on soils. The actions in Alternative A would contribute an appreciable increment to this cumulative impact.

Conclusion. Some of the park's soils would be affected by the actions under Alternative A, including the continuation of existing policies and practices for visitor use, land use and management, development, and land protection. Activities on private lands would also continue to affect the park's soils.

Visitor use impacts on soils would be long-term, adverse, minor to moderate, and localized. Land use and management impacts on soils would be long-term, adverse, minor to moderate, and localized. Facility development and maintenance impacts would be long-term, adverse, negligible to moderate, and localized. Land protection would result in long-term, beneficial, minor impacts and would be localized. Private land activities would result in long-term, adverse, localized impacts, with intensities ranging from negligible to major depending on the scale of these activities.

When the impacts of Alternative A are added to the effects of other current and foreseeable future actions, there would be a minor to moderate, long-term, adverse cumulative impact on soils in the park. The impacts would be localized. The actions in Alternative A would add an appreciable increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of soils in the park.

■ **Groundwater**

Direct and Indirect Impacts. Increases in visitation to the partner-owned sites would likely increase the demand for domestic water. Development of the Keister Tract would substantially increase visitor use in the southern portion of the park. Visitation at this site would increase after the area opens to the public and then would likely continue to gradually increase over the life of the plan. These new uses and corresponding increases in park visitation could result in long-term, adverse impacts on groundwater and domestic water supplies. The impacts could extend beyond park boundaries. Predicting the intensity of this impact is difficult, but it is anticipated to be minor because the increase in water use above existing rates of consumption would be relatively small when compared to the size of the aquifer.

Groundwater quality in the park could continue to be affected by visitor use in locations such as along existing roads and at parking areas. Inadvertent chemical spills, including oil from automobiles, could enter the soil profile and impact

groundwater quality. Park visitors could also affect groundwater resources by improperly or inadvertently disposing of chemicals or other substances that may enter groundwater via the park's karst topography. Areas with karst features, such as sinkholes, that have more direct connections to groundwater and surface waters, would be more likely to facilitate adverse impacts on groundwater. These adverse impacts would likely be long-term, localized, and of negligible to minor intensity because they would be limited to discrete areas such as roads and parking areas.

Under Alternative A, the NPS and its Key Partners would continue to utilize and manage groundwater resources independently according to their own policies. Groundwater resources in the park would continue to be affected by the land use and management decisions of the NPS and its Key Partners. The NPS and its Key Partners would continue to employ agricultural practices that have the potential to affect groundwater quality and consequently the underlying aquifer. Under Alternative A, technical assistance to Key Partners, private landowners, and nearby communities on groundwater extraction and groundwater quality issues would continue to be limited to nonexistent. These long-term adverse impacts would be localized and intensities would be negligible to minor because the scope and frequency of impacts would be relatively small.

According to the Frederick County Comprehensive Plan, it is unknown how long the area aquifer will be able to meet domestic water supply needs. It is presumed that the quantity of groundwater being withdrawn for current NPS and partner purposes is relatively small compared to private uses in the park, and water use is not expected to increase substantially during the life of this plan. No new facility development would occur on NPS-owned land; therefore, no additional water withdrawals would be expected. New facility development in the park resulting from partner actions could lead to increased demands on water resources. The establishment of new wells or other water withdrawals in the park could adversely affect water supplies parkwide over the long-term; however, the impact would be expected to be negligible to minor because a relatively small amount of water would be required for new facility development.

Land protection activities in the park would continue to affect the park's groundwater. Land protection and acquisition activities would continue to be primarily driven by the partners with no agreed-to plan. Although acquisition of key historic sites within the park would continue to be the focus, these properties overlay groundwater. Acquisition of these properties could aid in the protection of groundwater by eliminating or reducing the development potential of the property. This would result in a reduction in demand for domestic water that would help with current water supply issues. Elimination or reduction of development would also reduce the potential for adverse impacts on groundwater quality by reducing human activities that could result in inadvertent chemical contamination. Lacking a coordinated land protection approach, the effect on the protection and enhancement

of groundwater in the park would likely be beneficial, but limited in extent. Land protection under Alternative A would be expected to result in long-term, minor, beneficial impacts on groundwater.

Groundwater on private lands within the park, which constitute approximately two-thirds of the park's total acreage, would continue to be impacted by development and land use and management. Land protection activities and initiatives assumed by private landowners could have a beneficial impact on groundwater within the park. Increased residential and commercial development on private lands would adversely impact groundwater due to increased water extraction and the potential for groundwater quality impacts associated with residential and commercial activities. Land-use and land-management activities, including general residential use, agricultural production, or some inadvertent human activity, could adversely affect groundwater. Although the NPS and its Key Partners would continue to encourage and promote the protection of groundwater on private lands, resource preservation efforts would be subject to the discretion of individual landowners. Collectively, impacts on groundwater from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to moderate depending on the scale of these activities.

Cumulative Impacts. Three of the four actions and projects identified as “cumulative projects” would affect groundwater resources. The expansion of I-81 would likely affect groundwater supply in the area in the short-term because the water required for construction would likely be withdrawn from the local aquifer. Expansion of the O-N Minerals rock quarry is anticipated to result in aquifer drawdown and could affect groundwater quality in the immediate area. Aquifer drawdowns of 10 feet could occur up to 9,600 feet from the quarry (NPS 2006b). Quarries are regulated facilities that must adhere to federal and state permit requirements that would serve to mitigate any adverse impacts. The impacts of increased land conversion and development in the region would continue to increase property values in the park, adding pressure to landowners that could result in increased development. Increases in residential and commercial development near or adjacent to the park could result in impacts on groundwater resources due to increased water demand and the potential for impacts on groundwater quality. Population growth in the area is already stressing existing water supplies. Collectively, these other actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative A are added to the effects of other current and reasonably foreseeable actions described above, there would be a long-term, adverse cumulative impact on groundwater resources. The impacts would extend beyond park boundaries and would include the region. It is difficult to predict and quantify the impacts, but they are anticipated to be moderate; the impacts would be more than imperceptible, but

substantial changes to aquifer resources would not be expected. The actions in Alternative A would add a very small increment to this overall impact.

Conclusion. Groundwater resources in the park would continue to be affected by the actions under Alternative A, including the continuation of existing policies and practices for visitor use, land use and land management, development, and land protection. Activities on private lands would also continue to affect the park's scenic resources and viewsheds.

Visitor use impacts on groundwater would be long-term, adverse, negligible to minor, and localized. Land use and management impacts on groundwater would be long-term, adverse, negligible to minor, and localized. Facility development and maintenance impacts would be long-term, adverse, negligible to minor, and experienced parkwide. Land protection would result in long-term, beneficial, minor impacts that would be localized. Private land activities would result in long-term, adverse, localized impacts, with intensities ranging from negligible to moderate depending on the scale of these activities.

When the impacts of Alternative A are added to the effects of other current and foreseeable future actions, there would be a moderate, long-term, adverse, cumulative impact on groundwater resources. The impacts could extend beyond park boundaries in some cases. The actions in Alternative A would add a very small increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of groundwater in the park.

■ **Surface Water Quality**

Direct and Indirect Impacts. Under Alternative A, surface water quality in the park would continue to be affected by visitor use due to the potential for soil erosion and inadvertent chemical contamination. Trail use adjacent to surface waters would continue to cause soil erosion that would affect the turbidity and chemical integrity of surface waters. Large special events would likely continue to result in adverse impacts on surface water quality due to the concentration of visitor activities, including stock and vehicle use, and their potential to increase soil erosion. Concentrated or repeated visitor activities in riparian areas, such as the use of horses during battle re-enactments, would likely continue to result in adverse impacts on surface water quality due to vegetation loss and resultant increased erosion. This erosion would affect the turbidity and chemical integrity of surface waters. Chemical contamination of waters could occur due to surface water runoff from parking areas that may contain oil and heavy metals. These long-term adverse impacts would be of minor intensity and limited in extent because of the infrequency of impacts and the lack of proximity to surface waters.

Under Alternative A, the NPS and its Key Partners would continue to utilize and manage surface waters independently according to their own policies. Technical assistance to Key Partners, private landowners, and nearby communities on water resource management issues would continue to be limited to nonexistent. Surface waters and water quality in the park would continue to be affected by land use and management decisions of the NPS, its Key Partners, and private landowners. The NPS and its Key Partners would continue to employ agricultural practices that have the potential to affect surface water quality. Soils in the park would continue to be altered in areas that are in agricultural production, which would contribute to soil erosion. Cattle grazing in stream corridors would continue to cause soil erosion and nutrient input into streams. Chemical use could also affect surface waters.

Perennial streams in the park, including Cedar Creek, the North Fork of the Shenandoah River, and Meadow Brook, provide important habitat to aquatic organisms and sensitive wildlife species in the area; therefore, water quality within these streams is of concern. Impacts could include increased turbidity and water temperature, as well as altered chemical composition resulting from erosion and urban pollutants. These impacts could lead to the degradation of aquatic wildlife habitat and surface water resources available for agricultural use. Collectively, these long-term adverse impacts would be mostly localized, but could occur parkwide. The intensity of the impact would be minor to moderate because land management practices, especially agricultural practices, near streams and rivers would continue to contribute materials and substances that affect surface water quality.

Development of new facilities in the park, such as buildings, trails, and signs, would affect surface water quality. Should the respective partners choose to develop new facilities on the land they own, the impacts would depend on the nature and scope of the development and would be expected to include short-term adverse impacts from construction and long-term, adverse impacts from surface water runoff. Short-term impacts from construction include increased erosion and resultant sedimentation, while long-term impacts include increased nutrient and other chemical inputs from runoff generated by impervious surfaces. Facility development would likely be the greatest at the Keister Tract, which is adjacent to a reach of the North Fork of the Shenandoah River. The potential for adverse impacts on surface water quality would likely be greatest at this site. However, impacts would be reduced from the implementation of best management practices (BMPs) and mitigation measures. In general, impacts on surface water quality from actions in this plan would be localized and of minor intensity due to the relatively small amount of facility development.

Land protection and acquisition activities in the park would continue to affect the park's surface water quality. These activities would continue to be driven primarily by the partners with no agreed-to plan. Although acquisition of key historic sites

within the park would continue to be the focus, these properties could also contain surface waters or could influence nearby surface waters. Acquisition of these properties would aid in the protection of surface water quality by eliminating or reducing the development potential of the property over time. Elimination or reduction of development would reduce the potential for adverse impacts on surface water quality by reducing the potential for increased erosion, surface water runoff, and human activities that could result in inadvertent chemical contamination. Under Alternative A, technical assistance to Key Partners, private landowners, and nearby communities on groundwater issues would continue to be limited to nonexistent. Lacking a coordinated land protection approach, the effect on the protection and enhancement of surface water quality in the park would likely be beneficial, but limited in extent. Land protection under Alternative A would be expected to result in long-term, minor, beneficial impacts on surface water quality.

Surface water quality on private lands within the park, which constitute approximately two-thirds of the park's total acreage, would continue to be impacted by land use, land management, and development. Land-use and land-management activities, including general residential use, agricultural production, or other inadvertent human activity, would continue to adversely affect surface water quality due to the potential for contamination of surface waters from runoff and inadvertent chemical spills. Land protection activities and initiatives assumed by private landowners would continue to have a beneficial impact on surface water quality within the park. Increased residential and commercial development on private lands would adversely impact surface water quality from the addition of urban pollutants in surface water runoff. Although the NPS and its Key Partners would continue to encourage and promote the protection of surface water quality on private lands, resource preservation efforts would be subject to the discretion of individual landowners. Collectively, impacts on surface water quality from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to major depending on the scale of these activities.

Cumulative Impacts. Three of the four actions and projects identified as "cumulative projects" would affect surface water quality. The expansion of I-81 would affect surface water quality in the park in the short-term due to construction activities. I-81 crosses Cedar Creek and one of its unnamed tributaries. It is reasonable to expect that some short-term adverse impacts on surface water quality would occur due to increased erosion, sediment loading, and channel manipulation; however, employing mitigation measures during construction should eliminate any long-term impacts. Expansion of the O-N Minerals rock quarry is anticipated to result in potential impacts on surface water quality resulting from the disposal of large volumes of intercepted groundwater (NPS 2006b). Quarries are regulated facilities that must adhere to federal and state permit requirements, which would serve to mitigate any adverse impacts. The impacts of increased land

conversion and development in the region would continue to increase property values in the park, adding pressure to landowners that could result in increased development. Increases in residential and commercial development near or adjacent to the park would result in impacts on surface water quality due to increased erosion from construction near waterways and from overall increases in impervious surfaces and associated urban pollutants within the area. Development in close proximity to Cedar Creek and the North Fork of the Shenandoah River could adversely affect sensitive aquatic organisms and lead to a loss of biodiversity in the area. These cumulative impacts would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative A are added to the effects of other current and reasonably foreseeable actions described above, there would be a long-term, adverse cumulative impact on surface water quality in the park. The impacts would be mostly localized but could extend further downstream into the watershed. It is difficult to predict and quantify the impacts, but they are anticipated to be minor to moderate. The actions in Alternative A would add an appreciable increment to this overall impact.

Conclusion. Surface water quality in the park would continue to be affected by the actions under Alternative A, including the continuation of existing policies and practices for visitor use, land use and management, development, and land protection. Activities on private lands would also continue to affect the park's surface water quality.

Visitor use impacts on surface water quality would be long-term, adverse, minor, and localized. Land use and land management impacts on surface water quality would be long-term, adverse, minor to moderate, and mostly localized. Development impacts would be both short-term and long-term, adverse, minor, and localized. Land protection would result in long-term, beneficial, minor impacts and would be localized. Private land activities would result in long-term, adverse, localized impacts, with intensities ranging from negligible to major depending on the scale of these activities.

When the impacts of Alternative A are added to the effects of other current and foreseeable future actions, there would be a minor to moderate, long-term, adverse cumulative impact on surface water quality. The impacts would be mostly localized, but could extend beyond park boundaries. The actions in Alternative A would add an appreciable increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of surface water quality in the park.

■ Vegetation

Direct and Indirect Impacts. Under Alternative A, some of the existing visitor uses and recreational activities that occur in the park, including informal trail use and participation in large special events, would continue to affect vegetation. Some vegetation may be lost due to the formation of human-created, unofficial social trails in or near popular areas. General recreational use also could adversely affect native vegetation in local areas. Large special events would continue to impact vegetation by causing injury or mortality in isolated areas due to trampling from visitor use and damage to trees from horse activity and hitching. Impacts would likely continue to be greatest in sensitive areas such as riparian areas, wetlands, and rare plant communities. The volume of use and the effects of incompatible participant behavior generally lead to adverse impacts on native vegetation. Visitor use in the park, including automobile and human use, would continue to be a source of exotic and invasive plants and could facilitate the spread and proliferation of these species. Collectively, visitor use would result in long-term, adverse, minor impacts that would be localized.

Under Alternative A, the NPS and its Key Partners would continue to manage vegetation independently according to their own policies. Land use and resource management activities in the park would continue to affect vegetation. The management of vegetation that contributes to the park's cultural landscapes, agricultural lands, and natural areas would continue to be variable and could lead to impacts on vegetation. Managing vegetation to support cultural landscape values through agricultural use and/or mowing could impact plant communities. Agricultural lands in the park would continue to be used for cattle grazing, hay production, or crop cultivation. However, this would have a negligible effect on native vegetation, as native plants have been largely absent from these areas for many years. Conventional agricultural use could also produce unintended impacts on adjacent native vegetation due to chemical use, harvest activities, and general agricultural activity. Mowing could affect plant vigor and the presence and abundance of woody plant material. Management of natural areas, including riparian areas, wetlands, and sensitive plant communities, could have both adverse and beneficial impacts on vegetation. Adverse impacts could include vegetation trampling or loss due to year round grazing and agricultural use, intense deer browse, and the lack of integrated pest management (IPM). Beneficial impacts could result from implementing grazing management and livestock watering techniques, managing wildlife populations, and monitoring the impacts of exotic and invasive plants. The removal of cattle grazing at the Keister Tract would likely produce beneficial impacts on vegetation at this site.

Invasive and exotic plants would continue to affect vegetation in the park. Pockets of invasive and exotic plants would continue to be present in the park during the life of this plan. Alternative A does not contain any specific proposals or actions regarding integrated pest management. It is presumed that IPM on NPS-owned

land would be conducted in accordance with the requirements of NPS policy. IPM on partner-owned lands would be conducted according to their respective policies. The abundance and distribution of non-native plants in the park could increase. Although it is difficult to determine the impact on native species, due to the uncertainties about the type of species that might be introduced in the future and the locations and frequencies of introductions, it is expected that with adequate monitoring and weed control efforts, the impacts would be limited in extent and highest along areas such as trails, roads, and waterways.

Collectively, impacts on vegetation from land use and management would be localized, adverse, of minor to moderate intensity, and could be either short- or long-term.

Development and maintenance of park facilities, including buildings, trails, and signs, would continue to affect vegetation. Under Alternative A, decisions on new facility construction would continue to be left up to the respective partners and the NPS. Potential impacts on vegetation would include vegetation loss and increases in the introduction of exotic and invasive plants. The development of visitor facilities at the Keister Tract would cause permanent loss of vegetation in the footprint of a development and would likely cause short-term, adverse impacts on vegetation adjacent to the footprint due to construction activities. Depending on the nature and scope of facility development elsewhere in the park, impacts would be expected to be short- and long-term, adverse, localized, and could range from minor to moderate in intensity.

Land protection and acquisition activities in the park under Alternative A would continue to affect the park's vegetation. These activities would continue to be primarily driven by the partners with no agreed-to plan. Although acquisition of key historic sites within the park would continue to be the focus, these properties could also contain vegetation and associated natural landscapes. Acquisition of these properties could result in the protection of important vegetation communities and would prohibit development that could adversely impact these resources, a beneficial effect. Under Alternative A, technical assistance to Key Partners, private landowners, and nearby communities on vegetation management issues would continue to be limited to nonexistent. Lacking a coordinated land protection approach, the effect on the protection and enhancement of vegetation communities would likely be beneficial, but limited in extent. Continuation of the existing land protection approach would likely result in the protection of a core park area surrounded by a patchwork of developed private lands. Land protection under Alternative A would be expected to result in long-term, negligible to minor, beneficial impacts on vegetation.

Vegetation on private lands within the park, which constitute approximately two-thirds of the park's total acreage, would continue to be impacted by land-use and

land-management activities, development, and land protection. Land-use and land-management activities, including general residential use, agriculture, or some inadvertent human activity, could adversely affect vegetation and result in plant injury or mortality. Increased residential and commercial development on private lands would adversely impact vegetation, resulting in the loss of vegetation and degradation of vegetation communities. Land protection activities and initiatives assumed by private landowners would have beneficial impacts on vegetation within the park by preventing vegetation loss due to development. Although the NPS and its Key Partners would continue to encourage and promote the protection of native vegetation on private lands, resource preservation efforts would be subject to the discretion of individual landowners. In most cases, adverse impacts would be realized only when private lands are developed. Collectively, impacts on vegetation from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to major depending on the scale of these activities.

Cumulative Impacts. All four actions and projects identified as “cumulative projects” could affect the park’s vegetation. The expansion of I-81 would affect vegetation in the park due to construction activities and runoff. Road construction would result in the loss of vegetation where vegetation is cleared. Vegetation alongside the newly constructed interstate would also be affected by surface water runoff from the roadway. Expansion of the O-N Minerals rock quarry could result in impacts on vegetation due to potential impacts on surface water quality and groundwater drawdowns. The disposal of intercepted groundwater in nearby waterways could degrade surface water quality, which in turn could injure riparian and/or aquatic plants or cause mortality. Quarries are regulated facilities that must adhere to federal and state permit requirements, which would serve to mitigate any adverse impacts. Groundwater drawdowns would reduce the water table in affected areas, which could stress plants or even cause mortality in instances of long-term reductions in water availability. The maintenance of upgraded or newly constructed powerlines near the park could affect the park’s vegetation due to potential impacts associated with vegetation management in the powerline corridors. Herbicides are routinely used in powerline corridors to eliminate woody vegetation. The application of herbicides that control woody plant growth could result in drift to non-target species in the park. Since the Meadow Brook power substation and the nearest powerline corridor are about one mile from the park’s northern boundary, the likelihood of drift affecting park vegetation is very low, but it is possible. The impacts of increased land conversion and development in the region would continue to increase property values in the park, adding pressure to landowners that could result in increased development and permanent loss of native vegetation. Increases in residential and commercial development near or adjacent to the park could result in impacts on park vegetation. Vegetation adjacent to construction sites could be affected in the short-term by erosion, sedimentation, and impacts on surface water

quality resulting from construction activities. Vegetation adjacent to newly developed areas could be affected over the long-term by surface water runoff that may contain urban pollutants that may injure or kill plants. These cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative A are added to the effects of other current and reasonably foreseeable actions described above, there would be a long-term, adverse cumulative impact on vegetation in the park. The impacts would be localized. It is difficult to predict and quantify the impacts, but they are anticipated to be minor to moderate. The actions in Alternative A would add an appreciable increment to this overall impact.

Conclusion. Vegetation in the park would be affected by the actions under Alternative A, including those associated with visitor use, land use, land management, development, and land protection. Activities on private lands would also continue to affect the park's vegetation.

Visitor use impacts on vegetation would be long-term, adverse, minor, and localized. Land use and management would result in short- or long-term and adverse or beneficial impacts on vegetation that would be localized and of minor to moderate intensity. Development impacts would be short- and long-term, adverse, minor to moderate, and localized. Land protection impacts would be long-term, beneficial, negligible to minor, and localized. Private land activities would result in long-term, adverse, localized impacts, with intensities ranging from negligible to major depending on the scale of these activities.

When the impacts of Alternative A are added to the effects of other current and foreseeable future actions, there would be a minor to moderate, long-term, adverse cumulative impact on vegetation. The impacts would be mostly localized. The actions in Alternative A would add an appreciable increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of vegetation in the park.

4.3.3 Visitor Use and Experience

Direct and Indirect Impacts. Alternative A would continue the existing arrangement of visitor contact taking place primarily at Key Partner sites, including park headquarters. The Key Partners would be responsible for interpretation and visitor services at individual sites. The typical visitor would likely stop at a single Key Partner site, with contacts at multiple sites being less frequent. There would be limited opportunities for visitors with historical interests to be introduced to park-wide interpretive themes, to become aware of the full array of park resources, and to learn of its national significance. The NPS would have no role in providing formal services, and most visitors would not interact with NPS staff at park headquarters.

The park would not be readily identified as a unit of the National Park System by the public. The impact would be long-term, moderate, and adverse.

There would be a modest expansion of interpretive opportunities by the Key Partners. Belle Grove would rehabilitate Harmony Hall, and when that is completed, the site would be opened for public tours. The Cedar Creek Battlefield Foundation may further develop the trail on the Bayliss tract and others may be developed by NPS, Belle Grove, or the Shenandoah Valley Battlefields Foundation on their lands. Trails would be developed as individual segments, with little potential for physical or interpretive connections. These opportunities would provide a negligible to minor and beneficial long-term impact on the visitor experience.

Visitors would tend to focus their trip primarily around the northern battlefield area, which is the location of the contact sites. The southern portions of the park would be infrequently visited, although some visitors would continue to access this part of the park on an auto tour. The existing auto touring routes would be continued in this alternative. Auto tour visitors would, in general, experience the park as a series of individual sites, and like the visitors stopping at a contact site, would not have opportunities to be introduced to park-wide themes and the range of park resources. They would not be fully aware of the existence of a national park and its significance.

The Cedar Creek Battlefield Foundation would continue to sponsor the annual re-enactment of the Battle of Cedar Creek and possibly re-enactments of other Civil War battles. These events are not designed as venues for interpretation, although the Battle of Cedar Creek re-enactment may offer enhanced opportunities for learning about the events that took place in the park. There could be increased appreciation for the site on the part of participants and spectators, as visitors make the connection between the landscape and the military events and learn of the specific resources that influenced the outcomes of the battle. Re-enactments of other battles could provide opportunities for learning about the Civil War, but these events would take place without a connection to historical locations. Such re-enactments would provide limited opportunities to expose visitors to the park events, resources, and values that make it a significant place. Belle Grove would continue holding special events on an annual basis. Some of these events may have only a peripheral connection to the plantation, such as the "Of Ale and History" beer tasting festival, which draws a large crowd.

Taken as a whole, special events are enjoyed by thousands of visitors and account for a large proportion of current park attendance but do not appeal to all visitors with historical interests. Although held infrequently, they generate activity that precludes use and enjoyment of partner sites by other visitors in the northern battlefield area of the park. Visitors not interested in re-enactments could experience conflicts for the duration of the events, and conflicts would increase with

the frequency of large special events and re-enactments. For the re-enactment enthusiast and other special event attendees, the impact of park actions on the visitor experience would be beneficial. For visitors with other historical interests, the impact would be adverse. The duration in both cases is short-term. The level of intensity could vary from minor to major because there are a variety of factors, such as weather and traffic congestion, influencing these time-sensitive events.

The development of the Keister tract would increase opportunities for recreational uses of the park. This would lead to an increase in visits to the park. Park actions would have a long-term, minor, and beneficial impact on recreational opportunities.

During the public scoping process, many members of the public addressed the importance of scenic viewsheds and voiced general concerns about the protection of views and scenic landscapes. Visitor enjoyment of the park is to some extent dependent on being able to view scenic vistas and broad landscapes that may be fully or partially located on privately-owned lands. Some of these areas are located within the park; others are outside the park but visible from points within the boundary. This alternative would not take proactive steps to protect privately-owned lands; as development occurs, the absence of park actions in this area could lead to a lessening of visitor enjoyment and understanding of park resources.

Cumulative Impacts. Recent, current, and reasonably foreseeable planning endeavors and undertakings on or near park lands, such as expansion of the I-81 corridor through the park, encroaching residential, commercial, and industrial development on lands within the park boundaries resulting from the growth of Strasburg and Middletown, expansion of the Chemstone rock quarry adjacent to the park's western boundary, and construction of power transmission lines near the park, would likely contribute to disturbances in the visual landscape, increases in the ambient noise level, and traffic congestion. These factors would detract from the visitor's enjoyment of the park. Thus, such undertakings would be expected to have an adverse, long-term impact on visitor use and experience. To some extent, they may be localized. The level of intensity would range from minor to major, depending on the location.

When the likely effects of implementing the actions contained in Alternative A are added to the effects of other past, present, and reasonably foreseeable actions outside the park, there would be a long-term, moderate adverse cumulative impact on visitor use and experience. The absence of park actions in the area of land protection could contribute an appreciable increment to this cumulative impact.

Conclusion. While visitor services and interpretation would be available at individual contact sites managed by Key Partners, the typical visitor would not be exposed to full range of park resources at the park or to opportunities to learn about park-wide interpretive themes. Visitors may not reach an understanding of the park's national significance, and its identity as a unit of the National Park

System would not be clear. Park actions in Alternative A would lead to an increase in the ways that visitors could experience the park, but mainly for recreational use. Overall, the impact of Alternative A would be long-term, moderate, and adverse.

When the likely effects of implementing the actions contained in Alternative A are added to the effects of other past, present, and reasonably foreseeable actions outside the park, there would be a long-term, moderate adverse cumulative impact on visitor use and experience. The absence of park actions in the area of land protection could contribute an appreciable increment to this cumulative impact.

4.3.4 Socioeconomic Environment

Direct and Indirect Impacts. Under Alternative A, the park would continue to contribute to the tourism industry in the three-county area and be an important part of the local socioeconomic environment. Middletown, at the northeastern end of the park, and Strasburg, at the southwest end, are the two gateway towns most closely associated with the park. These communities provide a range of goods and services for the visiting public as well as for park employees and other workers employed in tourism-related businesses. Because of the proximity of these communities to the park and their distance from other visitor areas, these two individual gateway communities would continue to receive the greatest impacts from the actions in this alternative.

The scattered areas of the park that are currently accessible to the public are a result of its size, configuration, land ownership patterns, and the varying uses of land within the park. Visitors must travel through one or more of the three counties (Frederick, Shenandoah, Warren) to gain access to the park. Consequently, impacts would be expected to be confined to the three-county region or the smaller local area. Under Alternative A, it is expected that most visitors would continue to start their visit at the Belle Grove or the Cedar Creek Battlefield visitor contact facility in Middletown. Visitors would then begin their tour based upon their individual preferences. Visitation to the NPS-owned property (Hite-Whitham Farm) would continue to be discouraged, as it is currently leased as a residence and is relatively out-of-the-way. It is not likely that much visitor use would occur at the NPS site over time, unless its use changes from a private residence and further development occurs. Local visitors and others familiar with the park would continue to go directly to their desired destination, say the Belle Grove Plantation or Keister Tract, and would have little reason to include the visitor contact facility or the NPS site as part of their visit. It is expected that the NPS's association with the park would continue to result in increased public awareness, interest, and visibility to the park, but increases in total park visitation under this alternative would be expected to be the lowest among all of the alternatives.

