

ENVIRONMENTAL ASSESSMENT
FOR
RESOURCE PRESERVATION AND VISITOR INTERPRETATION OF
BLOODY HILL AT
WILSON'S CREEK NATIONAL BATTLEFIELD
GREENE COUNTY, MISSOURI



February 2014

ENVIRONMENTAL ASSESSMENT
FOR
RESOURCE PRESERVATION AND VISITOR INTERPRETATION OF
BLOODY HILL AT
WILSON'S CREEK NATIONAL BATTLEFIELD
GREENE COUNTY, MISSOURI

Summary

We are pleased to announce that an Environmental Assessment (EA) for resource preservation and visitor interpretation of Bloody Hill at Wilson's Creek National Battlefield is now available for a 30-day public review and comment period. The document is available for review at the National Park Service Planning, Environment, and Public Comment website (PEPC) at <http://parkplanning.nps.gov> and on the battlefield's web site <http://www.nps.gov/wicr>. Please submit your comments on the EA on PEPC or you may mail them directly to me at the address listed below.

Comments should be received no later than March 28, 2014. Members of the public that would like a copy of this document mailed to them can contact Gary Sullivan at 417-732-2662 ext. 286.

The purpose and need of the environmental assessment is to find solutions, define outcomes, and find ways to protect sensitive resources while providing interpretation to visitors that utilize the Bloody Hill area of Wilson's Creek National Battlefield. The need for this project, a description of the environment, alternative actions, and the potential impacts of the proposed project along with any appropriate mitigating measures are included. The proposed changes are necessary to provide effective interpretation to 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 harden existing trails, construct ADA resting platforms, install interpretive waysides and directional signs, install cannons, and re-route small sections of trail. This environmental assessment evaluates three alternatives that include; the construction of a boardwalk, 50 square foot shade shelter and signage and trail modifications to the Bloody Hill Trail at Wilson's Creek National Battlefield. The alternatives considered include a no action alternative and two other alternatives that promote the future health of a population of Missouri Bladderpod (Federally threatened plant species). Two alternatives would also provide ADA accessibility to approximately 3,300 feet of trail. The

NPS preferred alternative is C, which is also the alternative with the least impact to the environment.

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 1,969-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 30-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 partnership 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:
Superintendent
National Park
Service
Wilson's Creek National Battlefield
6424 West Farm Road 182
Republic, MO 65738

TABLE OF CONTENTS

TABLE OF CONTENTS	i
REGION MAP	1
PROJECT AREA	2
I PURPOSE AND NEED	3
II SCOPE AND ANALYSIS	3
III PARK PURPOSE AND SIGNIFICANCE	4
Purpose	
Significance	
FORMULATION OF THE ALTERNATIVES	6
ALTERNATIVE A — NO-ACTION ALTERNATIVE	6
ALTERNATIVE B	6
ALTERNATIVE C (PREFERRED ALTERNATIVE)	7
OTHER ALTERNATIVE CONSIDERED AND REJECTED	8
MITIGATION	16
ENVIRONMENTALLY PREFERABLE ALTERNATIVE	17
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	18
<i>METHODOLOGY FOR ASSESSING IMPACTS</i>	
<i>IMPACTS TO CULTURAL RESOURCES AND SECTION 106 OF THE NATIONAL</i>	
<i>HISTORIC PRESERVATION ACT</i>	
<i>DURATION</i>	
<i>CUMULATIVE IMPACT ANALYSIS</i>	
<i>POTENTIAL FOR IMPAIRMENT OF NATIONAL BATTLEFIELD RESOURCES AND</i>	
<i>VALUES</i>	
ARCHEOLOGICAL RESOURCES	21
<i>AFFECTED ENVIRONMENT</i>	
<i>INTENSITY DEFINITIONS</i>	
<i>IMPACTS</i>	
<i>Alternative A — No Action</i>	
<i>Alternative B—Preferred Alternative</i>	
<i>Alternative C</i>	
CULTURAL LANDSCAPES	24
AFFECTED ENVIRONMENT	
INTENSITY DEFINITIONS	

IMPACTS	
<i>Alternative A — No Action</i>	
<i>Alternative B—Preferred Alternative</i>	
<i>Alternative C</i>	
SPECIAL STATUS SPECIES	29
AFFECTED ENVIRONMENT	
INTENSITY DEFINITIONS	
IMPACTS	
<i>Alternative A — No Action</i>	
<i>Alternative B—Preferred Alternative</i>	
<i>Alternative C</i>	
VEGETATION	35
AFFECTED ENVIRONMENT	
INTENSITY DEFINITIONS	
IMPACTS	
<i>Alternative A — No Action</i>	
<i>Alternative B—Preferred Alternative</i>	
<i>Alternative C</i>	
VISITOR USE AND EXPERIENCE	42
AFFECTED ENVIRONMENT	
INTENSITY DEFINITIONS	
IMPACTS	
<i>Alternative A — No Action</i>	
<i>Alternative B—Preferred Alternative</i>	
<i>Alternative C</i>	
APPENDIX I: REFERENCES	47
APPENDIX II: MANAGEMENT PRESCRIPTIONS, GENERAL MANAGEMENT PLAN AMENDMENT	49
APPENDIX III: ELEVATION CALCULATIONS FOR BLOODY HILL TRAIL	51
APPENDIX IV: ALTERNATIVE MAPS	53
APPENDIX V: PHOTOGRAPHS	57
APPENDIX VI: COMPLIANCE DOCUMENTATION	71

