

**ENVIRONMENTAL ASSESSMENT
FOR
REMOVAL OF ROCK ADJACENT TO TOUR ROAD
AT
WILSON'S CREEK NATIONAL BATTLEFIELD
CHRISTIAN AND GREENE COUNTY, MISSOURI**



**DEPARTMENT OF INTERIOR
NATIONAL PARK SERVICE
MIDWEST REGION**

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Summary

The purpose of and the need for this action is to evaluate a range of alternatives and strategies for proposed repairs to the existing tour road at Wilson's Creek National Battlefield. Portions (401 linear feet) of an existing road cut and rock overhang require excavation to prevent additional rock falls. The need for these repairs, a description of the environment, alternative actions, and the potential impacts of the proposed project along with any appropriate mitigating measures are included. The repairs are necessary to ensure the safety of employees and visitors while protecting park resources as provided for in the National Battlefield's enabling legislation, purpose, mission, and goals. Upon completion of this process in accordance with the National Environmental Policy Act (NEPA), the National Park Service may take action to remove rocks.

Wilson's Creek National Battlefield is located five miles southwest of Springfield, Missouri, and three miles east of Republic, Missouri, in the southwest corner of the state. The county line between Greene and Christian Counties bisects the 2,000-acre park, which includes 75 percent of the actual battleground. Wilson's Creek National Battlefield provides visitors with an array of opportunities and experiences that enhances their understanding of the significance of the site and its role in the Civil War west of the Mississippi River. At the visitor center, battle-related exhibits, a 27-minute video, and a fiber-optics map provide historical context and give visitors a sense of the physical dimensions of the battle. A 12,000 volume Civil War library is available to the public and the Nation's premier collection of Trans-Mississippi Civil War artifacts is available for viewing at the museum. The park also maintains partnerships with local municipal and county governments; other Civil War related sites, such as Pea Ridge, Fort Scott, and the Battle of Newtonia; and the Springfield/Greene County Library.

Please address any comment to:

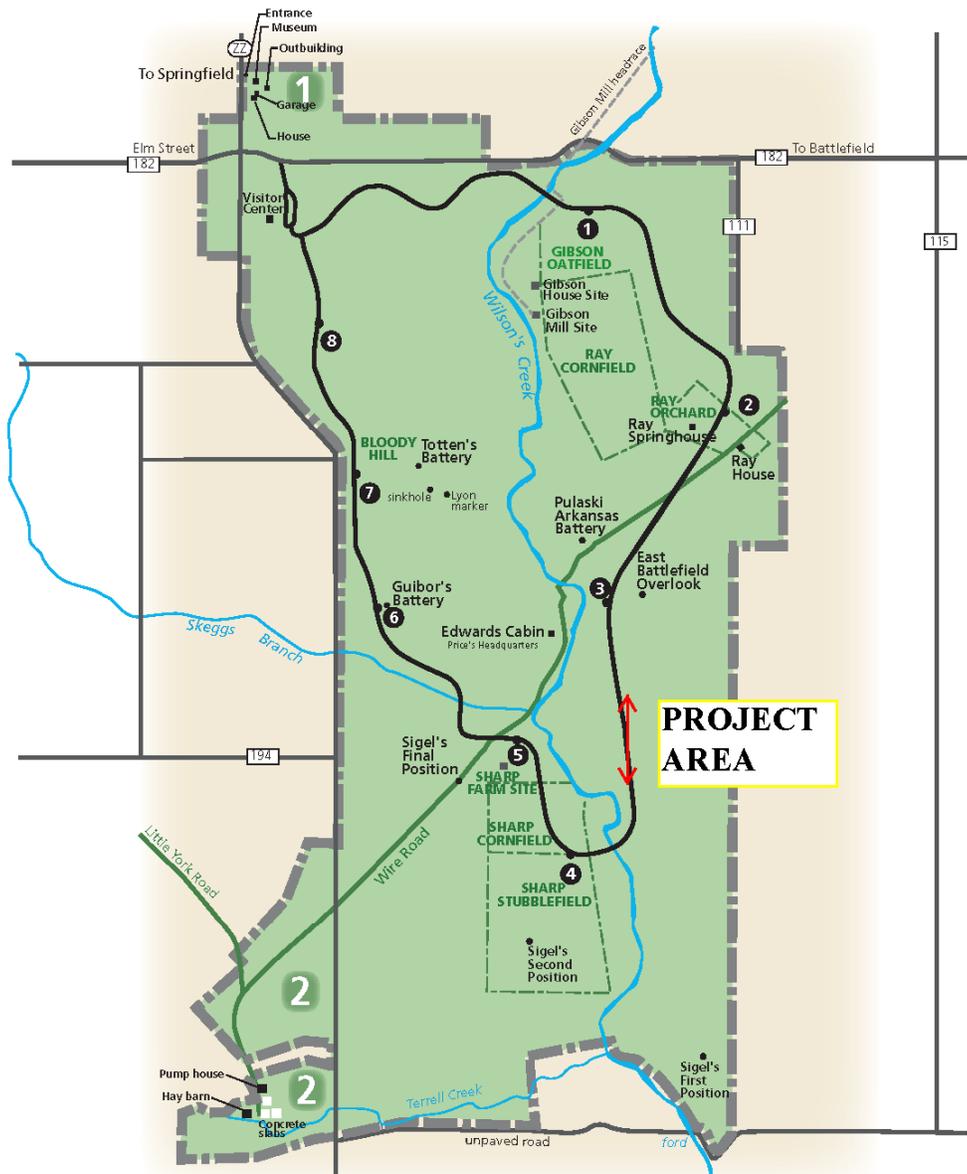
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- AREA 1** Civil War Museum
- AREA 2** Southwest Addition

MAP NOT TO SCALE



Boundary Adjustments
Wilson's Creek National Battlefield
General Management Plan Amendment
 United States Department of the Interior • National Park Service
 DSC • 410 • 20,022 • June 2007

I. PURPOSE AND NEED

The purpose of and the need for taking action is to evaluate a range of alternatives and strategies for proposed repairs to the existing tour road at Wilson's Creek National Battlefield. Portions (401 linear feet) of an existing road cut and rock overhang require excavation to prevent additional rock falls. The need for these repairs, a description of the environment, alternative actions, and the potential impacts of the proposed project along with any appropriate mitigating measures are included. The repairs are necessary to ensure the safety of employees and visitors while protecting park resources as provided for in the National Battlefield's enabling legislation, purpose, mission, and goals. Upon completion of this process in accordance with the National Environmental Policy Act (NEPA), the National Park Service may take action to remove rocks.

This environmental assessment evaluates three alternatives concerning the management of a rock bluff at Wilson's Creek National Battlefield. The alternatives considered include two alternatives to remove rock to prevent additional rock falls: A No Action alternative would continue existing management by only removing rocks after they fall; alternative A would remove rocks to create a stair stepped wall and ditch line; and alternative B would remove rocks to create a vertical wall and ditch line.

Figure 1: Photograph Documenting Condition on 6/09/03



Figure 2: Photograph Documenting Condition after a Rock Fall on 11/3/05



Figure 3: Photograph Documenting Condition after a Rock Fall on 12/30/2006



Figure 4: Rock that Fell onto Traffic Lane 12/30/2006



II SCOPE OF THE ANALYSIS

A potential for a rock fall was identified as a safety concern by Ranger Bob Randall in 2004. A Federal Highways inspection was conducted the summer of 2005 and found that underlying strata in a rock bluff along the existing tour road were eroding and causing the over burden (approximately 8 feet thick) to fall. Funds to address this problem were requested in the fall of 2005 and have been secured.

Rocks have periodically fallen on the road in the past and are removed by park staff. A major slide during the winter of 2006-2007 closed the road until heavy equipment could remove the debris. The entire bluff is now shifting towards the tour road and requires more drastic intervention to prevent a larger rock slide. This section of the tour road was built on an existing railroad grade constructed in the 1890's; therefore, the rock cut is now over 110 years old. Over time the underlying strata have been eroded by water filtering through the cracks and crevices in the rock layers. This process is accelerated in the winter with the freeze thaw cycle. The bluff is currently dropping rocks on the tour road which creates a safety hazard to visitors walking and driving. The rocks are large enough to damage vehicles and the tour road itself. The potential exists for the entire over burden to fall causing closure of the tour road, property damage, and possibly visitor and/or employee injuries. Approximately 120,000 visitors drive past this rock bluff each year.

Based on a field review in May, 2005 by Federal Highways Geotechnical, 650 cubic yards of rock need excavated and removed to prevent the rock overhang from falling on the tour road. The sections that require removal are 401 linear feet in length, 10 feet in width, and average 4 feet in height (maximum height is 14 feet). The existing overburden has a maximum overhang of 7.5 feet and a maximum depth of voids of 6 feet. One tenth of an acre of small brush will be removed along the top of the rock cut along with the rock itself. Excavation and trimming of the rock will be achieved by common construction equipment. Three trees will be removed in the project area and 50 linear feet of silt fence will be used to control erosion. Finally, these repairs will require the closure of the tour road with flagmen used for traffic control. The scaling back of the rock bluff will improve visitor and employee safety for 120,000 visitors each year and eliminate the rocks falling on the road and will provide a catch basin for falling rocks in the future.

While the Federal Highways Geotechnical field review identified the need for action and helped define the scope of this environmental assessment, NEPA regulations require an analysis of cumulative effects on resources of all past, present and reasonably foreseeable actions when added to the effects of the proposal (40 CFR 1508.7, 2000)). The scope of this analysis, therefore, is to define management alternatives specific to rock fall removals, in consideration of other uses, actions, and activities cumulatively affecting park resources and values.

III PARK PURPOSE AND SIGNIFICANCE

National park system units are established by Congress to fulfill specified purposes, based on the park's unique and "significant" resources. A park's purpose, as established by Congress, is the fundamental building block for its decisions to conserve resources while providing for the "enjoyment of future generations."

The enabling legislation for Wilson's Creek National Battlefield, its purpose and significance, and its broad mission goals are summarized in this section and are taken from the national battlefield's enabling legislation and the 2003 General Management Plan and the 2007 General Management Plan Amendment. In addition, the national battlefield's purpose, significance, and management objectives are all linked to the impairment findings that are made in the NEPA process, as stated in section 1.4.5 of the National Park Service Management Policies 2001 (NPS 2001c).

Establishment — The enabling legislation establishing Wilson's Creek National Battlefield, Public Law 86-434, was passed by Congress on April 22, 1960. This law mandated the National Park Service to acquire the lands comprising the battlefield site and any adjacent lands "...necessary or desirable to carry out the purposes of this Act...", and provided appropriations to do so. The law stated that the lands

acquired under the Act "...shall be set aside as a public park for the benefit and enjoyment of the people of the United States." The law also directed the Park Service to make improvements including roads, trails, markers and buildings and other improvements deemed necessary "...for the care and accommodation of visitors."

Purpose — In 2007 the General Management Plan Amendment for Wilson's Creek was completed. This plan states that the purpose of Wilson's Creek National Battlefield is to commemorate the Battle of Wilson's Creek, preserve the associated battlefield, and interpret the battle within the context of the Civil War in the Trans-Mississippi West.

Significance — The 2007 General Management Plan Amendment also outlines the park's primary significance:

- Wilson's Creek National Battlefield is significant as the site of the second battle of the Civil War and the first major battle west of the Mississippi River.
- Wilson's Creek National Battlefield is the site of the death of General Nathaniel Lyon, the first Union general killed in the Civil War.
- Lyon's death focused national attention on the potential loss of Missouri to the Confederacy. Wilson's Creek's rural character evokes the setting experienced by the combatants.
- The artifacts and archival records in Wilson's Creek National Battlefield's museum collections represent a nationally prominent and comprehensive documentation of the Civil War in the Trans-Mississippi West.