Visitors from outside the region would continue to be attracted to the park because of the extant historic facilities (e.g., Belle Grove Plantation), the historic battlefield

itself, and the battle reenactments. Access to the battlefield and interpretation of the Civil War that are provided by the Key Partners and the NPS would continue to be the key attractions for tourists. The reenactments would continue to be the most significant events in terms of number of visitors on site at one time and visitor-related spending that occurs each year. The battlefield reenactments are important short-term activities that draw increasing numbers of participants (historic Civil War re-enactors) and spectators to the region. This infusion of 12,000 to 14,000 visitors each year from outside the three-county region (with their accompanying spending) has a beneficial impact on the regional economy because it provides customers and income for local businesses. An increase in visitation is expected as a result of the NPS and Key Partners' efforts and would continue to produce beneficial economic and fiscal impacts for the local economy. Increasing visitation to the park would probably cause some increases in expenditures by out-of-the region visitors, which would benefit a few businesses and individuals within the local economy. Firms in the accommodations, food service, and retail trade industries are the most likely to be affected.

The NPS level of work under Alternative A would be essentially as it is now – two full-time equivalent (FTE) positions and an annual operating budget of \$284,500 (FY 2007). It is assumed that one additional NPS staff would be hired. The NPS annual operating budget would be expected to rise to about \$366,000 under current management trends. The low level of NPS presence at the park would continue to result in heavy reliance on the Key Partners for providing visitor access and programs, interpretation, management, maintenance, land acquisition, etc.

Signs, trails, and a visitor center that are typically part of a traditional NPS park would not be developed. The only potential capital investment by the NPS under Alternative A would be rehabilitation of the Hite-Whitham Farm property to be used for park administrative purposes. The economic impact of this project would be beneficial, but minor.

The NPS would not actively seek to acquire additional land holdings, but could respond as opportunities arise. Further protection of the park and other historic resources through increased land acquisition, conservation easements, or other means, would continue to be left up to the Key Partners and any actions by individual landowners or local government. Impacts from land acquisition under Alternative A would be negligible. Payments in Lieu of Taxes (PILT) would continue to be made by the federal government to Warren County for the NPS-owned parcel.

Economic and fiscal impacts on the local economy (areas within and adjacent to the park's boundaries and specifically Middletown and Strasburg) due to NPS actions would be beneficial, minor, local in extent, and long-term in duration (staffing and operations funding is an ongoing commitment). NPS spending would continue to affect only a few individuals and business firms.

The Key Partners would continue to employ the equivalent of six or seven FTEs for administration and resource management, and would continue to use the dozens of volunteers that assist them with their work. The Key Partners' annual operating expenditures would continue at approximately \$646,000. Development of the Keister Tract into a park would constitute the majority of any capital improvements by the Key Partners under Alternative A.

Economic and fiscal impacts on the three-county, regional economy are generally the same as the local impacts, with additional expenditures occurring in the region as out-of-region visitors travel to and from the park. Their spending for food, lodging, souvenirs, etc. in the region brings in income, which is vital to local businesses. These expenditures are also re-circulated within the economy as businesses pay staff and employees purchase goods and services within the three-county region. Total recurring costs by the NPS and Key Partners would be about \$1.0 million annually, while total one-time costs would be about \$7.3 million. A few businesses and individuals in the region would continue to benefit, but the overall impacts have much less importance due to the greater size of the economy of the three-county region. Impacts on the region—with over \$3.3 billion in earnings and over 96,600 jobs in 2004—as measured by these or other economic indicators (e.g., a notable increase in income or a decrease in unemployment, poverty, etc.) would be negligible.

Changes in the three-county (plus the city of Winchester) regional economy would include impacts on the regional socioeconomic base due to changes in park operations and other management or development actions. The socioeconomic base includes such factors as population, income, employment, earnings, etc. The relatively small amount of park development and rehabilitation projects contained in this alternative would benefit the construction industry and associated workers.

Cumulative Impacts. Expansion of the I-81 corridor could increase the number of construction-related jobs in the area as well as increase spending within the local hospitality industry, a beneficial impact that would be short-term and of minor intensity. Expansion of the Chemstone quarry and upgrade of the power transmission lines could also increase jobs and spending in the local area, producing long-term, minor, beneficial impacts. The quarry expansion could also have adverse impacts on property values in the nearby area. Increased residential and commercial development would increase spending on land and construction materials while producing jobs in the region. The beneficial impact on socioeconomic conditions from this action would likely be long-term and of moderate intensity.

When the likely effects of implementing the actions contained in Alternative A are added to the effects of other current and reasonably foreseeable actions as described above, there would be a long-term, beneficial, minor to moderate,

cumulative impact on the local and regional economy. The actions in Alternative A would add a very small increment to this overall impact.

Conclusion. The small NPS effort of three FTEs and an annual operating budget of \$366,000 would result in long-term, beneficial, negligible to minor fiscal impacts within the local and regional economies. The partners' \$646,000 annual expenditures and others' efforts would provide most of the impetus that results in greater long- and short-term, minor, beneficial fiscal impacts within the local and regional economies. Rehabilitation of the Hite-Whitham Farm property and development of the Keister Tract into a park would constitute the majority of capital investments under Alternative A. The battle reenactments would continue to result in beneficial, short-term, regional economic impacts that are major events during the short time they occur. Overall tourism spending is expected to increase to a minor to moderate degree as visitor use of the park by people from outside the region increases. Total recurring costs by the NPS and Key Partners would be about \$1.0 million annually, while total one-time costs would be about \$7.3 million. Some local and regional businesses and individuals would benefit. Acquisition of land for the park becomes more expensive and more difficult as the region continues to grow.

When the likely effects of implementing the actions contained in Alternative A are added to the effects of other current and reasonably foreseeable actions as described above, there would be a long-term, beneficial, minor to moderate, cumulative impact on the local and regional economy. The actions in Alternative A would add a very small increment to this overall impact.

4.3.5 Unavoidable Adverse Impacts

Unavoidable adverse impacts are defined as impacts that cannot be fully mitigated or avoided. Alternative A could result in several unavoidable adverse impacts on cultural and natural resources with impact intensities that are greater than minor, such as illegal collection of archeological resources, plants, and animals within the park boundary. Increased education, interpretation, and outreach efforts would help lessen, but not eliminate, the likelihood of this potential impact. Some soils and vegetation could be lost or altered, due to the construction of new facilities in the park and to soil erosion from increased visitor use.

4.3.6 Irreversible and Irretrievable Commitments of Resources

New actions would be taken that would either result in the consumption of nonrenewable cultural or natural resources, or in the use of renewable resources that would preclude other uses for a period of time. In the construction of new facilities, including buildings and trails, limited amounts of nonrenewable resources would be used, including fuels and building materials. These resources would be essentially irretrievable once they were committed.

4.3.7 The Relationship between Short-Term Uses of the Environment and Long-Term Productivity

Lands in the park that are protected would remain in their current state and maintain their long-term productivity. The primary short-term uses of Cedar Creek and Belle Grove NHP would continue to be historic preservation, heritage tourism, and recreational use. Disturbance of the park's soils, water quality, vegetation, and wildlife, due to visitor use and the construction of new facilities, would reduce the long-term productivity of the park in localized areas; however, overall there likely would be only a small effect on the park's long-term productivity. Efforts to protect, restore, and enhance natural and cultural resources in the park would increase the long-term productivity of the environment in localized areas.

4.4 Environmental Consequences of Alternative B

4.4.1 Cultural Resources

■ Archeological Resources

Direct and Indirect Impacts. The impacts of actions on archeological resources under Alternative B would be generally the same as those described under Alternative A. Although the NPS would acquire land and interests in land by donation or from willing sellers as funds are available, the partners would continue to have primary responsibility for land acquisition and resource protection. The current land status—approximately one-third of the park owned and protected from development by the NPS and its Key Partners and two-thirds of the park privately owned—would not be expected to change significantly.

Large special events would continue to have the potential to adversely impact archeological resources because visitors, vehicles, ground fires, and horses would likely continue to affect archeological resources. The development of new hiking/bicycling trails and auto touring routes in the park under Alternative B could affect archeological resources. However, trails and auto touring routes would be sited to avoid known archeological resources. Auto touring routes would be located within established rights-of-way. All ground-disturbing activities would be preceded by site-specific archeological surveys and, where appropriate, subsurface testing to determine the existence of archeological resources and how best to preserve them. If National Register-listed or National Register-eligible archeological resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the Virginia State Historic Preservation Officer (if the project was a federal undertaking). If previously undiscovered archeological resources were uncovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the Virginia State Historic Preservation Officer. Few, if any, adverse impacts on archeological resources would be expected due to efforts to avoid all known sites.

Archeological resources adjacent to or easily accessible from trails, roads, and developed areas could be vulnerable to surface disturbance, inadvertent damage, and vandalism. A loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence could result. However, continuing NPS staff presence, instituting and monitoring user capacity, and emphasizing visitor education would discourage vandalism and inadvertent destruction of cultural remains; any adverse impacts would be expected to be minimal if any.

Cumulative Impacts. In the past, human activities, lack of sufficient resource monitoring and protection programs, and climatic and natural processes have resulted in the loss or disturbance of archeological resources. Because much of the park was not surveyed and inventoried for archeological resources until recent years, some decisions about site development and permitted activities, such as large special events, have been made that, in hindsight, may have resulted in the loss or disturbance to an unknown number of archeological sites on lands in the park. Although ongoing and expanded archeological site monitoring programs would be initiated and efforts would be undertaken to minimize or mitigate potential impacts from human activities and natural causes, an unknown number of archeological sites on NPS- and partner-owned lands in the park would likely continue to be adversely impacted by current and ongoing human activities, such as large special events; weather and climatic conditions; and natural processes. Actions under Alternative B, such as development of new hiking/bicycling trails and new auto touring routes, could have minimal additional adverse impacts on archeological resources, although efforts would be undertaken to avoid all known sites. NPS staff presence, monitoring programs, and visitor education would be expected to discourage vandalism and inadvertent destruction.

Other recent, current, and reasonably foreseeable planning endeavors and undertakings on or near park lands, such as the expansion of the I-81 corridor through the park; encroaching residential, commercial, and industrial development on lands within the park boundaries due to regional growth; expansion of the of the O-N Minerals rock quarry adjacent to the park's western boundary; and construction of power transmission lines near the park, would likely contribute to disturbance or destruction of archeological resources. Thus, such undertakings would be expected to have adverse, minor to moderate, long-term impacts on archeological resources.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to contribute adverse impacts on any overall cumulative impact

on archeological resources. The adverse impacts on such resources associated with Alternative B, however, would constitute a relatively small component of any overall cumulative impact.

Section 106 Summary. The Section 106 determination of effect would be *no adverse effect* on archeological resources on NPS- and partner-owned lands in the park; the determination would be potential *adverse effect* on archeological resources on privately owned lands.

Conclusion. Overall, implementation of Alternative B would have beneficial, minor to moderate, long-term impacts on archeological resources on NPS- and partner-owned lands in the park; and would have potential adverse, minor to moderate, long-term impacts on archeological resources on privately owned lands.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have no adverse effect or a limited cumulative adverse, minor to moderate, long-term impacts on archeological resources; however, this alternative's contribution to these effects would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of archeological resources in the park.

■ Ethnographic Resources

Direct and Indirect Impacts. Under Alternative B the NPS and its Key Partners will consult with concerned Indian tribes and other groups (once ethnographic resources and potentially affected tribes and groups are identified) to identify, learn about, and develop strategies for preserving and providing access to ethnographic resources on NPS- and partner-owned lands. The NPS and its Key Partners would also continue to encourage archeologists, anthropologists, and researchers to consult with the tribes and other groups regarding areas of interest that could be included in research efforts, and to promote ethnographic involvement in excavations and anthropological research. The development of new hiking/bicycling trails and auto touring routes in the park under Alternative B could affect identified ethnographic resources; however, trails would be sited to avoid identified ethnographic resources and auto touring routes would be located in established rights-of-way. Few, if any, adverse impacts on such resources would be expected. Thus, implementation of this alternative would be expected to have beneficial, minor to moderate, long-term impacts on ethnographic resources on NPS- and partner-owned lands.

If ethnographic resources were identified on privately owned lands in the park, protection and preservation of such resources would be subject to the discretion of

landowners, although the NPS and its Key Partners would encourage preservation of identified ethnographic resources and technical assistance would be available to private landowners to enable them to protect such resources. In most cases, adverse impacts would be realized only when private lands are developed. Thus, implementation of this alternative could have potential adverse, minor to moderate, long-term impacts on ethnographic resources on privately owned lands.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and establishment of the NHP, ethnographic resources were likely subjected to minor to moderate adverse impacts by a variety of human activities, such as large special events, agricultural operations, inadvertent disturbance, and vandalism; and by natural processes. Many of these activities and processes have continued to the present and would likely continue if Alternative B were implemented.

Actions under this alternative, such as development of new hiking/bicycling trails and new auto touring routes, could have minimal additional adverse impacts on ethnographic resources, although efforts would be undertaken to avoid all known sites and NPS staff presence, monitoring programs, and visitor education would be expected to discourage vandalism and inadvertent destruction.

Current, ongoing, and reasonably foreseeable projects and developments on or adjacent to park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, industrial, and commercial development within the park boundaries due to regional growth, would potentially have adverse, minor to moderate, short-term impacts on identified ethnographic resources during periods of construction.

Additionally, these developments would likely contribute to an increase in park visitation and thus potentially disturb, or disrupt access to, ethnographic resources. Therefore, they would potentially result in adverse, minor to moderate, long-term impacts on identified ethnographic resources

These developments, along with major expansion of the O-N Minerals rock quarry adjacent to the park's western boundary and construction of overhead power transmission lines near the park, would also result in adverse, minor to moderate, long-term impacts on ethnographic resources.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to contribute minor to moderate, long-term, adverse impacts on any overall cumulative impact on ethnographic resources. The adverse impacts on such resources associated with Alternative B, however, would constitute a relatively small component of any overall cumulative impact.

Conclusion. Overall, implementation of Alternative B would result in beneficial, minor to moderate, long-term impacts on identified ethnographic resources on NPS- and partner-owned lands. Implementation of Alternative B would result in potential adverse, minor to moderate, long-term impacts on ethnographic resources on privately owned lands. Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would generally result in cumulative adverse, minor to moderate, long-term impacts on ethnographic resources; however, this alternative's contribution to these effects would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of ethnographic resources in the park.

■ **Historic Structures**

Direct and Indirect Impacts. The impacts of actions on historic structures would be generally the same as those described under Alternative A. Although the NPS would acquire land and interests in land by donation or from willing sellers as funds are available, the partners would continue to have primary responsibility for land acquisition and resource protection, and the current status of publicly and privately owned lands in the park would not be expected to change significantly.

Development of new recreational opportunities in the park, such as hiking and bicycle trails and auto touring routes, would likely result in increased park visitation and the possible loss of some historic fabric from historic structures. However, instituting and monitoring user-capacity indicators and implementing potential management strategies to mitigate adverse impacts would help reduce impacts on historic structures caused by visitor use. Thus, implementation of this alternative would result in beneficial, minor to moderate, long-term impacts on historic structures on NPS- and partner-owned lands in the park.

Protection and preservation of historic structures on privately owned property would continue to be subject to the discretion of private landowners, thus resulting in potential adverse impacts on historic fabric on historic structures. The NPS and partners would encourage preservation of historic structures on private lands, and technical assistance would be available to private landowners to enable them to preserve such resources; however actions regarding preservation would ultimately be subject to the discretion of landowners. In most cases, adverse impacts would be realized only when private lands are developed. Thus, actions under this alternative would result in potential adverse, minor to moderate, long-term impacts on historic structures on privately owned lands in the park.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and the establishment of the NHP, historic structures were adversely impacted by a variety

of human activities, such as large special events, inadvertent disturbance, and vandalism; and by natural processes. Many of these activities and process have continued to the present and would likely continue if Alternative B were implemented, although NPS staff presence, monitoring programs, and visitor education would be expected to discourage vandalism and inadvertent destruction.

Other recent, current, ongoing, and reasonably foreseeable projects and developments on or adjacent to park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, industrial, and commercial development within the park boundaries due to regional growth, would have adverse, minor to moderate, long-term impacts on historic structures because they would likely result in increased park visitation and the potential for loss of historic fabric on historic structures.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to contribute adverse impacts on any overall cumulative impact on historic structures. The adverse impacts on such resources associated with Alternative B, however, would constitute a relatively small component of any overall cumulative impact.

Section 106 Summary. The Section 106 determination of effect would be *no adverse effect* on historic structures on NPS- and partner-owned lands; the determination would be potential *adverse effect* on historic structures on privately owned lands.

Conclusion. Overall, the implementation of Alternative B would have beneficial, minor to moderate, long-term impacts on historic structures on NPS- and partner-owned lands in the park. The implementation of Alternative B would have potential adverse, minor to moderate, long-term impacts on historic structures on privately owned lands. Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have cumulative adverse, minor to moderate, long-term impacts on historic structures; however, this alternative's contribution to these effects would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of historic structures in the park.

■ Cultural Landscapes

Direct and Indirect Impacts. The impacts of actions on cultural landscapes under Alternative B would be generally the same as those described under Alternative A. Although the NPS would acquire land and interests in land by

donation or from willing sellers as funds are available, the partners would continue to have primary responsibility for land acquisition and resource protection, and the current status of publicly and privately owned lands in the park would not be expected to change significantly.

Development of new recreational opportunities in the park, such as hiking and bicycle trails and new auto touring routes, would likely result in increased park visitation and the possible loss of some cultural landscape elements. However, careful design would ensure that expansion or development of trails and touring routes would minimally affect the scale and visual relationships among landscape features. In addition, the topography, vegetation, circulation features, and land-use patterns of the cultural landscape would remain largely unaltered. Few if any adverse impacts would be anticipated. Instituting and monitoring user-capacity indicators, as well as implementing potential management strategies to mitigate adverse impacts, would help reduce impacts on cultural landscapes caused by visitor use. Thus, actions under this alternative would generally have beneficial, minor to moderate, long-term impacts on cultural landscapes on NPS- and partner-owned lands in the park.

Protection and preservation of significant elements of cultural landscapes, such as vegetation, land use, building and settlement patterns, and views and vistas, on privately owned property would continue to be subject to the discretion of private landowners, thus resulting in potential adverse impacts on historic properties. The NPS and partners would encourage preservation of significant elements of cultural landscapes on private lands, and technical assistance would be available to private landowners to enable them to preserve such resources; however actions regarding preservation would ultimately be subject to the discretion of landowners. In most cases, adverse impacts would be realized only when private lands are developed. Thus, actions under this alternative would result in potential adverse, minor to moderate, long-term impacts on cultural landscapes on privately owned lands in the park.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and the establishment of the NHP, cultural landscapes were adversely impacted by a variety of human activities, such as large special events, agricultural operations (which have impacted Civil War-related resources), inadvertent disturbance, and vandalism; and by natural processes. Many of these activities and processes have continued to the present and would likely continue if Alternative B were implemented. Actions under this alternative, such as development of new hiking/bicycling trails and new auto touring routes, could have minimal additional adverse impacts on cultural landscape elements, although efforts would be undertaken to avoid significant landscape components; NPS staff presence, monitoring programs, and visitor education would be expected to discourage vandalism and inadvertent destruction.

Other recent, current, and reasonably foreseeable planning endeavors and undertakings on or near park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, commercial, and industrial development on lands within the park boundaries due to regional growth, would have adverse, minor to moderate, long-term impacts on cultural landscape resources because they would likely result in increased park visitation and the potential for loss of some landscape features. These developments, along with major expansion of the of the O-N Minerals rock quarry adjacent to the park’s western boundary and construction of power transmission lines near the park, would have adverse, minor to moderate, long-term impacts on cultural landscape resources because they would result in visual intrusions on the historic scene and would contribute to the loss of significant elements of the park’s rural and pastoral landscape.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to contribute adverse impacts on any overall cumulative impact on cultural landscapes. The adverse impacts on such resources associated with Alternative B, however, would constitute a relatively small component of any overall cumulative impact.

Section 106 Summary. The Section 106 determination of effect would be *no adverse effect* on cultural landscapes on NPS- and partner-owned lands in the park; the determination would be potential *adverse effect* on cultural landscapes on privately owned lands.

Conclusion. Overall, implementation of Alternative B would result in beneficial, minor to moderate, long-term impacts on cultural landscapes on NPS- and partner-owned lands in the park; and would result in potential adverse, minor to moderate, long-term impacts on cultural landscapes on privately owned lands.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have cumulative adverse, minor to moderate, long-term impacts on cultural landscapes; however, this alternative’s contribution to these effects would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of cultural landscapes in the park.

■ **Museum Collections**

Direct and Indirect Impacts. The impacts of actions under Alternative B on museum collections would be generally the same as those described under

Alternative A. Under Alternative B, the NPS and its Key Partners would continue to preserve and manage collections of cultural and natural resource objects, artifacts, and archives relating to the parklands they own within the designated boundaries of the park in compliance with NPS and other professional standards for collecting, accessioning, cataloging, managing, and preserving such collections.

Privately owned cultural and natural objects, artifacts, and archival materials would continue to remain in private ownership or be deposited with organizations or institutions at the discretion of the landowners. As a result, collections could be potentially degraded, lost, or scattered, thus reducing or eliminating their future usefulness for research and interpretation.

Cumulative Impacts. Because conditions would not change, there would be no cumulative effects on museum collections under this alternative.

Conclusion. Overall, implementation of Alternative B would result in beneficial, minor to moderate, long-term impacts on museum collections possessed by the NPS and its Key Partners; and would result in potential adverse, minor to moderate, long-term impacts on privately owned collections.

There would be no cumulative effects on museum collections under this alternative.

Impacts from actions contained in this alternative would not likely result in impairment of museum collections in the park.

4.4.2 Natural Resources

■ Scenic/Visual Resources/Viewsheds

Direct and Indirect Impacts. The impacts of land protection in the park would be generally the same as in Alternative A. The partners would seek to acquire land within the park boundary as opportunities and funding allow—the current status of publicly and privately owned lands in the park would not be expected to change significantly. Under Alternative B, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including scenic resource protection. Lacking a coordinated land protection approach, the effect on scenic resource/viewshed protection and enhancement would be beneficial, but limited in extent. Continuation of the existing land protection approach would likely result in the protection of a core park area surrounded by a patchwork of developed private lands. Land protection under Alternative B would be expected to result in long-term, beneficial, minor impacts on scenic resources.

Impacts on scenic resources and viewsheds from visitor use, land use, and land management under Alternative B would be generally the same as those described in Alternative A. Scenic driving, large special events, trail use, and general

recreational use would be expected to cause adverse impacts on scenic and visual resources as described in Alternative A. Increases in park visitation resulting from the development of auto touring routes and new trail opportunities under Alternative B would likely increase the potential for adverse impacts on scenic resources. Visitor use under Alternative B would result in long-term, minor to moderate, adverse impacts on scenic resources that would be localized.

Land use and resource management activities in the park, including management of cultural landscapes and agricultural settings, would continue to affect the scenic resources of the park. Under Alternative B, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park, which would produce a beneficial long-term impact. The NPS and its Key Partners would collaborate to manage various aspects of the park, including scenic resources. As in Alternative A, resource management responsibilities would continue to be handled primarily by the Key Partners. Collectively, these actions would improve coordination and accountability for scenic resource management, which would result in long-term, beneficial, localized impacts on scenic resources and viewsheds. Predicting the intensity of this impact is difficult, but it is anticipated to be minor.

Alternative B utilizes existing facilities to conduct visitor contact and orientation functions, which would have no additional impact on scenic resources and viewsheds. However, some new visitor facilities would also be built under this alternative, including hiking and biking trails (with trailheads), auto touring routes (with waysides), and signs. Overall, facility development would be increased under Alternative B and would produce greater adverse impacts on scenic resources compared to Alternative A. The impacts on scenic resources from development under Alternative B would be expected to be long-term, adverse, localized, and of minor intensity.

Three Visitor Focal Areas have been proposed in this alternative. The locations of the proposed Visitor Focal Areas cross the boundaries of the following zones: Large Events, Cultural Landscape, and Natural Resource. Potential impacts on scenic resources from development in these areas could include obstructed views from poorly placed signs and interpretive structures. These impacts from development in Visitor Focal Areas would be expected to be long-term, adverse, localized, and of negligible to minor intensity.

The locations of the proposed Visitor Services Zone are fully contained inside the boundaries of the Cultural Landscape Zone. Potential impacts on scenic resources from development in these areas could include obstructed views from poorly placed facilities and structures that are incompatible with the surrounding landscape and rural character. Potential impacts from development in the Visitor Services Zone

would be expected to be long-term, adverse, localized, and of minor to moderate intensity.

Two conceptual trail corridors have been proposed in this alternative. Trails are planned to be four feet wide, constructed out of natural surfaces or gravel crusher fines, and used for hiking and bicycling only. Trails in this alternative pass through forested areas and traverse the borders of open fields. Trails themselves would have negligible impacts on scenic resources and viewsheds. However, trailhead development could have adverse impacts. This alternative proposes a total of two trailheads. Adverse impacts from trailheads have been minimized due to their placement along existing roads and highways. Potential impacts from trailhead development would be expected to be long-term, adverse, localized, and of negligible to minor intensity.

The development of auto touring routes could have adverse impacts on scenic resources and viewsheds. The routes themselves would use existing road rights-of-way and therefore would have no impact on scenic resources. The development of a wayside along U.S. 11 to support the touring routes has the potential to impact scenic resources. It is presumed that any construction required would be contained within the right-of-way. Even so, such a facility could affect the scenic qualities of the area due to increases in asphalt surfacing and the installation of new signs. If planned and constructed properly, adverse impacts from the development of a single wayside would be negligible. Impacts from auto tour routes could also include the creation of denuded areas and ruts along road corridors that may affect the scenic quality of the area. Impacts on scenic resources and viewsheds are expected to be long-term, adverse, minor, and localized.

Impacts on scenic resources and viewsheds from activities on private land would be generally the same as those described in Alternative A. Scenic resources on private lands within the park, which constitute approximately two-thirds of the park's total acreage, would continue to be impacted by land-use and land-management activities, development, and land protection. Collectively, impacts on scenic resources and viewsheds from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to major depending on the scale of these activities. Adverse impacts would be major only if significant portions of the land are developed.

Cumulative Impacts. The impacts of cumulative actions on scenic resources and viewsheds would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, moderate to major, adverse impacts. The impacts would be localized, but could affect many sites.

When the likely effects of implementing the actions contained in Alternative B are added to the effects of other current and reasonably foreseeable actions, there would be a long-term, moderate to major, adverse cumulative impact on the park's

scenic resources and viewsheds. The adverse effects of projects and actions outside of the park would substantially outweigh the beneficial impacts of land protection actions contained in this alternative. The actions in Alternative B would contribute a small increment to this resulting cumulative impact.

Conclusion. The park’s scenic resources and viewsheds would be affected by the actions under Alternative B. Impacts from visitor use, land use, land management, and land protection would be generally the same as those described in Alternative A. Adverse impacts from facility development in Alternative B would be greater than in Alternative A.

Visitor use would result in long-term, minor to moderate, adverse impacts that would be localized. Land use and management impacts would be long-term, beneficial or adverse, minor, and would be localized. Development impacts would be long-term, adverse, localized, and intensities would range from negligible to moderate depending upon the type of development. Land protection would result in long-term, beneficial, minor impacts that would be localized.

When the impacts of Alternative B are added to the effects of other current and foreseeable future actions, there would be a moderate to major, long-term, adverse cumulative impact on the park’s scenic resources and viewsheds. The impacts would be localized, but could affect many sites. The adverse impacts of projects and actions outside of the park would substantially outweigh the beneficial impacts of land protection actions contained in this alternative. The actions in Alternative B would contribute a small increment to this overall cumulative impact.

Impacts from actions contained in this alternative would likely result in potential impairment of scenic/visual resources/viewsheds in the park.

■ Soils

Direct and Indirect Impacts. The impacts of land protection on soils under Alternative B would be generally the same as in Alternative A. The partners would seek to acquire land within the park boundary as opportunities and funding allow—the current status of publicly and privately owned lands in the park would not be expected to change significantly. The land protection approach under Alternative B, which is the same as Alternative A, would be expected to result in long-term, negligible to minor, beneficial impacts on soils.

Impacts on soils from visitor use, land use, and land management under Alternative B would be generally the same as those described in Alternative A. Trail use would continue to cause soil compaction and erosion. Large special events would likely continue to cause soils compaction and erosion from people, vehicles, and horses. Increases in park visitation resulting from the development of auto touring routes and new trail opportunities under Alternative B would likely increase the potential

for adverse impacts on soils. These impacts would be long-term, adverse, minor to moderate, and localized.

Under Alternative B, instituting and monitoring user-capacity indicators, as well as implementing management strategies to mitigate adverse impacts, would help reduce soil erosion caused by visitor use. Compared to Alternative A, this would likely result in a minor, long-term, beneficial impact that would be localized.

Land use and resource management activities in the park would continue to affect soils. Agricultural production would produce soil compaction and erosion, both from field cultivation and livestock grazing. Under Alternative B, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including natural resource goals. Collectively, these activities would result in long-term, minor to moderate, adverse impacts that would be limited in extent.