I PURPOSE AND NEED

This project was triggered by a desire to protect a threatened species by installing a boardwalk, and by requests to install new interpretive signs, move cannons, and install a shade shelter for visitors. Early discussions also noted a desire to make the trail handicap accessible. Later discussions generated requests for a new cannon position and a new trail. The purpose and need of the environmental assessment is to find solutions, define outcomes, and find ways to protect sensitive resources while providing interpretation to visitors that utilize the Bloody Hill area of Wilson's Creek National Battlefield. The need for this project, a description of the environment, alternative actions, and the potential impacts of the proposed project along with any appropriate mitigating measures are included. The proposed changes are necessary to provide effective interpretation to 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 install interpretive wayside exhibits, construct new trail spur and cannon positions, and modify portions of existing trail to provide ADA accessibility.

This environmental assessment evaluates three alternatives that include: hardening or paving the existing trail; constructing resting platforms, a boardwalk, 50 square foot shade shelter, and signage and trail modifications to the Bloody Hill Trail. The alternatives considered include a no action alternative and two other alternatives that preserve a population of Missouri Bladderpod (Federally threatened plant species). Two alternatives would also provide adequate accommodations under the Americans with Disabilities Act (ADA) to approximately 3,300 feet of trail, and one alternative would provide access and interpretation for the DuBois cannon position.

II SCOPE OF THE ANALYSIS

The project area consists of approximately 200 acres that encompass an area named Bloody Hill, the highest elevation in the battlefield, the core area of combat during the Battle of Wilson's Creek. Proportionally, casualty rates among Union forces on Bloody Hill were some of the highest seen during the Civil War. The project area also includes a parking area and a 3,300 linear foot unpaved trail that guides visitors past one overlook and wayside exhibit; six cannon marking approximate locations of historic artillery positions; a sink hole where soldiers were buried after the battle; a limestone glade containing several special status species and a federally threatened plant; and the Lyon marker, which marks the approximate location of General Lyon's death. General Lyon was the first Union General killed in the Civil War, an event of national significance.

Reverence for Bloody Hill, specifically, the site of the death of General Lyon was demonstrated shortly after the end of the Civil War. Veterans periodically visited the site and marked what they thought was the location of the death of General Lyon by engraving and piling rocks at the site. Eventually the location was marked by a 4 foot tall rock cairn. When the rock cairn

disappeared the University Club erected a granite marker on the site. The thirty two acres around the Lyon Marker was the first battlefield land area protected in the 1950's.

Conservation of glade habitat has been a primary concern of park management since the listing of a Federally listed species, Missouri Bladderpod, in 1987 and the completion of a General Management Plan (2003) and Cultural Landscape Report (2004).

Current management of the battlefield is guided by a General Management Plan (2003) and General Management Plan Amendment (2007) and the Cultural Landscape Report (2004). These documents establish management prescriptions for all areas in the battlefield. The project area contains approximately 50 acres designated as a resource preservation zone which provides a high level of protection for sensitive cultural or natural resources; 100 acres designated as a battlefield landscape enhancement zone which concentrates on retaining and enhancing the general historic character of the park's battlefield landscape; and 50 acres in an interpretive focus zone which provides interpretive programs such as demonstrations, guided tours, and special events.

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. The scope of this analysis, therefore, is to define management alternatives specific to implementing resource preservation and visitor interpretation actions in the Bloody Hill area of Wilson's Creek National Battlefield, 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 battlefields enabling legislation, 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 2006* (NPS 2006).

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. The park's enabling legislation directs the National Park Service to make improvements including roads, trails,

markers and buildings and other improvements deemed necessary for the care and accommodation of visitors.

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 2006*, sec. 1.4.3). However, while some actions and activities cause impacts, the National Park Service cannot allow an adverse impact that constitutes resource impairment (*Management Policies 2006*, 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 impairment when its impacts “harm the integrity of park resources or values” (*Management Policies 2006*, 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 2006*, 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 implementing resource preservation and visitor interpretation actions in the Bloody Hill area of 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

Park staff met to discuss the project and formulate alternatives. Many alternatives were discussed, five were originally formulated but only the three alternatives listed below were considered feasible.