BACKGROUND NPS ORGANIC ACT AND MANAGEMENT POLICIES

By enacting the National Park Service Organic Act of 1916, Congress directed the U.S. Department of the Interior and the National Park Service to manage units of the national park system "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (16 USC 1). The Redwood National Park Expansion Act of 1978 reiterates this mandate by stating that the National Park Service must conduct its actions in a manner that will ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress" (16 USC 1a-1).

The National Park Service seeks to avoid or to minimize adverse impacts on park resources and values but has discretion to allow negative impacts when necessary (*Management Policies 2001*, sec. 1.4.3). However, while some actions and activities cause impacts, the National Park Service cannot allow an adverse impact that constitutes a resource impairment (*Management Policies 2001*, sec. 1.4.3). The Organic Act prohibits actions that permanently impair park resources unless a law directly and specifically allows for the acts (16 USC 1a-1). An action constitutes an impairment when its impacts "harm the integrity of park resources or values" (*Management Policies 2001*, sec. 1.4.4). To determine impairment, the National Park Service must evaluate "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" (*Management Policies 2001*, sec. 1.4.4).

Because park units vary based on their enabling legislation, natural resources, cultural resources, and missions, the recreational activities appropriate for each unit and for areas within each unit vary as well. An action appropriate in one unit may impair resources in another unit. Thus, this environmental assessment analyzes the context, duration, and intensity of impacts related to rock removal at Wilson's Creek National Battlefield, as well as potential for resource impairment, as required by *Director's Order #12: Conservation Planning, Environmental Impact Analysis and Decision-making (DO #12)*.

FORMULATION OF THE ALTERNATIVES

Alternative A - No Action – This action would consist of continuing actions that have been used to manage this rock bluff for the past 20 years. When portions of the rock bluff fall onto the road surface the

rock would be removed using small equipment owned or rented by the park. Individual rocks that are deemed to be in immediate danger of falling would also be removed.

Alternative B - Rock Removal Resulting in a Stair Step Cut and Ditch Line – This action would consist of the excavation and removal of rock into a stair step shape and the installation of a ditch line to catch any future falls.

Alternative C - Rock Removal Resulting in a Vertical Cut and Ditch Line (Preferred Alternative) – This action would consist of the excavation and removal of rock into a vertical wall and the installation of a ditch line to catch any future rock falls.

Other Alternatives Considered and Rejected

Other alternatives that were considered but rejected were construction of a fence to contain rock slides, and moving the road. Both alternatives were considered to be too costly to implement.

IMPACT TOPICS FOR FURTHER CONSIDERATION

The impact topics for this project have been identified on the basis of federal laws, regulations, and orders, and NPS policies. The impact topics carried forward for analysis in this environmental assessment are listed below, along with the reasons why the impact topic is further analyzed. For each of these topics there is a description of the existing setting or baseline conditions (i.e., the affected environment) within the project area. This information will be used to analyze impacts against the current conditions of the project area in the Environmental Consequences section of the document.

Archeological Resources

Consultation with the Missouri State Historic Preservation Officer is taking place concurrently with the public review of this document. Previous archeological surveys indicate that there are no known archeological sites in the areas proposed for construction. A paraprofessional archeologist will be onsite to monitor construction. Rock removal described in the action alternatives could disturb previously undiscovered subsurface materials or features, although the probability for undiscovered archeological resources in this area is low. To limit potential impacts to these unknown resources, a paraprofessional archeologist and cultural resource expert would monitor all ground-penetrating activities. If previously unknown archeological materials are discovered, the cultural resource expert would immediately halt work in that area and contact the Missouri State Historic Preservation Officer. Although there is a low probability for disturbance of previously undiscovered archeological resources, it is a possibility. Therefore, this topic has been carried forward for further analysis.

Cultural Landscapes

According to the NPS *Cultural Resource Management Guideline*, a cultural landscape is a reflection of human adaptation and use of natural resources, and it is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. At the time of the battle, the valley of Wilson's Creek was a thriving agricultural setting with several farms and homes for numerous families. Only a few remnants of this agricultural community remain. Other landscape features played key roles in the outcome of the battle.

The battlefield landscape at Wilson's Creek retains fair physical integrity. The vegetative changes that have taken place since the battle are reversible. Vegetation management consistent with the national battlefield's fire management plan (NPS 2004) and recommendations in the "Cultural Landscape Report for Wilson's Creek National Battlefield" (NPS 2004) can modify the national battlefield's appearance to resemble more closely the historic conditions, thereby enhancing the national battlefield's integrity. Important elements of the battlefield landscape such as the Wire Road, Bloody Hill, farm sites, and areas of combat are located outside the project area. However, the actions described in the alternatives are adjacent to remnants of the Missouri Pacific Railroad at Wilson's Creek and could have impacts on this cultural resource. The condition was noted as "good" at the time of the Cultural Landscape Report (2004). Therefore, this topic has been carried forward for further analysis.

NPS Operations

NPS *Management Policies 2006* state that park units will pursue a human resources program that is comprehensive, that is based on competency, and that encompasses the entire workforce, including employees, volunteers, contractors, concession employees, interns, and partners. NPS operations for Wilson's Creek National battlefield include administration, law enforcement, interpretation and education, and facility management. Most operations for the national battlefield are concentrated in the visitor center area, however, some staff time is dedicated to maintaining the tour road and patrolling the tour road. The actions described in the alternatives could affect NPS operations, including law enforcement, facility management, and traffic circulation. Therefore, this topic has been carried forward for further evaluation.

Special Status Species

The Endangered Species Act of 1973 requires examination of impacts on all federally listed threatened, endangered, and candidate species. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service (or designated representative) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. NPS *Management Policies 2006* state that the National Park Service will inventory, monitor, and manage state and locally listed species in a manner similar to its treatment of federally listed species to the greatest extent possible. In addition, the National Park Service will inventory other native species that are of special management concern to park units (such as rare, declining, sensitive, or unique species, and their habitats) and will manage them to maintain their natural distribution and abundance.

Four state-listed species inhabit the national battlefield but are not in the project area. These species are provided protection and conservation in ongoing resource management and rehabilitation programs. The Missouri bladderpod and the gray bat, two federally listed species that are protected under the Endangered Species Act and NPS management policies, inhabit the national battlefield. A small population of Missouri bladderpod (*Lesquerella filiformis*) resides adjacent to the project area. The population size ranged from 101 plants in 2002 to 679 plants in 2007 (Young, 2008). Because the action alternatives have the potential to affect an adjacent population of Missouri bladderpod, this topic has been carried forward for further analysis.

Visitor Use and Experience

According to NPS *Management Policies 2006*, the enjoyment of Wilson's Creek National Battlefield resources and values by current and future generations is a fundamental purpose of all national battlefields. The National Park Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy the park units and will maintain within the park units an atmosphere that is open, inviting, and accessible to every segment of society.

Many visitors to Wilson's Creek National Battlefield begin their visit at the visitor center, where they can receive an orientation to the national battlefield, talk with NPS staff, buy materials at the cooperating association sales area, and see exhibits about the battle. A 14-minute video at the visitor center presents the battle's historical background. In addition, an eight-minute program conducted on a lighted battle map illustrates the course of the battle. About 50% of visitors to the national battlefield use the visitor center to see the video, exhibits, or lighted battle map. The visitor center is accessible by wheelchair from the parking area.

An excellent Civil War research library in the visitor center is open to visitors and researchers on an advanced reservation basis, although only a small percentage of visitors use the library. The research library does not maintain open stock or permit visitors to check out material.

Living history programs depicting Civil War soldier life are presented, and guided tours of Bloody Hill are provided on weekends during the summer. In addition, NPS staff and volunteers present several special events throughout the year, including a moonlight tour and anniversary celebration in August, artillery and musket-firing demonstrations in the summer, and several genealogical programs.

The 4.9-mile paved tour-road loop, with eight interpretive stops at significant battle points, provides a self-guided automobile tour of the battlefield. In addition to the tour-road loop, there are five walking trails (varying in length from 0.25 to 0.75 of a mile) that are accessible to visitors from the tour-road loop that provide access to additional battle-related sites. One trail leads to the Ray House, a historic house built before the battle that served as a temporary field hospital for Confederate soldiers following the battle. The body of General Nathaniel Lyon was taken here after he was killed in battle; the bed on which the general's body was placed remains on exhibit in one of the house's rooms.

The Civil War Museum provides a broader contextual view of the Battle of Wilson's Creek and the Civil War west of the Mississippi River. Visitors to the Civil War Museum must exit the main national battlefield to Highway ZZ and drive north 0.25 mile to the museum.

Trails are accessed via the tour road and visitors view the battlefield from the tour road and associated trails. The tour road has been and could be closed in the future due to rock falls. Therefore, the action alternatives have the potential to substantially effect visitor satisfaction and visitor understanding of the Battle of Wilson's Creek and the war in the Trans-Mississippi West. This topic has been carried forward for further analysis.

IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION

Some impact topics have been dismissed from further consideration, as listed below. The rationale for dismissing these specific topics is stated for each topic.

Environmental Justice

Presidential Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to the Environmental Protection Agency, environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. The goal of fair treatment is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts.

The communities surrounding Wilson's Creek National Battlefield contain both minority and low-income populations; however, environmental justice is dismissed as an impact topic for the following reasons:

- Implementation of the preferred alternative would not result in any identifiable adverse human health effects. Therefore, there would be no direct or indirect adverse effects on any minority or low income population.
- The impacts associated with implementation of the preferred alternative would not disproportionately affect any minority or low-income population or community.
- Implementation of the preferred alternative would not result in any identified effects that would be specific to any minority or low-income community.
- The impacts to the socioeconomic environment resulting from implementation of any of the action alternatives would be beneficial. In addition, NPS and the planning team do not anticipate the impacts on the socioeconomic environment to alter the physical and social structure of the nearby communities.

Ethnographic Resources

Ethnographic resources, such as a site, structure, landscape or natural resource feature assigned traditional, legendary, subsistence, religious, or other significance in addition to traditional cultural properties, do not exist in the area of the national battlefield under consideration in this amendment. Traditional cultural properties are ethnographic resources that can be associated with cultural practices or beliefs and that are either eligible for inclusion in, or are listed on, the National Register of Historic Places. Such properties could be sites regarded as sacred, locations for gathering resources, activity areas, or other areas of ongoing traditional use. Because no ethnographic resources or traditional cultural properties exist in the areas under consideration in this amendment, this topic has been dismissed from further analysis.

Geological Features and Soils

Primary soils at the park are deep, stony, and chert silt loam to shallow soils (9 to 20 inches in depth) over fractured limestone that have been formed by weathering of underlying parent materials, including limestone, dolomite, sandstone, and shale (NPS 1988). In addition, alluvial soils are present along Wilson's Creek and its tributaries. The project area consists of soils of the Goss-Gasconade Complex with 2-50 % slopes. These soils are typically found on limestone glades with shallow, rocky soils are scattered throughout the park and support vegetation different from other areas in the park, including several species of rare and protected plants.

Actions described in this amendment would not affect geological features in the national battlefield. Actions described in this document would excavate, displace, and disturb up to one tenth of an acre of soils in the proposed construction area. Proposed re-vegetation would help stabilize soils and reduce erosion. Because these effects would be minor, the topic of geological features and soils has been dismissed from further analysis.