Under Alternative B, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including soils. As in Alternative A, resource management responsibilities would continue to be handled primarily by the Key Partners. Collectively, these actions would improve coordination and accountability for soil resource management in comparison to Alternative A; this would result in long-term beneficial impacts on soils that are localized. Predicting the intensity of this impact is difficult, but it is anticipated to be minor.

Alternative B utilizes existing facilities to conduct visitor contact and orientation functions, which would have no additional impact on soils. As in all the alternatives, maintenance of existing facilities would probably result in some erosion and/or alteration of soil properties, resulting in a negligible to minor, long-term adverse impact in localized areas.

Some new visitor facilities would also be built under this alternative, including hiking and biking trails (with trailheads), auto touring routes (with waysides), and signs. Overall, facility development would be increased under Alternative B and would produce greater adverse impacts on soils compared with those of Alternative A.

Three Visitor Focal Areas have been proposed in this alternative. Proposed development in the Visitor Focal Areas and Visitor Services Zone would affect soils. The degree of impact would depend on the scale of development that occurred on the site. Impacts on soils in these areas would likely include the loss of soils due to the facility construction and the potential for compaction and alteration of soils adjacent to the sites due to heavy equipment use. Impacts from development in the Visitor Focal Areas and Visitor Services Zone would be expected to be long-term, adverse, localized, and of minor to moderate intensity.

Two conceptual trail corridors have been proposed in this alternative. The trails would traverse mostly upland soils. Site preparation work would disturb the soil profile and displace soils along the trail, generally down to the level where mineral soil can be found. Construction equipment also would likely disturb and compact adjacent soils in the project areas. The potential for soil erosion would increase in these areas. Construction of the trails would result in long-term, minor to moderate adverse impacts in localized areas. The implementation of best management practices (BMPs) would reduce the adverse impacts on soils. Trailhead development, which could include the clearing of areas to accommodate parking and trail access, would be expected to result in long-term, moderate, adverse impacts in localized areas.

The development of auto touring routes could have adverse impacts on soils. The routes themselves would use existing road rights-of-way and therefore would have no impact on soils. The development of a wayside along U.S. 11 to support the touring routes could adversely impact soils. It is presumed that any construction required would be contained within the road right-of-way; however, portions of the right-of-way may be undisturbed. Impacts from auto tour routes could also include the compaction of soil along road corridors and the potential for soil erosion. Increases in asphalt surfacing and the installation of new signs would disturb soils. Impacts on soils are expected to be long-term, adverse, moderate, and localized.

Impacts on soils from private land activities would be generally the same as those described in Alternative A. Soils on private lands within the park, which constitute approximately two-thirds of the park's total acreage, would continue to be impacted by development, agricultural production, and visitor use in the park. Collectively, impacts on soils from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to major depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on soils would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative B are added to the effects of other current and reasonably foreseeable actions, there would be a long-term, moderate, adverse cumulative impact on soils. The actions in Alternative B would contribute an appreciable increment to this cumulative impact.

Conclusion. The park's soils would be affected by the actions under Alternative B. Impacts from visitor use, land use, land management, and land protection would be generally the same as those described in Alternative A. Adverse impacts from facility development would be greater in Alternative B than in Alternative A.

Visitor use would result in long-term, minor to moderate, adverse impacts on soils that would be localized. Land use and land management impacts on soils would be long-term, beneficial or adverse, minor to moderate, and localized. Development impacts would be long-term, adverse, and localized, with intensities ranging from negligible to moderate depending upon the type of development. Land protection would result in long-term, negligible to minor, beneficial impacts that would be localized.

When the impacts of Alternative B are added to the effects of other current and foreseeable future actions, there would be a moderate, long-term adverse cumulative impact on soils in the park. The impacts would be localized. The actions in Alternative B would add a moderate increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of soils in the park.

■ **Groundwater**

Direct and Indirect Impacts. The impacts of land protection under Alternative B would be generally the same as in Alternative A. The partners would seek to acquire land within the park boundary as opportunities and funding allow – the current status of publicly and privately owned lands in the park would not be expected to change significantly. Continuation of the existing land protection approach would be expected to result in long-term, minor, beneficial impacts on groundwater.

Impacts on groundwater from visitor use, land use, and land management under Alternative B would be generally the same as those described in Alternative A. Increased park visitation to the partner-owned sites would likely increase the demand for domestic water. Development of the Keister Tract would substantially increase visitor use in the southern portion of the park. Visitation at this site would increase after the site opens to the public and then would likely continue to gradually increase over the life of the plan. These new uses and corresponding increases in park visitation could result in long-term, adverse impacts on groundwater and domestic water supplies. The impacts could extend beyond park boundaries. Predicting the intensity of this impact is difficult, but it is anticipated to be minor because the increase in water use above existing rates of consumption would be relatively small when compared to the size of the aquifer.

As in Alternative A, visitor use would continue to affect groundwater quality in the park in locations such as along existing roads and at parking areas. Under Alternative B, new parking areas developed in the Visitor Focal Areas and/or the Visitor Services Zone would contribute to any potential impacts. Inadvertent chemical spills, including oil from automobiles, could enter the soil profile and impact groundwater quality. Areas with karst features, such as sinkholes, that have

more direct connections to groundwater and surface waters, would be more likely to experience adverse impacts on groundwater. These adverse impacts would likely be long-term, localized, and of negligible to minor intensity because they would be limited to discrete areas such as roads and parking areas. Under Alternative B, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including natural resource goals. Collectively, these activities would result in long-term, adverse, localized, minor impacts.

Under Alternative B, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including water resources. As in Alternative A, resource management responsibilities would continue to be handled primarily by the Key Partners. Collectively, these actions would improve coordination and accountability for water resource management, which would result in long-term, beneficial impacts on groundwater that are localized. Predicting the intensity of this impact is difficult, but it is anticipated to be negligible to minor.

Facility development under Alternative B would be increased and would produce greater adverse impacts on groundwater when compared to Alternative A. However, groundwater withdrawal for NPS and partner uses would continue to be relatively small compared to other uses in the park, and water consumption is not expected to increase substantially over the life of the plan. Impacts on groundwater from facility development under this alternative would be limited to those generated by facility development in the Visitor Services Zone. Facilities built in the Visitor Service Zone, such as restrooms and campgrounds, would likely require water to support visitor use. The number of new wells or the amount of domestic water that would be needed has not been determined and would be dependent on the scale of development that occurs. Overall, impacts would be expected to be long-term, adverse, mostly localized, and their intensity would be negligible to minor.

Impacts on groundwater from private land activities would be generally the same as those described in Alternative A. Groundwater on private lands within the park, which constitute approximately two-thirds of the park's total acreage, would continue to be impacted by development, land use, and land management. In most cases, adverse impacts would be realized only when private lands are developed. Collectively, impacts on groundwater from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to moderate depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on groundwater would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative B are added to the effects of other current and reasonably foreseeable actions outside the park, there would be a long-term adverse cumulative impact on groundwater resources. The impacts could extend beyond park boundaries and could include the region. It is difficult to predict and quantify the impacts, but they are anticipated to be moderate. The actions in Alternative B would add a small increment to this overall impact.

Conclusion. Groundwater resources in the park would be affected by the actions under Alternative B. Impacts from visitor use, land use, land management, and land protection would be generally the same as those described in Alternative A. Adverse impacts from facility development in Alternative B would be greater than in Alternative A.

Visitor use impacts would be short- and long-term, adverse, negligible to minor, and localized. Land use and land management impacts would be long-term, adverse, minor, and localized. Facility development and maintenance impacts would be long-term, adverse, negligible to minor, and localized. Land protection would result in long-term, minor, beneficial impacts that would be localized.

When the impacts of Alternative B are added to the effects of other current and foreseeable future actions, there would be a moderate long-term, adverse cumulative impact on groundwater resources. The impacts could extend beyond park boundaries in some cases. The actions in Alternative B would add a small increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of groundwater in the park.

■ Surface Water Quality

Direct and Indirect Impacts. The impacts of land protection in the park would be generally the same as in Alternative A. The partners would seek to acquire land within the park boundary as opportunities and funding allow – the current status of publicly and privately owned lands in the park would not be expected to change significantly. Continuation of the existing land protection approach would be expected to result in long-term, minor, localized, beneficial impacts on surface water quality.

Impacts on surface water quality from visitor use, land use, and land management under Alternative B would be generally the same as those described in Alternative A. Trail use and large special events would continue to produce adverse impacts on surface water, such as vegetation loss with resultant increased erosion and inadvertent chemical contamination. Agricultural practices would continue to cause stream bank erosion and chemical inputs into surface waters. Impacts on surface

water quality from visitor use would be expected to be long-term, adverse, minor, and localized.

Under Alternative B, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including natural resource goals. The NPS and its Key Partners would also develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including water resources. As in Alternative A, resource management responsibilities would continue to be handled primarily by the Key Partners. Collectively, these actions would improve coordination and accountability for water resource management in comparison to Alternative A; this would result in long-term beneficial impacts on surface water quality that are localized. Predicting the intensity of this impact is difficult, but it is anticipated to be minor.

As in all of the action alternatives, the Natural Resource Zone is designed to protect areas of high biodiversity such as stream corridors and the state-designated Panther Conservation Site. This zone spans approximately 300 feet on both sides of all streams and rivers within the park boundary. This zone would preserve existing vegetation within this 600-foot corridor, providing a vegetated riparian buffer that would filter pollutants and reduce inputs into streams and rivers. The impact on surface water quality would be expected to be long-term, beneficial, moderate, and localized.

Facility development would be increased under Alternative B and would produce greater adverse impacts on surface water quality compared to Alternative A. Impacts on surface water quality from facility development proposed under Alternative B would be limited primarily to those generated by the construction of a trail that terminates at Cedar Creek—no other new facilities are proposed near surface waters. Site preparation work would disturb and displace soils along the trail, which could result in sediment inputs into the stream. There is also potential for inadvertent chemical contamination from the use of construction equipment. With the application of mitigation measures, such as the installation of erosion barriers, any adverse impacts on surface water quality would likely be short-term and negligible to minor in local areas.

New parking areas developed in the Visitor Focal Areas and/or the Visitor Services Zone under Alternative B could contribute to potential impacts on surface water quality through runoff. Inadvertent chemical spills, including oil from automobiles, could enter surface waters through runoff. These long-term, adverse impacts would likely be of negligible to minor intensity and localized because the sites are discrete and relatively small in area.

Impacts on surface water quality from private land activities would be generally the same as those described in Alternative A. Surface water quality on private lands within the park, which constitute approximately two-thirds of the park's total acreage, would continue to be impacted by land use and management, development, and land protection. Collectively, impacts on surface water quality from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to moderate depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on surface water quality would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative B are added to the effects of other current and reasonably foreseeable actions outside the park, there would be a long-term, adverse cumulative impact on surface water quality in the park. The impacts would be mostly localized, but could extend further downstream into the watershed. It is difficult to predict and quantify the impacts, but they are anticipated to be minor to moderate. The actions in Alternative B would add an appreciable increment to this overall impact.

Conclusion. Surface water quality in the park would be affected by the actions under Alternative B. Impacts from visitor use, land use, land management, and land protection would be generally the same as those described in Alternative A. Adverse impacts from facility development would be greater than Alternative A.

Visitor use impacts would be long-term, adverse, minor, and localized. Land use and land management impacts would be long-term, adverse or beneficial, minor to moderate, and mostly localized. Development impacts would be short-term, adverse, negligible to minor, and localized. Land protection would result in long-term, beneficial, minor impacts that would be localized.

When the impacts of Alternative B are added to the effects of other current and foreseeable future actions, there would be a minor to moderate long-term, adverse cumulative impact on surface water quality. The impacts would be mostly localized, but could extend beyond park boundaries. The actions in Alternative B would add an appreciable increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of surface water quality in the park.

■ **Vegetation**

Direct and Indirect Impacts. The impacts of land protection in the park under Alternative B would be generally the same as those in Alternative A. The partners would seek to acquire land within the park boundary as opportunities and funding

allow—the current status of publicly and privately owned lands in the park would not be expected to change significantly. Land protection under Alternative B would be expected to result in long-term, negligible to minor, beneficial impacts on vegetation.

Under Alternative B, impacts on vegetation from visitor use, land use, and land management would be generally the same as those in Alternative A. General recreational use and trail use, along with large special events, would continue to adversely impact vegetation through trampling and vegetation loss. Large special events would continue to impact vegetation by causing injury or mortality in isolated areas due to trampling from visitor use and damage to trees from horse activity and hitching. Increases in park visitation resulting from the development of auto touring routes and new trail opportunities under Alternative B would likely increase the trampling of plants or loss of vegetation. Increased automobile and human use would also increase the potential for the spread and proliferation of exotic and invasive plants. Illegal collection of plants could also occur in the park. Collectively, this would result in long-term, adverse, localized, minor impacts on vegetation.

Under Alternative B, instituting and monitoring user-capacity indicators, as well as implementing management strategies to mitigate adverse impacts, would reduce impacts on vegetation caused by visitor use. In comparison with Alternative A, this alternative would likely result in a minor, long-term, beneficial impact that would be localized.

Impacts on vegetation from land use and land management under Alternative B would be generally the same as those described in Alternative A. The management of agricultural lands, natural areas, exotic and invasive plants, and cultural landscapes would continue to be variable and could lead to impacts on vegetation.

Under Alternative B, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including natural resource goals.

Under Alternative B, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would manage various aspects of the park, including vegetation. As in Alternative A, resource management responsibilities would continue to be handled primarily by the Key Partners. Collectively, these actions would improve coordination and accountability for vegetation management, which would result in long-term beneficial impacts on vegetation that are localized. Predicting the intensity of this impact is difficult, but it is anticipated to be minor.

As in all of the action alternatives, the Natural Resource Zone is designed to protect areas of high biodiversity such as stream corridors and the state-designated Panther Conservation Site. This zone spans approximately 300 feet on both sides of all streams and rivers within the park boundary. This zone would preserve existing vegetation within the 600-foot corridor and would act as a riparian buffer. The park would seek to develop a habitat management program for the Panther Conservation Site in cooperation with the Cedar Creek Battlefield Foundation (who owns the site) and the state of Virginia. Such a program would likely result in increased protection and enhancement of rare plant communities compared to Alternative A. The impact on vegetation from these actions would likely be long-term, beneficial, minor to moderate, and localized.

Overall, impacts on vegetation from land use and land management under Alternative B would be long-term, adverse, localized, and of minor intensity.

Facility development would be increased under Alternative B and would produce greater adverse impacts on vegetation compared to Alternative A. The construction of new facilities in the park under this alternative, including hiking and biking trails (with trailheads), auto touring routes (with waysides), and signs, has the potential to affect vegetation. As in all of the alternatives, the development of visitor facilities at the Keister Tract would cause permanent loss of vegetation in the footprint of a development and would likely cause short-term adverse impacts on vegetation adjacent to the footprint due to construction activities. Maintenance of existing facilities would likely result in some injury or loss of plant material, resulting in a negligible to minor, long-term, adverse impact in localized areas.

Three Visitor Focal Areas have been proposed in this alternative. New development to support interpretive experiences in the Visitor Focal Areas would result in negligible to minor impacts on vegetation due to the installation of signs or other similar interpretive facilities. Impacts would be limited mostly to agricultural lands where native vegetation has already been substantially altered or is not present. Some negligible to minor impacts on woodlands could be realized at the Keister Tract, such as tree removal and root damage from construction and visitation. These impacts would be long-term, adverse, and localized.

Development in the Visitor Services Zone could result in impacts on agricultural lands and woodlands. The intensity of the impacts would be greater than in the Visitor Focal Areas due to the potential impacts on woodlands. Impacts would be long-term, adverse, localized, and of minor to moderate intensity.

Two conceptual trail corridors have been proposed in this alternative. Trails are planned to be four feet wide, constructed out of natural surfaces or gravel crusher fines, and used for hiking and bicycling only. The trails would traverse mostly forested uplands. Some upland grasslands (open fields) would be affected, primarily along the field border, and some riparian vegetation could also be

affected. The removal of trees would be avoided to the extent possible. Trail construction would result in permanent loss of vegetation within the trail corridor, and some adverse impacts on adjacent vegetation could also be realized from the use of heavy equipment. Impacts on vegetation would be long-term, adverse, minor, and localized. Trailhead development would result in similar impacts.

The development of auto touring routes could have adverse impacts on vegetation. The routes themselves would utilize existing road rights-of-way and therefore would have no impact on vegetation. Development of a wayside along U.S. 11 to support the touring routes could adversely impact vegetation if additional clearing of vegetation is required. Impacts from auto tour routes could also include injury to or loss of vegetation along road corridors. Impacts on vegetation are expected to be long-term, adverse, minor, and localized, affecting a relatively small area.

Impacts on vegetation from private land activities under Alternative B would be generally the same as those described in Alternative A. Vegetation on private lands within the park, which constitute approximately two-thirds of the park's total acreage, would continue to be impacted by land-use and land-management activities, development, and land protection. In most cases, adverse impacts would be realized only when private lands are developed. Collectively, impacts on vegetation from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to moderate depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on vegetation would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative B are added to the effects of other current and reasonably foreseeable actions outside the park, there would be a long-term adverse cumulative impact on vegetation in the park. The impacts would be localized. It is difficult to predict and quantify the impacts, but they are anticipated to be minor to moderate. The actions in Alternative B would add an appreciable increment to this overall impact.

Conclusion. Vegetation in the park would be affected by the actions under Alternative B. Impacts from visitor use, land use, land management, and land protection would be generally the same as those described in Alternative A. Adverse impacts from facility development in Alternative B would be greater than in Alternative A.

Visitor use impacts would be long-term, adverse, minor, and localized. Land use and management would result in long-term, adverse or beneficial, localized impacts of minor intensity. Development impacts would be long-term, adverse, negligible to

moderate, and localized. Land protection impacts would be long-term, beneficial, negligible to minor, and localized.

When the impacts of Alternative B are added to the effects of other current and foreseeable future actions, there would be minor to moderate, long-term, adverse cumulative impacts on vegetation. The impacts would be mostly localized. The actions in Alternative B would add an appreciable increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of vegetation in the park.

4.4.3 Visitor Use and Experience

Direct and Indirect Impacts. In Alternative B, the NPS and the Key Partners would collaborate in the development of interpretive programming. Harmony Hall would be open to the public for tours after Belle Grove completes rehabilitation of the site, as in Alternative A. In Alternative B, there would be an increase in the NPS presence, and rangers would be involved at partner sites, including Harmony Hall, in activities such as talks or tours.

Visitors would still continue to access the northern battlefield area of the park with frequency due to the location of Key Partner sites. In general, this alternative would make more areas of the park accessible to the visitor through the expansion of auto touring routes, and hiking and biking trails. However, the trails would be located in selected or discrete areas. As in Alternative A, they would lack connectivity.

New auto touring routes would likely lead to connections to existing local and regional tours. Users of these auto routes would tour more areas of the park, and park visitors would be introduced to attractions and sites in the region. Due to the collaborative approach to interpretation, there would be more opportunity for users of auto routes and trails in this alternative to be exposed to park wide themes and stories. The impact would be long-term, minor, and beneficial.

The Cedar Creek Battlefield Foundation would continue to sponsor the annual re-enactment of the Battle of Cedar Creek and possibly re-enactments of other Civil War battles. The impacts of re-enactments and other special events held by Key Partners would be similar to Alternative A.

Under Alternative B, the development of the Keister tract would increase opportunities for recreational use. This would lead to an increase in recreational visitors, and provide a long-term, minor, and beneficial impact on visitor use.

This alternative, as in Alternative A, would not lead to proactive steps to protect privately-owned lands. As development occurs, the absence of park actions in this

area could lead to a lessening of visitor enjoyment and understanding of park resources.

Cumulative Impacts. Recent, current, and reasonably foreseeable planning endeavors and undertakings on or near park lands, such as expansion of the I-81 corridor through the park, encroaching residential, commercial, and industrial development on lands within the park boundaries resulting from the growth of Strasburg and Middletown, expansion of the Chemstone rock quarry adjacent to the park's western boundary, and construction of power transmission lines near the park, would likely contribute to disturbances in the visual landscape, increases in the ambient noise level, and traffic congestion. These factors would detract from the visitor's enjoyment of the park. Thus, such undertakings would be expected to have an adverse, long-term impact on visitor use and experience. To some extent, they may be localized. The level of intensity would range from minor to major, depending on the location.

When the likely effects of implementing the actions contained in Alternative B are added to the effects of other past, present, and reasonably foreseeable actions outside the park, there would be a long-term, moderate adverse cumulative impact on visitor use and experience. The absence of park actions in the area of land protection could contribute an appreciable increment to this cumulative impact on visitor use and experience.

Conclusion. In Alternative B the visitor experience would be enriched through a collaborative approach to interpretation among the Key Partners. Overall, park actions in Alternative B would have a long-term, minor, and beneficial impact on visitor use and experience.

When the likely effects of implementing the actions contained in Alternative B are added to the effects of other past, present, and reasonably foreseeable actions outside the park, there would be a long-term, moderate adverse cumulative impact on visitor use and experience. The absence of park actions in the area of land protection could contribute an appreciable increment to this cumulative impact on visitor use and experience.

4.4.4 Socioeconomic Environment

Direct and Indirect Impacts. Under Alternative B, the park would continue to contribute to the tourism industry in the three-county area and be an important part of the local socioeconomic environment. Beneficial impacts on the local and regional economy from actions contained in Alternative B would be slightly greater than those in Alternative A.

Middletown, at the northeastern end of the park, and Strasburg, at the southwest end, are the two gateway towns most closely associated with the park. These

communities provide a range of goods and services for the visiting public as well as for park employees and other workers employed in tourism-related businesses. Because of the proximity of these communities to the park and their distance from other visitor areas, these two individual gateway communities would continue to receive the greatest impacts from the actions in this alternative.

As in Alternative A, only scattered areas of the park would be accessible to the public due to its size, configuration, land ownership patterns, and the varying uses of land within the park. Visitors must travel through one or more of the three counties (Frederick, Shenandoah, Warren) to gain access to the park.

The battle reenactments would continue to be the most significant events in terms of the number of visitors on site at one time and visitor-related spending that occurs each year. The Key Partners and local merchants would continue to provide goods and services to the visiting public. The battlefield reenactments are important short-term activities that would likely continue and could draw increasing numbers of participants (historic Civil War re-enactors) and spectators to the region. This infusion of 12,000 to 14,000 visitors each year from outside the three-county region (with their accompanying spending) has a beneficial impact on the local and regional economy because it would continue to provide customers and income for local businesses. Increasing visitation is expected as a result of NPS and Key Partners' efforts and would continue to produce beneficial economic and fiscal impacts for the local economy.

Alternative B includes a low level of development sponsored by the NPS. There would not be an NPS visitor center. It is expected that most visitors would continue to start their visit at the Cedar Creek Battlefield visitor contact facility in Middletown as they do under Alternative A. Park staff would provide services and interpretation through ranger led tours and talks. Most contacts by park staff would be at sites owned by the Key Partners or other locations within the park. Visitation patterns and the resulting economic impacts would be expected to be generally the same as in Alternative A. Hiring a staff of six FTEs (about \$600,000 for salaries, benefits, utilities, equipment, and consumables such as office supplies, etc.) would provide the primary recurring fiscal impact. Short-term expenditures (one-time costs) of about \$2.7 million would be used to develop NPS facilities in the park. These capital investments would constitute the major portion of the NPS development of the park over the next 20 years. As in Alternative A, the only capital investment by the Key Partners would be developing the Keister Tract into a park – the economic impact would be the same as in Alternative A.

Relative to Alternative A, park visitation would be expected to increase moderately under Alternative B. Table 4.2 presents the visitation figures for 1996 through 2005 for some NPS battlefield parks that are in Virginia and/or relatively close to Cedar Creek and Belle Grove NHP. It is not likely that visitor use at Cedar Creek and Belle

Table 4.2 Visitor Use at NPS Civil War Battlefield Parks near Cedar Creek and Belle Grove National Historical Park

Year	Antietam NB	Appomattox Courthouse NHP	Fredericksburg & Spotsylvania NMP	Gettysburg NMP	Harpers Ferry NHP	Manassas NBP	Petersburg NB	Richmond NBP
1996	246,082	205,938	477,991	1,632,720	314,548	725,086	171,312	77,807
1997	275,639	204,862	464,773	1,727,070	340,246	1,025,826	177,325	77,707
1998	275,385	201,874	449,798	1,701,660	371,094	972,709	155,993	82,187
1999	268,897	198,665	480,820	1,641,838	333,738	815,338	148,676	87,957
2000	286,896	196,363	489,833	1,542,184	317,699	692,006	171,099	90,422
2001	303,599	190,422	465,323	1,792,380	325,156	822,684	161,999	108,244
2002	303,209	177,219	464,890	1,833,033	286,289	779,147	167,563	106,397
2003	279,694	155,031	443,634	1,769,688	264,478	759,953	162,547	96,014
2004	237,885	152,453	443,030	1,724,420	260,783	722,132	158,167	84,876
2005	295,309	136,827	534,636	1,705,601	241,807	715,622	143,455	68,438
Average	277,260	181,965	471,473	1,707,059	305,584	803,050	161,814	88,005
Maximum	303,599	205,938	534,636	1,833,033	371,094	1,025,826	177,325	108,244
Minimum	237,885	136,827	443,030	1,542,184	241,807	692,006	143,455	68,438

¹ All figures are recreation visits based on the Fiscal Year.

Source: National Park Service, Public Use Statistics Office.

Grove NHP would approach the range for better known parks like Gettysburg National Military Park (averaging 1.7 million recreation visits annually) or Manassas National Battlefield Park (averaging 0.8 million recreation visits annually). Petersburg National Battlefield and Richmond National Battlefield Park are most similar to Cedar Creek and Belle Grove NHP in that they have multiple units separated by distance, requiring motorized transportation (perhaps an auto tour) for the visitor to experience all the parts of the park. These two parks are well established and have had annual visitation in the 70,000 to 177,000 range during the period 1996-2005. Over the next 20 years, as Cedar Creek and Belle Grove NHP becomes established, more developed, and better known to the public, annual visitation at the lower end of the range of 50,000 to 200,000 could be reasonably expected.

Increasing visitation is expected as a result of NPS and Key Partners' efforts and would continue to produce beneficial economic and fiscal impacts for the local economy, affecting only a few businesses and individuals within the local economy. Overall, increases in visitation would be expected to produce greater beneficial economic impacts compared to Alternative A. It is presumed that the staffing levels and annual operating budgets of the Key Partners could increase slightly under Alternative B (estimated at \$660,000 annually), but would remain at least the same as in Alternative A.

As development of the park moves from the planning stage to implementation of the approved GMP, additional fiscal impacts would occur as funds are spent for facilities development and additional staff. People being drawn to the park because of the NPS presence would also result in additional beneficial fiscal and employment impacts due to increased spending by visitors from outside the three-county region.

The impacts of land acquisition would be expected to be the same as in Alternative A. Payments in Lieu of Taxes (PILT) would be generally the same as described in Alternative A. Land acquisition efforts would continue to have a negligible impact on the local economy. The Key Partners would seek to acquire lands as opportunities and funding allow, but the amount of parkland acquired would not be expected to change much compared to existing conditions. Further protection of the park and other historic resources through increased land acquisition, conservation easements, or other means, would continue to be left up to the Key Partners and any actions by individual landowners or local government. Land acquisition would be on a willing seller-willing buyer basis. Private owners would receive fair market value in exchange for any land bought by the federal government. Acquisition of any privately owned land by the federal government would remove this property from the local tax rolls, but federal PILT payments would increase and partially offset the decrease in property taxes collected by the local governments.

Locally, businesses and individuals in the towns of Middletown and Strasburg, and in other nearby local commercial centers, would probably benefit the most from implementation of Alternative B. Most goods and services needed for the park would be acquired from this local area or the greater three-county region. The demand for goods and services by the NPS and the Key Partners would increase compared to the current levels under Alternative A. Businesses and individuals in the local/regional construction industry and related suppliers of materials would benefit in the short-term during construction activities. These developments would happen over a number of years and the resulting beneficial impacts (e.g., increases in income and the creation of some jobs) would be moderate to major for some business firms and individuals within the local economy. Firms in the accommodations, food service, and retail trade industries are the most likely to be affected. The annual NPS operating budget would increase to approximately \$730,000 (in 2007 dollars), which would provide the primary recurring fiscal impact.