Alternative A–No Action- Under this alternative, management would continue to permit employees and visitors to park in a paved parking area and utilize approximately 3,300 linear feet (0.4 acres) of unpaved existing trail that is not ADA accessible. This action would continue to allow approximately 15,000 visitors a year to walk past one overlook; one interpretive wayside exhibit and eight interpretive numbered posts; three directional signs; five cannon marking approximate locations of historic artillery positions; a sink hole where soldiers were buried after the battle; six park benches; a six foot wide trail defined by a two foot tall split rail fence for a distance of 445 linear feet (0.06 acres) through a limestone glade that contains several special status species and a federally threatened plant; the Lyon marker which commemorated the first Union General killed. Under this alternative the only improvements to interpretation or ADA accessibility would be the erection of cell phone signs on a few existing interpretive poles that would allow visitors to access audio descriptions on their cell phone. Special status species would continue to be provided some protection from a small split rail fence that limits foot traffic impacts to a defined area.

Alternative B – Paved (pervious pavement) ADA Trail with 15 Resting Platforms, Waysides with Audio Description, Benches, Re-Location of Cannons, New Trail and Cannon Position, Viewing Platform and Boardwalk

– Under this alternative, management would continue to permit employees and approximately 15,000 visitors a year to park in a paved parking area. This action would modify 2,750 linear feet (0.4 acres) of existing trail and construct approximately 15 resting platforms on the steepest section of trail (650 linear feet) so people using wheelchairs can view waysides; pave (pervious pavement) 2,750 linear feet of existing trail to ADA trail standards and construct 490 linear feet of new paved trail; construct a new 50 square foot shade shelter with hardened surfaced underneath at the existing Bloody Hill overlook; rehabilitate 440 (0.06 acres) feet of abandoned trail in federally threatened plant habitat, provide up to 12 interpretive wayside exhibits (11 new, one existing) with cell phone audio descriptions; remove eight interpretive numbered posts; install six new directional signs; provide eight cannon (five relocated, three new) to mark approximate locations of historic artillery positions; provide interpretation for a historic sink hole where soldiers were buried after the battle; provide seven park benches (one new and one

relocated); install a Boardwalk made from recycled plastic on 105 feet of existing trail and 45 feet of new paved trail and 120 square foot viewing platform (.002 acres) viewing area across from the Lyon Marker. Under this alternative trail modifications would be made to provide an ADA accessible trail. The boardwalk and viewing platform in the glade habitat will provide protection for several special status species and a federally threatened plant and would provide ADA access to the historic Lyon marker. This alternative would also rehabilitate 400 feet of abandoned trail within core habitat of a federally threatened plant species.

Alternative C – Hardened Trail, Waysides with Audio Description, Benches, Re-Location of Cannon and ADA Resting Platforms (Preferred Alternative) – Under this alternative, management would continue to permit employees and approximately 15,000 visitors a year to park in a paved parking area. This action would: modify 2,920 linear feet (0.4 acres) of existing trail by constructing approximately 15 resting platforms on the steepest section of trail (650 linear feet); harden 2,920 linear feet (0.4 acres) of existing trail to ADA trail standards; create 320 feet of new hardened trail to a new cannon battery; rehabilitate 440 feet (0.06 acres) of abandoned trail; provide up to 12 interpretive wayside exhibits (11 new, one existing) with cell phone audio descriptions; remove eight interpretive numbered posts; install 6 new directional signs; provide eight cannon (five relocated, three new) to mark approximate locations of historic artillery positions; provide interpretation for a historic sink hole where soldiers were buried after the battle; provide seven park benches (one new and one relocated). Under this alternative trail modifications would be made to provide an ADA accessible trail.

Other Alternatives Considered and Rejected

Other alternatives that were considered but rejected were

- Construction of numerous switch backs along the existing trail to improve ADA accessibility to exhibit waysides; this alternative was considered too costly and damaging to the resource to implement.
- Construction of an alternative trail route to avoid the steepest section of existing trail; this alternative was abandoned because it would not provide a direct route to trail resources, and the existing route can be modified with resting platforms to meet ADA trail guidelines.
- Construction of a new trail through a resource preservation zone to the historic Dubois battery position; this alternative was determined to be inconsistent with the management prescriptions set forth in the 2007 General Management Plan Amendment.

IMPACT TOPICS FOR FURTHER CONSIDERATION

The impact topics for this project have been identified on the basis of federal laws, regulations, 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 the entire project area contains archeological resources that require protection. Although the project area was intensely surveyed for artifacts related to the battle during a 100% archeological survey in 2000-2004 (Scott, 2006) the probability of locating undiscovered archeological resources in the project remains moderate. To limit potential impacts to unknown resources, a paraprofessional archeologist and cultural resource expert would monitor disturbance created by the installation of resting platforms, interpretive shelter, new signs, new trail construction, and boardwalk supports. Since all known burials have been reinterred in the Springfield National Cemetery the likelihood of finding human remains is very low. If previously unknown archeological materials, including human remains, are discovered, the cultural resource expert would immediately halt work in that area and contact the Missouri State Historic Preservation Officer. There is a moderate probability for disturbance of previously undiscovered archeological resources; 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 constructed. 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 include Bloody Hill, which is in the project area. 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, resource management, interpretation and education, and facility management. Most operations for the battlefield are concentrated in the visitor center area; however, some staff time is dedicated to providing interpretation in the project area. The actions described in the alternatives