Historic Structures

Wilson's Creek National Battlefield is listed on the National Register of Historic Places. Specific sites and structures related to the 1861 battle are also listed and include the following:

Structures

- Ray House
- Ray Spring House
- Ray cornfield
- Gibson's Mill
- Edwards Cabin
- Sharp House
- Sharp's cornfield
- Short farmstead
- T.B. Manley House
- C.B. Manley House
- Gwinn House
- Manley Cemetery
- Edgar Cemetery
- Lyon marker
- Bloody Hill
- the Sinkhole
- Wire Road
- Sigel's artillery position

The only structure in the project area is the tour road grade which was originally part of the Missouri Pacific Railroad grade. In 1995 the State Historic Preservation Officer found the Railroad grade ineligible for the National Register because it does not retain sufficient integrity of materials. The Railroad grade was also identified as a non-historic feature in the 1976 National Register Nomination. The Missouri Pacific Railroad grade runs diagonally across the park from northeast to south, and forms the park's southern boundary. The railroad was established in 1905 as a branch line for the Missouri Pacific, which in 1902, had extended a line from Carthage, Missouri, to a junction with the Iron Mountain and Southern

Railroad in northwestern Arkansas. In 1905, Springfield business persons convinced the Missouri Pacific to build a 35 mile branch from Crane, Missouri, in Stone County, to Springfield. That fall, the 100 foot right-of-way was deeded by John McConnell, James B. and Lucy Stewart, and M.C. and Pricilla McCroskey. The line was completed in 1907. The railroad grade within the park is approximately 3 miles long, and consists of a raised earth grade. The railroad was removed by 1972, and the tracks, sleepers, culverts, ties, rails, and bridges were removed. The park's tour road, including the section in the project area, was constructed on 1.1 miles of the grade in the 1980's. Because the action alternatives will not affect a historic structure this topic has been dismissed from further analysis.

Indian Trust Resources

Indian trust resources include tribal lands, assets, resources, and treaty rights. Any anticipated impacts to Indian trust resources that would result from a federal action must be explicitly addressed in environmental documents. There are no Indian trust resources within the boundaries of Wilson's Creek National battlefield. Therefore, this topic has been dismissed from further consideration.

Lightscape Management

In accordance with its *Management Policies 2006*, the National Park Service will preserve, to the extent possible, natural lightscape of parks, which are natural resources and values that exist in the absence of human-caused light. The national battlefield strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements and ensures that all outdoor lighting is shielded to the maximum extent possible to keep light on the intended subject and out of the night sky. The proposed actions would not affect the existing exterior lighting in the battlefield. There is no existing or proposed lighting in the project area. Therefore, lightscape management was dismissed as an impact topic.

Museum Collections

The Wilson's Creek National Battlefield's Civil War Museum has the nation's largest archival and materials collections related to the Civil War in the Trans-Mississippi West. The outstanding collection of more than 15,000 artifacts includes the sword belt and sash of Arkansas General Patrick Cleburne and the flag of the Confederate "Cherokee Braves." The main national battlefield archival collections contain more than 4,000 volumes and extensive primary documentation. The museum collections contain approximately 40,000 artifacts related to the battle and the war in the Trans-Mississippi region. These include one-of-a-kind pieces related to the battle, such as General Lyon's presentation sword and scabbard, the Lyon bed, and the counterpane used to cover Lyon's body. The actions described in the alternatives would have no impact on museum collections. Therefore, this topic has been dismissed from further analysis.

Prime and Unique Farmlands

Primary soils at the park are deep, stony, and chert silt loam to shallow soils (9 to 20 inches in depth) over fractured limestone that have been formed by weathering of underlying parent materials, including limestone, dolomite, sandstone, and shale (NPS 1988). In addition, alluvial soils are present along Wilson's Creek and its tributaries. The project area consists of soils of the Goss-Gasconade Complex with 2-50 % slopes. These soils are typically found on limestone glades with shallow, rocky soils are scattered throughout the park and support vegetation different from other areas in the park, including several species of rare and protected plants.

Prime or unique farmlands are defined as soils particularly suited for growing general or specialty crops. Prime farmland produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. The national battlefield is in the uplands of the Ozark Plateau. The soils within the project area do not qualify as prime or unique. Therefore, the topic of prime and unique farmlands has been dismissed from further consideration.

Sacred Sites

According to Executive Order 13007 on "Indian Sacred Sites" (1996), the National Park Service will accommodate, to the extent practicable, access to and ceremonial use of Indian sacred sites by religious practitioners from recognized American Indian and Alaska native tribes and avoid adversely affecting the physical integrity of such sacred sites. There are no sacred sites within the boundaries of Wilson's Creek National battlefield. Therefore, this topic has been dismissed from further consideration.

Socioeconomics

The proposed action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Implementation of the proposed action could provide a negligible beneficial impact to the economy of nearby Springfield, as well as Greene and Christian counties (e.g., minimal increases in employment opportunities for the construction workforce and revenues for local businesses and government generated from construction activities and workers). Any increase, however, would be temporary and negligible, lasting only as long as construction. Therefore, this topic has been dismissed from further consideration.

Soundscape Management

In accordance with NPS *Management Policies 2006* and Director's Order #47, "Sound Preservation and Noise Management," an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound and are the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Despite the substantial growth of the Springfield metropolitan area during the last decade, the current soundscape at Wilson's Creek National Battlefield consists mainly of natural sounds, without the interference of too much man-made noise. Natural sounds that can be heard at the national battlefield include wind in the trees and sounds related to wildlife, such as those sounds made by birds, coyotes, frogs, and crickets. The natural soundscape is important to the reflective qualities associated with appreciation of the battlefield.

Construction activities would have temporary, minor and localized adverse impacts on the natural soundscape. Therefore, the topic of natural soundscape management was dismissed from further consideration.

Vegetation

Under the actions described in the alternatives, vegetation removal and/or disturbance would be kept to a minimum. One tenth of an acre of small brush would be removed along the top of the rock cut. Disturbed areas would be re-vegetated and rehabilitated following construction, as appropriate; therefore, removal and/or disturbance of vegetation in the project areas is expected to result in negligible to minor adverse impacts on vegetation. Because these effects would be minor or less in degree, the topic of vegetation has been dismissed from further analysis.

Water Quality and Water Quantity

There are no water bodies in the project area. This proposed project poses no threat to water quality. Any potential runoff associated with the project will be mitigated through the use of silt fencing. The actions proposed in the action alternatives would have no effects on water quality or water quantity from construction activities, this topic has been dismissed from further consideration.

Water Quality

Wilson's Creek, with its watershed located predominantly outside of the park, is the primary aquatic feature at the battlefield. The creek flows south-southwest from the city of Springfield and bisects the park from north to south for about three miles before reaching its confluence with the James River about one mile south of the park. Skeggs Branch, a small tributary of Wilson's Creek, flows east and joins Wilson's Creek in the west-central portion of the park. McElhaney Branch also flows into Wilson's Creek and forms part of the park's southern boundary. Wilson's Creek National Battlefield also contains numerous springs and sinkholes.

Wilson's Creek is heavily influenced by the permitted discharge of treated sewage effluent from the city of Springfield (population 150,600), which has a permit to discharge 42.5 million gallons of treated sewage effluent each day. During low-flow periods an estimated 80 percent of the water flowing through Wilson's Creek National Battlefield is treated sewage effluent.

The city of Springfield has worked hard to provide adequate treatment facilities for this rapidly growing area. The water pollution problems caused by inadequate treatment of organic materials in the 1970s and

early 1980s have largely been eliminated. Fecal coliform bacteria levels are usually within limits within the park and noxious odors are no longer a source of major complaints by park visitors. The city is continuing to improve its wastewater facilities with the recent installation of phosphorus removal equipment. The threat of raw sewage spills caused by infrastructure failure, however, remains. In the summer of 1996, a sewage spill into Wilson's Creek killed fish within the park. Additionally, in the summer of 2000, a 36-inch sewer line main deteriorated causing a major spill that required the closing of horse trails within the park boundary, but resulted in no visible adverse effect on aquatic life.

Wetlands

No wetlands occur within the project area nor would they be impacted by proposed construction, therefore, no wetland impacts are anticipated, and a statement of findings for wetlands will not be prepared. For these reasons, the topic of wetlands has been dismissed from further consideration.

Wildlife

Increasing urban and suburban development in the Springfield-Battlefield-Republic area has diminished the extent of wildlife habitat in the region. As a result, the importance of Wilson's Creek National Battlefield as open space and wildlife habitat has increased in recent years. Wildlife at the park is dominated by common species adapted to human disturbance, including white-tailed deer, cottontail rabbit, squirrel, coyote, bobcat, fox, skunk, opossum, woodchuck, beaver, muskrat, mice, and bobwhite quail. In addition, a variety of common songbirds and raptors, primarily associated with woodland and woodland margins, are found at the park. Although the fragmented nature of wildlife habitat at and adjacent to the park restricts the number and diversity of species inhabiting the area, the park nevertheless provides important nesting and rearing habitat for many species, including mammals, birds, and amphibians.

There is minimal potential for habitat disturbance or alteration from actions proposed in the action alternatives. Approximately one tenth of an acre of small brush would be removed along the top of the rock cut. Disturbed areas would be revegetated and rehabilitated following construction. Therefore, the actions described in this amendment would have negligible to minor adverse impacts on wildlife. Because the effects to wildlife and wildlife habitat would be minor, this topic has been dismissed from further analysis.

MITIGATION

Under all alternatives, NPS staff would mitigate impacts arising from construction activities.

NPS management would limit construction activities to the project area. Archeological monitoring and subsurface investigations, where necessary, would be conducted to ensure that construction activities do not affect the national battlefield's significant archeological resources. Every effort would be made to avoid known archeological sites. NPS staff would work with para-professional archeologists and to monitor construction activities.

NPS staff would apply ecological principles to ensure that natural resources were maintained and not impaired. The staff would continue to inventory and monitor the natural resources to avoid or minimize impacts resulting from future development. They would use fire and other techniques, such as mechanical processes, to maintain and/or restore ecosystem integrity and use integrated pest management procedures when necessary to control nonnative organisms or other pests. Habitats for threatened and endangered species would also be conserved and restored if they were found.

NPS *Management Policies* (2006), state that the National Park Service has an obligation to promote leadership in environmental stewardship. The National Park Service must set an example not only for visitors, other governmental agencies, the private sector, and the public at large, but also for a worldwide audience. Environmental leadership will be demonstrated in all aspects of NPS planning, operations, and facilities, design, construction, and management.

Accordingly, NPS staff would apply mitigation techniques to minimize the impacts of construction and other activities on national battlefield resources. To prevent soil erosion that degrades water quality, best

management practices such as thorough design analysis, the use of soil retention structures, and prompt revegetation would be applied to all disturbed sites associated with construction activities.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is the alternative that will promote the national environmental policy as expressed in Section 101 of the National Environmental Policy Act. Ordinarily, this means the alternative that would cause the least damage to the biological and physical environment; it also means the alternative that would best protect, preserve, and enhance historic, cultural, and natural resources. Three of the six criteria listed in the act for determining the environmentally preferred alternative are particularly relevant to actions described in this environmental assessment/assessment of effect:

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice.

In the process used to identify the preferred alternative, alternatives B and C were found to be essentially equivalent in providing the best overall potential for protecting and preserving the historic, cultural, and natural resources of Wilson's Creek National Battlefield. Alternatives B and C provide the same range of visitor experiences that do not pose a conflict with the national battlefield's legislated mandate to commemorate the Battle of Wilson's Creek. The actions under alternatives B and C would preserve important historic, cultural, and natural aspects associated with the Battle of Wilson's Creek.