The 2005 economic impact of all the NPS parks (that report visitor use according to NPS standards and methodology) was calculated based upon the Money Generation Model Version 2.¹ Data for some relatively close battlefield parks are displayed in Table 4.3. For fiscal year 2005, Petersburg NB had nearly 150,000 recreation visits and Richmond NBP received about 72,000 recreation visits. Non-local visitor

¹ *Stynes, Daniel J. August 2006.*

Table 4.3 Economic Impacts for NPS Battlefield Parks near Cedar Creek and Belle Grove NHP
(estimated using Money Generation Model 2)

Park	2005* Recreation Visits	Visitor Spending 2005*		Jobs	Personal income	Value added
		All visitors	Non-local Visitors			
Antietam NB	281,009	\$12,791,000	\$11,482,000	258	\$4,754,000	\$7,523,000
Appomattox Court House NHP	142,009	6,943,000	6,480,000	146	2,683,000	4,246,000
Fredericksburg & Spotsylvania NMP	532,369	26,029,000	24,294	546	10,058,000	15,917,000
Gettysburg NMP	1,716,467	97,123,000	96,439,000	2,999	33,782,000	53,840,000
Harpers Ferry NHP	242,116	11,838,000	11,049,000	248	4,574,000	7,239,000
Manassas NBP	718,712	12,006,000	11,594,000	251	5,422,000	8,581,000
Petersburg NB	149,911	7,330,000	6,841,000	154	2,832,000	4,482,000
Richmond NBP	71,695	4,271,000	3,849,000	86	1,594,000	2,522,000
Average	481,786	22,291,375	18,469,787	586	8,212,375	13,043,750
Maximum	1,716,467	97,123,000	96,439,000	2,999	33,782,000	53,840,000
Minimum	71,695	\$4,271,000	\$24,294	86	\$1,594,000	\$2,522,000

* Data for Recreation Visits and Visitor Spending are from Fiscal Year 2005.
Source: Stynes, Daniel J. August 2006.

spending in the local region associated with these parks was more than \$6.8 million and \$3.8 million, respectively. About 150 jobs were supported by visitation to Petersburg NB and over 80 jobs by visitors to Richmond NBP.¹ Respectively, over \$2.8 million and nearly \$1.6 million in personal income in the regions surrounding these parks can be attributed to park visitors.² Visitor use and spending associated with visitor use at these two parks generated \$4.4 million and \$2.5 million, respectively, in value added.³ Based on this information, the economic impact of Cedar Creek and Belle Grove NHP (including both NPS and Key Partner activities and contributions) could be expected to fall within these ranges after the park is further developed, becomes better known, and average visitation reaches the 70,000 to 150,000 range. Economic and fiscal impacts on the three-county, regional economy are the local impacts identified above with some additional expenditure occurring in the region as out-of-region visitors travel to and from the park. Total recurring costs by the NPS and Key Partners would be about \$1.4 million annually, while total one-time costs would be

¹ "Jobs are the number of jobs in the region supported by the visitor spending. Job estimates are not full time equivalents, but include part time and seasonal positions." Stynes, et al May 2000.

² "Personal income includes wage and salary income, proprietor's income and employee benefits." Stynes, et al May 2000.

³ "Value added is a commonly used measure of the contribution of an industry or region to gross national or gross state product. Value added is personal income plus rents and profits, plus indirect business taxes. As the name implies, it is the "value added" by the region to the final good or service being produced." Stynes, et al May 2000.

about \$9.1 million. Some businesses and individuals in the region would benefit, but the overall impacts have much less importance due to the greater size of the economy of the three-county region. Impacts on the region – with over \$3.3 billion in earnings and over 96,600 jobs in 2004 – as measured by these or other economic indicators (e.g., a notable increase in income or a decrease in unemployment, poverty, etc.) would be negligible.

Changes in the three-county (plus the city of Winchester) regional economy would include impacts on the regional socioeconomic base due to changes in park operations and other management or development actions. The socioeconomic base includes such factors as population, income, employment, earnings, etc. Park development and rehabilitation projects during the life of the plan would generally benefit the construction industry and associated workers.

Cumulative Impacts. Expansion of the I-81 corridor could increase the number of construction-related jobs in the area as well as increase spending within the local hospitality industry, a beneficial impact that would be short-term and of minor intensity. Expansion of the Chemstone quarry and upgrade of the power transmission lines could also increase jobs and spending in the local area, producing long-term, minor, beneficial impacts. The quarry expansion could also have adverse impacts on property values in the nearby area. Increased residential and commercial development would increase spending on land and construction materials while producing jobs in the region. The beneficial impact on socioeconomic conditions from this action would likely be long-term and of moderate intensity.

When the likely effects of implementing the actions contained in Alternative B are added to the effects of other current and reasonably foreseeable actions as described above, there would be a long-term, beneficial, minor to moderate, cumulative impact on the local and regional economy. The actions in Alternative B would add a very small increment to this overall impact.

Conclusion. The NPS expansion to six FTEs and an annual operating budget of \$730,000 would result in minor, long-term, beneficial fiscal impacts within the local and regional economies. Short-term expenditures (one-time costs) of approximately \$2.7 million by the NPS for facility development would occur under Alternative B. This spending would benefit a few businesses and individuals, mostly in the construction industrial sector. The Key Partners' annual operating costs would be about \$660,000. The Key Partners' and others' efforts would provide most of the impetus that results in greater long- and short-term, minor, beneficial recurring fiscal impacts within the local and regional economies, but the increased NPS presence would also contribute to these results. The battle reenactments would continue to result in beneficial, short-term, regional, economic impacts that are major events during the short time they occur. Overall tourism spending is expected to increase to a minor to moderate degree as use of the park by people

from outside the region increases. Total recurring costs by the NPS and Key Partners would be about \$1.4 million annually, while total one-time costs would be about \$9.1 million. Some local and regional businesses and individuals (most likely in the accommodations and food service, and retail trade industries) providing goods and services to the park and the visiting public would benefit. Acquisition of land for the park would become more expensive and more difficult as the region continues to grow.

When the likely effects of implementing the actions contained in Alternative B are added to the effects of other current and reasonably foreseeable actions as described above, there would be a long-term, beneficial, minor to moderate, cumulative impact on the local and regional economy. The actions in Alternative B would add a very small increment to this overall impact.

4.4.5 Unavoidable Adverse Impacts

Unavoidable adverse impacts are defined as impacts that cannot be fully mitigated or avoided. Alternative B could result in several unavoidable adverse impacts on cultural and natural resources with impact intensities that are greater than minor, such as illegal collection of archeological resources, plants, and animals within the park boundary. Increased education, interpretation, and outreach efforts would help lessen, but not eliminate, the likelihood of this potential impact. Some soils and vegetation could be lost or altered due to the construction of new facilities in the park and to soil erosion from increased visitor use.

4.4.6 Irreversible and Irretrievable Commitments of Resources

New actions would be taken that would either result in the consumption of nonrenewable cultural or natural resources, or in the use of renewable resources that would preclude other uses for a period of time. In the construction of new facilities, including buildings and trails, limited amounts of nonrenewable resources would be used, including fuels and building materials. These resources would be essentially irretrievable once they were committed.

4.4.7 The Relationship between Short-Term Uses of the Environment and Long-Term Productivity

Lands in the park that are protected would remain in their current state and maintain their long-term productivity. The primary short-term uses of Cedar Creek and Belle Grove NHP would continue to be historic preservation, heritage tourism, and recreation. Disturbance of the park's soils, water quality, vegetation, and wildlife, due to visitor use and the construction of new facilities, would reduce the long-term productivity of the park in localized areas; however, overall there likely would only be a small effect on the park's long-term productivity. Efforts to protect, restore, and enhance natural and cultural resources in the park would increase the long-term productivity of the environment in localized areas.

4.5 Environmental Consequences of Alternative C

4.5.1 Cultural Resources

■ Archeological Resources

Direct and Indirect Impacts. Actions under Alternative C would be expected to have beneficial, minor to moderate, long-term impacts on archeological resources on NPS- and partner-owned lands because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of key historic sites
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Alternative C, when compared with Alternative A, holds the potential for greater protection and preservation of archeological resources because the NPS and its Key Partners would own more land within the legislated boundaries of the park and develop collaborative proactive land protection strategies for resource preservation within and outside park boundaries.

Large special events would continue to have the potential to adversely impact archeological resources because visitors, vehicles, ground fires, and horses would likely continue to affect archeological resources. Development of new hiking/bicycling trails, auto touring routes, and a visitor center (either in or near the park) under Alternative C could affect archeological resources. However, the facilities would be sited to avoid known archeological resources. All ground-disturbing activities would be preceded by site-specific archeological surveys and, where appropriate, subsurface testing to determine the existence of archeological resources and how best to preserve them. If National Register-listed or National Register-eligible archeological resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the Virginia State Historic Preservation Officer (if the project was a federal undertaking). If previously undiscovered archeological resources were uncovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the Virginia State Historic Preservation Officer. Few, if any, adverse impacts on archeological resources would be expected due to efforts to avoid all known sites.

Archeological resources adjacent to or easily accessible from trails, roads, and developed areas could be vulnerable to surface disturbance, inadvertent damage, and vandalism. A loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence could result. However, NPS staff presence, instituting and monitoring user capacity, and emphasizing visitor education would discourage vandalism and inadvertent destruction of cultural remains, and any adverse impacts would be expected to be minimal if any.

While anticipated growth in park visitation and the continuation of large special events could result in rising levels of inadvertent disturbance to archeological resources, these impacts would be expected to be negligible because the NPS and its Key Partners would initiate efforts to educate the general public and private landowners about the importance and value of archeological resources.

Under this alternative, activities to protect and preserve archeological resources on privately owned lands within the park boundaries, which would constitute less than 10% of the park's total acreage, would ultimately remain at the discretion of the landowners. In most cases, adverse impacts would be realized only when private lands are developed. Thus, implementation of Alternative C would be expected to have potential adverse, minor to moderate, long-term impacts on archeological resources on privately owned lands.

Cumulative Impacts. In the past, human activities, lack of sufficient resource monitoring and protection programs, and climatic and natural processes have resulted in the loss or disturbance of archeological resources. Because much of the park was not surveyed and inventoried for archeological resources until recent years, some decisions about site development and permitted activities, such as large special events, have been made that, in hindsight, may have resulted in the loss or disturbance to an unknown number of archeological sites on lands in the park. Although ongoing and expanded archeological site monitoring programs would be initiated and efforts would be undertaken to minimize or mitigate potential impacts from human activities and natural causes, an unknown number of archeological sites on NPS- and partner-owned lands in the park would likely continue to be adversely impacted by current and ongoing human activities, such as large special events, weather and climatic conditions, and natural processes, such as erosion and the shifting and cutting of river channels. Actions under this alternative, such as development of new hiking/bicycling trails and auto touring routes, could have minimal additional adverse impacts on archeological resources, although efforts would be undertaken to avoid all known sites, while NPS staff presence, monitoring programs, and visitor education would be expected to discourage vandalism and inadvertent destruction.

Other recent, current, and reasonably foreseeable planning endeavors and undertakings on or near park lands, such as the expansion of the I-81 corridor

through the park, encroaching residential, commercial, and industrial development on lands within the park boundaries due to regional growth, expansion of the of the O-N Minerals rock quarry adjacent to the park’s western boundary, and construction of power transmission lines near the park, would likely contribute to disturbance or destruction of archeological resources. Thus, such undertakings would be expected to have adverse, minor to moderate, long-term impacts on archeological resources.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to contribute adverse effects to any overall cumulative impact on archeological resources. The adverse impacts on such resources associated with Alternative C, however, would constitute a relatively small component of any overall cumulative impact.

Section 106 Summary. The Section 106 determination of effect would be *no adverse effect* on archeological resources on NPS- and partner-owned lands; the determination would be potential *adverse effect* on privately owned lands.

Conclusion. Overall, implementation of Alternative C would result in beneficial, minor to moderate, long-term impacts on archeological resources on NPS- and partner-owned lands and potential adverse, minor to moderate, long-term impacts on archeological resources on privately owned lands. The adverse impacts under this alternative, however, would be less than those resulting from Alternative A because the NPS and its Key Partners would acquire more land within the legislated boundaries of the park and develop proactive strategies for resource and viewshed protection within and outside the park boundaries.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have potential cumulative adverse, minor to moderate, long-term impacts on archeological resources; however, this alternative’s contribution to these impacts would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of archeological resources in the park.

■ **Ethnographic Resources**

Direct and Indirect Impacts. Actions under Alternative C would be expected to have beneficial, minor to moderate, long-term impacts on ethnographic resources (once they are identified) on NPS- and partner-owned lands because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach

based on land protection priorities, with the highest priority being given to acquisition of key historic sites

- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Alternative C, when compared with Alternative A, holds the potential for greater protection and preservation of ethnographic resources because the NPS and its Key Partners would own more land within the legislated boundaries of the park and would develop collaborative proactive land protection strategies for viewshed and resource preservation within and outside park boundaries. The NPS and its Key Partners will consult with concerned Indian tribes and other groups (once ethnographic resources and potentially affected tribes and groups are identified) to identify, learn about, and develop strategies for preserving and providing access to ethnographic resources on NPS- and partner-owned lands.

The development of new facilities, such as hiking/bicycling trails, auto touring routes, and a visitor center (either in or near the park) under Alternative C would be expected to have negligible impacts on ethnographic resources because the facilities would avoid known resources. While anticipated growth in park visitation could result in rising levels of inadvertent disturbance to ethnographic resources, these impacts would be expected to be negligible because the NPS and its Key Partners would initiate efforts to educate the general public and private landowners about the importance and value of such resources.

Under this alternative, activities to protect and preserve ethnographic resources on privately owned lands within the park, which would constitute less than 10% of the park's total acreage, would ultimately remain at the discretion of the landowners. In most cases, adverse impacts would be realized only when private lands are developed. Thus, implementation of Alternative C would be expected to have potential adverse, minor to moderate, long-term impacts on ethnographic resources on privately owned lands.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and the establishment of the NHP, ethnographic resources were likely subjected to minor to moderate adverse impacts by a variety of human activities, such as large special events, agricultural operations, inadvertent disturbance, and vandalism; and by natural processes. Many of these activities and processes have continued to the present and would likely continue if Alternative C were implemented. Actions under this alternative, such as the development of new hiking/bicycling trails and new auto touring routes, could have minimal additional adverse impacts on ethnographic

resources, although efforts would be undertaken to avoid all known sites, while NPS staff presence, monitoring programs, and visitor education would be expected to discourage vandalism, and inadvertent destruction.

Current, ongoing, and reasonably foreseeable projects and developments on or adjacent to park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, industrial, and commercial development within the park boundaries due to regional growth, would potentially have adverse, minor to moderate, short-term impacts on identified ethnographic resources during periods of construction.

Additionally, these developments would likely contribute to an increase in park visitation and thus potentially disturb, or disrupt access to, ethnographic resources. Therefore, they would potentially result in adverse, minor to moderate, long-term impacts on identified ethnographic resources.

These developments, along with major expansion of the O-N Minerals rock quarry adjacent to the park's western boundary and construction of overhead power transmission lines near the park, would also have potential adverse, minor to moderate, long-term impacts on ethnographic resources.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to contribute minor to moderate, long-term to permanent, adverse impacts on any overall cumulative impact on ethnographic resources. The adverse impacts on such resources associated with Alternative C, however, would constitute a relatively small component of any overall cumulative impact.

Conclusion. Overall, implementation of Alternative C would result in beneficial, minor to moderate, long-term impacts on ethnographic resources on NPS- and partner-owned lands in the park. Implementation of Alternative C would result in potential adverse, minor to moderate, long-term impacts on such resources on privately owned lands. However, this alternative, when compared with Alternative A, holds the potential for greater protection and preservation of ethnographic resources because the NPS and its Key Partners would own more land within the legislated boundaries of the park and develop proactive strategies for viewshed and resource protection within and outside the park boundaries.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have cumulative adverse, minor to moderate, long-term impacts on ethnographic resources; however, this alternative's contribution to these impacts would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of ethnographic resources in the park.

■ **Historic Structures**

Direct and Indirect Impacts. Actions under Alternative C would be expected to have beneficial, minor to moderate, long-term impacts on historic structures on NPS- and partner-owned lands because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of key historic sites
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Alternative C, when compared with Alternative A, holds the potential for greater protection and preservation of historic structures because the NPS and its Key Partners would own more land within the legislated boundaries of the park and develop collaborative proactive protection strategies for resource protection and preservation within and outside park boundaries. Few, if any, adverse impacts on historic structures would be anticipated.

While anticipated growth in park visitation and the continuation of large special events could result in the loss of some historic fabric in historic structures. NPS and partner acquisition of lands and key historic sites, as well as development of proactive strategies to protect resources within and outside the park, would be expected to result in beneficial, minor to moderate, long-term impacts on historic structures. Nevertheless, activities to protect and preserve historic structures on privately owned lands within park boundaries, which would constitute less than 10% of the park's total acreage, would ultimately remain subject to the discretion of landowners. In most cases, adverse impacts would be realized only when private lands are developed. Thus, actions under this alternative would have potential adverse, minor to moderate, long-term impacts on such resources on privately owned lands.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and the establishment of the NHP, historic structures were adversely impacted by a variety of human activities, such as large special events, inadvertent disturbance, and vandalism; and by natural processes. Many of these activities and processes have continued to the present and would likely continue if Alternative C were

implemented. NPS staff presence, monitoring programs, and visitor education would be expected to discourage vandalism and inadvertent destruction.

Current, ongoing, and reasonably foreseeable projects and developments on or adjacent to park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, industrial, and commercial development within the park boundaries due to regional growth, would potentially result in adverse, minor to moderate, long-term impacts on historic structures because these developments would likely result in increased park visitation and the potential for loss of historic fabric from historic structures.

As described above, implementation of Alternative C would result in both beneficial and adverse impacts on historic structures. Yet, due to the adverse impacts of other current or reasonably foreseeable actions, the cumulative impact would be adverse, minor to moderate, and long-term. Alternative C, however, would contribute only minimally to the cumulative adverse impact.

Section 106 Summary. The Section 106 determination of effect would be *no adverse effect* on historic structures on NPS- and partner-owned lands; the determination would be potential *adverse effect* on privately owned lands.

Conclusion. Overall, implementation of Alternative C would result in beneficial, minor to moderate, long-term impacts on historic structures on NPS- and partner-owned lands. Implementation of Alternative C would result in potential adverse, minor to moderate, long-term impacts on historic structures on privately owned lands. The adverse impacts under this alternative, however, would be less than those resulting from Alternative A because the NPS and its Key Partners would acquire more land within the legislated boundaries of the park and develop proactive strategies for resource preservation within and outside the park boundaries.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have potential cumulative adverse, minor to moderate, long-term impacts on historic structures; however, this alternative's contribution to these effects would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of historic structures in the park.

■ **Cultural Landscapes**

Direct and Indirect Impacts. Actions under Alternative C would be expected to have beneficial, minor to moderate, long-term impacts on cultural landscapes on NPS- and partner-owned lands because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of key historic sites
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Alternative C, when compared with Alternative A, holds the potential for greater protection and preservation of cultural landscapes because the NPS and its Key Partners would own more land within the legislated boundaries of the park and would develop collaborative proactive land protection strategies for viewshed and resource preservation within and outside park boundaries.

Although development of new auto touring routes, trails, and a visitor center (either in or near the park) under Alternative C could potentially impact some elements of cultural landscapes. These impacts would be negligible because efforts would be undertaken to avoid significant cultural landscape elements and ensure that the facilities would blend with their natural surroundings as well as the park's pastoral and rural landforms. Careful design would ensure that expansion or development of trails on NPS- and partner-owned lands would minimally affect the scale and visual relationships among landscape features. In addition, the topography, vegetation, circulation features, and land use patterns of the cultural landscape would remain largely unaltered. Few, if any, adverse impacts would be anticipated.

While anticipated growth in park visitation and the continuation of large special events could result in the loss of some cultural landscape elements, NPS and partner acquisition of lands and key historic sites, as well as development of proactive strategies to protect resources and viewsheds within and outside the park, would be expected to have beneficial, minor to moderate, long-term impacts on cultural landscapes. Nevertheless, activities to protect and preserve cultural landscapes on privately owned lands within park boundaries, which would constitute less than 10% of the park's total acreage, would ultimately remain subject to the discretion of landowners. In most cases, adverse impacts would be realized only when private lands are developed. Thus, actions under this alternative would have

potential adverse, minor to moderate, long-term impacts on cultural landscapes on privately owned lands.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and the establishment of the NHP, cultural landscapes were adversely impacted by a variety of human activities, such as large special events, agricultural operations (which have impacted Civil War-related resources), inadvertent disturbance, and vandalism; and by natural processes. Many of these activities and processes have continued to the present and would likely continue if Alternative C were implemented. Actions under this alternative, such as development of new hiking/bicycling trails and new auto touring routes, could have minimal additional adverse impacts on cultural landscapes, although efforts would be undertaken to avoid all known sites, while NPS staff presence, monitoring programs, and visitor education would be expected to discourage vandalism and inadvertent destruction.

Current, ongoing, and reasonably foreseeable projects and developments on or adjacent to park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, industrial, and commercial development within the park boundaries due to regional growth, would have adverse, minor to moderate, long-term impacts on cultural landscape resources because they would likely result in increasing park visitation and the potential for loss of some significant cultural landscape features. Additionally, these developments, along with major expansion of the O-N Minerals rock quarry adjacent to the park's western boundary and construction of overhead power transmission lines near the park, would have adverse, minor to moderate, long-term impacts on cultural landscape resources because the developments would result in visual intrusions on the historic scene and contribute to the loss of significant elements of the park's rural and pastoral landscape.

As described above, implementation of Alternative C would result in both beneficial and adverse impacts on cultural landscapes. Yet, due to the adverse impacts of other current or reasonably foreseeable actions, the cumulative impact would be adverse, minor to moderate, and long-term. Alternative C, however, would contribute only minimally to the adverse cumulative impact.

Section 106 Summary. The Section 106 determination of effect would be *no adverse effect* on cultural landscapes on NPS- and partner-owned lands; the determination would be potential *adverse effect* on cultural landscapes on privately owned lands.

Conclusion. Overall, implementation of Alternative C would result in beneficial, minor to moderate, long-term impacts on cultural landscapes on NPS- and partner-owned lands. Implementation of Alternative C would result in potential adverse, minor to moderate, long-term impacts on cultural landscapes on privately owned lands. The adverse impacts under this alternative, however, would be less than

those resulting from Alternative A because the NPS and its Key Partners would acquire more land within the legislated boundaries of the park and develop proactive strategies for resource and viewshed protection within and outside the park boundaries.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have potential cumulative adverse, minor to moderate, long-term impacts on cultural landscapes; however, this alternative's contribution to these effects would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of cultural landscapes in the park.

■ **Museum Collections**

Direct and Indirect Impacts. The impacts of actions under Alternative C on museum collections would be generally the same as those described under Alternative A. However, this alternative holds the potential for enlarged museum collections compared with Alternative A, because the NPS and its Key Partners would acquire more land within the legislated boundaries of the park. All NPS- and partner-owned collections would be accessioned, cataloged, preserved, protected, and made available for access and use according to NPS and other professional standards and guidelines. Under Alternative C, some items in the collections would likely be displayed in the NPS visitor center or at the partner-owned or privately owned sites that participate in the park's interpretive program.

Privately owned collections of cultural and natural objects, artifacts, and archival materials would likely continue to remain in private ownership or be deposited with organizations or institutions at the discretion of the landowners. As a result, such collections of historical and natural objects, artifacts, and archives could potentially be degraded, lost, or scattered, thus reducing or eliminating their future usefulness for research and interpretation.

Cumulative Impacts. Because conditions would not change, there would be no cumulative effects on museum collections under this alternative.

Conclusion. Overall, implementation of Alternative C would result in beneficial, minor to moderate, long-term impacts on museum collections possessed by the NPS and its Key Partners. Implementation of Alternative C would result in potential adverse, minor to moderate, long-term impacts on privately owned collections. However, this alternative holds the potential for enlarged museum collections compared with Alternative A, because the NPS and its Key Partners would acquire more land within the legislated boundaries of the park.

Impacts from actions contained in this alternative would not likely result in impairment of museum collections in the park.

4.5.2 Natural Resources

■ Scenic/Visual Resources/Viewsheds

Direct and Indirect Impacts. Alternative C holds the potential for greater protection and preservation of scenic resources and viewsheds because the NPS and its Key Partners would own more land in the park and develop collaborative, proactive land protection strategies for resource preservation within and outside park boundaries.

Impacts on scenic resources under Alternative C would be expected to be less than those under Alternative A because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of key historic sites
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Land protection activities in the park would continue to affect the park's scenic resources and viewsheds. Relative to Alternative A, coordination of land protection and acquisition activities would be improved under Alternative C. The NPS and its Key Partners would protect and acquire about 2,000 acres of land. The acquisition of key properties could result in the protection of important scenic resources and would prohibit development that could adversely impact the scenic resources and viewsheds of the park. Acquisition of key historic sites within the park would continue to be the focus, in contrast to protecting key views, vistas, and scenic backdrops. However, the NPS and its Key Partners would develop proactive strategies to protect related resources outside the park boundary, utilizing conservation easements and consulting with local governments. Under Alternative C, the NPS and the Key Partners would also provide technical assistance to one another, to private landowners, and to nearby communities specifically related to viewshed protection issues in the park. The beneficial impacts on scenic resources from land protection would be greater than those under Alternatives A and B. Collectively, this land protection approach would be expected to result in long-term, beneficial, moderate, localized impacts.

Visitor use, including trail use, scenic driving, and participation in large special events, would continue to affect scenic resources. Increases in park visitation, resulting from the development of auto touring routes and new trail opportunities under Alternative C, would likely increase the potential for adverse impacts on scenic resources. The acquisition of key historic properties would also increase the visitor opportunities available in the park, which, in turn, would likely increase total park visitation. Collectively, this would result in long-term, minor to moderate, adverse impacts on scenic resources that would be localized.

Land use and resource management activities in the park would continue to affect the scenic resources of the park. The management of cultural landscapes and agricultural settings would continue to affect scenic resources. Impacts are likely to be long-term and could be beneficial or adverse. The intensity of the impacts is unknown; however the impacts are expected to be localized.

Under Alternative C, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including scenic resources. Collectively, these actions would improve coordination and accountability for scenic resource management compared to Alternative A; this would result in long-term beneficial localized impacts on scenic resources and viewsheds. Predicting the intensity of this impact is difficult, but it is anticipated to be minor.

Facility development under Alternative C would increase and could produce greater impacts on scenic resources compared to Alternative A. The types of impacts would be generally the same as in Alternative A, but the impacts would be greater and would affect more areas of the park.

The construction of new facilities under this alternative, including hiking and biking trails (with trailheads), auto touring routes (with waysides), and signs, has the potential to affect the scenic resources of the park. As in all alternatives, maintenance of existing facilities would probably result in some erosion and/or alteration of soil properties, resulting in a negligible to minor long-term adverse impact in localized areas.

This alternative includes the development of a visitor center in, or near, the park in an undetermined location. The visitor center would not be an imposing structure on the landscape and would not be located in key viewsheds - potential impacts to scenic resources would be expected to be negligible. Appropriate studies and NEPA compliance would be required to move forward with implementation.

Eight Visitor Focal Areas have been proposed in this alternative. Potential impacts on scenic resources from development in these areas could include obstructed views from poorly placed signs and interpretive structures. Potential impacts from

development in Visitor Focal Areas would be expected to be long-term, adverse, localized, and of negligible to minor intensity.

The locations of the proposed Visitor Services Zone are fully contained inside the boundaries of the Cultural Landscape Zone. Potential impacts on scenic resources from development in these areas could include obstructed views from poorly placed facilities and structures that are incompatible with the surrounding landscape and rural character. Potential impacts from development in the Visitor Services Zone would be expected to be long-term, adverse, localized, and of minor to moderate intensity.

Several conceptual trail corridors have been proposed in this alternative, including one that follows the course of the battle. Trails in this alternative pass through forested areas and traverse the borders of open fields. Trails are planned to be four feet wide, constructed out of natural surfaces or gravel crusher fines, and used for hiking and bicycling only. Trails themselves would have negligible impacts on scenic resources and viewsheds. However, trailhead development could have adverse impacts. This alternative proposes a total of seven trailheads. Adverse impacts from trailheads have been minimized due to their placement at sites with previous disturbance—along existing highways, roads, and driveways. Some new disturbance would still be required, which could affect the pastoral landscape and its scenic qualities. Potential impacts from trailhead development would be expected to be long-term, adverse, minor, and localized.

The development of auto touring routes could have adverse impacts on scenic resources and viewsheds. The routes themselves would utilize existing road rights-of-way and therefore would have no impact on scenic resources. The development of two waysides along existing roadways to support the touring routes has the potential to impact scenic resources. It is presumed that any construction required would be contained within the right-of-way. Even so, such a facility has the potential to affect the scenic qualities of the area due to increases in asphalt surfacing and the installation of new signs. If wayside developments are planned and constructed properly, adverse impacts would likely be negligible. Impacts from auto tour routes could also include the creation of denuded areas and ruts along road corridors that may affect the scenic quality of the area. Impacts on scenic resources and viewsheds are expected to be long-term, adverse, minor, and localized.

Impacts on scenic resources from activities on private land would be less than those described in Alternative A due to increased land protection. Scenic resources on private lands within the park, which would constitute less than half of the park's total acreage under Alternative C, would continue to be impacted by land-use and land-management activities, development, and land protection. The types of impacts would be generally the same as those described in Alternative A.