could affect NPS operations, including interpretation and law enforcement. 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 and one is 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 large population of Missouri bladderpod (*Lesquerella filiformis*) resides in the project area. The population size has ranged greatly during the years for which data is available. The population was recorded at 0 plants in 1993 and 1994, and had been as many as 261,837 plants in 1991 (Figure 3). In 2010, the population size was estimated between 1,558 and 6,288 plants, which continued a five year downward trend. The population size was comparable to levels observed in 2002, 2004, 2008, and 2009 (Young, 2010).

Because the action alternatives have the potential to affect a population of Missouri bladderpod, this topic has been carried forward for further analysis

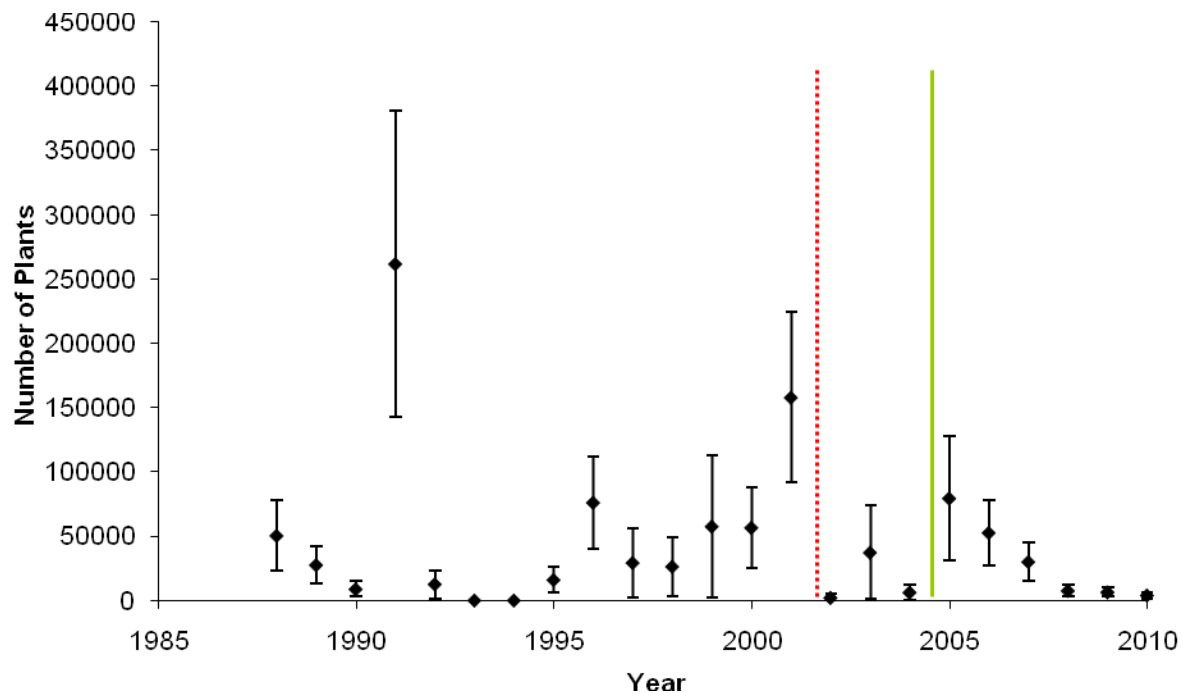


Figure 3. Missouri bladderpod population size in the core area in Bloody Hill Glade .Error bars represent 95% confidence intervals (1988-2005) and population size intervals (2006-2010). Red dashed lines represent prescribed fire events. Green solid lines represent Eastern redcedar clearing events.

Vegetation

Vegetation occurs throughout the project area and will be impacted by the action alternatives, therefore, 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 observe exhibits in the gallery. A 30 minute video at the visitor center presents the battle's historical background. In addition, an 8 minute program conducted on a lighted battle map illustrates the course of the battle. About 50% of visitors to the battlefield use the visitor center to observe 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 Tuesday through Saturday, although only a small percentage of visitors use the library. The research library does not 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, Anniversary celebration in August, artillery and musket-firing demonstrations in the summer, and several genealogical programs throughout the year.

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 there 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.

Trails are accessed via the tour road and visitors view the battlefield from the tour road and associated trails.