Affected Environment and Environmental Consequences

The National Environmental Policy Act requires that environmental documents disclose the environmental impacts of all the reasonable alternatives and any adverse environmental effects that cannot be avoided should an alternative be implemented. This chapter analyzes the environmental impacts of the three alternatives, including the no-action alternative, on archeological resources, cultural landscapes, NPS Operations, Special Status Species, and Visitor Use and Experience. These analyses provide the basis for comparing the effects of the alternatives.

Methodology for Assessing Impacts

Potential impacts (direct, indirect, and cumulative effects) are described in terms of type, context (are the effects site-specific, local, or even regional?), duration (are the effects short term, long term, or permanent?) and intensity (is the degree or severity of effects negligible, minor, moderate, or major?). Because definitions of intensity (negligible, minor, moderate, or major) vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this environmental assessment.

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

In this environmental assessment 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. These impact analyses are intended, however, to comply with the requirements of both the National Environmental Policy Act and Section 106 of the National Historic Preservation Act. In accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 (36 CFR Part 800, *Protection of Historic Properties*), impacts on cultural resources were also identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects 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 listed cultural resources; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the advisory council's regulations, a determination of either *adverse effect* or *no adverse effect* must also be made for affected national register listed or eligible cultural resources. 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 effects also include reasonably foreseeable effects 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 National Park Service'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 only under the National Environmental Policy Act. It does not suggest that the level of effect as defined by Section 106 is similarly reduced. Cultural resources are nonrenewable resources, and adverse effects 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 effect under Section 106 may be mitigated, the effect remains adverse.

A Section 106 summary is included, as appropriate, 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 listed cultural resources only, based upon the criterion of effect and criteria of adverse effect found in the advisory council's regulations.

Duration

Duration refers to the time period during which the effects of an impact persist. For impact topics evaluated in this document, the duration of impacts across all categories were determined using the following definitions:

short term — the impact lasts less than one year

long term — the impact lasts one year or longer

Cumulative Impact Analysis

Cumulative impacts are impacts on the environment that result from the incremental (i.e., additive) impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what entity (federal or nonfederal) undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place during a period of time.

Cumulative impacts analyzed in this document consider the incremental effects of the no-action alternative and each of the action alternatives in conjunction with past, current, and future actions at Wilson's Creek National Battlefield. These actions include the following planned or ongoing activities:

- Repair to the existing tour road at Wilson's Creek National Battlefield. Portions (401 linear feet) of an existing road cut and rock overhang require excavation to prevent additional rock falls.
- Storage of rock for future use.

Potential for Impairment of National Battlefield Resources and Values

In determining whether impairment may occur, NPS managers consider the duration, severity, and magnitude of the impact; the resources and values affected; and direct, indirect, and cumulative effects of the action.

According to NPS policy, "An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is: (a) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; (b) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or (c) identified as a goal in the park's general management plan or other relevant NPS planning documents."

This policy does not prohibit impacts to park resources and values. The National Park Service has the discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impacts do not constitute impairment. Moreover, an impact is 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.

Archeological Resources

Affected Environment

No known archeological sites are present in the project area, however, the park preserves over 50 archeological sites within the battlefield. During Fiscal Years 2001 through 2003 the Midwest Archeological Center (MWAC) conducted metal detecting and visual inventories of the accessible areas of Wilson's Creek. Within Greene and Christian Counties, Missouri, there are about 1600 recorded archeological sites and 50 of those sites are found on Wilson's Creek National Battlefield. Just over one-half of the identified sites within the battlefield have a component that is prehistoric in age. Twenty-five sites derive from the historic occupation of the land, and most of those were occupied at the time of the Civil War Battle of Wilson's Creek. Wilson's Creek National Battlefield is listed on the National Register of Historic Places. Specific sites and features related to the 1861 battle are also listed and include: Ray House, Ray Spring House, Ray Cornfield, Gibson's Mill, Edwards Cabin, Sharp House, Sharp's Cornfield, Short Farmstead, T.B. Manley House, C.B. Manley House, Gwinn House, Manley Cemetery, Edgar Cemetery, Lyon Marker, Bloody Hill, the Sinkhole, Wire Road, and Sigel's artillery position (Scott, 2005).

Intensity Definitions

The following are the definitions for intensity levels for archeological resources in this document.

Negligible: Impact(s) is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for Section 106 would be *no adverse effect*.

Minor: Adverse impact — Alteration of an archeological site(s) would not diminish the overall integrity of the site. The determination of effect for Section 106 would be *no adverse effect*.

Moderate: Adverse impact — Alteration of an archeological site(s) would diminish the overall integrity of the archeological site(s). The determination of effect for Section 106 would be *adverse effect*. A memorandum of agreement is executed among the National Park Service 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 to minimize or mitigate adverse impacts reduce the intensity of impact under the National Environmental Policy Act from major to moderate.

Major: Adverse impact — Alteration of an archeological site(s) would diminish the overall integrity of an archeological site(s). The determination of effect for Section 106 would be *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service 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).

Impacts on Archeological Resources

Alternative A – No Action

Under the no-action alternative, actions would be continued that have been used to manage this rock bluff for the past 20 years. When portions of the rock bluff fall onto the road surface the rock would be removed using small equipment owned or rented by the park. Individual rocks that are deemed to be in immediate danger of falling would also be removed. Since no known archeological sites are present in the project area, this action would continue to result in long-term, negligible, adverse impacts on archeological resources.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and would continue to affect the archeological resources at and adjacent to the national battlefield. The no-action alternative would contribute a negligible, long-term, adverse component to the overall cumulative long-term, negligible, adverse impacts on the archeological resource in the region. The alternative's contribution would be a relatively small part of the overall cumulative impacts.

Conclusion. Continuing the removal of rock from the tour road and bluff each time it falls would continue to have long-term, negligible, adverse impacts on archeological resources and have a non-adverse effect on archeological resources.

Alternative B - Rock Removal Resulting in a Stair Step Cut and Ditch Line

Under this action alternative, actions would consist of the excavation and removal of rock into a stair step shape and the installation of a ditch line to catch any future falls. Since no known archeological sites are present in the project area, this action would continue to result in long-term, negligible, adverse impacts on archeological resources.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and would continue to affect the archeological resources at and adjacent to the national battlefield. The no-action alternative would contribute a negligible, long-term, adverse component to the overall cumulative long-term, negligible, adverse impacts on the archeological resource in the region. The alternative's contribution would be a relatively small part of the overall cumulative impacts.

Conclusion. Excavation and removal of rock into a stair step shape and the installation of a ditch line would continue to have long-term, negligible, adverse impacts and have a non-adverse effect on archeological resources.

Alternative C - Rock Removal Resulting in a Vertical Cut and Ditch Line (Preferred Alternative)

Under this action alternative, actions would consist of the excavation and removal of rock into a vertical wall and the installation of a ditch line to catch any future rock falls. Since no known archeological sites are present in the project area, this action would continue to result in long-term, negligible, adverse impacts on archeological resources.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and would continue to affect the archeological resources at and adjacent to the national battlefield. The no-action alternative would contribute a negligible, long-term, adverse component to the overall cumulative long-term, negligible, adverse impacts on the archeological resource in the region. The alternative's contribution would be a relatively small part of the overall cumulative impacts.

Conclusion. Excavation and removal of rock into a vertical wall and the installation of a ditch line would continue to have long-term, negligible, adverse impacts and have a non-adverse effect on archeological resources.

Section 106 Summary. After applying the Advisory on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative C would have no adverse effect on the archeological resources of Wilson's Creek National Battlefield.

Cultural Landscapes

Affected Environment

The actions described in the alternatives are adjacent to remnants of the Missouri Pacific Railroad that have a modern tour road built a top the railroad bed, but could have impacts on this cultural resource. The condition was noted as “good” at the time of the Cultural Landscape Report (2004).

At the time of the battle, the valley of Wilson’s Creek was a thriving agricultural setting with several farms and homes for numerous families. Only a few remnants of this agricultural community remain. Other landscape features played key roles in the outcome of the battle. The park’s significant landscape features include the following:

- The Ray House built in 1852. This house and the spring house at the bottom of the hill are the only structures in the park that date from the battle
- Wire Road
- the Ray cornfield
- the Gibson Mill site
- Price’s Headquarters’ site
- the Sharp cornfield and Sharp stubble field
- the Pulaski Arkansas Battery site
- Sigel’s first, second, and final positions
- Guibor’s Battery site
- Tote’s Battery site
- Bloody Hill
- the Lyon marker
- the historic overlook of the Union advance and withdrawal

A cultural landscape report (CLR) for Wilson’s Creek was completed in 2004. In assessing the integrity of Wilson’s Creek National Battlefield, the CLR team concluded that overall the battlefield landscape at Wilson’s Creek retains fair to good physical integrity. The document indicates that the vegetative changes that have taken place since the battle are a reversible condition. Vegetation management consistent with the park vegetation management plan and the cultural landscape report treatment recommendations can modify the park’s appearance to resemble more closely the historic conditions, thereby enhancing the park’s integrity.

The CLR also finds that several individual landscape features, such as the McElhane Farm, the County Road bridge, and two stone field walls, may be eligible for the National Register and contribute to a National Register district associated with Wilson’s Creek National Battlefield. In addition, the CLR finds four other historic associations with park resources. These include the following:

- archeological resources dating from the Early Archaic period
- the John Ray House complex as one of three early settlement dwellings in the Springfield area
- the Wire Road as an important early transportation route associated with Civil War troop movements, the Butterfield Overland Stage line, and the Cherokee Trail of Tears
- expansion of the issue of efforts to commemorate the battle’s significance

The CLR also suggests that two additional periods of significance should be added to the current August 10, 1861 period of significance. The three periods recommended are:

- Archaic through Mississippian periods – ca. 10,000 BP through 1700 AD
- Civil War Battle of Wilson’s Creek – August 10, 1861
- commemoration of the battle and the death of General Lyon – 1861 to 1960

The CLR suggests that specific resources may have their own periods of significance, such as the Wire Road (1836–1900), the Ray House (1852), and the McElhaney Farm complex (1911). The CLR recommends that the National Register nomination be revised to include extant areas surrounding the park.

INTENSITY DEFINITIONS

The following are the definitions for intensity levels for cultural landscapes in this document.

Negligible: Impact(s) is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for Section 106 would be *no adverse effect*.

Minor: 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 *no adverse effect*.

Moderate: 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 *adverse effect*. A memorandum of agreement is executed among the National Park Service 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 to minimize or mitigate adverse impacts reduce the intensity of impact under the National Environmental Policy Act from major to moderate.

Major: 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 *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service 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).

IMPACTS ON CULTURAL LANDSCAPES

Alternative A – No Action

Under the no-action alternative, actions would be continued that have been used to manage this rock bluff for the past 20 years. This portion of the cultural landscape (i.e. railway grade) would continue to be used as a transportation corridor for the tour road. When portions of the rock bluff fall onto the road surface the rock would be removed using small equipment owned or rented by the park. Individual rocks that are deemed to be in immediate danger of falling would also be removed. The tour road is already built upon this portion of the cultural landscape (i.e. railway grade) and it was documented in “good” condition in 2004, therefore this action would continue to result in long-term, negligible, adverse impacts on archeological resources.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and would continue to affect the cultural landscape at and adjacent to the national battlefield. The no-action alternative would contribute a negligible, long-term, adverse component to the overall cumulative long-term, negligible, adverse impacts on the cultural landscape in the region. The alternative’s contribution would be a relatively small part of the overall cumulative impacts.

Conclusion. Continuing the removal of rock from the tour road and bluff each time it falls would continue to have long-term, negligible, adverse impacts on the cultural landscape and have a non-adverse effect on cultural landscapes.