Collectively, impacts on scenic resources and viewsheds from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to major depending on the scale of these activities. Adverse impacts would be major only if significant portions of the land are developed.

Cumulative Impacts. The impact of cumulative actions on scenic resources and viewsheds would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, moderate to major, adverse impacts.

When the likely effects of implementing the actions contained in Alternative C are added to the effects of other current and reasonably foreseeable actions outside the park described above, there would be a long-term, moderate, adverse cumulative impact on the park's scenic resources and viewsheds. The adverse impacts of projects and actions outside of the park would be substantially mitigated by the beneficial impacts of land protection actions contained in this alternative. The actions in Alternative C would contribute an appreciable increment to this resulting cumulative impact.

Conclusion. The park's scenic resources and viewsheds would be affected by the actions under Alternative C, including those associated with visitor use, land use, land management, development, and land protection. Adverse impacts on soils from facility development would be greater than those in Alternatives A and B, but the beneficial impacts of land protection would also be greater.

Visitor use would result in long-term, minor to moderate, adverse impacts on scenic resources that would be localized. Land use and management impacts on scenic resources would be long-term, beneficial or adverse, minor, and would be localized. Development impacts would be long-term, adverse, localized, and intensities would range from negligible to moderate depending upon the type of development. Land protection would result in long-term, beneficial, moderate impacts that would be localized.

When the impacts of Alternative C are added to the effects of other current and foreseeable future actions, there would be a moderate to major, long-term, adverse cumulative impact on the park's scenic resources and viewsheds. The impacts would be localized. The adverse impacts of projects and actions outside of the park would be substantially mitigated by the beneficial impacts of land protection actions contained in this alternative. The actions in Alternative C would contribute an appreciable increment to this overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of scenic/visual resources/viewsheds in the park.

■ Soils

Direct and Indirect Impacts. Alternative C holds the potential for greater protection and preservation of soils because the NPS and its Key Partners would own more land in the park and would develop collaborative, proactive land protection strategies for resource preservation within and outside park boundaries.

Impacts on soils under Alternative C would be expected to be less than those under Alternative A because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of key historic sites
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Land protection activities in the park would continue to affect the park's soils. Relative to Alternative A, coordination of land protection and acquisition activities would be improved under Alternative C. Together the NPS and its Key Partners would protect and acquire about 2,000 acres of land. Although acquisition of key historic sites within the park would continue to be the focus, these properties would also contain soil resources. Acquisition of these properties could result in the protection of important soils, including prime farmland or hydric soils, and would prohibit development that could adversely impact these resources. The beneficial impacts on soils from land protection would be greater than those under Alternative A and Alternative B. Under this alternative the NPS and its Key Partners would also develop proactive strategies to protect related resources outside the park boundary, utilizing conservation easements and consulting with local governments. Under Alternative C, the NPS and Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities specifically related to viewshed protection issues in the park. Collectively, this land protection approach would be expected to result in long-term, beneficial, localized impacts on soils of minor to moderate intensity.

Impacts on soils from visitor use would continue to affect soils in the park. Trail use and large special events such as battle reenactments would continue to compact soils and cause erosion from people, vehicles, and horses. Soils along existing trails and near parking areas would likely experience the same effect.

Increases in park visitation, resulting from the development of auto touring routes and new trail opportunities under Alternative C, would likely increase the potential for adverse impacts on soils as described above. The acquisition of key historic properties would also increase the visitor opportunities available in the park, which, in turn, would likely increase total park visitation. The potential for increased development of unofficial social trails created by visitors would likely increase under this alternative since the development of more trails in the park would allow visitors to access previously inaccessible areas of the park and may encourage them to go off trail, especially near the Visitor Focal Areas. On the other hand, it could be argued that the development of the trail system will formalize access and minimize impacts from visitor use. Overall, visitor use would result in long-term, minor to moderate, adverse impacts on soils and would be localized.

Under Alternative C, instituting and monitoring user-capacity indicators, as well as implementing management strategies to mitigate adverse impacts, would reduce soil erosion caused by visitor use. Compared to Alternative A, implementing Alternative C would likely result in a minor, long-term, beneficial impact that would be localized.

Land use and resource management activities in the park would continue to affect soils. Agricultural production and livestock grazing would continue to cause soil compaction and erosion. Under Alternative C, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including natural resource goals. Collectively, these activities would result in long-term, minor to moderate, adverse impacts that would be limited in extent.

Under Alternative C, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including soils. Collectively, these actions would improve coordination and accountability for scenic resource management compared to Alternative A; this would result in long-term beneficial impacts on soils that are localized. Predicting the intensity of this impact is difficult, but it is anticipated to be minor.

Facility development under Alternative C would increase and would produce greater impacts on soils compared to Alternatives A and B. The construction of new facilities under this alternative, including a visitor center, hiking and biking trails (with trailheads), auto touring routes (with waysides), and signs, would affect soils. As in all alternatives, maintenance of existing facilities would probably result in some erosion and/or alteration of soil properties, resulting in a negligible to minor, long-term, adverse impact in localized areas.

This alternative includes the development of a visitor center in, or near, the park in an undetermined location outside of the park. If establishment of the visitor center

required new construction, some soils would be lost to erosion and/or substantially altered in local areas where ground disturbance occurs. Mitigation measures, such as installing erosion matting and silt fences, would help reduce the impacts. The impact on soils would be long-term, adverse, moderate, and localized.

Eight Visitor Focal Areas have been proposed in this alternative. Proposed development in the Visitor Focal Areas and Visitor Services Zone would affect soils. The degree of impact would depend on the scale of development that occurred on the site. Impacts on soils in these areas would likely include the loss of soils due to the facility construction and the potential for compaction and alteration of soils adjacent to the sites due to heavy equipment use. Impacts from development in the Visitor Focal Areas and Visitor Services Zone would be expected to be long-term, adverse, localized, and of minor to moderate intensity.

Several conceptual trail corridors have been proposed in this alternative. Trails are planned to be four feet wide, constructed out of natural surfaces or gravel crusher fines, and used for hiking and bicycling only. These trails would traverse mostly upland soils. Site preparation work would disturb the soil profile and displace soils along the trail, generally down to the level where mineral soil can be found. Construction equipment also would likely disturb and compact adjacent soils in the project areas. The potential for soil erosion would increase in these areas. Construction of the trails would result in long-term, minor to moderate adverse impacts in localized areas. The implementation of best management practices (BMPs) would reduce the adverse impacts on soils. Trailhead development, which could include the clearing of areas to accommodate parking and trail access, would be expected to result in long-term, moderate, adverse impacts in localized areas.

The development of auto touring routes could have adverse impacts on soils. The routes themselves would utilize existing road rights-of-way and therefore would have no impact on soils. The development of two waysides along existing roadways to support the touring routes could adversely impact soils. It is presumed that any construction required would be contained within the road right-of-way; however, portions of the right-of-way may be undisturbed. Impacts from auto tour routes could also include the compaction of soil along road corridors and the potential for soil erosion. Increases in asphalt surfacing and the installation of new signs would disturb soils. Impacts on soils are expected to be long-term, adverse, moderate, and localized.

Impacts on soils on private lands in the park would be less than those described in Alternative A due to increased land protection. Soils on private lands within the park, which would constitute less than half of the park's total acreage under Alternative C, would continue to be impacted by development and agricultural production. The types of impacts would be generally the same as those described in Alternative A. Collectively, impacts on soils from activities that occur on private

lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to major depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on soils would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative C are added to the effects of other current and reasonably foreseeable actions outside the park, there would be a long-term, moderate, adverse cumulative impact on soils. The actions in Alternative C would contribute an appreciable increment to this cumulative impact.

Conclusion. The park's soils would be affected by the actions under Alternative C, including those associated with visitor use, land use, land management, development, and land protection. Adverse impacts on soils from facility development would be greater than those in Alternatives A and B, but the beneficial impacts of land protection would be greater.

Visitor use would result in long-term, minor to moderate, adverse impacts on soils that would be localized. Land use and management impacts on soils would be long-term, beneficial or adverse, minor to moderate, and would be localized. Development impacts would be long-term, adverse, localized, and intensities would range from negligible to moderate depending upon the type of development. Land protection would result in long-term, minor to moderate, beneficial impacts that would be localized.

When the impacts of Alternative C are added to the effects of other current and foreseeable future actions, there would be a moderate, long-term, adverse cumulative impact on soils in the park. The impacts would be localized. The actions in Alternative C would add an appreciable increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of soils in the park.

■ **Groundwater**

Direct and Indirect Impacts. Alternative C holds the potential for greater protection and preservation of groundwater because the NPS and its Key Partners would own more land in the park and would develop collaborative, proactive land protection strategies for resource preservation within and outside park boundaries.

Impacts on groundwater under Alternative C would be expected to be less than those under Alternative A because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of key historic sites
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Land protection activities in the park would continue to affect the park's groundwater. Relative to Alternative A, coordination of land protection and acquisition activities would be improved under Alternative C. The NPS and its Key Partners would protect and acquire about 2,000 acres of land. Although acquisition of key historic sites within the park would continue to be the focus, these properties would also overlay groundwater. Acquisition of these properties could aid in the protection of groundwater by eliminating or reducing the development potential of the property. This would result in a reduction in demand for domestic water that would help with current water supply issues. Elimination or reduction of development would also reduce the potential for adverse impacts on groundwater quality by reducing human activities that could result in inadvertent chemical contamination. The beneficial impacts on groundwater from land protection would be greater than those under Alternative A, but still minor. Land protection under Alternative C would be expected to result in long-term, beneficial, minor, localized impacts.

Impacts on groundwater from visitor use under Alternative C would be greater than under Alternative A due to increased park visitation and corresponding increases in water consumption. Increased park visitation resulting from increased visits to the partner-owned sites would likely increase the demand for domestic water. Development of the Keister Tract would also substantially increase visitor use in the southern portion of the park. Visitation at this site would increase after the area opens to the public and then would likely continue to gradually increase over the life of the plan. The acquisition of key historic properties would also increase the visitor opportunities available in the park, which, in turn, would likely increase total park visitation. These new uses and corresponding increases in park visitation could result in long-term, adverse impacts on groundwater and domestic water supplies. The impacts could extend beyond park boundaries. Predicting the intensity of this impact is difficult, but it is anticipated to be minor because the increase in water use above existing rates of consumption would be relatively small when compared to the size of the aquifer.

As in Alternative A, groundwater quality in the park, in locations such as along existing roads and at parking areas, would continue to be affected by visitor use. Under Alternative C, new parking areas developed in the Visitor Focal Areas and/or the Visitor Services Zone would contribute to potential impacts. Inadvertent chemical spills, including oil from automobiles, could enter the soil profile and impact groundwater quality. Areas with karst features, such as sinkholes, that have more direct connections to groundwater and surface waters, would be more likely to experience adverse impacts on groundwater. These adverse impacts would likely be long-term, localized, and of negligible to minor intensity because they would be limited to discrete areas such as roads and parking areas.

Land use and resource management activities in the park could continue to affect groundwater. Groundwater quality could be affected by chemicals used in agricultural production. The impact would likely be long-term, adverse, minor, and localized. Under Alternative C, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including natural resource goals. Collectively, these activities would result in long-term, adverse, minor, localized impacts.

Under Alternative C, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including water resources. Collectively, these actions would improve coordination and accountability for water resource management in comparison to Alternative A, which would result in long-term beneficial impacts on groundwater that are localized. Predicting the intensity of this impact is difficult, but it is anticipated to be negligible to minor.

Facility development would increase under Alternative C and the impacts on groundwater would be slightly greater than in Alternatives A and B. Groundwater withdrawal for NPS and partner uses would continue to be relatively small compared to other uses in the park, and water consumption is not expected to increase substantially over the life of the plan. Impacts on groundwater from facility development under this alternative would be limited to those generated by the establishment of a visitor center and facility development in the Visitor Services Zone. The visitor center would require domestic water to support visitor use and staff operations. Increased water withdrawals required for domestic water use would adversely impact groundwater supply and/or aquifer levels in the area. Facilities built in the Visitor Service Zone, such as restrooms and campgrounds, would likely require water to support visitor use. The number of new wells or the amount of domestic water that would be needed has not been determined and would be dependent on the scale of development that occurs. Overall, impacts would be expected to be long-term, adverse, mostly localized, and their intensity

would be negligible to minor. Trailhead development on NPS-owned land is not expected to require additional water consumption over the long-term.

Adverse impacts on groundwater on private lands in the park would be less than those described in Alternative A due to increased land protection. Groundwater on private lands within the park, which would constitute less than half of the park's total acreage under Alternative C, would continue to be impacted by development, land use, and land management. The types of impacts would be generally the same as those described in Alternative A. In most cases, adverse impacts would be realized only when private lands are developed. Collectively, impacts on groundwater from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to moderate depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on groundwater would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative C are added to the effects of other current and reasonably foreseeable actions outside the park, there would be a long-term, adverse cumulative impact on groundwater resources. The impacts could extend beyond park boundaries and could include the region. It is difficult to predict and quantify the impacts, but they are anticipated to be moderate. The actions in Alternative C would add a small increment to this overall impact.

Conclusion. Groundwater resources in the park would be affected by the actions under Alternative C, including those related to visitor use, land use, land management, development, and land protection. Adverse impacts on groundwater from facility development would be slightly greater than those in Alternatives A and B, but the beneficial impacts of land protection would also be greater.

Visitor use impacts on groundwater would be short- and long-term, adverse, negligible to minor, and localized. Land use and management impacts on groundwater would be long-term, adverse or beneficial, negligible to minor, and localized. Facility development and maintenance impacts would be long-term, adverse, negligible to minor, and localized. Land protection would result in long-term, beneficial, minor impacts that would be localized.

When the impacts of Alternative C are added to the effects of other current and foreseeable future actions, there would be a moderate long-term adverse cumulative impact on groundwater resources. The impacts could extend beyond park boundaries in some cases. The actions in Alternative C would add a small increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of groundwater in the park.

■ **Surface Water Quality**

Direct and Indirect Impacts. Alternative C holds the potential for greater protection and preservation of surface water quality because the NPS and its Key Partners would own more land in the park and develop collaborative, proactive land protection strategies for resource preservation within and outside park boundaries.

Impacts on surface water quality under Alternative C would be expected to be less than those under Alternative A because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of key historic sites
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Land protection activities in the park would continue to affect the park's surface water quality. Relative to Alternative A, coordination of land protection and acquisition activities would be improved under Alternative C. The NPS and its Key Partners would protect and acquire about 2,000 acres of land. The beneficial impacts on surface water quality from land protection under Alternative C would be greater than those under Alternatives A and B. Many of the tracts identified as protection priorities in Alternative C contain creek and stream frontage. Acquisition of the properties provides the NPS and its Key Partners with the ability to control land uses adjacent to surface waters and thereby minimize inputs into waterways. Land use and/or management practices would likely transition from rural agricultural use to visitor use and preservation over the life of the plan, which would produce beneficial impacts. Land protection under Alternative C would be expected to result in long-term, beneficial, minor, localized impacts.

Under Alternative C, surface water quality in the park would continue to be affected by visitor use due to the potential for soil erosion and inadvertent chemical contamination. Trail use and large special events would continue to produce adverse impacts on surface water, such as vegetation loss with resultant increased erosion, and inadvertent chemical contamination. The acquisition of key historic properties would also increase the visitor opportunities available in the park, which,

in turn, would likely increase total park visitation. Visitor use under Alternative C would result in long-term, adverse, minor, localized impacts.

Compared to Alternative A, adverse impacts on surface water quality from land use and resource management would be reduced; however, surface water quality would continue to be affected. Agricultural practices would continue to cause stream bank erosion and chemical inputs into surface waters. Under Alternative C, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including assistance on natural resource issues. Collectively, these activities would result in long-term, adverse, minor to moderate, localized impacts.

Under Alternative C, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including water resources. Collectively, these actions would improve coordination and accountability for water resource management in comparison to Alternative A; this would result in long-term beneficial impacts on surface water quality that are localized. Predicting the intensity of this impact is difficult, but it is anticipated to be minor.

As in all of the action alternatives, the Natural Resource Zone is designed to protect areas of high biodiversity such as stream corridors and the state-designated Panther Conservation Site. This zone spans approximately 300 feet on both sides of all streams and rivers within the park boundary. This zone would preserve existing vegetation within this 600-foot corridor, providing a vegetated riparian buffer that would filter pollutants and reduce inputs into streams and rivers. The impact on surface water quality would be expected to be long-term, beneficial, moderate, and localized.

Facility development would increase under Alternative C and would produce greater impacts on surface water quality compared to Alternatives A and B. Impacts on surface water quality from facility development proposed under this alternative would be generally limited to the construction of trails, trail crossings, and trailheads—no other new facilities are proposed near surface waters. Trail construction adjacent to Cedar Creek, Meadow Brook, and the North Fork of the Shenandoah River could affect surface water quality. With the implementation of mitigation measures, such as erosion control, impacts would be reduced. Impacts from trail construction would be short-term, adverse, localized, and of minor intensity.

The conceptual trail corridors identify three crossings of Cedar Creek and two crossings of Meadow Brook. Construction of trail crossings would affect surface water quality. There is also potential for inadvertent chemical contamination from

the use of construction equipment. Impacts from the construction of trail crossings would be short-term, adverse, localized, and of minor intensity. Seven trailheads are proposed under this alternative; however, they are all located away from surface waters and mitigation measures should reduce or eliminate any impacts on surface water quality. The impacts from construction of trailheads would be short-term, adverse, localized, and of negligible to minor intensity.

New parking areas developed near surface waters in the Visitor Focal Areas would contribute to any potential impacts on surface water quality. Inadvertent chemical spills, including oil from automobiles parked at Visitor Focal Areas or in the Visitor Services Zone, could enter surface waters through runoff. The impacts would be long-term, adverse, localized, and of negligible to minor intensity.

Impacts on surface water quality on private lands in the park would be less than those described in Alternative A. Surface water quality on private lands within the park, which would constitute less than half of the park's total acreage under Alternative C, would continue to be impacted by development, land use, land management, and land protection. The types of impacts would be generally the same as those described in Alternative A. Collectively, impacts on surface water quality from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to moderate depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on surface water quality would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative C are added to the effects of other current and reasonably foreseeable actions outside the park, there would be a long-term adverse cumulative impact on surface water quality in the park. The impacts would be mostly localized and could extend further downstream into the watershed. It is difficult to predict and quantify the impacts, but they are anticipated to be minor to moderate. The actions in Alternative C would add a small increment to this overall impact.

Conclusion. Surface water quality in the park would be affected by the actions under Alternative C, including actions associated with visitor use, land use, land management, development, and land protection. Adverse impacts on surface water quality from facility development would be greater than those in Alternatives A and B, but the beneficial impacts of land protection would also be greater.

Visitor use impacts on surface water quality would be long-term, adverse, minor, and localized. Land use and land management impacts on surface water quality would be long-term, adverse or beneficial, minor to moderate, and mostly localized. Development impacts would be short-term, adverse, negligible to minor, and

localized. Land protection would result in long-term, beneficial, localized, minor impacts.

When the impacts of Alternative C are added to the effects of other current and foreseeable future actions, there would be a minor to moderate, long-term, adverse cumulative impact on surface water quality. The impacts would be mostly localized, but could extend beyond park boundaries. The actions in Alternative C would add a small increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of surface water quality in the park.

■ **Vegetation**

Direct and Indirect Impacts. Alternative C holds the potential for greater protection and preservation of vegetation because the NPS and its Key Partners would own more land in the park and would develop collaborative, proactive land protection strategies for resource preservation within and outside park boundaries.

Impacts on vegetation under Alternative C would be expected to be less than those under Alternative A because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of key historic sites
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Land protection activities in the park would continue to affect the park’s vegetation. Relative to Alternative A, coordination of land protection and acquisition activities would be improved under Alternative C. The NPS and its Key Partners would protect and acquire about 2,000 acres of land. Although acquisition of key historic sites within the park would continue to be the focus, these properties would also contain vegetation. Acquisition of these properties could result in the protection of important vegetation, including wetlands, riparian areas, and other unique or rare plant communities, and would prohibit development that could adversely impact these resources. The beneficial impacts on vegetation from land protection would be greater than those under Alternatives A and B. Land protection under Alternative C would be expected to result in long-term, beneficial, minor, localized impacts.

General recreational use and trail use, along with large special events, would continue to adversely impact vegetation through trampling and vegetation loss. Large special events would continue to impact vegetation by causing injury or mortality in isolated areas due to trampling from visitor use and damage to trees from horse activity and hitching. Increases in park visitation, resulting from the development of auto touring routes and new trail opportunities under Alternative C, would likely increase the trampling of plants or loss of vegetation. The acquisition of key historic properties would also increase the visitor opportunities available in the park, which in turn, would likely increase total park visitation. Increased automobile and human use would also increase the potential for the spread and proliferation of exotic and invasive plants. The potential for development of unofficial social trails caused by visitors would likely increase under this alternative since the development of more trails in the park would allow visitors to access previously inaccessible areas of the park and may encourage them to go off trail, especially near the Visitor Focal Areas. On the other hand, it could be argued that the development of the trail system will formalize access and minimize impacts on vegetation from visitor use. Illegal collection of plants could also occur in the park. Visitor use under Alternative C would result in long-term, adverse, localized, minor impacts on vegetation.

Under Alternative C, instituting and monitoring user-capacity indicators, as well as implementing management strategies to mitigate adverse impacts, should reduce impacts on vegetation caused by visitor use. Compared to Alternative A, Alternative C would likely result in a minor, long-term, beneficial impact that would be localized.

Land use and resource management activities in the park would continue to affect vegetation. Although the management of agricultural lands, natural areas, exotic and invasive plants, and vegetation that contribute to the park's cultural landscapes would continue to be variable and could produce adverse impacts, the beneficial impacts on vegetation from land use and land management under Alternative C would be greater than those under Alternative A due to increased coordination between the NPS and its Key Partners.

Under Alternative C, the NPS and Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including natural resource and vegetation management goals. The NPS and its Key Partners would also develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including vegetation. Collectively, these actions would improve coordination and accountability for vegetation management, which would result in long-term beneficial impacts on vegetation that are localized. Predicting the intensity of these impacts is difficult, but they are anticipated to be minor.

As in all of the action alternatives, the Natural Resource Zone is designed to protect areas of high biodiversity such as stream corridors and the state-designated Panther Conservation Site. This zone spans approximately 300 feet on both sides of all streams and rivers within the park boundary. This zone would preserve existing vegetation within the 600-foot corridor and would act as a riparian buffer. The park would seek to develop a habitat management program for the Panther Conservation Site in cooperation with the Cedar Creek Battlefield Foundation (who owns the site) and the state of Virginia. Such a program would likely result in increased protection and enhancement of rare plant communities compared to Alternative A. The impact on vegetation from these actions would likely be long-term, beneficial, minor to moderate, and localized.

Collectively, impacts on vegetation from land use and management under Alternative C would be long-term, adverse or beneficial, localized, and of minor intensity.

Facility development would increase under Alternative C and would produce greater impacts on vegetation compared to Alternatives A and B. The construction of new facilities under this alternative, including a visitor center, hiking and biking trails (with trailheads), auto touring routes (with waysides), and signs, has the potential to affect vegetation. As in all of the alternatives, the development of visitor facilities at the Keister Tract would cause permanent loss of vegetation in the footprint of a development and would likely cause short-term adverse impacts on vegetation adjacent to the footprint due to construction activities. Maintenance of existing facilities would likely result in some injury to, or loss of, plant material, resulting in a negligible to minor, long-term, adverse impact in localized areas.

This alternative includes the development of a visitor center in, or near, the park in an undetermined location. The siting of the new facility would likely be in a previously disturbed and developed area with limited native vegetation. Construction of the visitor center would result in permanent loss of vegetation, which would be a long-term, adverse, minor, localized impact.

Eight Visitor Focal Areas have been proposed in this alternative. New development to support interpretive experiences in the Visitor Focal Areas would result in negligible to minor impacts on vegetation due to the installation of signs or other similar interpretive facilities. Impacts would be limited mostly to agricultural lands where native vegetation has already been substantially altered or is not present. Some negligible to minor impacts on woodlands, such as tree removal and root damage from construction and visitation, could be realized at the Keister Tract. These impacts would be long-term, adverse, and localized.

Development in the Visitor Services Zone could result in impacts on agricultural lands and woodlands similar to those described above. The intensity of the impacts would be greater in this zone than in the Visitor Focal Areas due to the potential

impacts on woodlands. Impacts would be long-term, adverse, localized, and of minor to moderate intensity.

Several conceptual trail corridors have been proposed in this alternative. Trails are planned to be four feet wide, constructed out of natural surfaces or gravel crusher fines, and used for hiking and bicycling only. The trails would traverse forested uplands and upland grasslands (open fields). Trails in open fields travel primarily along the field border. Trails near waterways could affect riparian vegetation. The removal of trees would be avoided to the extent possible. Trail construction would result in permanent loss of vegetation within the trail corridor, and some adverse impacts on adjacent vegetation could also be realized from the use of heavy equipment. Trail construction in the Panther Conservation Site could result in impacts on rare or unique plant communities due to the loss of vegetation and the indirect impacts on vegetation from the use of heavy equipment. Impacts on vegetation would be long-term, adverse, minor, and localized. Development of seven trailheads under this alternative would result in similar impacts.

The development of auto touring routes could have adverse impacts on vegetation. The routes themselves would utilize existing road rights-of-way and therefore would have no impact on vegetation. The development of two waysides along existing roadways to support the touring routes could adversely impact vegetation if additional clearing of vegetation is required. Impacts from auto tour routes could also include injury to or loss of vegetation along road corridors. Impacts on vegetation are expected to be long-term, adverse, minor, and localized, affecting a relatively small area.

Impacts on vegetation on private lands in the park under Alternative C would be less than those described in Alternative A due to increased land protection. Vegetation on private lands within the park, which would constitute less than half of the park's total acreage under Alternative C, would continue to be impacted by development, land use, land management, and land protection. The types of impacts would be generally the same as those described in Alternative A. In most cases, adverse impacts would be realized only when private lands are developed. Collectively, impacts on vegetation from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to moderate depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on vegetation would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative C are added to the effects of other current and reasonably foreseeable actions outside the park, there would be a long-term adverse cumulative impact on vegetation in the park. The impacts would be localized. It is difficult to predict and quantify the

impacts, but they are anticipated to be minor to moderate. The actions in Alternative C would add an appreciable increment to this overall impact.

Conclusion. Vegetation in the park would be affected by the actions under Alternative C, including those associated with visitor use, land use, land management, development, and land protection. Adverse impacts on vegetation from facility development under Alternative C would be greater than those in Alternatives A and B, but the beneficial impacts of land protection would also be greater.

Visitor use impacts on vegetation would be long-term, adverse or beneficial, minor, and localized. Land use and management would result in long-term, adverse or beneficial, minor impacts on vegetation that would be localized. Development impacts would be long-term, adverse, negligible to moderate, and localized. Land protection impacts would be long-term, beneficial, minor, and localized.

When the impacts of Alternative C are added to the effects of other current and foreseeable future actions, there would be a minor to moderate long-term adverse cumulative impact on vegetation. The impacts would be mostly localized. The actions in Alternative C would add an appreciable increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of vegetation in the park.

4.5.3 Visitor Use and Experience

Direct and Indirect Impacts. Under Alternative C, the NPS and the Key Partners would collaborate in the development of interpretive programming and sites operated by the Key Partners would remain open. There would be an increase in the NPS presence, and rangers would be involved at partner sites, including Harmony Hall, in activities such as talks or tours. The NPS identity and presence in the region would be promoted. Under this alternative, the NPS would develop a visitor center in, or near, the park, providing a focus for orientation, visitor services, and interpretation. The visitor center would serve as a central hub for visitors to learn the stories of the park and be oriented to the National Historic District. The Key Partners would continue to operate their sites, effectively serving as visitor facilities within the park. The visitor center would clearly identify the park as a unit of the National Park System. More visitors would be drawn to the park due to the presence of the NPS visitor center, which would likely function as an attraction in the region. Park actions would lead to increased visitation due to interest among NPS 'baggers', curious visitors drawn by the NPS visitor center or other interpretive sites, and visitors with historical interests who want to see more of the National Historic District. The impact would be long-term, moderate, and beneficial.

Alternative C proposes a substantial increase in interpretive opportunities over Alternatives A and B by developing venues or focal areas for interpretation at key historic sites and trails that follow the course of the battle of Cedar Creek and the historic mill road network. The trails and focal areas would guide visitors throughout the park for an immediate on-site experience of key historic sites, enriching the interpretation of significant events. Park actions to expand interpretive experiences would provide a long-term, major and beneficial impact.

The Cedar Creek Battlefield Foundation would continue to sponsor the annual re-enactment of the Battle of Cedar Creek and possibly re-enactments of other Civil War battles. The impacts of re-enactments and other special events held by Key Partners would be similar to Alternative A.