The project area is accessible via the Bloody Hill parking area and trail. Actions evaluated in this document have the potential to affect visitor use and experience. 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 all alternatives 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 all alternatives would not disproportionately affect any minority or low-income population or community.
- Implementation of all alternatives 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 environmental assessment. 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 battlefield 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. In addition, alluvial soils are present along Wilson's Creek and its tributaries. The project area consists of the following soils: Pembroke Silt Loam on 1-5% slopes, Gasconade-Rock Outcrop Complex on 2-20% slopes, Wilderness Gravelly Silt Loam on 2-9% slopes, Goss Gravelly Silt Loam on 5-14% slopes.

Actions described in this assessment would not affect geological features in the battlefield.

Actions described in this document would provide further protection to glade soils and disturb up to 0.17 acres of soils in the proposed construction area. Proposed re-vegetation would help stabilize up to 0.09 acres of soil and reduce erosion. Because these effects would be minor, the topic of geological features and soils has been dismissed from further analysis.

Historic Resources

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:

- 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 three resources in the project area are Lyon's Marker, Bloody Hill, and the Sinkhole. Because the alternatives promote the preservation and interpretation of these resources and utilize the existing trail route; we believe it will not affect historic resources and therefore 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 lightscapes 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

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 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.. Therefore, the topic of natural soundscape management was dismissed from further consideration.

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.

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 within the park boundaries. 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 0.17 acres of grass and shrub vegetation would be removed along proposed new trails along with 0.09 acres of steep trail re-vegetated to native vegetation. 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. An archeologist will be employed to survey all areas of new trail construction, relocated or new cannon locations, and new park benches. New trails, cannon positions, and park benches would be located in previously disturbed areas or those with a low concentration of artifacts. A paraprofessional archeologist and cultural resource expert would monitor disturbance created by the installation of new signs and boardwalk supports. 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.

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, facilities, design, construction, and management.

Accordingly, NPS staff would apply mitigation techniques, such as best management practices, 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 re-vegetation 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 enhances historic, cultural, and natural resources. Four 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;
- Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- 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, alternative C was found to have the best overall potential for protecting and preserving the historic, cultural, and natural resources of Wilson's Creek National Battlefield. Alternative C also provides the best visitor experience that does not pose a conflict with the national battlefield's legislated mandate to commemorate the Battle of Wilson's Creek. The actions under alternatives A, 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 (36CFR 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 historic 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. 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 previous, ongoing, and planned activities:

- Construction of a tour road, parking area, and trail to Bloody Hill in the 1980's.
- Installation of a monitoring grid on Bloody Hill in the late 1990's to monitor threatened species.
- Closure of a portion of a trail in the early 1990's to protect the habitat of a Federally threatened species.
- Interpretive use of the Bloody Hill area for school tours and special events.
- Installation of 5 cannons in historic locations from the 1980's through present.
- Installation of a 2 foot tall split rail fence in 2004 to protect a Federally threatened species.
- Removal of selected eastern juniper trees on the glade in 2004.
- Periodic (once every 3-5 years) of prescribed fire from 1988 to present.
- Mowing shrubs, grass, and forbs (except on the glade) periodically from the 1960's to present.
- Planting native grasses and forbs (except on the glade) in the 1970's.
- Planned replacement and installation of new wayside exhibits throughout the park.
- Planned relocation and installation of historic artillery positions.

- Planned prescribed fires.
- Planned realignment of trails along historic road traces.
- Clear weedy and woody vegetation to open up important views available in 1861, including the views of the surrounding area from the crest of Bloody Hill.
- Maintain and enhance the health and diversity of vegetation in sensitive or remnant communities, particularly the limestone glades.

Impairment of National Battlefield Resources

In addition to determining the environmental consequences of implementing the preferred and other alternatives, NPS *Management Policies 2006* (section 1.4) requires analysis of potential effects to determine whether or not proposed actions would impair a park's resources and values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of the park. That discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (NPS *Management Policies 2006*). Whether an impact meets this definition depends on the particular resources 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.

An impact on any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

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

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

mitigated.

Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park.

Impairment findings are not necessary for visitor experience, socioeconomics, public health and safety, environmental justice, land use, and park operations, etc., because impairment findings relate back to park resources and values. The determination of impairment for the preferred alternative is found in Appendix V.

Impacts on Archeological Resources

Affected Environment

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, 2006).

Two archeological sites have been identified within the project area (Lyon Marker and sinkhole); however, the entire project area contains archeological resources that may qualify as an archeological site in the future. Dr. Doug Scott (2006) did an excellent job summarizing relic hunting and archeological studies in the Bloody Hill area. Daryl Trogdon was a relic hunter collecting in the Bloody Hill area prior to park establishment. He used newly developed metal detecting technology, and documented his finds on a rough map. Dr. Scott (2005) reported that Trogdon found one whole 12 pounder cannon shell, 72 artillery shell and case fragments, 39 canister balls, 17 bullets, and 3 gun tools in the Bloody Hill area. Portions of the Trogdon collection are now in the museum collection at Wilson's Creek. Bray was the first archeologist to survey the Bloody Hill area but was unfamiliar with metal detecting technology and only found 1 lead ball, and 3 canister shot fragments. Park Historian Rick Hatcher found 130 artifacts during the construction of the existing trail on Bloody Hill from 1985-1986. During Fiscal Years 2001 through 2003, under the leadership of Doug Scott, the Midwest Archeological Center (MWAC) conducted metal detecting and visual inventories of the project area. Approximately 501 artifacts were identified and removed from the project area, 303 were bullets of various caliber.