Alternative B - Rock Removal Resulting in a Stair Step Cut and Ditch Line

Under this action alternative, actions would consist of the excavation and removal of rock into a stair step shape and the installation of a ditch line to catch any future falls. The tour road is already built upon this portion of the cultural landscape (i.e. railway grade) and it was documented in “good” condition in 2004. Removal of additional rock would result in long-term, minor, adverse impacts on the cultural landscape (i.e. railway grade).

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and would continue to affect the cultural landscape at and adjacent to the national battlefield. The no-action alternative would contribute a negligible, long-term, adverse component to the overall cumulative long-term, negligible, adverse impacts on the cultural landscape in the region. The alternative’s contribution would be a relatively small part of the overall cumulative impacts.

Conclusion. Excavation and removal of rock into a stair step shape and the installation of a ditch line would continue to have long-term, minor, adverse impacts on the cultural landscape (i.e. railway grade) and have a non-adverse effect on cultural landscapes.

Alternative C - Rock Removal Resulting in a Vertical Cut and Ditch Line (Preferred Alternative)

Under this action alternative, actions would consist of the excavation and removal of rock into a vertical cut and the installation of a ditch line to catch any future falls. The tour road is already built upon this portion of the cultural landscape (i.e. railway grade) and it was documented in “good” condition in 2004. Removal of additional rock would result in long-term, minor, adverse impacts on the cultural landscape (i.e. railway grade).

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and would continue to affect the cultural landscape at and adjacent to the national battlefield. The no-action alternative would contribute a negligible, long-term, adverse component to the overall cumulative long-term, negligible, adverse impacts on the cultural landscape in the region. The alternative’s contribution would be a relatively small part of the overall cumulative impacts.

Conclusion. Excavation and removal of rock into a vertical cut and the installation of a ditch line would continue to have long-term, minor, adverse impacts on the cultural landscape (i.e. railway grade) and have a non-adverse effect on cultural landscapes.

Section 106 Summary. After applying the Advisory on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative C would have no adverse effect on the cultural landscape of Wilson's Creek National Battlefield.

NPS Operations

AFFECTED ENVIRONMENT

NPS *Management Policies 2006* state that park units will pursue a human resources program that is comprehensive, that is based on competency, and that encompasses the entire workforce, including employees, volunteers, contractors, concession employees, interns, and partners.

The *Wilson's Creek National Battlefield Business Plan* identifies five functional areas for national battlefield activities. These include resource protection, visitor experience and enjoyment, facility operations, maintenance, and management and administration. These functional areas oversee 35 programs. Most of these operations are concentrated at the main national battlefield unit. However, some staff time is dedicated to the operations, management, and protection of the Civil War Museum. There are a total 26 full-time employees (FY2006) at the national battlefield. Staff time at Wilson's Creek is supplanted by an active volunteer program that contributes on average more than 5,000 hours yearly.

INTENSITY DEFINITIONS

Implementation of a project can affect the operations of a park unit, such as the number of employees needed, the type of duties that need to be conducted, when/who would conduct these duties, how activities should be conducted, and administrative procedures.

The intensity thresholds used to assess potential changes to NPS operations are defined as follows:

Negligible: NPS operations would not be affected or the effect would be at or below the lower levels of detection, and would not have an appreciable effect.

Minor: The effect would be detectable, but would be of a magnitude that would not have an appreciable adverse or beneficial effect on NPS operations. If mitigation were needed to offset adverse effects, it would be relatively simple and successful.

Moderate: The effects would be readily apparent and would result in a substantial adverse or beneficial change in operations in a manner noticeable to staff and the public. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.

Major: The effects would be readily apparent and would result in a substantial adverse or beneficial change in operations in a manner noticeable to staff and the public, and changes would be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, could be expensive, and their success could not be guaranteed.

IMPACTS ON NPS OPERATIONS

Alternative A – No Action

Under the no-action alternative, actions would be continued that have been used to manage this rock bluff for the past 20 years. When portions of the rock bluff fall onto the road surface the rock would be removed using

small equipment owned or rented by the park. Individual rocks that are deemed to be in immediate danger of falling would also be removed. This action would require law enforcement staff to monitor the rock bluff and implement closures when a fall appeared eminent. Maintenance staff would have to remove rocks falls before the road could be re-opened. These conditions would continue to result in long-term, minor, adverse impacts on NPS operations.

Cumulative Impacts. Continued rock falls on the tour road would decrease the effectiveness of NPS operations, resulting in a long-term, minor, adverse impact on operations. The no-action alternative would contribute a minor, long-term adverse component to cumulative minor, beneficial impacts on NPS operations. This alternative's contribution would be a modest part of the overall cumulative impact.

Conclusion. The no-action alternative would continue to have a long-term, minor, adverse impact on NPS operations.

The no-action alternative would contribute a minor, long-term adverse component to cumulative minor, beneficial impacts on NPS operations. This alternative's contribution would be a modest part of the overall cumulative impact.

Alternative B - Rock Removal Resulting in a Stair Step Cut and Ditch Line

Under this action alternative, actions would consist of the excavation and removal of rock into a stair step shape and the installation of a ditch line to catch any future falls. During construction the action would have a short-term, moderate, adverse impact on NPS operations. The long-term impact would be, minor, beneficial impact on NPS operations. These actions would result in long-term, minor, adverse impacts on NPS operations.

Cumulative Impacts. Removal of rock increase the effectiveness of NPS operations, resulting in a long-term, minor, beneficial impact on operations. The action alternative would contribute a minor, long-term beneficia component to cumulative minor, beneficial impacts on NPS operations. This alternative's contribution would be a modest part of the overall cumulative impact.

Conclusion. The action alternative would continue to have a long-term, minor, beneficial impact on NPS operations. The action alternative would contribute a minor, long-term beneficial component to cumulative minor, beneficial impacts on NPS operations. This alternative's contribution would be a modest part of the overall cumulative impact.

Alternative C - Rock Removal Resulting in a Vertical Cut and Ditch Line (Preferred Alternative)

Under this action alternative, actions would consist of the excavation and removal of rock into a vertical wall and the installation of a ditch line to catch any future falls. During construction the action would have a short-term, moderate, adverse impact on NPS operations. The long-term impact would be, minor, beneficial impact on NPS operations. These actions would result in long-term, minor, adverse impacts on NPS operations.

Cumulative Impacts. Removal of rock increase the effectiveness of NPS operations, resulting in a long-term, minor, beneficial impact on operations. The action alternative would contribute a minor, long-term beneficia component to cumulative minor, beneficial impacts on NPS operations. This alternative's contribution would be a modest part of the overall cumulative impact.

Conclusion. The preferred alternative would continue to have a long-term, minor, beneficial impact on NPS operations. The action alternative would contribute a minor, long-term beneficial component to cumulative minor, beneficial impacts on NPS operations. This alternative's contribution would be a modest part of the overall cumulative impact.

Special Status Species

Affected Environment

Two federally listed species and several species of special concern to the State of Missouri (state) have been documented at Wilson's Creek National Battlefield. The Missouri bladderpod (*Lesquerella filiformis*) exists adjacent to the project area and is listed as threatened by both the federal and state governments. In addition, the state considers five additional plants at the park to be imperiled or critically imperiled, including greenthread (*Thelesperma filifolium* var. *filifolium*), buffalograss (*Buchloe dactyloides*), blue gramma grass (*Bouteloua gracilis*), royal catchfly (*Silene regia*), and false gaura (*Stenosiphon linifolius*) (Missouri Department of Conservation 2000). Except for royal catchfly and false gaura, these plants are found on or adjacent to limestone glades. Royal catchfly inhabits transition zones in savanna habitat between open fields and woodlands. False gaura occurs along the tour-road loop near the southern bridge over Wilson's Creek and may have been brought into the park as part of a wildflower seed mix.

In addition to plants, the federally and state endangered gray bat (*Myotis grisescens*) has been observed in McElhane Branch Cave near Wilson's Creek east of the visitor center. Gray bats have a limited geographic range in the southeastern United States where they generally inhabit pits and caves in limestone karst regions characterized by sinks, ridges, and caverns (USFWS 1999). The gray bat was last documented in the park in 1996. The grotto salamander (*Typhlotriton spelaeus*), a species of concern to the state, also was documented in McElhane Branch Cave during surveys conducted in 1985.

Vegetation

Ecologically, the park is located at the far-western edge of the eastern broadleaf forest province near the edge of the prairie parkland province (Bailey 1995). Historical documentation describes much of the park landscape as savanna (Missouri Department of Conservation 1986). Savanna is a fire-dependent environment that supports an understory of herbaceous, prairie species and an overstory of scattered trees. At the time of the battle, oaks were the dominant trees in the park area. In uncultivated areas, blackjack oak dominated the uplands, while other species of oaks were present in smaller numbers. Black oak, white oak, and post oak were dominant overstory species in the draws and bottoms.

Although native plants were present in the area in 1861, much of the landscape supported agricultural fields prior to the Civil War. After the war, agricultural use of the land intensified with additional fields plowed and grazed. In addition, as agriculture expanded in the late 1800s and early 1900s, suppression of fires increased. The result of fire-suppression tactics, which decreased the frequency and extent of fire, was a gradual succession of uncultivated fields to thick, second-growth forests.

Vegetative communities at Wilson's Creek National Battlefield currently include a mosaic of mature forest, riparian woodland, prairie, and cultivated hay fields. Each community type is present in various densities and successional stages indicative of changes in land-use patterns and/or fire suppression. For instance, some areas support high densities of red cedar that indicate succession from open fields or oak woodlands that have been affected by fire suppression activities. Some woodland areas were cleared prior to establishment of the battlefield and are populated by pasture or exotic grasses. In all communities, interspersed among native plants are non-native, invasive species that continue to compete with native species for land and resources. Exotic species of particular concern within the park include non-native bromes (e.g., soft chess, downy brome, and barren brome), Johnsongrass (*Sorghum halipense*), multiflora rose (*Rosa multiflora*), musk thistle (*Carduus nutans*), and Chinese bushclover (*Sericea lespedeza*). Invasive trees of concern include Osage orange (*Maclura pomifera*) and honey locust (*Gleditsia triacanthos*). Non-native plants currently inhabit dense patches on about 500 acres of parkland and pose a major management concern for park staff.

Description of Vegetation in the Project Area

Dominant woody species in an area adjacent to the project area were documented by Sasseen (2003) and includes white oak (*Quercus alba*), post oak (*Quercus stellata*), black jack oak (*Quercus*, black oak (*Quercus velutina*), eastern red cedar (*Juniperus virginiana*), red elm (*Ulmus rubra*), hackberry (*Celtis occidentalis*), chinquapin oak (*Quercus muehlenbergii*), mulberry (*Morus alba*), walnut (*Juglans nigra*), and bitternut hickory (*Carya cordiformis*).

Dominant herbaceous vegetation in the area adjacent to the project area was documented by Sasseen (2003) and include Hog-peanut (*Amphicarpa bracteata*, Sedge (*Carex* spp.), Virginia Creeper (*Parthenocissus quinquefolia*), Coralberry (*Symphoricarpos orbiculatus*), Fragrant Sumac (*Rhus aromatica*), Tick-trefoil (*Desmodium obtusum*), Sumac (*Rubus* spp.), Wild Grape (*Vitis* spp.), Tall ageeratina (*Ageratina altissima*), May-apple (*Podophyllum peltatum*), Missouri gooseberry (*Ribes missouriense*), Bedstraw (*Galium pilosum*), and Leafy elephant's foot (*Elephantopus carolinianus*).