Under Alternative C, new auto touring routes would likely lead to connections to existing local and regional tours through park and non-park actions. Users of these auto routes would tour more areas of the park, and park visitors would be introduced to attractions and sites in the region. The impact would be long-term, minor and beneficial.

Visitors would continue to access the northern battlefield area of the park with frequency due to the location of Key Partner sites. Alternative C provides greater accessibility to the southern portions of the park through the trail system. Several visitor focal areas are proposed in the southern portions of the park, and would serve as a visitor draw to that area.

The development of the Keister tract would increase opportunities for recreational use, as in Alternatives A and B. Recreational use would also increase on the trail system. The trails would attract more bicyclists and hikers using the park for recreational use and using it more frequently. The impact on recreational use would be long-term, moderate, and beneficial.

The focus of land and resource protection under Alternative C would be key historic sites. The park would either acquire or assure the preservation of several discrete historic sites, which would then be available for visitor use and enjoyment over the long term. However, lands around focal areas that are in private ownership and unprotected may be developed, so over time there could be some diminishment of the visitor experience and understanding of historical events. The impact of park actions on visitor use and experience would be long-term, minor to moderate and beneficial.

Cumulative Impacts. Recent, current, and reasonably foreseeable planning endeavors and undertakings on or near park lands, such as expansion of the I-81 corridor through the park, encroaching residential, commercial, and industrial development on lands within the park boundaries resulting from the growth of Strasburg and Middletown, expansion of the Chemstone rock quarry adjacent to the

park's western boundary, and construction of power transmission lines near the park, would likely contribute to disturbances in the visual landscape, increases in the ambient noise level, and traffic congestion. These factors would detract from the visitor's enjoyment of the park. Thus, such undertakings would be expected to have an adverse, long-term impact on visitor use and experience. To some extent, they may be localized. The level of intensity would range from minor to major, depending on the location.

When the likely effects of implementing the actions contained in Alternative C are added to the effects of other past, present, and reasonably foreseeable actions outside the park, there would be a long-term, moderate adverse cumulative impact on visitor use and experience. The beneficial effect is likely to be at a minor to moderate level, due to the focus on individual sites. Park actions in the area of land protection would help to reduce the adverse cumulative impact on visitor use and experience.

Conclusion. The visitor would benefit from a central, NPS managed visitor center, an expanded interpretive experience and multiple ways to access and use the park. However, park actions would not be sufficient to protect landscape settings. Overall, park actions in Alternative C would have a long-term, moderate, and beneficial impact on visitor use and experience.

When the likely effects of implementing the actions contained in Alternative C are added to the effects of other past, present, and reasonably foreseeable actions outside the park, there would be a long-term, moderate adverse cumulative impact on visitor use and experience. The beneficial effect is likely to be at a minor to moderate level, due to the focus on individual sites. Park actions in the area of land protection would help to reduce the adverse cumulative impact on visitor use and experience.

4.5.4 Socioeconomic Environment

Direct and Indirect Impacts. Under Alternative C, the park would continue to contribute to the tourism industry in the three-county area and be an important part of the local socioeconomic environment. Beneficial impacts on the local and regional economy from actions contained in Alternative C would be greater than from those contained in Alternatives A and B.

Middletown, at the northeastern end of the park, and Strasburg, at the southwest end, are the two gateway towns most closely associated with the park. These communities provide a range of goods and services for the visiting public as well as for park employees and other workers employed in tourism-related businesses. Because of the proximity of these communities to the park and their distance from other visitor areas, these two individual gateway communities would continue to receive the greatest impacts from the actions in this alternative.

The reenactments would continue to be the most significant events in terms of number of visitors at the site at one time and visitor-related spending that occurs each year. The battlefield reenactments are important short-term activities that would likely continue and could draw increasing numbers of participants (historic Civil War re-enactors) and spectators to the region. This infusion of 12,000 to 14,000 visitors each year from outside the three-county region (with their accompanying spending) would continue to have a beneficial impact on the local and regional economy because it would continue to provide customers and income for local businesses. Increasing visitation is expected as a result of NPS and Key Partners' efforts and would continue to produce beneficial economic and fiscal impacts for the local and regional economy, affecting some businesses and individuals within the local/regional economy.

Compared to Alternative A, public accessibility to the park is improved under Alternative C. Limitations on accessibility to park lands would continue, due to land ownership patterns and the varying uses of land within the park. Visitors must still travel through one or more of the three counties (Frederick, Shenandoah, Warren) to gain access to the park.

Under Alternative C, an NPS visitor center would be constructed and would be the focal point for visitor orientation. It is anticipated that most visitors would start their visit at the new visitor center and then begin their tour to major visitor attractions within the park. Relative to Alternative A, this would result in increased public awareness, interest, and visibility to the park over time, which would result in increased visitation to the park as a whole.

Under Alternative C, the NPS would hire 18 FTEs (about \$1.6 million for salaries, benefits, utilities, and consumables such as office supplies, etc.) to operate the visitor center, provide interpretation and other visitor services, and implement the actions contained in this alternative.

Short-term development projects would include building a visitor center and developing a variety of park facilities, including trails, trailheads, waysides, interpretive media, etc. for a total of about \$13.2 million in one-time NPS costs. These facility investments (one-time costs) would constitute the major portion of the NPS development of the park over the next 20 years. As in Alternative A, the only capital investment by the Key Partners would be developing the Keister Tract into a park – the economic impact would be the same as in Alternative A.

It is presumed that the staffing levels and annual operating budgets of the Key Partners could increase slightly under Alternative C (estimated at \$660,000 annually), but would remain at least the same as in Alternative A.

As development of the park moves from the planning stage to implementation of the approved GMP, additional fiscal impacts would occur as funds are spent for

facilities development and additional staff. People drawn to the park because of the NPS presence would also result in additional beneficial fiscal and employment impacts due to increased spending by visitors from outside the three-county region.

Land acquisition under Alternative C would have an impact on the local economy. Approximately 2,000 acres of land would be acquired by the NPS and the Key Partners at a projected cost of \$40 million. Spending by the NPS on land required for the development of the visitor center is estimated at \$250,000. Land acquisition would be on a willing seller-willing buyer basis. Private owners would receive fair market value in exchange for any land bought by the federal government. Acquisition of privately owned land by the federal government would remove this property from the local tax rolls, but federal Payments in Lieu of Taxes (PILT) would increase and partially offset the decrease in property taxes collected by the local governments.

Relative to Alternative A, park visitation would be expected to increase substantially under Alternative C. Table 4.2 above presents the visitation figures for 1996 through 2005 for some NPS battlefield parks that are in Virginia and/or relatively close to Cedar Creek and Belle Grove NHP. It is not likely that visitor use at Cedar Creek and Belle Grove NHP would approach the range for better known parks like Gettysburg National Military Park (averaging 1.7 million recreation visits annually) or Manassas National Battlefield Park (averaging 0.8 million recreation visits annually). Petersburg National Battlefield and Richmond National Battlefield Park are most similar to Cedar Creek and Belle Grove NHP in that they have multiple units separated by distance, requiring motorized transportation (perhaps an auto tour) for the visitor to experience all the parts of the entire park. These two parks are well established and have had annual visitation in the 70,000 to 177,000 range during the period 1996 - 2005. Over the next 20 years, as Cedar Creek and Belle Grove NHP becomes more developed, well established, and better known to the public, annual visitation in the middle of the range of 50,000 to 200,000 could be reasonably expected. Overall, increases in visitation would be expected to produce greater beneficial economic impacts on the local and regional economy compared to Alternative A.

Locally, businesses and individuals in the towns of Middletown and Strasburg, and other local commercial centers, would probably benefit the most from implementation of Alternative C. Most goods and services needed for the park would be acquired from this area or the greater three-county region. The demand for goods and services by the NPS and the Key Partners would increase compared to the current levels under Alternative A. Spending would happen over a number of years and the resulting impacts (e.g., increases in income and the creation of some jobs) would be moderate to major for some business firms and individuals within the local economy. The NPS annual operating budget would increase to

approximately \$2.0 million (in 2007 dollars), providing the primary long-term recurring fiscal impact.

The 2005 economic impact of all the NPS parks (that report visitor use according to NPS standards and methodology) was calculated based upon the Money Generation Model Version 2.¹ Data for some relatively close battlefield parks are displayed in Table 4.3 above. For fiscal year 2005 Petersburg NB had nearly 150,000 recreation visits and Richmond NBP received about 72,000 recreation visits. Non-local visitor spending in the local region associated with these parks was more than \$6.8 million and \$3.8 million, respectively. About 150 jobs were supported by visitation to Petersburg NB and over 80 jobs by visitors to Richmond NBP.² Respectively, over \$2.8 million and nearly \$1.6 million in personal income in the regions surrounding these parks can be attributed to park visitors.³ Visitor use, and spending associated with visitor use, at these two parks generated \$4.4 million and \$2.5 million, respectively, in value added.⁴ Based upon this information, the economic impact of Cedar Creek and Belle Grove NHP (including both NPS and partner activities and contributions) could be expected to fall within these ranges after the park is further developed and becomes better known, and average visitation reaches the 70,000 to 150,000 range.

Economic and fiscal impacts on the three-county, regional economy are the local impacts identified above with some additional expenditures occurring in the region as out-of-region visitors travel to the park. Total recurring costs by the NPS and Key Partners would be about \$2.7 million annually, while total one-time costs would be about \$55.6 million. Some businesses and individuals in the region would benefit, but the overall impacts have much less importance due to the greater size of the economy of the three-county region. Impacts on the region—with over \$3.3 billion in earnings and over 96,600 jobs in 2004—as measured by these or other economic indicators (e.g., a notable increase in income or a decrease in unemployment, poverty, etc.) would be negligible.

Changes in the three-county (plus the city of Winchester) regional economy would include impacts on the regional socioeconomic base due to changes in park operations and other management or development actions. The socioeconomic base includes such factors as population, income, employment, earnings, etc. Park development and rehabilitation projects during the life of the plan would generally benefit the construction industry and associated workers.

¹ *Stynes, Daniel J. August 2006.*

² *"Jobs are the number of jobs in the region supported by the visitor spending. Job estimates are not full time equivalents, but include part time and seasonal positions." Stynes, et al May 2000.*

³ *"Personal income includes wage and salary income, proprietor's income and employee benefits." Stynes, et al May 2000.*

⁴ *"Value added is a commonly used measure of the contribution of an industry or region to gross national or gross state product. Value added is personal income plus rents and profits, plus indirect business taxes. As the name implies, it is the "value added" by the region to the final good or service being produced." Stynes, et al May 2000.*

Cumulative Impacts. Expansion of the I-81 corridor could increase the number of construction-related jobs in the area as well as increase spending within the local hospitality industry, a beneficial impact that would be short-term and of minor intensity. Expansion of the Chemstone quarry and upgrade of the power transmission lines could also increase jobs and spending in the local area, producing long-term, minor, beneficial impacts. The quarry expansion could also have adverse impacts on property values in the nearby area. Increased residential and commercial development would increase spending on land and construction materials while producing jobs in the region. The beneficial impact on socioeconomic conditions from this action would likely be long-term and of moderate intensity.

When the likely effects of implementing the actions contained in Alternative C are added to the effects of other current and reasonably foreseeable actions as described above, there would be a long-term, beneficial, moderate to major, cumulative impact on the local and regional economy. The actions in Alternative C would add an appreciable increment to this overall impact.

Conclusion. The NPS expansion to 18 FTEs and an annual operating budget of \$2.0 million (in 2007 dollars) would result in minor, long-term, beneficial fiscal impacts within the local and regional economies. Short-term expenditures (one-time costs) by the NPS of approximately \$13.2 million for a visitor center and park facility development would occur. About 2,000 acres of land would be acquired under Alternative C by the NPS and Key Partners for a total of about \$40 million. PILT payments to the affected local governments would increase. Acquisition of land for the park will become more expensive and more difficult as the region continues to grow. The Key Partners' annual operating costs would be about \$660,000. The Key Partners' and others' efforts would provide most of the impetus that results in greater long- and short-term, minor beneficial fiscal impacts within the local and regional economies, but the increased NPS presence would also contribute to these results. The battle reenactments would continue to result in beneficial, short-term, regional, economic impacts that are major events during the short time they occur. Overall tourism spending is expected to increase to a minor to moderate degree as use of the park by people from outside the region increases. Total recurring costs by the NPS and Key Partners would be about \$2.7 million annually, while total one-time costs would be about \$55.6 million. Some local and regional businesses and individuals (most likely in the accommodations and food service, and retail trade industries) providing goods and services to the park and the visiting public would benefit.

When the likely effects of implementing the actions contained in Alternative C are added to the effects of other current and reasonably foreseeable actions as described above, there would be a long-term, beneficial, moderate to major,

cumulative impact on the local and regional economy. The actions in Alternative C would add an appreciable increment to this overall impact.

4.5.5 Unavoidable Adverse Impacts

Unavoidable adverse impacts are defined as impacts that cannot be fully mitigated or avoided. Alternative C could result in several unavoidable adverse impacts on cultural and natural resources with impact intensities that are greater than minor, such as illegal collection of archeological resources, plants, and animals within the park boundary. Increased education, interpretation, and outreach efforts would help lessen, but not eliminate, the likelihood of this potential impact. Some soils and vegetation could be lost or altered due to the construction of new facilities in the park and due to soil erosion from increased visitor use.

4.5.6 Irreversible and Irretrievable Commitments of Resources

New actions would be taken that would either result in the consumption of nonrenewable cultural or natural resources, or in the use of renewable resources that would preclude other uses for a period of time. In the construction of new facilities, including buildings and trails, limited amounts of nonrenewable resources would be used, including fuels and building materials. These resources would be essentially irretrievable once they were committed.

4.5.7 The Relationship between Short-Term Uses of the Environment and Long-Term Productivity

Lands in the park that are protected would remain in their current state and maintain their long-term productivity. The primary short-term uses of Cedar Creek and Belle Grove NHP would continue to be historic preservation, heritage tourism, and recreation. Disturbance of the park's soils, water quality, vegetation, and wildlife, due to visitor use and the construction of new facilities, would reduce the long-term productivity of the park in localized areas; however, overall there likely would be only a small effect on the park's long-term productivity. Efforts to protect, restore, and enhance natural and cultural resources in the park would increase the long-term productivity of the environment in localized areas.

4.6 Environmental Consequences of Alternative D (Preferred)

4.6.1 Cultural Resources

■ Archeological Resources

Direct and Indirect Impacts. Actions under Alternative D would be expected to have beneficial, minor to moderate, long-term impacts on archeological resources on NPS- and partner-owned lands because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of the park's broader landscapes and connectivity between parcels of land currently owned by the partners
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection within the park and outside park boundaries

Alternative D, when compared with the other alternatives, holds the greatest potential for protection and preservation of archeological resources, because the NPS and its Key Partners would own more land within the legislated boundaries of the park and would develop collaborative proactive land protection strategies for viewshed and resource preservation within and outside the park boundaries.

Large special events would continue to have the potential to adversely impact archeological resources because visitors, vehicles, ground fires, and horses would likely continue to affect archeological resources. Under Alternative D, the development of new hiking/bicycling trails in the park with connections to regional trails outside the park, new auto touring routes, and a visitor center (either in or near the park) could affect archeological resources. However, the facilities would be sited to avoid known archeological resources. All ground-disturbing activities would be preceded by site-specific archeological surveys and, where appropriate, subsurface testing to determine the existence of archeological resources and how best to preserve them. If National Register-listed or National Register-eligible archeological resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the Virginia State Historic Preservation Officer (if the project was a federal undertaking). If previously undiscovered archeological resources were uncovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy could be developed in consultation with the Virginia State Historic Preservation Officer. Few,

if any, adverse impacts on archeological resources would be expected due to efforts to avoid all known sites.

Archeological resources adjacent to or easily accessible from trails, roads, and developed areas could be vulnerable to surface disturbance, inadvertent damage, and vandalism. A loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence could result. However, continued NPS staff presence, instituting and monitoring user capacity, and emphasizing visitor education would discourage vandalism and inadvertent destruction of cultural remains; any adverse impacts would be expected to be minimal.

While anticipated growth in park visitation and continuing large special events could result in rising levels of inadvertent disturbance to archeological resources, such impacts would be expected to be negligible because the NPS and its Key Partners would initiate efforts to educate the general public and private landowners about the importance and value of archeological resources.

Nevertheless, activities to protect and preserve archeological resources on privately owned lands in the park, which would represent less than 10% of the park under Alternative D, would ultimately be subject to the discretion of landowners. In most cases, adverse impacts would be realized only when private lands are developed. Thus, implementation of this alternative would be expected to have potential adverse, minor to moderate, long-term impacts on archeological resources on privately owned lands.

Cumulative Impacts. In the past, human activities, lack of sufficient resource monitoring and protection programs, and climatic and natural processes have resulted in the loss or disturbance of archeological resources. Because much of the park was not surveyed and inventoried for archeological resources until recent years, some decisions about site development and permitted activities, such as large special events, have been made that, in hindsight, may have resulted in the loss or disturbance to an unknown number of archeological sites on lands in the park. Although ongoing and expanded archeological site monitoring programs would be initiated and efforts would be undertaken to minimize or mitigate potential impacts from human activities and natural causes, an unknown number of archeological sites on NPS- and partner-owned lands in the park would likely continue to be adversely impacted by current and ongoing human activities, such as large special events; weather and climatic conditions; and natural processes, such as erosion and the shifting and cutting of river channels. Actions under this alternative, such as development of new hiking/bicycling trails and auto touring routes, could have minimal additional adverse impacts on archeological resources, although efforts would be undertaken to avoid all known sites; NPS staff presence,

monitoring programs, and visitor education would be expected to discourage vandalism and inadvertent destruction.

Other recent, current, and reasonably foreseeable planning endeavors and undertakings on or near park lands, such as the expansion of the I-81 corridor through the park; encroaching residential, commercial, and industrial development on lands within the park boundaries due to regional growth; expansion of the of the O-N Minerals rock quarry adjacent to the park's western boundary; and construction of power transmission lines near the park, would likely contribute to disturbance or destruction of archeological resources. Thus, such undertakings would be expected to have adverse, minor to moderate, long-term impacts on archeological resources.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to contribute adverse, minor to moderate, long-term impacts on any overall cumulative impact on archeological resources. The adverse impacts on such resources associated with Alternative D, however, would constitute a relatively small component of any overall cumulative impact.

Section 106 Summary. The Section 106 determination of effect would be *no adverse effect* on archeological resources on NPS- and partner-owned lands; the determination would be potential *adverse effect* on archeological resources on privately owned lands.

Conclusion. Overall, implementation of Alternative D would result in beneficial, minor to moderate, long-term impacts on archeological resources on NPS- and partner-owned lands. Implementation of Alternative D would result in potential adverse, minor to moderate, long-term impacts on archeological resources on privately owned lands. The adverse effects under this alternative, however, would be less than those resulting from Alternative A because the NPS and its Key Partners would acquire more land within the legislated boundaries of the park and would develop proactive strategies for resource protection within and outside the park boundaries.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have cumulative adverse, minor to moderate, long-term impacts on archeological resources; however, this alternative's contribution to these effects would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of archeological resources in the park.

■ **Ethnographic Resources**

Direct and Indirect Impacts. Actions under Alternative D would be expected to have beneficial, minor to moderate, long-term impacts on ethnographic resources (once they are identified and documented) on NPS- and partner-owned lands because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of the park's broader landscapes and connectivity between parcels of land currently owned by the partners
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Alternative D, when compared with the other alternatives, holds the greatest potential for protection and preservation of ethnographic resources because the NPS and its Key Partners would own more land within the legislated boundaries of the park and develop collaborative proactive land protection strategies for viewshed and resource preservation within and outside park boundaries. The NPS and its Key Partners will consult with concerned Indian tribes and other groups (once ethnographic resources and potentially affected tribes and groups are identified) to identify, learn about, and develop strategies for preserving and providing access to ethnographic resources on NPS- and partner-owned lands.

Under Alternative D, the development of new facilities in the park, such as hiking/bicycling trails, auto touring routes, and a visitor center, would be expected to have negligible impacts on ethnographic resources because the facilities would be sited to avoid such resources. While anticipated growth in park visitation could result in rising levels of inadvertent disturbance to ethnographic resources, these impacts would be expected to be negligible because the NPS and its Key Partners would initiate efforts to educate the general public and private landowners about the importance and value of such resources.

Under this alternative, activities to protect and preserve ethnographic resources on privately owned lands within the park, which would represent less than 10% of the park under Alternative D, would ultimately remain at the discretion of the landowners. In most cases, adverse impacts would be realized only when private lands are developed. Thus, implementation of this alternative would be expected to have potential adverse, minor to moderate, long-term impacts on ethnographic resources on privately owned lands.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and the establishment of the NHP, ethnographic resources were likely subjected to minor to moderate adverse impacts by a variety of human activities, such as large special events, agricultural operations, inadvertent disturbance, and vandalism; and by natural processes. Many of these activities and processes have continued to the present and would likely continue if Alternative D were implemented. Actions under this alternative, such as development of new hiking/bicycling trails and new auto touring routes, could have minimal additional adverse impacts on ethnographic resources, although efforts would be undertaken to avoid all known sites; NPS staff presence, monitoring programs, and visitor education would be expected to discourage vandalism and inadvertent destruction.

Current, ongoing, and reasonably foreseeable projects and developments on or adjacent to park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, industrial, and commercial development within the park boundaries due to regional growth, would potentially have adverse, minor to moderate, short-term impacts on identified ethnographic resources during periods of construction.

Additionally, these developments would likely contribute to an increase in park visitation and thus potentially disturb, or disrupt access to, ethnographic resources. Therefore, they would potentially result in adverse, minor to moderate, long-term impacts on identified ethnographic resources.

These developments, along with major expansion of the O-N Minerals rock quarry adjacent to the park's western boundary and construction of overhead power transmission lines near the park, would also have potential adverse, minor to moderate, long-term impacts on ethnographic resources for similar reasons.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to contribute minor to moderate, long-term to permanent, adverse impacts on any overall cumulative impact on ethnographic resources. The adverse impacts on such resources associated with Alternative D, however, would constitute a relatively small component of any overall cumulative impact.

Conclusion. Overall, implementation of Alternative D would result in beneficial, minor to moderate, long-term impacts on ethnographic resources on NPS- and partner-owned lands in the park. Implementation of Alternative D would result in potential adverse, minor to moderate, long-term impacts on such resources on privately owned lands. However, this alternative, when compared with Alternative A, holds the potential for greater protection and preservation of and access to ethnographic resources because the NPS and its Key Partners would own more land within the legislated boundaries of the park and would develop proactive strategies for viewshed and resource protection within and outside the park boundaries.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have cumulative adverse, minor to moderate, long-term impacts on archeological resources; however, this alternative's contribution to these impacts would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of ethnographic resources in the park.

■ **Historic Structures**

Direct and Indirect Impacts. Actions under Alternative D would be expected to have beneficial, minor to moderate, long-term impacts on historic structures on NPS- and partner-owned lands because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of the park's broader landscapes and connectivity between parcels of land currently owned by the partners
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Alternative D, when compared with the other alternatives, holds the greatest potential for protection and preservation of historic structures because the NPS and its Key Partners would own more land within the legislated boundaries of the park and would develop collaborative proactive protection strategies for resource preservation within and outside park boundaries. Few, if any, adverse impacts would be anticipated.

While anticipated growth in park visitation and the continuation of large special events could result in the loss of some historic fabric in historic structures, NPS and partner acquisition of lands focused on the park's broader landscapes, as well as development of proactive strategies to protect historic structures within and outside the park boundaries, would be expected to have beneficial, minor to moderate, long-term impacts on historic structures. Nevertheless, activities to protect and preserve historic structures on privately owned lands within the park, which would represent less than 10% of the park under Alternative D, would continue to be subject to the discretion of landowners. In most cases, adverse impacts would be realized only when private lands are developed. Thus, actions under this alternative

would potentially have adverse, minor to moderate, long-term impacts on such resources on privately owned lands.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and the establishment of the NHP, historic structures were adversely impacted by a variety of human activities, such as large special events, inadvertent disturbance, and vandalism; and by natural processes. Many of these activities and processes have continued to the present and would likely continue if Alternative D were implemented. NPS staff presence, monitoring programs, and visitor education would be expected to discourage vandalism and inadvertent destruction.

Current, ongoing, and reasonably foreseeable projects and developments on or adjacent to park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, industrial, and commercial development within the park boundaries due to regional growth, would have adverse, minor to moderate, long-term impacts on historic structures because they would likely result in increasing park visitation and the potential for loss of historic fabric on some historic structures.

As described above, implementation of Alternative D would result in both beneficial and adverse impacts on historic structures. Yet, due to the adverse impacts of other current or reasonably foreseeable actions, the cumulative impact would be adverse, minor to moderate, and long-term. Alternative D, however, would contribute only minimally to the adverse cumulative impact.

Section 106 Summary. The Section 106 determination of effect would be *no adverse effect* on historic structures on NPS- and partner-owned lands and potential *adverse effect* on historic structures on privately owned lands.

Conclusion. Overall, implementation of Alternative D would result in beneficial, minor to moderate, long-term impacts on historic structures on NPS- and partner-owned lands. Implementation of Alternative D would result in potential adverse, minor to moderate, long-term impacts on such resources on privately owned lands. The adverse impacts under this alternative, however, would be less than those resulting from Alternative A because the NPS and its Key Partners would acquire more land within the legislated boundaries of the park and would develop proactive strategies for resource and viewshed protection within and outside the park boundaries.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have cumulative adverse, minor to moderate, long-term impacts on historic structures; however, this alternative's contribution to these effects would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of historic structures/cultural landscapes in the park.

■ **Cultural Landscapes**

Direct and Indirect Impacts. Actions under Alternative D would be expected to have beneficial, minor to moderate, long-term impacts on cultural landscapes on NPS- and partner-owned lands because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of the park’s broader landscapes and connectivity between parcels of land currently owned by the partners
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Alternative D, when compared with the other alternatives, holds the greatest potential for protection and preservation of cultural landscapes because the NPS and its Key Partners would own more land within the legislated boundaries of the park and develop collaborative proactive land protection strategies for viewshed and resource preservation within and outside park boundaries. Although development of new auto touring routes, trails, and a visitor center (either in or near the park) under Alternative D could potentially impact some elements of cultural landscapes, these impacts would be negligible because efforts would be undertaken to ensure that the facilities would avoid significant landscape features and blend with their natural surroundings as well as the park’s pastoral and rural landforms and features. Careful design would ensure that the expansion and development of trails and auto touring routes on NPS- and partner-owned lands would minimally affect the scale and visual relationships among landscape features. In addition, the topography, vegetation, circulation features, and land use patterns of the cultural landscape would remain largely unaltered. Few, if any, adverse impacts would be anticipated.

While anticipated growth in park visitation and the continuation of large special events could result in the loss of some cultural landscape elements, NPS and partner acquisition of lands focused on the park’s broader landscapes, as well as development of proactive strategies to protect resources and viewsheds within and outside the park boundaries, would be expected to have beneficial, minor to moderate, long-term impacts on cultural landscapes. Nevertheless, activities to

protect and preserve cultural landscapes on privately owned lands within the park, which would represent less than 10% of the park under Alternative D, would continue to be subject to the discretion of landowners. In most cases, adverse impacts would be realized only when private lands are developed. Thus, actions under this alternative would potentially have adverse, minor to moderate, long-term impacts on cultural landscape resources on privately owned lands.

Cumulative Impacts. Prior to partner acquisition of lands in the park area and the establishment of the NHP, cultural landscapes were adversely impacted by a variety of human activities, such as large special events, agricultural operations (which have impacted Civil War-related resources), inadvertent disturbance, and vandalism; and by natural processes. Many of these activities and processes have continued to the present and would likely continue if Alternative D were implemented. Actions under this alternative, such as development of new hiking/bicycling trails and new auto touring routes, could have minimal additional adverse impacts on cultural landscapes, although efforts would be undertaken to avoid all known sites, and NPS staff presence, monitoring programs, and visitor education would be expected to discourage vandalism and inadvertent destruction.

Current, ongoing, and reasonably foreseeable projects and developments on or adjacent to park lands, such as the expansion of the I-81 corridor through the park and encroaching residential, industrial, and commercial development within the park boundaries due to regional growth, would have adverse, minor to moderate, long-term impacts on cultural landscape resources because these developments would likely result in increasing park visitation and the potential for loss of some significant cultural landscape features. These developments, along with major expansion of the O-N Minerals rock quarry adjacent to the park's western boundary and construction of overhead power transmission lines near the park, would have adverse, minor to moderate, long-term impacts on cultural landscape resources because they would result in visual intrusions on the historic scene and would contribute to the loss of significant elements of the park's rural and pastoral landscape.

As described above, implementation of Alternative D would result in both beneficial and adverse impacts on cultural landscapes. Yet, due to the adverse impacts of other current or reasonably foreseeable actions the cumulative impact would be adverse, minor to moderate, and long-term. Alternative D, however, would contribute only minimally to the cumulative adverse impact.

Section 106 Summary. The Section 106 determination of effect would be *no adverse effect* on cultural landscapes on NPS- and partner-owned lands; the determination would be *adverse effect* on such resources on privately owned lands.