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

Alternative A – No Action

Under the no-action alternative, actions would be continued that have been used to manage the Lyon's Marker area since 1990. Employees and visitors are allowed to enter the Lyon's Marker area afoot along the Bloody Hill trail from the Tour Road loop. The two known archeological sites (Lyon Marker and sinkhole) in the project area would not be impacted; 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 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 project area. The alternative's contribution would be a relatively small part of the overall cumulative impacts.

Conclusion

Continuing to allow employees and visitors to walk along the Bloody Hill trail near the Lyon Marker and sinkhole would continue to have long-term, negligible, adverse impacts on archeological resources and have a non-adverse effect on archeological resources.

Alternative B – Paved (Pervious Pavement) ADA Trail, Wayside Exhibits with Audio Description, Benches, and Re-Location of Cannon, New Trail and Cannon Position, Boardwalk and Shelter

Under this action alternative, actions would consist of constructing a shade shelter in a new location; constructing 15 resting platforms on the existing trail; paving 2750 linear feet of existing trail and 490 linear feet of new trail; as well as installing educational wayside exhibits (12 new and one existing) along the trail, drilling and inserting rebar into the glade on Bloody Hill in order to stabilize a 150 linear foot boardwalk over the existing and new trail; as well as installing educational wayside exhibits along the trail including two on the boardwalk/glade (around Lyon's Marker). and an education wayside exhibit, and bench at the sinkhole. The two known archeological sites (Lyon Marker and sinkhole) in the project area would be altered but would not diminish the overall historic integrity of the site. Therefore, this action would continue to result in long-term, minor, adverse impacts on archeological resources. The installation of the Boardwalk would protect the federally threatened plant species present on Bloody Hill while still allowing access to the Lyon Marker.

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 battlefield. This action alternative would contribute a minor, long-term, adverse component to the overall cumulative long-term, minor, 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

Paving the existing trail on Bloody Hill glade, installing three wayside exhibits, and 1 park bench adjacent to archeological sites would have long-term, minor, adverse impacts and have a non- adverse effect on archeological resources. The disruption of the landscape caused by the installation of the shelter, nine wayside exhibits, and relocation of cannons will have no short or long term effects on archeological resources.

Alternative C –Hardened ADA Trail, Waysides with Audio Description, Benches, and Re-Location of Cannon (Preferred Alternative)

Under this action alternative, actions would consist of constructing 15 resting platforms on the existing trail; hardening 2,920 linear feet of existing trail and 320 linear feet of new trail; installing educational wayside exhibits along the trail including two on the boardwalk/glade (around Lyon's Marker) and an education wayside exhibit and bench at the sinkhole. The two known archeological sites (Lyon Marker and sinkhole) in the project area would be altered but would not diminish the overall integrity of the site. Therefore, this action would continue to result in long-term, minor, 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. This action alternative would contribute a minor, long-term, adverse component to the overall cumulative long-term, minor, 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

Installing three waysides, and one park bench adjacent to archeological sites; and hardening the trail adjacent to the sinkhole would continue to have long-term, minor, adverse impacts and have a minor effect on archeological resources. The disruption of the landscape caused by hardening the trail surface, constructing a new cannon position and trail, and installing waysides will have no short or long term effects on archeological resources. The construction of 15 resting platforms on the existing trail will not have long term effects on archeological resources.

Impacts on Cultural Landscapes

Affected Environment

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
- Ray cornfield
- Gibson Mill site
- Price's Headquarters' site
- Sharp cornfield and Sharp stubble field
- Pulaski Arkansas Battery site
- Sigel's first, second, and final positions
- Guibor's Battery site
- Totten's Battery site
- Bloody Hill
- Lyon marker
- 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 McElhaney 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
- Expansion of efforts commemoration of the battle and the death of General Lyon – 186 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.

The actions described in the alternatives are on Bloody Hill and include the Lyon Marker; both have been identified as an important feature of the cultural landscape. The condition of Bloody Hill was noted as "fair" at the time of the Cultural Landscape Report (2004) and indicated the following: The landform associated with this important knoll remains in good condition. However, the existing vegetative cover is not contributing to percolation of rainwater into the soil. Runoff is causing erosion and degradation of soil conditions. Glade vegetation communities are currently being degraded by a combination of invasion by Eastern red cedar trees, shading, and soil erosion.