One federally threatened species, Missouri bladderpod (*Lesquerella filiformis*), is found on land adjacent (within 15 meters) to the project area. No plants have ever been found in areas that will be disturbed by this project. This population was planted with seed collected by a researcher in the early 1990's. The population has slowly grown to its present numbers. The population has remained relatively consistent over an eight-year period. The population has been monitored from 2000 to present

Missouri bladderpod life-history

The following life history information is from Young (2008). The Missouri bladderpod (*Lesquerella filiformis* Rollins, nomenclature follows USDA Plants database) is a small, 10 to 20 cm tall, winter annual mustard with yellow flowers (Rollins and Shaw 1973) (Figures 1 and 2). Individual plants usually consist of multiple stems arising from a basal rosette, 1 to 4 cm in diameter. On average, plants produce two to three flowering stems (Thomas and Jackson 1990, Thomas and Willson 1992), but robust individuals have been observed to produce as many as thirty flowering stems (Hickey 1988). Fine silvery-gray stellate hairs cover the slender leaves and stems. Leaves are typically less than 1 inch long and taper towards the stem. Missouri bladderpod grows in open cedar glades, barrens, limestone outcrops, and rock pastures (Rollins and Shaw 1973).

The Missouri bladderpod produces flowers and fruits from early April through May, producing up to 4 lenticular seeds per capsule (Morgan 1986). The fruits are "small (1/8 inch diameter), spherical, green, gradually turning brown as they dry" (MDC 2005). The plants die by late June. The seeds lack specialized dispersal structures, but may be carried across the glade surface by runoff during heavy rains (USFWS 1988). The dispersed seeds lie dormant through the summer. In other winter annual plants similar to the Missouri bladderpod, a temperature controlled after ripening process breaks seed dormancy (Baskin and Baskin 1985a). Presumably seeds breaking dormancy either germinate in the late summer or fall, or cycle back into dormancy following exposure to cooler fall temperatures. Estimates of the longevity of seed viability range from two to five years (Thomas and Jackson 1990, M. Kelrick unpublished data). Morgan (1986) observed small Missouri bladderpod basal rosettes first emerging in November. The rosettes remain green throughout the winter and bolt in the spring.

As with other winter annuals, the size of Missouri bladderpod populations fluctuates dramatically from year to year (USFWS 2003). In some years, populations consist of no or very few plants. Factors that affect population size appear to operate independently of density (Thomas 1996), suggesting that a combination of edaphic factors, climate, and disturbance control population size. While such low abundance years are often of concern to resource managers, winter annuals such as Missouri bladderpod are well adapted to the harsh conditions and shallow unproductive soils of glades. These stress-tolerant plants complete their life cycles before summer drought occurs. Furthermore, fall germination followed by spring growth and reproduction allows winter annuals to avoid competition with summer annuals (Baskin and Baskin 1985b). These attributes may constitute an adaptive strategy for winter annuals that are smaller and have lower potential growth rates than summer annuals (Grime 1979). The persistent seed bank allows the population to reestablish very rapidly under favorable environmental conditions and mitigates against periodic unsuccessful seed set or germination (Baskin and Baskin 1985b).

Missouri bladderpod at Wilson's Creek National Battlefield

The following information on Missouri bladderpod at Wilson's Creek is from Young (2008). Limestone glades occupy 37.5 acres at Wilson's Creek National Battlefield, representing 2.1% of the total park acreage (Gremaud 1986). Thomas and Jackson (1990) identified and surveyed nine glades at Wilson's Creek National Battlefield. Five sites supported Missouri bladderpod populations: Bloody Hill Glade-hillside, Bloody Hill Glade-north, Bloody Hill Glade-main, Walnut Glade (WnG), and Wire Road Glade

(WRG). Rocky Draw Glade, Price Glade, Rock Wall Glade, and Horse Glade were not found to support the plant. Bloody Hill Glade-hillside and Bloody Hill Glade-main are currently referred to as Bloody Hill Glade (BHG) and Bloody Hill Glade-north is referred to as North Bloody Hill Glade (NBHG). Subsequent surveys also found Missouri bladderpod to occur at Rock Wall Glade, now known as Manley Woods Glade (MWG). In 2007, NPS staff identified a low number of Missouri bladderpod plants on Terrell Creek Glade (TCG)—a glade acquired by the park in 2007. Northwest Bloody Hill Glade (NwBHG), initially documented in 1988, was relocated in 2008 (Thomas and Jackson 1990). Based on the current delineation of glades, Missouri Bladderpod occurs on six glades (BHG, MWG, NBHG, NwBHG, TCG, WnG, and WRG) at Wilson’s Creek National Battlefield. (Note that we have referred to the group of plants at each site as a population, although we do not know the distances over which cross-pollination occurs. The potential for genetic and demographic connections among glades through the movement of seeds is also unknown.)

The Missouri bladderpod populations at Wilson’s Creek National Battlefield differ with respect to soil type. The soils at BHG, NwBHG, and WnG consist primarily of the Gasconade-Rock outcrop complex. This soil complex consists of horizontal bands of the shallow Gasconade series, a stony silty clay loam, and limestone outcrop on slopes and ridges (NRCS 1982, 1985) (Figure 3). The MWG and TCG populations occur on the Goss-Gasconade complex, which may extend from the sides of bluffs and ridges to stream floodplains. The complex may also contain limestone outcrops. The soils of the WRG and NBHG populations were mapped as Goss cherty silt loam. Soils of this series are deeper, more friable, and more permeable than Gasconade soils.

Given the natural rarity of the Missouri bladderpod, proper stewardship of existing habitat is critical for the conservation of the species. Possible threats to the Missouri bladderpod may include encroachment of woody vegetation in glade habitat due to fire suppression, competition from invasive non-native plants (especially grasses), conversion of rocky sites to pasture, herbicide application, right-of-way maintenance, haying, trampling from humans (Thomas and Willson 1992) or livestock, and habitat destruction from development (USFWS 2003). At Wilson’s Creek National Battlefield, the non-native plants annual cheatgrass (*Bromus tectorum*, *Bromus sterilis*), smooth brome (*Bromus inermis*), and sericea lespedeza (*Lespedeza cuneata*) have invaded glades (Morgan 1986, Gremaud 1986), as have the hop clovers (*Trifolium campestre* and *T. dubium*) (Thomas and Jackson 1990). To date, however, no instances of local extinction due to non-native plant invasion have been documented (USFWS 2003). Hardwoods and Eastern redcedar (*Juniperus virginiana*) are also encroaching on glades. Because the Missouri bladderpod population at BHG surrounds the Lyon marker, a highly significant historic site, foot traffic from visitors is high and may negatively impact the population (Thomas and Willson 1992).

Moderate disturbance from mowing or grazing may benefit Missouri bladderpod populations. Based on the best available evidence, a combination of mechanical clearing and prescribed burning appears to stimulate reproduction in Missouri bladderpod populations (USFWS 2003). At the Rocky Barrens Conservation Area, a population counted at 1,500 plants in 1988 and 2,000 plants in 1992 increased to over 50,000 plants in 1994 following an August 1993 prescribed fire (USFWS 2003). A similar response was seen in 1997 and 1998 following prescribed fires in 1996. Managers must manipulate habitats judiciously, however, given that microsite characteristics promoting plant survival and flowering may shift from year to year (Thomas 1996).

Recent management at Wilson’s Creek National Battlefield has focused on thinning cedar trees to increase irradiation in Missouri bladderpod habitat, controlling exotic brome species, and controlling foot traffic. Resource managers have also set prescribed fires in the early summer or late fall to control woody vegetation and invasive non-native plants on glades. Prescribed burns have been conducted in Missouri bladderpod populations at Wilson’s Creek National Battlefield since at least 1988. In general, flame lengths have been low and burns have been patchy with much unconsumed fuel. As an example, experimental burns were conducted in plots ≤ 0.1 acres at BHG during 1988, 1991, and 1992. The glade was apparently excluded from prescribed fire on adjacent land in 1993, 1995, and 1999. Fire managers suspended an attempt to burn BHG in 1996 due to high fuel moisture. During 2002, a low abundance year for the Missouri bladderpod, fire managers used interior ignitions to consume all available fuels. The fire primarily consumed fine fuels, although the fire scorched some cedars <2 m in height. A number of cedars were also

felled and pile-burned along the eastern edge of BHG during the 2002 operation. In 2004, resource management staff thinned cedars on BHG by removing approximately every third stem, with additional removal below large, historic chinquapin oaks. The cedar material was chipped and hauled off-site. Network staff will use monitoring data to evaluate the effect of management on the Missouri bladderpod population at BHG. (Paragraph based on narrative from Gary Sullivan, Wilson's Creek National Battlefield).

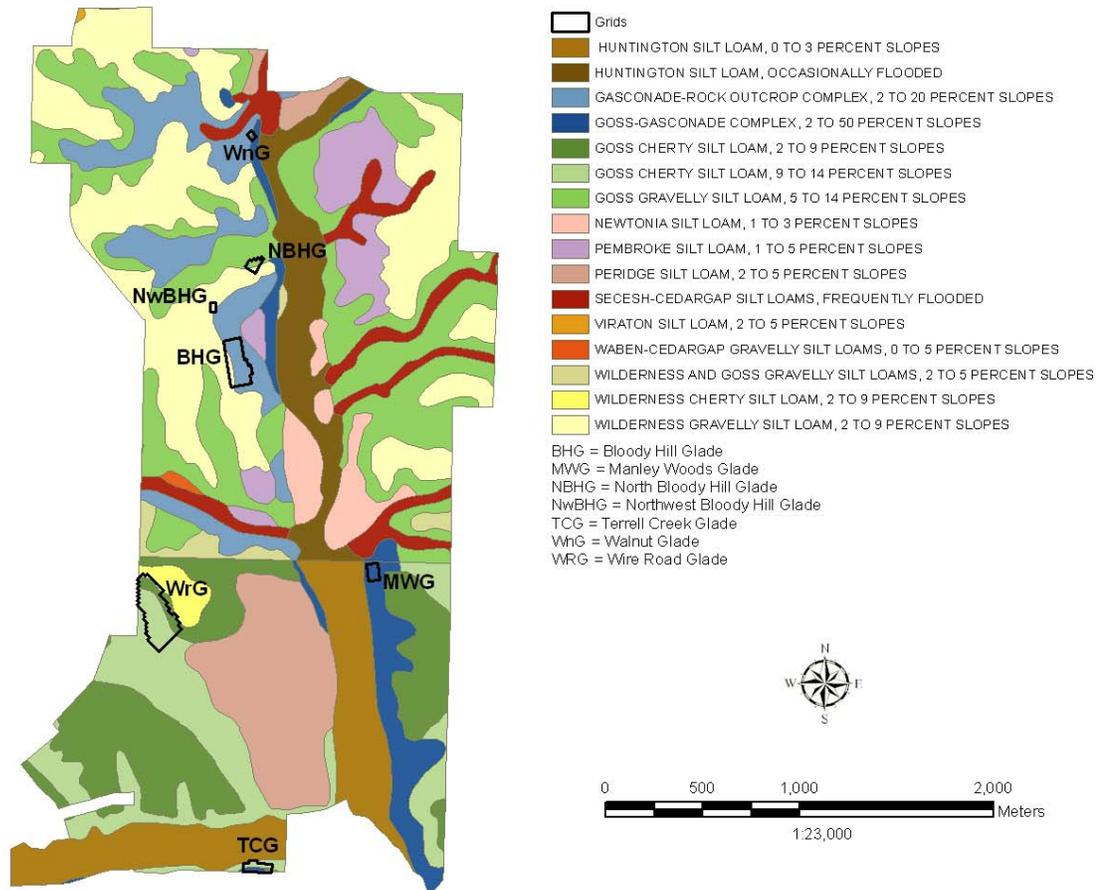


Figure 3. Missouri bladderpod locations superimposed on soil types at Wilson's Creek National Battlefield (Greene and Christian Counties, Missouri). Map based on USDA Natural Resource Conservation Service soil surveys (1982, 1985).