Conclusion. Overall, implementation of Alternative D would result in beneficial, minor to moderate, long-term impacts on cultural landscapes on NPS- and partner-

owned lands. Implementation of Alternative D would result in potential adverse, minor to moderate, long-term impacts on such resources on privately owned lands. The adverse impacts under this alternative, however, would be less than those resulting from Alternative A because the NPS and its Key Partners would acquire more land within the legislated boundaries of the park and develop proactive strategies for resource and viewshed protection within and outside the park boundaries.

Actions under this alternative, when combined with other current and reasonably foreseeable future undertakings in the park and surrounding area, would be generally expected to have cumulative adverse, minor to moderate, long-term impacts on cultural landscapes; however, this alternative's contribution to these impacts would constitute a relatively small component of any overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of cultural landscapes in the park.

■ **Museum Collections**

Direct and Indirect Impacts. Actions under Alternative D would have beneficial, minor to moderate, long-term impacts on museum collections associated with NPS- and partner-owned lands and would have potential adverse, minor to moderate, long-term impacts on collections associated with privately owned lands. However, this alternative holds the potential for enlarged museum collections compared with Alternative A, because the NPS and its Key Partners would acquire more land within the legislated boundaries of the park. All NPS- and partner-owned collections would be accessioned, cataloged, preserved, protected, and made available for access and use according to NPS and other professional standards and guidelines. Under Alternative D, some items in the collections would likely be displayed in the NPS visitor center or at the partner- and privately owned sites that participate in the park's interpretation program.

Privately owned collections of cultural and natural objects, artifacts, and archival materials would likely continue to remain in private ownership or be deposited with organizations or institutions at the discretion of the landowners. As a result, such collections of historical and natural objects, artifacts, and archives could be potentially degraded, lost, or scattered, thus reducing or eliminating their future usefulness for research and interpretation.

Cumulative Impacts. Because conditions would not change, there would be no cumulative impacts on museum collections under this alternative.

Conclusion. Overall, implementation of Alternative D would result in beneficial, minor to moderate, long-term impacts on museum collections possessed by the NPS

and its Key Partners. Implementation of Alternative D would result in potential adverse, minor to moderate, long-term impacts on privately owned collections. However, this alternative holds the potential for enlarged museum collections compared with Alternative A, because the NPS and its Key Partners would acquire more land within the legislated boundaries of the park.

There would be no cumulative impacts on museum collections under this alternative.

Impacts from actions contained in this alternative would not likely result in impairment of museum collections in the park.

4.6.2 Natural Resources

■ Scenic/Visual Resources/Viewsheds

Direct and Indirect Impacts. Alternative D, when compared with the other alternatives, holds the greatest potential for protection and preservation of scenic resources and viewsheds because the NPS and its Key Partners would own more land within the legislated boundaries of the park and develop collaborative, proactive land protection strategies for resource preservation within and outside park boundaries.

Impacts on scenic resources under Alternative D would be expected to be less than those under Alternative A because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of the park's broader landscapes and connectivity between parcels of land currently owned by the partners
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Land protection activities in the park would continue to affect the park's scenic resources and viewsheds. Relative to Alternative A, coordination of land protection and acquisition activities would be improved and would be greatest under Alternative D. The NPS and its Key Partners would protect and acquire about 2,000 acres of land, with the highest priority being given to protecting cultural landscapes and/or providing connectivity between NPS- and partner-owned tracts of land. Protecting cultural landscapes would include the protection of key views, vistas, and scenic backdrops. Land acquisition would prohibit development that could adversely

impact the scenic resources and viewsheds of the park and would likely result in the protection of important scenic resources. Under Alternative D, the NPS and its Key Partners would develop proactive strategies to protect related resources outside the park boundary, using conservation easements and consulting with local governments. The NPS and the Key Partners would also provide technical assistance to one another, to private landowners, and to nearby communities specifically related to viewshed protection issues in the park under this alternative. Land protection under Alternative D would be expected to result in long-term, beneficial, localized impacts of moderate to major intensity.

Visitor use, including trail use, scenic driving, and participation in large special events, would continue to affect scenic resources. Park visitation is expected to be highest under this alternative. Increases in park visitation, resulting from the development of auto touring routes and new trail opportunities under Alternative D, would likely increase the potential for adverse impacts on scenic resources. Trail connections to regional trails outside the park would increase opportunities for area residents to travel to and through the park, which would likely increase park visitation. The acquisition of key historic properties would also increase the visitor opportunities available in the park, which, in turn, would likely increase total park visitation. The potential for increased development of unofficial social trails caused by visitors would likely increase under this alternative since the development of more trails in the park would allow visitors to access previously inaccessible areas of the park and may encourage them to go off trail, especially near the Visitor Focal Areas. On the other hand, it could be argued that the development of the trail system will formalize access and minimize impacts on scenic resources from visitor use. Visitor use would result in long-term, minor to moderate, adverse impacts on scenic resources that would be localized.

Land use and resource management activities in the park would continue to affect the scenic resources of the park. The management of cultural landscapes and agricultural settings would continue to affect scenic resources. Impacts are likely to be long-term and could be beneficial or adverse. The intensity of the impacts is unknown, although it is expected that it would be localized.

Under Alternative D, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including scenic resources and viewsheds. The beneficial impacts on scenic resources due to increased and improved coordination between the NPS and its Key Partners would be greater than in Alternative A.

Collectively, these actions would improve coordination and accountability for scenic resource management, which would result in long-term, beneficial impacts on scenic resources and viewsheds. The impacts may not include the entire park, but would

be widespread. Predicting the intensity of this impact is difficult, but it is anticipated to be moderate.

Facility development would be increased under Alternative D and the impacts would be greater than in all other alternatives. The construction of new facilities under this alternative, including a visitor center, hiking and biking trails (with trailheads), auto touring routes (with waysides), and signs, has the potential to affect the scenic resources of the park. As in all of the alternatives, maintenance of existing facilities would probably result in some erosion and/or alteration of soil properties, resulting in a negligible to minor, long-term, adverse impact in localized areas.

This alternative includes the development of a visitor center in, or near, the park in an undetermined location. The visitor center will not be an imposing structure on the landscape and would not be located in key viewsheds - potential impacts to scenic resources would be expected to be negligible. Appropriate studies and NEPA compliance would be required to move forward with implementation.

Ten Visitor Focal Areas have been proposed in this alternative. The locations of the proposed Visitor Focal Areas cross the boundaries of all of the proposed management zones in the park. Potential impacts on scenic resources from development in these areas could include obstructed views from poorly placed signs and interpretive structures. Potential impacts from development in Visitor Focal Areas would be expected to be long-term, adverse, localized and of negligible to minor intensity.

The locations of the proposed Visitor Services Zone are fully contained inside the boundaries of the Cultural Landscape Zone. Potential impacts on scenic resources from development in these areas could include obstructed views from poorly placed facilities and structures that are incompatible with the surrounding landscape and rural character. Potential impacts from development in the Visitor Services Zone would be expected to be long-term, adverse, localized and of minor to moderate intensity.

The trail system in this alternative would be more extensive than in the other alternatives. These trails would pass through all of the park's management zones, and would include a trail that follows the course of the battle. Trails are planned to be four feet wide, constructed out of natural surfaces or gravel crusher fines, and used for hiking and bicycling only. Trails in this alternative pass through forested areas and traverse the borders of open fields. The trails themselves would have negligible impacts on scenic resources and viewsheds. However, trailhead development could have adverse impacts. This alternative proposes a total of nine trailheads. Adverse impacts from trailheads have been minimized due to their placement at sites with previous disturbance: along existing highways, roads, and driveways. Some new disturbance would still be required, which could affect the

pastoral landscape and its scenic qualities. Potential impacts from trailhead development would be expected to be long-term, adverse, minor, and localized.

The development of auto touring routes could have adverse impacts on scenic resources and viewsheds. The routes themselves would use existing road rights-of-way and therefore would have no impact on scenic resources. The development of four waysides along existing roadways to support the touring routes has the potential to impact scenic resources. It is presumed that any construction required would be contained within the right-of-way. Even so, such a facility has the potential to affect the scenic qualities of the area due to increases in asphalt surfacing and the installation of new signs. If wayside developments are planned and constructed properly, adverse impacts would likely be negligible. Impacts from auto tour routes could also include the creation of denuded areas and ruts along road corridors that may affect the scenic quality of the area. Impacts on scenic resources and viewsheds are expected to be long-term, adverse, minor, and localized.

Adverse impacts on scenic resources and viewsheds on private lands in the park would be less than those described in Alternative A. Scenic resources on private lands within the park, which would constitute less than 10% of the park's total acreage under Alternative D, would continue to be impacted by development, land use, land management, and land protection. The types of impacts would be generally the same as those described in Alternative A. The NPS and its Key Partners would continue to encourage and promote the protection of scenic resources and viewsheds on private lands, with improved capacity for community outreach and education on resource preservation efforts due to the establishment of a new visitor center. This would enable the park to realize its special mandates for resource conservation as identified in the park's enabling legislation. Final decision and actions on private lands would still be left to the discretion of private landowners. In most cases, adverse impacts would be realized only when private lands are developed. Collectively, impacts on scenic resources and viewsheds from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to major depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on scenic resources and viewsheds would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, moderate to major, adverse impacts.

When the likely effects of implementing the actions contained in Alternative D are added to the effects of other current and reasonably foreseeable actions, there would be a long-term, minor, adverse cumulative impact on the park's scenic resources and viewsheds. Impacts would be localized, but could affect many sites. The adverse effects of projects and actions outside of the park would be

substantially mitigated by the beneficial impacts of land protection actions contained in this alternative. The actions in Alternative D would contribute a large increment to this resulting cumulative impact.

Conclusion. The park's scenic resources and viewsheds would be affected by the actions under Alternative D, including actions associated with visitor use, land use, land management, development, and land protection. The potential for adverse impacts on scenic resources from facility development would be greater than in all other alternatives, but the beneficial impacts of land protection would be greatest under Alternative D.

Visitor use would result in long-term, minor to moderate, adverse impacts on scenic resources that would be localized. Land use and management impacts on scenic resources would be long-term, beneficial, moderate, and localized. Development impacts would be long-term, adverse, localized, with intensities ranging from negligible to moderate depending upon the type of development. Land protection would result in long-term, moderate to major, beneficial impacts that would be localized.

When the impacts of Alternative D are added to the effects of other current and foreseeable future actions, there would be a minor, long-term, adverse cumulative impact on the park's scenic resources and viewsheds. The impacts would be localized. The adverse impacts of projects and actions outside of the park would be substantially mitigated by the beneficial impacts of land protection actions contained in this alternative. Impacts would be localized, but could affect many sites. The actions in Alternative D would contribute a large increment to this overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of scenic/visual resources/viewsheds in the park.

■ Soils

Direct and Indirect Impacts. Alternative D, when compared with the other alternatives, holds the greatest potential for protection and preservation of soils because the NPS and its Key Partners would own more land within the legislated boundaries of the park and would develop collaborative, proactive land protection strategies for resource preservation within and outside park boundaries.

Impacts on soils under Alternative D would be expected to be less than those under Alternative A because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to

acquisition of the park's broader landscapes and connectivity between parcels of land currently owned by the partners

- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Land protection activities in the park would continue to affect the park's soils. Relative to Alternative A, coordination of land protection and acquisition activities would be improved and would be the greatest under Alternative D. The NPS and its Key Partners would protect and acquire about 2,000 acres of land. Acquisition of these properties could result in the protection of important soils, including prime farmland or hydric soils, and would prohibit development that could adversely impact these and other soil resources. Under Alternative D, the NPS and its Key Partners would develop proactive strategies to protect related resources outside the park boundary, using conservation easements and consulting with local governments. Land protection under Alternative D would be expected to result in long-term, beneficial, moderate to major, localized impacts.

Impacts on soils from visitor use would continue to affect soils in the park. Trail use and visitor use during large special events such as battle reenactments would compact soils and cause erosion from people, vehicles, and horses. Soils along existing trails and near parking areas would likely experience the same impacts.

Increases in park visitation, resulting from the development of new facilities in the park under Alternative D, would likely increase the potential for adverse impacts on soils as described above. The acquisition of key historic properties would also increase the visitor opportunities available in the park, which, in turn, would likely increase total park visitation. The potential for increased development of unofficial social trails caused by visitors would likely increase under this alternative since the development of more trails in the park would allow visitors to access previously inaccessible areas of the park and may encourage them to go off trail, especially near the Visitor Focal Areas. On the other hand, it could be argued that the development of the trail system will formalize access and minimize impacts from visitor use. Overall, visitor use would result in long-term, minor to moderate, adverse impacts on soils that would be localized.

Under Alternative D, instituting and monitoring user-capacity indicators, as well as implementing management strategies to mitigate adverse impacts, would reduce soil erosion caused by visitor use. Compared to Alternative A, this would likely result in a minor, long-term, beneficial impact that would be localized.

Land use and resource management activities in the park would continue to affect soils. Agricultural production and livestock grazing would continue to cause soil compaction and erosion. Under Alternative D, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including natural resource goals. Collectively, these activities would result in long-term, minor to moderate, adverse impacts that would be limited in extent.

Under Alternative D, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including soils.

The Key Partners would continue to be the majority landowner under this alternative; however, the NPS would also be a significant landowner and would be most involved in resource management under this alternative. There would still be the potential for adverse impacts on the soils in the park due to varied management by the respective owners; however, compared to Alternative A, land use and management would be greatly improved. Collectively, these actions would improve coordination and accountability for resource management in comparison with Alternative A; this would result in long-term beneficial impacts on soils that are localized. Predicting the intensity of this impact is difficult, but it is anticipated to be minor.

Facility development would be increased under Alternative D and impacts would be greater than those under all the other alternatives. The construction of new facilities under this alternative, including a visitor center, hiking and biking trails (with trailheads), auto touring routes (with waysides), and signs, has the potential to affect soils. As in all of the alternatives, maintenance of existing facilities would probably result in some erosion and/or alteration of soil properties, resulting in a negligible to minor, long-term, adverse impact in localized areas.

This alternative includes the development of a visitor center in, or near, the park in an undetermined location. If establishment of the visitor center required new construction, some soils would be lost to erosion and/or substantially altered in local areas where ground disturbance occurs. Mitigation measures, such as installing erosion matting and silt fences, would help reduce the impacts. The impact on soils would be long-term, adverse, moderate, and localized.

Ten Visitor Focal Areas have been proposed in this alternative. Proposed development in the Visitor Focal Areas and Visitor Services Zone would affect soils. The degree of impact would depend on the scale of development that occurred on site. Impacts on soils in these areas would likely include the loss of soils due to the facility construction and the potential for compaction and alteration of soils adjacent to the sites due to heavy equipment use. Impacts from development in the Visitor

Focal Areas and Visitor Services Zone would be expected to be long-term, adverse, localized, and of minor to moderate intensity.

The trail system in this alternative would be more extensive than in the other alternatives. These trails would pass through all of the park's management zones, and would include a trail that follows the course of the battle. Trails are planned to be four feet wide, constructed out of natural surfaces or gravel crusher fines, and used for hiking and bicycling only. Site preparation work would disturb the soil profile and displace soils along the trail, generally down to the level where mineral soil can be found. Construction equipment also would likely disturb and compact adjacent soils in the project areas. The potential for soil erosion would increase in these areas. Construction of the trails would result in long-term, minor to moderate, adverse impacts in localized areas. This alternative includes a total of nine trailheads. Trailhead development, which could include the clearing of areas to accommodate parking and trail access, would be expected to result in long-term, moderate, adverse impacts in localized areas.

The development of auto touring routes could have adverse impacts on soils. The routes themselves would utilize existing road rights-of-way and therefore would have no impact on soils. The development of four waysides along existing roadways to support the touring routes could adversely impact soils. It is presumed that any construction required would be contained within the road right-of-way; however, portions of the right-of-way may be undisturbed. Increases in asphalt surfacing and the installation of new signs would disturb soils. Impacts from auto tour routes could also include the compaction of soil along road corridors and the potential for soil erosion. Impacts on soils are expected to be long-term, adverse, moderate, and localized.

Impacts on soils on private lands in the park would be less than those described in Alternative A. Soils on private lands within the park, which would constitute less than 10% of the park's total acreage under Alternative D, would continue to be impacted by development, land use, land management, and land protection. The types of impacts would be generally the same as those described in Alternative A. Collectively, impacts on soils from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to major depending on their land use implications.

Cumulative Impacts. The impact of cumulative actions on soils would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative D are added to the effects of other current and reasonably foreseeable actions outside the park, there would be a long-term, minor to moderate, adverse, localized cumulative impact on soils. The adverse effects of projects and actions outside of the park

would be mitigated and largely outweighed by the beneficial impacts of land protection actions contained in this alternative. The actions in Alternative D would contribute a large increment to this resulting cumulative impact.

Conclusion. The park's soils would be affected by the actions under Alternative D, including those associated with visitor use, land use, land management, development, and land protection. Adverse impacts on soils from facility development would be greater than in all other alternatives, but the beneficial impacts of land protection would be greatest under Alternative D.

Visitor use would result in long-term, minor to moderate, adverse impacts on soils that would be localized. Land use and management impacts on soils would be long-term, beneficial or adverse, minor to moderate, and would be localized. Development impacts would be long-term, adverse, localized, with intensities ranging from negligible to moderate depending upon the type of development. Land protection would result in long-term, moderate to major, beneficial impacts that would be localized.

When the impacts of Alternative D are added to the effects of other current and foreseeable future actions, there would be a minor to moderate long-term adverse cumulative impact on soils in the park. The impacts would be localized. The adverse effects of projects and actions outside of the park would be mitigated and largely outweighed by the beneficial impacts of land protection actions contained in this alternative. The actions in Alternative D would contribute a large increment to this overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of soils in the park.

■ **Groundwater**

Direct and Indirect Impacts. Alternative D, when compared with the other alternatives, holds the greatest potential for protection and preservation of groundwater because the NPS and its Key Partners would own more land within the legislated boundaries of the park and would develop collaborative, proactive land protection strategies for resource preservation within and outside park boundaries.

Impacts on groundwater under Alternative D would be expected to be less than those under Alternative A because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of the park's broader landscapes and connectivity between parcels of land currently owned by the partners

- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Land protection activities in the park would continue to affect the park's groundwater. Relative to Alternative A, coordination of land protection and acquisition activities would be improved and would be the greatest under Alternative D. The NPS and its Key Partners would protect and acquire about 2,000 additional acres of land. Although acquisition of cultural landscapes would continue to be the focus, these properties overlay groundwater. Acquisition of these properties could aid in the protection of groundwater by eliminating or reducing the development potential of the property. This would result in a reduction in demand for domestic water that would help with current water supply issues. Elimination or reduction of development would also reduce the potential for adverse impacts on groundwater quality by reducing human activities that could result in inadvertent chemical contamination. The beneficial impacts on groundwater from land protection would be the greater than in Alternative A. Under Alternative D, the NPS and its Key Partners would develop proactive strategies to protect related resources outside the park boundary, using conservation easements and consulting with local governments. Land protection under Alternative D would be expected to result in long-term, beneficial, moderate, localized impacts.

Under Alternative D, increased park visitation resulting from increased visits to the partner-owned sites would likely increase the demand for domestic water. Development of the Keister Tract would substantially increase visitor use in the southern portion of the park. Visitation at this site would increase after the area opens to the public and then would likely continue to gradually increase over the life of the plan. The acquisition of key properties would also increase the visitor opportunities available in the park, which, in turn, would likely increase total park visitation. These new uses and corresponding increases in park visitation could result in long-term, adverse impacts on groundwater and domestic water supplies. The impacts could extend beyond park boundaries. Predicting the intensity of this impact is difficult, but it is anticipated to be minor because the increase in water use above existing rates of consumption would be relatively small when compared to the size of the aquifer.

As in Alternative A, groundwater quality in the park, in locations such as along existing roads and at parking areas, would continue to be affected by visitor use. Under Alternative D, new parking areas developed in the Visitor Focal Areas and/or the Visitor Services Zone would contribute to any potential impacts. Inadvertent chemical spills, including oil from automobiles, could enter the soil profile and

impact groundwater quality. Areas with karst features, such as sinkholes, that have more direct connections to groundwater and surface waters, would be more likely to experience adverse impacts on groundwater. These adverse impacts would likely be long-term, localized, and of negligible to minor intensity because they would be limited to discrete areas such as roads and parking areas.

Land use and resource management activities in the park could continue to affect groundwater. Groundwater quality could be affected by chemicals used in agricultural production. The impact would likely be long-term, adverse, minor, and localized. Under Alternative D, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including natural resource goals. Collectively, these activities would result in long-term, adverse, localized, minor impacts.

Under Alternative D, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including water resources.

The Key Partners would continue to be the majority landowner under this alternative; however, the NPS would also be a significant landowner and would be most involved in resource management under this alternative. There would still be potential for adverse impacts on groundwater in the park due to varied management by the respective owners; however, compared to Alternative A, that potential would be reduced. Collectively, these actions would improve coordination and accountability for water resource management, which would result in long-term beneficial impacts on groundwater that are localized. Predicting the intensity of this impact is difficult, but it is anticipated to be negligible to minor.

Facility development would increase under Alternative D and the impacts on groundwater would be greater than in Alternative A, but about the same as in Alternatives B and C. Groundwater withdrawal for NPS and partner uses would continue to be relatively small compared to other uses in the park, and water consumption is not expected to increase substantially over the life of the plan. Impacts on groundwater from facility development under this alternative would be limited to those generated by the establishment of a visitor center and facility development in the Visitor Services Zone. The visitor center would require domestic water to support visitor use and staff operations. Increased water withdrawals required for domestic water use would adversely impact groundwater supply and/or aquifer levels in the area. Facilities built in the Visitor Service Zone, such as restrooms and campgrounds, would likely require water to support visitor use. The number of new wells or the amount of domestic water that would be needed has not been determined and would be dependent on the scale of development that occurs.

Overall, impacts would be expected to be long-term, adverse, mostly localized, and negligible to minor in intensity. Trailhead development on NPS-owned land is not expected to require additional water consumption over the long-term.

Impacts on groundwater on private lands in the park would be less than those described in Alternative A. Groundwater on private lands within the park, which would constitute less than 10% of the park's total acreage under Alternative D, would continue to be impacted by development, land use, land management, and land protection. In most cases, adverse impacts would be realized only when private lands are developed. The types of impacts would be generally the same as those described in Alternative A. Collectively, impacts on groundwater from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to moderate depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on groundwater would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative D are added to the effects of other current and reasonably foreseeable actions, there would be a long-term adverse cumulative impact on groundwater resources. The impacts could extend beyond park boundaries and could include the region. The adverse effects of projects and actions outside of the park would be mitigated by the beneficial impacts of land protection actions contained in this alternative. It is difficult to predict and quantify the impacts, but they are anticipated to be moderate. The actions in Alternative D would contribute an appreciable increment to this resulting cumulative impact.

Conclusion. Groundwater resources in the park would be affected by the actions under Alternative D, including actions associated with visitor use, land use and management, development, and land protection. Adverse impacts on groundwater from facility development would be greater than in Alternative A, but the beneficial impacts of land protection would be the greatest under Alternative D.

Visitor use impacts on groundwater would be short- and long-term, adverse, negligible to minor, and localized. Land use and management impacts on groundwater would be long-term, adverse or beneficial, negligible to minor, and localized. Facility development and maintenance impacts would be long-term, adverse, negligible to minor, and localized. Land protection would result in long-term, beneficial, moderate impacts that would be localized.

When the impacts of Alternative D are added to the effects of other current and foreseeable future actions, there would be a moderate long-term adverse cumulative impact on groundwater resources. The impacts could extend beyond

park boundaries in some cases. The actions in Alternative D would add an appreciable increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of groundwater in the park.

■ **Surface Water Quality**

Direct and Indirect Impacts. Alternative D, when compared with the other alternatives, holds the greatest potential for protection and preservation of surface water quality because the NPS and its Key Partners would own more land within the legislated boundaries of the park and develop collaborative, proactive land protection strategies for resource preservation within and outside park boundaries.

Impacts on surface water quality under Alternative C would be expected to be less than those under Alternative D because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of the park’s broader landscapes and connectivity between parcels of land currently owned by the partners
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Land protection activities in the park would continue to affect the park’s surface water quality. Relative to Alternative A, coordination of land protection and acquisition activities would be improved and would be the greatest under Alternative D. The NPS and its Key Partners would protect and acquire about 2,000 additional acres of land. Although acquisition of cultural landscapes within the park would be the focus, these properties could also contain surface waters or could influence nearby surface waters. Many of the tracts identified as protection priorities in Alternative D contain creek and stream frontage. This alternative provides the greatest level of riparian protection. Acquisition of these properties would aid in the protection of surface water quality by eliminating or reducing the development potential of the property. This would result in a reduction in erosion caused by construction activities and property use. Elimination or reduction of development would also reduce the potential for adverse impacts on surface water quality by reducing surface water runoff and human activities that could result in inadvertent chemical contamination. Under Alternative D, the NPS and its Key Partners would develop proactive strategies to protect related resources outside the park boundary,

using conservation easements and consulting with local governments. Land protection under Alternative D would be expected to result in long-term, beneficial, moderate, localized impacts.

Under Alternative D, surface water quality in the park would continue to be affected by visitor use due to the potential for soil erosion and inadvertent chemical contamination. Trail use and large special events would continue to produce adverse impacts on surface water, such as vegetation loss with resultant increased erosion and inadvertent chemical contamination. The large amount of land acquisition in this alternative would likely result in increased visitor opportunities available in the park, which, in turn, would likely increase total park visitation. Park visitation is expected to be highest under this alternative. These new uses and corresponding increases in park visitation could result in impacts on surface water quality similar to the impacts described in Alternative A. The acquisition of key historic properties would also increase the visitor opportunities available in the park, which, in turn, would likely increase total park visitation. Visitor use under Alternative D would result in long-term, adverse, localized, minor impacts.

Compared to Alternative A, adverse impacts on surface water quality from land use and resource management would be reduced; however, surface water quality would continue to be affected. Agricultural practices would continue to cause stream bank erosion and chemical inputs into surface waters. Under Alternative D, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including assistance on natural resources. Collectively, these activities would result in long-term, adverse, minor to moderate, localized impacts.

Under Alternative D, the NPS and its Key Partners would develop written, shared strategies for implementing the GMP and policies for operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including water resources. Beneficial impacts on surface water quality would be greater than those under Alternative A and generally the same as in Alternative C.

The Key Partners would continue to be the majority landowner under this alternative; however, the NPS would also be a significant landowner and would be most involved in resource management under this alternative. There would still be potential for adverse impacts on the surface water quality in the park due to varied management by the respective owners; however, compared to Alternative A, land use and management would be greatly improved. Land acquisition under this alternative would provide the NPS and its Key Partners with the ability to control land uses adjacent to surface waters and thereby minimize inputs into waterways. Land use and/or management practices would likely transition from rural agricultural use to a focus on visitor use and preservation over the life of the plan, which would produce beneficial impacts. Land ownership provides special

opportunities to implement restoration projects that could beneficially impact surface water quality and wildlife that depend on high quality waters. Collectively, these actions would improve coordination and accountability for water resource management in comparison to Alternative A; this would result in long-term beneficial impacts on surface water quality that are localized. Predicting the intensity of this impact is difficult, but it is anticipated to be minor to moderate.

As in all of the action alternatives, the Natural Resource Zone is designed to protect areas of high biodiversity such as stream corridors and the state-designated Panther Conservation Site. This zone spans approximately 300 feet on both sides of all streams and rivers within the park boundary. This zone would preserve existing vegetation within this 600-foot corridor, providing a vegetated riparian buffer that would filter pollutants and reduce inputs into streams and rivers. The impact on surface water quality would be expected to be long-term, beneficial, moderate, and localized.

Facility development would be increased under Alternative D and impacts on surface water quality would be greater than those under Alternative A. Impacts on surface water quality from facility development proposed under this alternative would be generally limited to the construction of trails, trail crossings, and trailheads—no other new facilities are proposed near surface waters. Trail construction adjacent to Cedar Creek, Meadow Brook, and the North Fork of the Shenandoah River could affect surface water quality. With the implementation of mitigation measures, such as erosion control, impacts would be reduced. Impacts from trail construction would be short-term, adverse, localized, and of minor intensity. The conceptual trail corridors identify four crossings of Cedar Creek, five crossings of Meadow Brook, and two crossings of an unnamed tributary to Meadow Brook. Construction of trail crossings would affect surface water quality. There is also potential for inadvertent chemical contamination from the use of construction equipment. Impacts from the construction of trail crossings would be short-term, adverse, localized, and of minor intensity.

Nine trailheads are proposed under this alternative. Two of them are located adjacent to surface waters and therefore could have effects on surface water quality. With the implementation of mitigation measures, such as erosion control, impacts would be reduced. The impacts from construction of trailheads would be short-term, adverse, localized, and of negligible to minor intensity. Inadvertent chemical spills, including oil from automobiles parked at trailheads, could enter surface waters through runoff. New parking areas developed near surface waters in the Visitor Focal Areas would also contribute to any potential impacts on surface water quality. The impacts would be long-term, adverse, localized, and of negligible to minor intensity.