CLR treatment recommendations related to the Bloody Hill follow: Avoid altering topography, minimal grading for new trails is acceptable. Avoid placing any new construction or adding any new features within the Bloody Hill view shed. Consider placing additional cannon at site's where artillery is known to have been utilized during the Battle of Wilson's Creek. Identify appropriate locations for quiet sitting areas where visitors can pause for contemplation and reflection. Such locations could include spots with panoramic views known to have played an important role in the battle and locations where major fighting occurred. Consider the following locations for establishing contemplative nodes: Lyon Marker and sinkhole. Clear weedy and woody vegetation to open important views and maintain views available in 1861.

CLR treatment recommendations that apply specifically to the glade on Bloody Hill follow: The priority in this zone is protection of natural resources through reestablishment of native vegetation communities, controlling erosion and deposition of sediment, limiting visitor access,

and avoiding construction of new features or facilities. Maintain and enhance the health and diversity of vegetation in sensitive or remnant communities, particularly the limestone glades. However, the existing vegetative cover prevents percolation of rainwater into the soil. Re-vegetate the abandoned trail segment east of the Lyon Marker.

Avoid adding small-scale features in the glade area aside from minimal signage to inform or educate visitors, and the fewest features necessary to discourage them from leaving the trails. Retain, maintain, and treat with a conservation approach the Lyon Marker and the etched stone atop Bloody Hill.

Cumulative Impacts

Trail modifications have been proposed in both the GMP and CLR. These modifications will be evaluated in a future EA that addresses trail modifications in a comprehensive manner across the entire battlefield. Cumulative impacts that may be possible in the future: The GMP and CLR both recommended realignment of trails to utilize historic paths. The CLR recommends a trail from the sinkhole traveling north past the east battlefield overlook and south eventually linking to the Edwards cabin and Guibor's battery. No changes to the existing Bloody Hill trail alignment was proposed, other than linking two new trails to the existing path.

Thinning of red cedar trees, periodic prescribed burns, and treatment of exotic species were evaluated in the Fire Management Plan in 2005. These actions will likely continue in order to fulfill our mandate to manage sensitive species and our management goals to control exotic species, and restore native plant communities to approximate the 1861 landscape condition.

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

Alternative A- No action

Under the no-action alternative, actions would be continued that have been utilized to manage the area near the Lyon's Marker for the past 20 years. This portion of the cultural landscape (i.e. Bloody Hill) would continue to be used as a transportation corridor for the Bloody Hill trail. Visitors to the site of the Lyon's Marker would continue to be allowed to enter the area on foot along the path of the Bloody Hill trail. The trail exists as a feature of the cultural landscape and was documented in "good" condition in the CLR (2004). Furthermore the actions that would continue under the no-action alternative are consistent with the recommendations in the CLR; therefore this action would continue to result in long-term, negligible, adverse impacts on the cultural landscape.

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 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 with the allowance of employees and visitors to walk along the Bloody Hill trail near the Lyon's Marker would continue to have long-term, negligible, adverse impacts on the cultural landscape and have a non-adverse effect on cultural landscapes.

Alternative B – Paved (Pervious Pavement) ADA Trail, Waysides with Audio Description, Benches, and Re-Location of Cannon, New Trail and Cannon Position, Boardwalk and Shelter

Under this action alternative, actions would consist of constructing a 50 square foot shade shelter at a relocated Bloody Hill overlook; constructing 15 resting platforms on the existing trail; paving 2,750 linear feet of existing trail and 490 linear feet of new trail; provide up to 12 interpretive waysides (11 new, one existing) with cell phone audio descriptions; remove 8 interpretive numbered posts; install 6 new directional signs; provide 8 cannon (5 relocated, 3 new) to mark approximate locations of historic artillery positions; provide interpretation for a historic sink hole where soldiers were buried after the battle; provide 7 park benches (1 new and 1 relocated); construct and harden a 120 square foot (.003 acres) viewing platform adjacent to the Lyon marker on the existing trail in glade habitat, drilling and inserting rebar into the glade on Bloody Hill in order to stabilize a 445 linear foot boardwalk over the existing trail. The trail exists as a feature of the cultural landscape and was documented in "good" condition in the CLR (2004). The hardening, shade shelter, interpretive waysides, directional signs, cannon batteries, and park benches are additions to the cultural landscape. The hardening of the trail and shade

shelter are additions to the landscape that were not recommended in the CLR but are either small in size (less than a tenth of an acre) or limited to the existing trail and if constructed with sensitivity to the resource and would have a long-term, negligible, adverse impact on the cultural landscape.

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 battlefield. This action alternative would contribute a negligible, long-term, adverse component to the overall cumulative long-term, 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

Paving the trail surface; installing a shade shelter, interpretive waysides, directional signs, cannon batteries, and park benches are additions to the cultural landscape that would have a long-term, minor, adverse impact on the cultural landscape (i.e. Bloody Hill) and have a non-adverse effect on cultural landscapes.