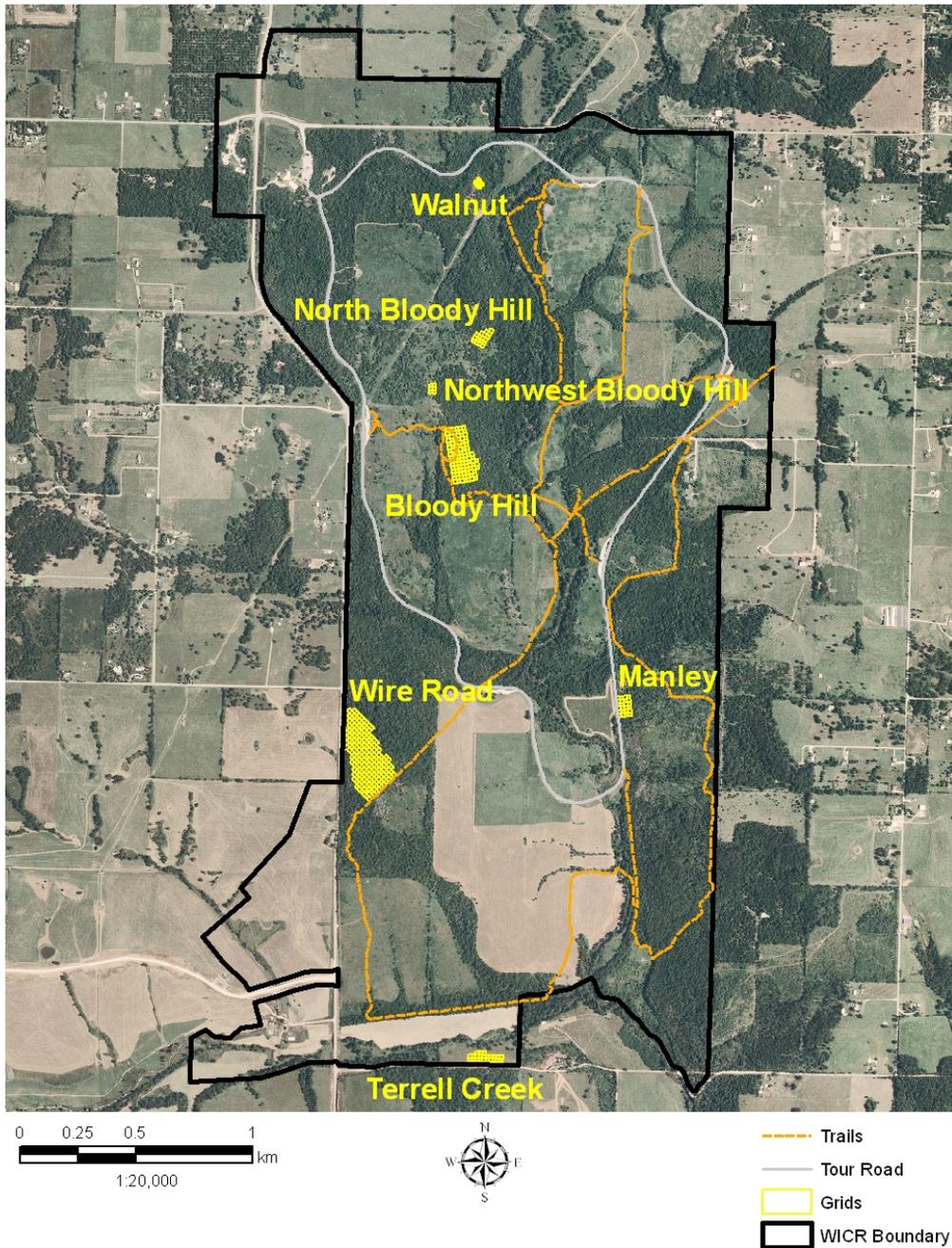


Figure 1. Seven Missouri bladderpod populations in Wilson's Creek National Battlefield.

- Point estimates for the Missouri bladderpod population in MWG have ranged from 101 plants in 2002 to 679 plants in 2007 (figure 3).
- In 2008, population size was estimated as between 170 and 696 plants.
- In 2007, the Missouri bladderpod population in MWG was higher than in previous and subsequent years. The increase may reflect the effect of the 2006 prescribed fire.
- Overall, population size in MWG has been remarkably stable despite the effects of a tornado in 2003, prescribed fire in 2006, and an ice storm in 2007.

INTENSITY DEFINITIONS

The Endangered Species Act of 1973 requires examination of impacts on all federally listed threatened, endangered, and candidate species. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service (or designated representative) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats.

NPS *Management Policies 2006* state that the National Park Service will inventory, monitor, and manage state and locally listed species in a manner similar to its treatment of federally listed species to the greatest extent possible. In addition, the National Park Service will inventory other native species that are of special management concern to park units (such as rare, declining, sensitive, or unique species, and their habitats) and will manage them to maintain their natural distribution and abundance.

No construction or other disturbance associated with the alternative would occur in areas where these species are found, however, the project area is adjacent to a population of Missouri Bladderpod.

The following are the definitions for intensity levels for Special Status Species.

Negligible: Special status species would not be directly affected and changes to adjacent habitat would be below or at the level of detection. Future population levels of the special status species would likely not be affected by the actions proposed in the alternative.

Minor: Special status species would not be directly affected and changes to adjacent habitat would be detectable, although the changes would be slight. Future population levels of the special status species would likely be affected by the actions proposed in the alternative, but the effects would be slight.

Moderate: Special status species would not be directly affected and changes to adjacent habitat would be readily apparent. Future population levels of the special status species would be affected by the actions proposed in the alternative, and the effects would be significant.

Major: Special status species would be directly affected or changes to adjacent habitat would be readily apparent and significant. Future population levels of the special status species would be affected by the actions proposed in the alternative, and the effects would be dramatic.

IMPACTS ON SPECIAL STATUS SPECIES

Alternative A – No Action

Under the no-action alternative, rock would be removed when sporadic rock falls occur. Individual rocks that are deemed to be in immediate danger of falling would also be removed. This action would require the removal of an unknown amount of habitat in the future. It is likely that future rock falls would be limited to approximately one-tenth acres in size. These conditions would continue to result in long-term, minor, adverse impacts on special status species.

Cumulative Impacts. Continued rock falls on the tour road would result in continued erosion of habitat, resulting in a long-term, minor, adverse impact on special status species. Because of the actions proposed in this no-action alternative and the extensive habitat improvement efforts throughout the battlefield the no-action alternative would contribute a minor, long-term adverse component to cumulative minor, beneficial impacts on special status species. This alternative's contribution would be a modest part of the overall cumulative impact.

Alternative B - Rock Removal Resulting in a Stair Step Cut and Ditch Line

Under this action alternative, actions would consist of the excavation and removal of rock into a stair step shape and the installation of a ditch line to catch any future falls. This action would require the removal of

approximately one-tenth acre of habitat. This action would result in long-term, minor, adverse impacts on special status species.

Cumulative Impacts. Removal of the rock would result in continued erosion of habitat, resulting in a long-term, minor, adverse impact on special status species. Because of the actions proposed in this action alternative and the extensive habitat improvement efforts throughout the battlefield this alternative would contribute a minor, long-term adverse component to cumulative minor, beneficial impacts on special status species. This alternative's contribution would be a modest part of the overall cumulative impact.

Alternative C - Rock Removal Resulting in a Vertical Cut and Ditch Line (Preferred Alternative)

Under alternative C (preferred alternative) a rock bluff would be scaled back 11 feet for a distance of 401 linear feet, removing approximately 650 cubic yards of rock and soil, creating a vertical cut and ditch line along the existing tour road. The total area of disturbance would be limited to one-tenth of an acre. One federally threatened species, Missouri bladderpod (*Lesquerella filliformis*), is found on land adjacent (within 15 meters) to the project area. No plants have ever been found in areas that will be disturbed by this project. This population was planted with seed collected by a researcher in the early 1990's and has slowly grown to its present numbers. The population has remained relatively stable over a five year period with 101 plants found in 2002 to 679 plants in located in 2007. This action would result in long-term, minor, adverse impacts on special status species.

Cumulative Impacts. Removal of the rock would result in continued erosion of habitat, resulting in a long-term, minor, adverse impact on special status species. Because of the actions proposed in this action alternative and the extensive habitat improvement efforts throughout the battlefield this alternative would contribute a minor, long-term adverse component to cumulative minor, beneficial impacts on special status species. This alternative's contribution would be a modest part of the overall cumulative impact.

Conclusion. The preferred alternative (alternative C) would continue to have a long-term, minor, adverse impact on special status species. Because of the actions proposed in this action alternative and the extensive habitat improvement efforts throughout the battlefield this action alternative would contribute a minor, long-term adverse component to cumulative minor, beneficial impacts on special status species. This alternative's contribution would be a modest part of the overall cumulative impact.

Visitor Use and Experience

Affected Environment

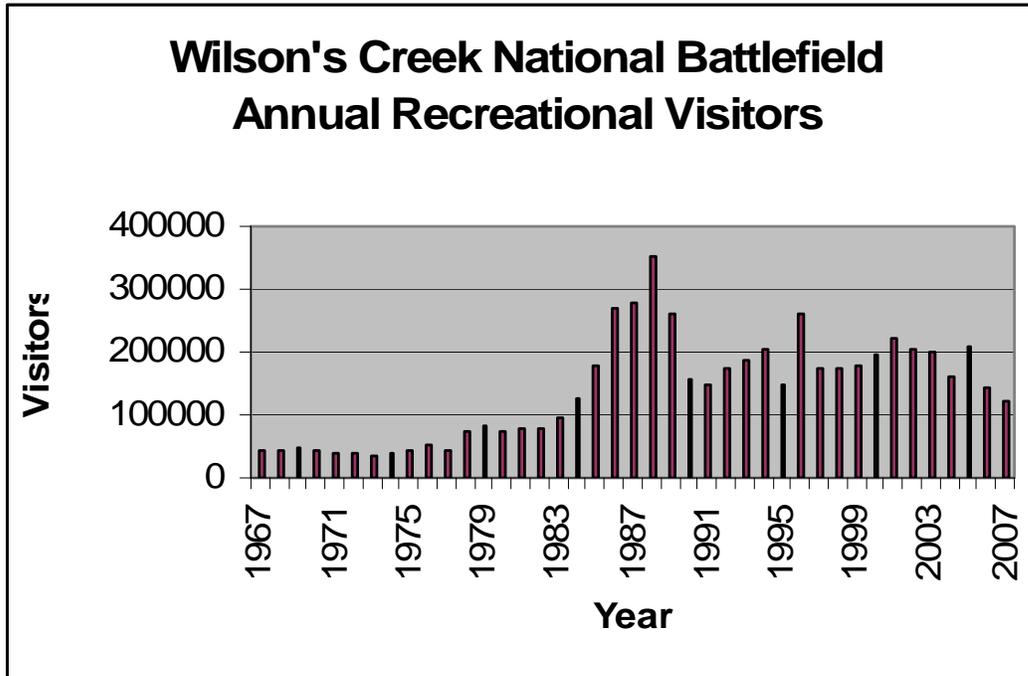
The actions described in the alternatives are within Wilson's Creek National Battlefield which is located five miles southwest of Springfield, Missouri, and three miles east of Republic, Missouri, in the southwest corner of the state. The county line between Greene and Christian Counties bisects the 2,000-acre park, which includes 75 percent of the actual battleground. Wilson's Creek National Battlefield provides visitors with an array of opportunities and experiences that enhances their understanding of the significance of the site and its role in the Civil War west of the Mississippi River. At the visitor center, battle-related exhibits, a 27-minute video, and a fiber-optics map provide historical context and give visitors a sense of the physical dimensions of the battle. A 12,000 volume Civil War library is available to the public and the Nation's premier collection of Trans-Mississippi Civil War artifacts is available for viewing at the museum. The park also maintains partnerships with local municipal and county governments; other Civil War related sites, such as Pea Ridge, Fort Scott, and the Battle of Newtonia; and the Springfield/Greene County Library.