Impacts on surface water quality on private lands in the park would be less than those described in Alternative A. Surface water quality on private lands within the park, which would constitute less than 10% of the park's total acreage under Alternative D, would continue to be impacted by development, land use, land management, and land protection. The types of impacts would be generally the same as those described in Alternative A. The establishment of a new visitor center would improve the NPS's capacity for community outreach and education on resource preservation efforts. The NPS would be better able to meet its special mandates for resource conservation as identified in the park's enabling legislation by having an opportunity to encourage and promote the protection of surface water quality on private lands. Although the NPS and its Key Partners would continue to encourage and promote the protection of surface water quality on private lands, resource preservation efforts would be subject to the discretion of individual landowners. Collectively, impacts on surface water quality from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to moderate depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on surface water quality would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative D are added to the effects of other current and reasonably foreseeable actions outside the park, there would be a long-term, adverse cumulative impact on surface water quality in the park. The impacts would be mostly localized, but could extend further downstream into the watershed. The adverse effects of projects and actions outside of the park would be mitigated by the beneficial impacts of land protection actions contained in this alternative. It is difficult to predict and quantify the impacts, but they are anticipated to be minor to moderate. The actions in Alternative D would contribute a large increment to this resulting cumulative impact.

Conclusion. Surface water quality in the park would be affected by the actions under Alternative D, including actions associated with visitor use, land use, land management, development, and land protection. Adverse impacts on surface water quality from facility development would be greater than in all other alternatives, but the beneficial impacts of land protection would be greatest under Alternative D.

Visitor use impacts on surface water quality would be long-term, adverse, minor, and localized. Land use and management impacts on surface water quality would be long-term, adverse or beneficial, minor to moderate, and mostly localized. Development impacts would be short-term, adverse, negligible to minor, and localized. Land protection would result in long-term, beneficial, moderate, localized impacts.

When the impacts of Alternative D are added to the effects of other current and foreseeable future actions, there would be a minor to moderate long-term adverse cumulative impact on surface water quality. The impacts would be mostly localized, but could extend beyond park boundaries. The adverse impacts of projects and actions outside of the park would be mitigated by the beneficial impacts of land protection actions contained in this alternative. The actions in Alternative D would add a large increment to this overall impact.

Impacts from actions contained in this alternative would not likely result in impairment of surface water quality in the park.

■ **Vegetation**

Direct and Indirect Impacts. Alternative D, when compared with the other alternatives, holds the greatest potential for greater protection and preservation of vegetation because the NPS and its Key Partners would own more land within the legislated boundaries of the park and develop collaborative, proactive land protection strategies for resource preservation within and outside park boundaries.

Impacts on vegetation under Alternative D would be expected to be less than those under Alternative A because the NPS and its Key Partners would

- develop a land protection plan and acquire land and interest in land (approximately 2,000 acres over the life of the plan) in a phased approach based on land protection priorities, with the highest priority being given to acquisition of the park’s broader landscapes and connectivity between parcels of land currently owned by the partners
- develop proactive strategies to protect related resources outside the park boundary
- provide technical assistance to one another, private landowners, and nearby communities in support of viewshed and resource protection in the park and outside park boundaries

Land protection activities in the park would continue to affect the park’s vegetation. Relative to Alternative A, coordination of land protection and acquisition activities would be improved and would be the greatest under Alternative D. The NPS and its Key Partners would protect and acquire about 2,000 acres of land, with the highest priority being given to protecting cultural landscapes and/or providing connectivity between NPS- and partner-owned tracts of land. Although acquisition of cultural landscapes within the park would be the focus, these properties would also contain vegetation. Acquisition of these properties could result in the protection of important vegetation, including wetlands, riparian areas, and other unique or rare plant communities, and would prohibit development that could adversely impact these resources. This alternative includes protection of a larger proportion of lands

in the southern portion of the park where woodlands dominate. Therefore, woodlands would be best protected under Alternative D.

General recreational use and trail use, along with large special events, would continue to adversely impact vegetation through trampling and vegetation loss. Large special events would continue to impact vegetation by causing injury or mortality in isolated areas due to trampling from visitor use and damage to trees from horse activity and hitching. Park visitation is expected to be highest under this alternative. Increases in park visitation, resulting from the development of auto touring routes and new trail opportunities under Alternative D, would likely increase trampling of plants and loss of vegetation. Land acquisition would also likely increase the visitor opportunities available in the park, which, in turn, would likely increase total park visitation. Increased automobile and human use would also increase the potential for the spread and proliferation of exotic and invasive plants. The potential for increased development of unofficial social trails created by visitors would likely increase under this alternative since the development of more trails in the park would allow visitors to access previously inaccessible areas of the park and may encourage them to go off trail, especially near the Visitor Focal Areas. On the other hand, it could be argued that the development of the trail system will formalize access and minimize impacts on vegetation from visitor use. Illegal collection of plants could also occur in the park. Visitor use under Alternative D would result in long-term, adverse, localized, minor impacts on vegetation.

Under Alternative D, instituting and monitoring user-capacity indicators, as well as implementing management strategies to mitigate adverse impacts, should reduce impacts on vegetation caused by visitor use. Compared to the Alternative A, this would likely result in a minor, long-term, beneficial impact that would be localized.

Land use and resource management activities in the park would continue to affect vegetation. Although the management of agricultural lands, natural areas, exotic and invasive plants, and vegetation that contribute to the park's cultural landscapes would continue to be variable and could produce adverse impacts, the beneficial impacts on vegetation from land use and management would be greater than those under Alternative A due to increased coordination between the NPS and its Key Partners. The reduction or elimination of livestock grazing in the park over the life of the plan would also be expected to produce beneficial impacts on vegetation from removing livestock herbivory and reducing the transport and proliferation of exotic and invasive plants.

Under Alternative D, the NPS and the Key Partners would provide technical assistance to one another, to private landowners, and to nearby communities in support of goals that further the purposes of the park, including natural resource and vegetation management goals. The NPS and its Key Partners would also develop written, shared strategies for implementing the GMP and policies for

operating the park. The NPS and its Key Partners would collaborate to manage various aspects of the park, including vegetation.

The Key Partners would continue to be the majority landowner under this alternative; however, the NPS would also be a significant landowner and would be most involved in resource management under this alternative. There would still be potential for adverse impacts on vegetation in the park due to varied management by the park's partners; however, compared to Alternative A, land use and management would be improved. Increased land ownership would provide increased opportunities to implement restoration projects that could beneficially impact vegetation and natural landscapes in the park. Collectively, these actions would improve coordination and accountability for vegetation management, which would result in long-term beneficial impacts on vegetation that are localized. Predicting the intensity of this impact is difficult, but it is anticipated to be moderate.

As in all of the action alternatives, the Natural Resource Zone is designed to protect areas of high biodiversity such as stream corridors and the state-designated Panther Conservation Site. This zone spans approximately 300 feet on both sides of all streams and rivers within the park boundary. This zone would preserve existing vegetation within the 600-foot corridor and would act as a riparian buffer. The park would seek to develop a habitat management program for the Panther Conservation Site in cooperation with the Cedar Creek Battlefield Foundation (who owns the site) and the state of Virginia. Such a program would likely result in increased protection and enhancement of rare plant communities compared to such protection in Alternative A. The impact on vegetation from these actions would likely be long-term, beneficial, minor to moderate, and localized.

Collectively, impacts on vegetation from land use and management under Alternative D would be long-term, adverse or beneficial, localized, and of minor to moderate intensity.

Facility development would be increased under this alternative and adverse impacts would be greater than those under all other alternatives. The construction of new facilities under this alternative, including a visitor center, hiking and biking trails (with trailheads), auto touring routes (with waysides), and signs, has the potential to affect vegetation. As in all of the alternatives, the development of visitor facilities at the Keister Tract would cause permanent loss of vegetation in the footprint of a development and would likely cause short-term adverse impacts on vegetation adjacent to the footprint due to construction activities. Maintenance of existing facilities would likely result in some injury or loss of plant material, resulting in a negligible to minor, long-term, adverse impact in localized areas.

This alternative includes the development of a visitor center in, or near, the park in an undetermined location. Citing of the new facility would likely be in a previously

disturbed and developed area with limited native vegetation. Construction of the visitor center would result in permanent loss of vegetation, which would be a long-term, adverse, minor, localized impact.

Ten Visitor Focal Areas have been proposed in this alternative. New development to support interpretive experiences in the Visitor Focal Areas would result in negligible to minor impacts on vegetation due to the installation of signs or other similar interpretive facilities. Impacts would be limited mostly to agricultural lands where native vegetation has already been substantially altered or is not present. Some negligible to minor impacts on woodlands could be realized at the Keister Tract, such as tree removal and root damage from construction and visitation. These impacts would be long-term, adverse, and localized.

Development in the Visitor Services Zone could result in impacts on agricultural lands and woodlands similar to those described above. The intensity of the impacts in the Visitor Services Zone would be greater than in the Visitor Focal Areas. Impacts would be long-term, adverse, localized, and of minor to moderate intensity.

The trail system in this alternative would be more extensive than in the other alternatives. These trails would pass through all of the park's management zones, and would include a trail that follows the course of the battle. Trails are planned to be four feet wide, constructed out of natural surfaces or gravel crusher fines, and used for hiking and bicycling only. Trails would traverse forested uplands, upland grasslands (open fields), and forested bottomlands. Trails in open fields would be primarily along the field border. Trails near waterways could affect riparian vegetation. Trail construction would result in permanent loss of vegetation within the trail corridor, and some adverse impacts on adjacent vegetation could also be realized from the use of heavy equipment. Trail construction in the Panther Conservation Site could result in impacts on rare or unique plant communities due to the loss of vegetation and the indirect impacts on vegetation from the use of heavy equipment. Impacts on vegetation would be long-term, adverse, minor, and localized. Development of nine trailheads under this alternative would result in similar impacts.

The development of auto touring routes could have adverse impacts on vegetation. The routes themselves would use existing road rights-of-way and therefore would have no impact on vegetation. The development of four waysides along existing roadways to support the touring routes could adversely impact vegetation if additional clearing of vegetation is required. Impacts from auto tour routes could also include injury to or loss of vegetation along road corridors. Impacts on vegetation are expected to be long-term, adverse, minor, and localized, affecting a relatively small area.

Under Alternative D, the NPS and its Key Partners would develop proactive strategies to protect related resources outside the park boundary, using

conservation easements and consulting with local governments. This would likely include a focus on vegetation that contributes to the scenic qualities and natural landscapes of the area.

Overall, land protection under Alternative D would be expected to result in long-term, beneficial, moderate, localized impacts.

Adverse impacts on vegetation on private lands in the park would be less than those described in Alternative A due to increased land protection. Vegetation on private lands within the park, which would constitute less than 10% of the park's total acreage under Alternative D, would continue to be impacted by development, land use, land management, and land protection. In most cases, adverse impacts would be realized only when private lands are developed. The types of impacts would be generally the same as those described in Alternative A.

The establishment of a new visitor center would improve the NPS's capacity for community outreach and education on resource preservation efforts. The NPS would be better able to meet its special mandates for resource conservation as identified in the park's enabling legislation by having an opportunity to encourage and promote the protection of vegetation on private lands. Final decision and actions on private lands would still be left to the discretion of individual private landowners.

Collectively, impacts on vegetation from activities that occur on private lands in the park are expected to be long-term, adverse, and localized, with intensities ranging from negligible to moderate depending on the scale of these activities.

Cumulative Impacts. The impact of cumulative actions on vegetation would be generally the same as those described under Alternative A. Cumulative actions would result in long-term, minor to moderate, adverse impacts.

When the likely effects of implementing the actions contained in Alternative D are added to the effects of other current and reasonably foreseeable actions, there would be a long-term, adverse cumulative impact on vegetation in the park. The impacts would be localized. It is difficult to predict and quantify the impacts, but they are anticipated to be minor. The adverse impacts of projects and actions outside of the park would be mitigated and largely outweighed by the beneficial impacts of land protection actions contained in this alternative. The actions in Alternative D would contribute a large beneficial increment to this resulting cumulative impact.

Conclusion. Vegetation in the park would be affected by the actions under Alternative D, including those associated with visitor use, land use, land management, development, and land protection. In general, adverse impacts on

vegetation from facility development would be greater than in all other alternatives, but the beneficial impacts of land protection would be greatest under Alternative D.

Visitor use impacts on vegetation would be long-term, adverse or beneficial, minor, and localized. Land use and management would result in long-term and adverse or beneficial impacts on vegetation that would be localized and of minor to moderate intensity. Development impacts would be long-term, adverse, negligible to moderate, and localized. Land protection impacts would be long-term, beneficial, moderate, and localized.

When the impacts of Alternative D are added to the effects of other current and foreseeable future actions, there would be a minor long-term, adverse cumulative impact on vegetation. The impacts would be mostly localized. The adverse impacts of projects and actions outside of the park would be mitigated and largely outweighed by the beneficial impacts of land protection actions contained in this alternative. The actions in Alternative D would contribute a large increment to this overall cumulative impact.

Impacts from actions contained in this alternative would not likely result in impairment of vegetation in the park.

4.6.3 Visitor Use and Experience

Direct and Indirect Impacts. Under Alternative D, the Key Partners would collaborate in the development of interpretive programming, and sites operated by Key Partners would remain open. A visitor center would be developed in, or near, the park, providing a focus for visitor contact, orientation, and interpretation to the park and the National Historic District. The visitor center would also provide educational and research activities in the areas of research and resource conservation. The impact on visitor understanding and appreciation of the park would be long-term, major and beneficial.

The NPS identity and presence in the region would be promoted. This alternative would expand the NPS presence beyond individual sites in the park to sites in the National Historic District. Personal services such as ranger led talks and tours would strengthen park-district linkages and promote recognition of the district as nationally significant. Increased visitation is expected due to interest among NPS 'baggers', curious visitors drawn by the NPS visitor center and other interpretive sites, and visitors with historical interests who want to see more of the National Historic District. These actions would provide a long-term, moderate, and beneficial impact.

Interpretive experiences in this alternative would be expanded and enriched over Alternative C. In Alternative D, focal areas would serve as venues for interpretation, with historic sites presented in the context of broader landscapes,

natural resource protection, and connectivity between Key Partner sites. The ability to deliver focused interpretation in landscape settings would add to the effectiveness of the park's programs. The trails following the course of the battle of Cedar Creek and the historic mill road network would travel through the full extent of the park. Visitors would have opportunities for exposure to the full range of park resources on the trail, and to enjoy physical connections between individual sites. Additionally, trails would connect to resource outside the park in Strasburg, Middletown, and the George Washington National Forest, allowing visitors to access regional resources and trail systems.

New auto touring routes would likely lead to connections to existing local and regional tours through park actions. Users of these auto routes would tour more areas of the park, and park visitors would be introduced to attractions and sites in the region. The impact would be long-term, minor, and beneficial.

The Cedar Creek Battlefield Foundation would continue to sponsor the annual re-enactment of the Battle of Cedar Creek and possibly re-enactments of other Civil War battles. The impacts of re-enactments and other special events held by Key Partners would be similar to Alternative A.

Visitor focal areas and the extensive trail system would bring visitors to the southern portions of the park to a greater extent than the other alternatives. There would be greater connectivity between Key Partner sites, as land protection efforts would focus on connections between park-owned or protected lands.

Park actions to protect landscape settings, develop connections to the regional trail system, and create new auto routes would have a long-term, major, and beneficial impact on heritage tourism in the region. Among the alternatives, D has the potential to benefit related regional initiatives to the greatest extent.

The focus of land protection activities would be broader landscapes and connectivity between lands currently owned by the partners. The protection of larger landscape settings would support the visitor experience in terms of scenic enjoyment and understanding of historic events, particularly at visitor focal areas where active interpretation is provided. However, development of lands close to the park but outside the boundary that are of scenic or historic interest could potentially diminish this aspect of the park experience. Despite this, the impact of park actions on visitor use and experience would be long-term, major, and beneficial.

Cumulative Impacts. Recent, current, and reasonably foreseeable planning endeavors and undertakings on or near park lands, such as expansion of the I-81 corridor through the park, encroaching residential, commercial, and industrial development on lands within the park boundaries resulting from the growth of Strasburg and Middletown, expansion of the Chemstone rock quarry adjacent to the park's western boundary, and construction of power transmission lines near the

park, would likely contribute to disturbances in the visual landscape, increases in the ambient noise level, and traffic congestion. These factors would detract from the visitor's enjoyment of the park. Thus, such undertakings would be expected to have an adverse, long-term impact on visitor use and experience. To some extent, they may be localized. The level of intensity would range from minor to major, depending on the location.

When the likely effects of implementing the actions contained in Alternative D are added to the effects of other past, present, and reasonably foreseeable actions outside the park, there would be a long-term, minor, adverse cumulative impact on visitor use and experience. Park actions in the area of land protection would reduce the adverse cumulative impact on visitor use and experience. The beneficial effect is likely to be at a moderate to major level, due to focus on landscape-scale settings and connectivity between Key Partner sites.

Conclusion. The visitor would benefit from a central, NPS developed and managed visitor center, a range of interpretive opportunities in protected landscape settings, and connectivity to the regional trail system. The overall impact of Alternative D on visitor use and experience would be long-term, major, and beneficial.

When the likely effects of implementing the actions contained in Alternative D are added to the effects of other past, present, and reasonably foreseeable actions outside the park, there would be a long-term, minor, adverse cumulative impact on visitor use and experience. Park actions in the area of land protection would reduce the adverse cumulative impact on visitor use and experience. The beneficial effect is likely to be at a moderate to major level, due to focus on landscape-scale settings and connectivity between Key Partner sites.

4.6.4 Socioeconomic Environment

Direct and Indirect Impacts. Under Alternative D, the park would continue to contribute to the tourism industry in the three-county area and would be an important part of the local socioeconomic environment. Beneficial impacts on the local and regional economy from actions contained in Alternative D would be greater than those in Alternatives A, B, and C.

Middletown, at the northeastern end of the park, and Strasburg, at the southwest end, are the two gateway towns most closely associated with the park. These communities provide a range of goods and services for the visiting public as well as for park employees and other workers employed in tourism-related businesses. Because of the proximity of these communities to the park and their distance from other visitor areas, these two individual gateway communities would continue to receive the greatest impacts from the actions in this alternative.

The reenactments would continue to be the most significant events in terms of number of visitors on site at one time and visitor-related spending that occurs each year. The battlefield reenactments are important short-term activities that would likely continue and could draw increasing numbers of participants (historic Civil War re-enactors) and spectators to the region. This infusion of 12,000 to 14,000 visitors each year from outside the three-county region (with their accompanying spending) has a beneficial impact on the local and regional economy because it would continue to provide customers and income for local businesses. Increasing visitation is expected as a result of NPS and Key Partners' efforts and would continue to produce beneficial economic and fiscal impacts for the local economy.

Compared to Alternative A, public accessibility to the park would be the greatest under Alternative D. Limitations on accessibility to park lands, due to land ownership patterns and the varying uses of land within the park, would be greatly reduced under Alternative D. Visitors must still travel through one or more of the three counties (Frederick, Shenandoah, Warren) to gain access to the park.

As in Alternative C, an NPS visitor center would be constructed and would be the focal point for visitor orientation. It is anticipated that most visitors would start their visit at the new visitor center and then begin their tour to major visitor attractions within the park. Relative to Alternative A, this would result in increased public awareness, interest, and visibility to the park over time, which would result in increased visitation to the park as a whole.

Under Alternative D, a staff of 25 FTEs (about \$2.2 million annually for salaries, benefits, utilities, and consumables such as office supplies, etc.) would be required to operate the visitor center, provide interpretation and other visitor services, and implement the actions contained in Alternative D.

Facility development would be the greatest under Alternative D. The major short-term NPS development projects would include building a visitor center and developing a variety of facilities in the park, including trails, trailheads, waysides, interpretive media, etc. (\$18.5 million). These facility investments (one-time costs) would constitute the major portion of the NPS development of the park over the next 20 years. As in Alternative A, the only capital investment by the Key Partners would be developing the Keister Tract into a park – the economic impact would be the same as in Alternative A.

It is presumed that the staffing levels and annual operating budgets of the Key Partners could increase slightly under Alternative D (estimated at \$660,000 annually), but would remain at least the same as in Alternative A.

As development of the park moves from the planning stage to implementation of the approved GMP, additional fiscal impacts would occur as funds are spent to develop facilities and hire additional staff. People drawn to the park because of the

NPS presence would also result in additional beneficial fiscal and employment impacts due to increased spending by visitors from outside the three-county region.

Land acquisition efforts under Alternative D would be the same as alternative C in terms of acres acquired over the life of the plan. The NPS and Key Partners would seek to acquire about 2,000 acres at a projected cost of about \$40 million. Spending by the NPS on land required for the development of the visitor center is estimated at \$250,000. Land acquisition would be on a willing seller-willing buyer basis. Private owners would receive fair market value in exchange for any land brought by the federal government. Acquisition of privately owned land by the federal government would remove this property from the local tax rolls, but federal Payments in Lieu of Taxes (PILT) would increase and partially offset the decrease in property taxes collected by the local governments.

Relative to Alternative A, park visitation would be expected to increase the most under Alternative D. Table 4.2 above presents the visitation figures for 1996 through 2005 for some NPS battlefield parks that are in Virginia and/or relatively close to Cedar Creek and Belle Grove NHP. It is not likely that visitor use at Cedar Creek and Belle Grove NHP would approach the range for better-known parks like Gettysburg National Military Park (averaging 1.7 million recreation visits annually) or Manassas National Battlefield Park (averaging 0.8 million recreation visits annually). Petersburg National Battlefield and Richmond National Battlefield Park are most similar to Cedar Creek and Belle Grove NHP in that they have multiple units separated by distance requiring motorized transportation (perhaps an auto tour) for the visitor to experience all the parts of the entire park. These two parks are well established and have had annual visitation in the 70,000 to 177,000 range during the period 1996 to 2005. Over the next 20 years, Cedar Creek and Belle Grove NHP becomes more developed, well established, and better known to the public, annual visitation in the upper part of the range of 50,000 to 200,000 could be reasonably expected.

Locally the towns of Middletown and Strasburg, and other local commercial centers, would probably benefit the most from implementation of Alternative D. Most goods and services needed for the park would be acquired from this area or the greater three-county region. The demand for goods and services by the NPS and the Key Partners would increase compared to the current levels under Alternative A. Spending would happen over a number of years and the resulting impacts (e.g., increases in income and the creation of some jobs) would be moderate to major for some business firms and individuals within the local economy. The NPS annual operating budget would increase to approximately \$2.8 million (in 2007 dollars), providing the primary long-term recurring fiscal impact.

The 2005 economic impact of all the NPS parks (that report visitor use according to NPS standards and methodology) was calculated based upon the Money Generation

Model Version 2.⁹ Data for some relatively close battlefield parks are displayed in Table 4.3 above. For fiscal year 2005 Petersburg NB had nearly 150,000 recreation visits and Richmond NBP received about 72,000 recreation visits. Non-local visitor spending in the local region associated with these parks was more than \$6.8 million and \$3.8 million, respectively. About 150 jobs were supported by visitation to Petersburg NB and over 80 jobs by visitors to Richmond NBP.¹⁰ Respectively, over \$2.8 million and nearly \$1.6 million in personal income in the regions surrounding these parks can be attributed to park visitors.¹¹ Visitor use and spending associated with visitor use at these two parks generated \$4.4 million and \$2.5 million, respectively, in value added.¹² Based upon this information, the economic impact of Cedar Creek and Belle Grove NHP (including both NPS and Key Partner activities and contributions) could be expected to fall within these ranges after the park is further developed, becomes better known, and average visitation reaches the 70,000 to 150,000 range.

Economic and fiscal impacts on the three-county, regional economy are the local impacts identified above with some additional expenditures occurring in the region as out-of-region visitors travel to the park. Total recurring costs by the NPS and Key Partners would be about \$3.4 million annually, while total one-time costs would be about \$60.1 million. Some businesses and individuals in the region would benefit but the overall impacts have much less significance due to the greater size of the economy of the three-county region. Impacts on the region – with over \$3.3 billion in earnings and over 96,600 jobs in 2004 – as measured by these or other economic indicators (e.g., a notable increase in income or a decrease in unemployment, poverty, etc.) would be negligible.

Changes in the three-county (plus the city of Winchester) regional economy would include impacts on the regional socioeconomic base due to changes in park operations and other management or development actions. The socioeconomic base includes such factors as population, income, employment, earnings, etc. Park development and rehabilitation projects during the life of the plan would generally benefit the construction industry and associated workers.

Cumulative Impacts. Expansion of the I-81 corridor could increase the number of construction-related jobs in the area as well as increase spending within the local hospitality industry, a beneficial impact that would be short-term and of minor intensity. Expansion of the Chemstone quarry and upgrade of the power

⁹ Stynes, Daniel J. August 2006.

¹⁰ "Jobs are the number of jobs in the region supported by the visitor spending. Job estimates are not full time equivalents, but include part time and seasonal positions." Stynes, et al May 2000.

¹¹ "Personal income includes wage and salary income, proprietor's income and employee benefits." Stynes, et al May 2000.

¹² "Value added is a commonly used measure of the contribution of an industry or region to gross national or gross state product. Value added is personal income plus rents and profits, plus indirect business taxes. As the name implies, it is the "value added" by the region to the final good or service being produced." Stynes, et al May 2000.

transmission lines could also increase jobs and spending in the local area, producing long-term, minor, beneficial impacts. The quarry expansion could also have adverse impacts on property values in the nearby area. Increased residential and commercial development would increase spending on land and construction materials while producing jobs in the region. The beneficial impact on socioeconomic conditions from this action would likely be long-term and of moderate intensity.

When the likely effects of implementing the actions contained in Alternative D are added to the effects of other current and reasonably foreseeable actions as described above, there would be a long-term, beneficial, moderate to major, cumulative impact on the local and regional economy. The actions in Alternative D would add an appreciable increment to this overall impact.

Conclusion. The NPS expansion to 25 FTEs and an annual operating budget of \$2.8 million (in 2007 dollars) would result in negligible to minor, long-term, beneficial fiscal impacts within the local and regional economies. Short-term expenditures (one-time costs) by the NPS of approximately \$18.5 million for the development of a visitor center and various park facilities would occur. This spending would benefit some businesses and individuals, mostly in the construction industrial sector. About 2,000 acres of land would be acquired under Alternative D. Acquisition of land for the park would become more expensive and more difficult as the region continues to grow. The Key Partners' annual operating costs would be about \$660,000. The Key Partners and others' efforts would provide most of the impetus that would result in greater long- and short-term, minor, beneficial fiscal impacts within the regional and local economies, but the increased NPS presence would also contribute to these results. The battle reenactments would continue to result in beneficial, short-term, regional, economic impacts that are major events during the short time they occur. Overall tourism spending is expected to increase to a minor to moderate degree as use of the park by people from outside the region increases. Total recurring costs by the NPS and Key Partners would be about \$3.4 million annually, while total one-time costs would be about \$60.1 million. Some local and regional businesses and individuals (most likely in the accommodations and food service, and retail trade industries) providing goods and services to the park and the visiting public would benefit.

When the likely effects of implementing the actions contained in Alternative D are added to the effects of other current and reasonably foreseeable actions as described above, there would be a long-term, beneficial, moderate to major, cumulative impact on the local and regional economy. The actions in Alternative D would add an appreciable increment to this overall impact.

4.6.5 Unavoidable Adverse Impacts

Unavoidable adverse impacts are defined as impacts that cannot be fully mitigated or avoided. Alternative D could result in several unavoidable adverse impacts on cultural and natural resources with impact intensities that are greater than minor, such as illegal collection of archeological resources, plants, and animals within the park boundary. Increased education, interpretation, and outreach efforts would help lessen, but not eliminate, the likelihood of this potential impact. Some soils and vegetation could be lost or altered due to the construction of new facilities in the park and to soil erosion from increased visitor use.

4.6.6 Irreversible and Irretrievable Commitments of Resources

New actions would be taken that would either result in the consumption of nonrenewable cultural or natural resources, or in the use of renewable resources that would preclude other uses for a period of time. In the construction of new facilities, including buildings and trails, limited amounts of nonrenewable resources would be used, including fuels and building materials. These resources would be essentially irretrievable once they were committed.

4.6.7 The Relationship between Short-Term Uses of the Environment and Long-Term Productivity

Lands in the park that are protected would remain in their current state and maintain their long-term productivity. The primary short-term uses of Cedar Creek and Belle Grove NHP would continue to be historic preservation, heritage tourism, and recreation. Disturbance of the park's soils, water quality, vegetation, and wildlife, due to visitor use and the construction of new facilities, would reduce the long-term productivity of the park in localized areas; however, overall there likely would be only a small effect on the park's long-term productivity. Efforts to protect, restore, and enhance natural and cultural resources in the park would increase the long-term productivity of the environment in localized areas.