Visitor Use

Information regarding visitation at Wilson's Creek National Battlefield is limited. Most existing information is based on traffic counter readings and/or staff observations. To supplement that information, as part of the general management planning process, the NPS commissioned the University of Minnesota

Cooperative Park Studies Unit to undertake a visitor survey that currently is scheduled for completion in late 2001.

Over the last 41 years recreational visits to the Battlefield have ranged from 33,900 (1973) to 351,658 (1988) and averaged 138,342 recreational visits per year. Variation in park visitation is likely due to variations in weather patterns and shifts in the local and national economy.



Park visitation is highest during May and June and lowest in November and December, although visitation on pleasant February weekends can surpass visitation on weekends in June, as visitation is highly dependent on weather conditions. Based on staff observations, the average length of stay for visitors is approximately one to three hours and approximately half of the visitors are repeat visitors. Half of the visitors are from the Springfield metropolitan area and surrounding counties.

The most popular visitor activities at Wilson's Creek National Battlefield are 1) driving the tour-road loop, 2) viewing exhibits at the visitor center, 3) viewing the battle map, 4) viewing the film, and 5) shopping in the museum bookstore. Wilson's Creek National Battlefield also provides open space for the Springfield metropolitan area where many local residents regularly undertake recreational activities such as horseback riding, bicycling, exercising their pets, jogging, or physical conditioning. Non-local visitors more commonly cited the opportunity to learn about the Battle of Wilson's Creek and the Civil War as their primary reason for visiting.

Visitor Experience and Interpretation

Many visitors to Wilson's Creek National Battlefield begin their visit at the visitor center located at the road entrance just inside the northwest corner of the park. At the center, visitors can receive an orientation to the park, talk with a park representative, buy materials at the cooperating association sales area, and view exhibits about the battle. A 27-minute video, which is available for viewing at the visitor center, presents the battle's historical background. In addition, a six-minute program conducted on a fiber-optically-lighted map illustrates the course of the battle. Approximately 50 percent of visitors to the park used the visitor center to view the video, exhibits, or fiber-optic battle map. The visitor center is accessible by wheelchair from the parking lot.

An excellent Civil War research library in the visitor center is open to visitors and researchers on an advanced reservation basis, although only a small percentage of visitors use the library. The research library does not maintain open stock or permit visitors to check out material.

Living history programs depicting Civil War soldier life are presented and guided tours of Bloody Hill are provided on weekends during the summer. In addition, the park presents several special events throughout the year, including a moonlight tour and anniversary celebration in August, artillery and musket-firing demonstrations in the summer, and several genealogical programs.

Repeat visitors and recreational users are less likely to use visitor center facilities than first-time visitors, except perhaps for restrooms. Repeat visitors typically begin their park experience by proceeding directly to the tour-road loop, while recreational users often park in the visitor center's parking lot from which they begin jogging or bicycling. Equestrian users also generally park in the visitor center's parking lot or in other areas of the park, including the overflow lot and along the tour-road loop. A seven-mile trail system for horseback riding and hiking is accessible from the tour-road loop. Although highways and roads surround all sides of the park, traffic noise in most places is typically unobtrusive. However, traffic noise at Bloody Hill, adjacent to County Road ZZ, is fairly audible.

The 4.9-mile paved tour-road loop, with eight interpretive stops at significant battle points, provides a self-guided automobile tour of the battlefield. The tour-road loop receives considerable use by bicyclists, joggers, and walkers. Although bicyclists, pedestrians, and motorized vehicles often use the tour-road loop at the same time, there is a specific lane designated for bicycle use that also may be used by pedestrians.

In addition to the tour-road loop, there are five walking trails (varying in length from one-quarter to three-quarters of a mile) that are accessible to visitors from the tour-road loop and provide access to additional sites related to the battle. For example, one trail leads to the Ray House, which is an historic house on the northeastern corner of the park that was built before the battle. The Ray House served as a temporary field hospital for Confederate soldiers following the battle and the body of General Nathaniel Lyon was taken here after he was killed in battle—the bed on which the general's body was placed remains on exhibit in one of the house's rooms. The Ray House is closed during the off-season but open daily during the summer; even during the off-season, however, tourists can learn about the battle by peering through windows and reading wayside exhibits. Although interpretive trails off the tour-road loop are primitive and not designed for wheelchair use, the Ray House and interpretive stops along the tour-road loop are accessible by wheelchair.

INTENSITY DEFINITIONS

The following are the definitions for intensity levels for visitor use and experience in this document.

Negligible: Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the actions proposed in the alternative.

Minor: Changes in visitor use and/or experience would be detectable, although the changes would be slight. The visitor would be aware of the effects associated with implementing the alternative, but the effects would be slight.

Moderate: Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the effects associated with implementing the alternative and would likely be able to express an opinion about the changes.

Major: Changes in visitor use and/or experience would be readily apparent and have substantial consequences. The visitor would be aware of the effects associated with implementing the alternative and would likely express a strong opinion about the changes.

IMPACTS ON VISITOR USE AND EXPERIENCE

Alternative A – No Action

Under the no-action alternative, visitors could be injured by falling rocks and sporadic rock falls would continue to periodically interrupt visitation by forcing closures of the tour road. The likelihood that a substantial number of visitors would not enjoy the full range of potential experiences would continue to have a long-term, minor, adverse impact on visitor use and experience.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and would continue to affect visitor use at the national battlefield. Before its establishment in 1960, Wilson’s Creek Battlefield was privately owned and visitation was restricted accordingly. Following establishment of the national battlefield, visitation increased gradually to a high of 262,000 visitors in 1996. Construction of the visitor center and tour-road loop increased the attractiveness of Wilson’s Creek National Battlefield as a tourist and recreational destination, and improvements to adjacent roads, including Road ZZ and Route 182, increased accessibility to the national battlefield and surrounding areas. These actions resulted in a long-term, moderate, beneficial impact on visitor use and experience.

The creation of the private General Sweeney’s Museum of Civil War History contributed to visitor opportunities to learn about the Battle of Wilson’s Creek and the War in the Trans-Mississippi West. The acquisition of this museum by the National Park Service in August 2005 enhances the visitor experience at the national battlefield. As the regional population grows, visitor use of the national battlefield will likely increase and visitation also might grow. Transportation improvements, including widening of County Roads M and MM and construction of the Highway 60 Bypass, would contribute to increased visitor use of the national battlefield and surrounding areas, resulting in a long-term, moderate, beneficial impact on visitor use and experience in the region and at the national battlefield.

The no-action alternative would contribute a negligible, long-term, beneficial component to the overall cumulative long-term, moderate, beneficial impacts on visitor use and experience in the region. This alternative’s contribution would be a relatively small component of the overall cumulative impacts.

Conclusion. The no-action alternative would continue to have a minor, long-term, adverse impact on visitor use at the national battlefield. The no-action alternative would contribute a negligible, long-term, beneficial component to the overall cumulative long-term, moderate beneficial impacts on visitor use and experience in the region. This alternative’s contribution would be a relatively small component of the overall cumulative impacts.

Alternative B - Rock Removal Resulting in a Stair Step Cut and Ditch Line

Under this action alternative, actions would consist of the excavation and removal of rock into a stair step shape and the installation of a ditch line to catch any future falls. This action would prevent visitors from being injured by falling rocks and sporadic rock falls would no longer interrupt visitation by forcing closures of the tour road. The prevention of future rock falls would enhance the visitor experience at the national battlefield, resulting in moderate, long-term, beneficial impact on visitor use and experience.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and would continue to affect visitor use at the national battlefield. Before its establishment in 1960, Wilson’s Creek Battlefield was privately owned and visitation was restricted accordingly. Following establishment of the national battlefield, visitation increased gradually to a high of 262,000 visitors in 1996. Construction of the visitor center and tour-road loop increased the attractiveness of Wilson’s Creek National Battlefield as a tourist and recreational destination, and improvements to adjacent roads, including Road ZZ and Route 182, increased accessibility to the national battlefield and surrounding areas. These actions resulted in a long-term, moderate, beneficial impact on visitor use and experience.

The creation of the private General Sweeney’s Museum of Civil War History contributed to visitor opportunities to learn about the Battle of Wilson’s Creek and the War in the Trans-Mississippi West. The acquisition of this museum by the National Park Service in August 2005 enhances the visitor experience at

the national battlefield. As the regional population grows, visitor use of the national battlefield will likely increase and visitation also might grow. Transportation improvements, including widening of County Roads M and MM and construction of the Highway 60 Bypass, would contribute to increased visitor use of the national battlefield and surrounding areas, resulting in a long-term, moderate, beneficial impact on visitor use and experience in the region and at the national battlefield.

This action alternative would contribute a minor, long-term, beneficial component to the overall cumulative long-term, moderate, beneficial impacts on visitor use and experience in the region. This alternative's contribution would be a relatively small component of the overall cumulative impacts.

Conclusion. Alternative B would contribute a minor, long-term, beneficial component to the overall cumulative long-term, moderate beneficial impacts on visitor use and experience in the region. This alternative's contribution would be a relatively small component of the overall cumulative impacts.

Alternative C - Rock Removal Resulting in a Vertical Cut and Ditch Line (Preferred Alternative)

Under this action alternative, actions would consist of the excavation and removal of rock into a vertical wall and the installation of a ditch line to catch any future falls. This action would prevent visitors from being injured by falling rocks and sporadic rock falls would no longer interrupt visitation by forcing closures of the tour road. The prevention of future rock falls would enhance the visitor experience at the national battlefield, resulting in moderate, long-term, beneficial impact on visitor use and experience.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and would continue to affect visitor use at the national battlefield. Before its establishment in 1960, Wilson's Creek Battlefield was privately owned and visitation was restricted accordingly. Following establishment of the national battlefield, visitation increased gradually to a high of 262,000 visitors in 1996. Construction of the visitor center and tour-road loop increased the attractiveness of Wilson's Creek National Battlefield as a tourist and recreational destination, and improvements to adjacent roads, including Road ZZ and Route 182, increased accessibility to the national battlefield and surrounding areas. These actions resulted in a long-term, moderate, beneficial impact on visitor use and experience.

The creation of the private General Sweeney's Museum of Civil War History contributed to visitor opportunities to learn about the Battle of Wilson's Creek and the War in the Trans-Mississippi West. The acquisition of this museum by the National Park Service in August 2005 enhances the visitor experience at the national battlefield. As the regional population grows, visitor use of the national battlefield will likely increase and visitation also might grow. Transportation improvements, including widening of County Roads M and MM and construction of the Highway 60 Bypass, would contribute to increased visitor use of the national battlefield and surrounding areas, resulting in a long-term, moderate, beneficial impact on visitor use and experience in the region and at the national battlefield.

This action alternative would contribute a minor, long-term, beneficial component to the overall cumulative long-term, moderate, beneficial impacts on visitor use and experience in the region. This alternative's contribution would be a relatively small component of the overall cumulative impacts.

Conclusion. The preferred alternative would contribute a minor, long-term, beneficial component to the overall cumulative long-term, moderate beneficial impacts on visitor use and experience in the region. This alternative's contribution would be a relatively small component of the overall cumulative impacts.

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Appendix II Project Area Photographs