Alternative C – Hardened ADA Trail, Waysides with Audio Description, Benches, and Re-Location of Cannon (Preferred Alternative)

Under this action alternative, actions would consist of constructing 15 resting platforms on the existing trail; paving hardening 2,920 linear feet of existing trail and 320 linear feet of new trail to a new cannon position; provide up to 12 interpretive waysides (11 new, one existing) with cell phone audio descriptions; remove 8 interpretive numbered posts; install 6 new directional signs; provide 6 cannon (5 relocated, one new) to mark approximate locations of historic artillery positions; provide interpretation for a historic sink hole where soldiers were buried after the battle; and provide 7 park benches (1 new and 1 relocated). Total area affected by this action alternative is approximately 0.25 acres. The 320 feet of new trail and cannon position are additions to the landscape that were not recommended in the CLR but the cannon position is considered a part of the cultural landscape and the trail is small in size (less than a tenth of an acre). Minimal grading for new trails was a recommendation of the CLR; therefore, this action would have a long-term, negligible, adverse impact on the cultural landscape.

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 action alternative would contribute a negligible, long-term, adverse component to the overall cumulative adverse impacts on the cultural landscape in the region. With the relocation of part of the existing trail to the site of the former roadbed, the impacts to the cultural landscape would be minimized. The alternative's contribution would be a relatively small part of the overall cumulative impacts.

Conclusion

The modification of trails, interpretive waysides, directional signs, cannon batteries, and park

benches are additions to the cultural landscape that would have a long-term, minor, adverse impact on the cultural landscape (i.e. Bloody Hill) 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 B would have no adverse effect on the cultural landscape of Wilson's Creek National Battlefield.

Impacts on Special Status Species

Affected Environment

Two federally listed species and several species of special concern to the State of Missouri 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 green thread (*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 McElhaney 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 McElhaney Branch Cave during surveys conducted in 1985.

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) (Figure 1). 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 (i.e. soil; soil drainage, texture, or chemical properties such as pH), 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).

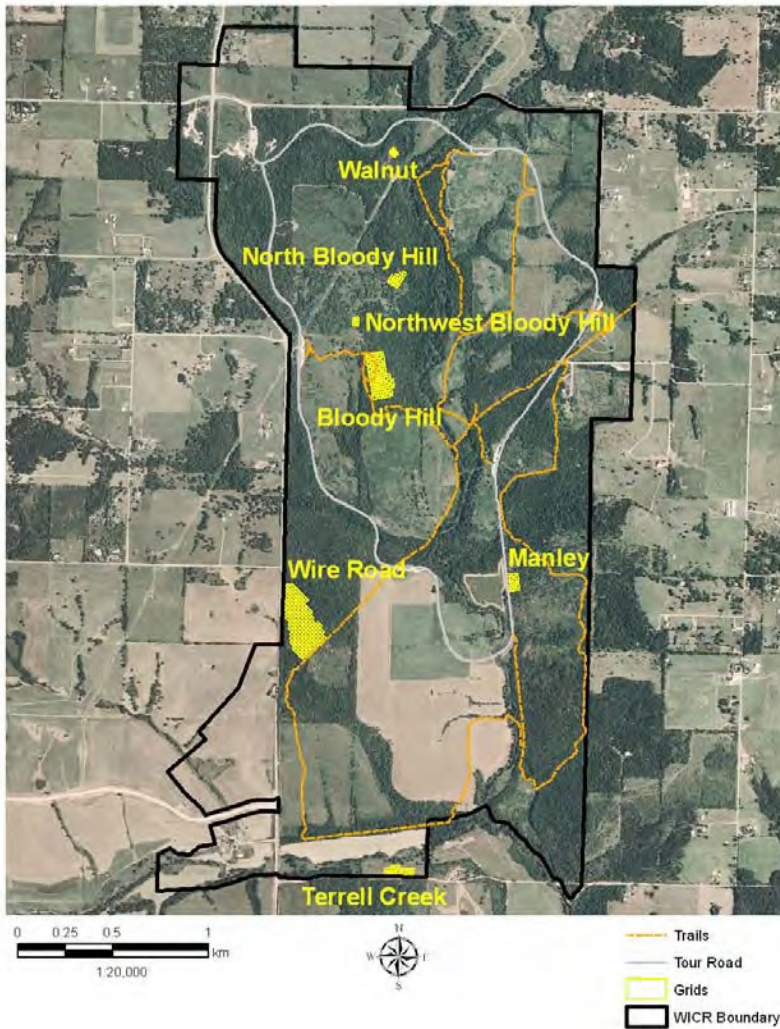


Figure 1. Seven Missouri bladderpod populations in Wilson's Creek National Battlefield.

- 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.

Two federally listed species and several species of special concern to the State of Missouri (state) have been documented in the project area. The Missouri bladderpod (*Lesquerella filiformis*) exists within glade habitat on Bloody Hill and is listed as threatened by both the federal and state governments. In addition, the following State listed species also occur on the glade: greenthread (*Thelesperma filifolium* var. *filifolium*), buffalograss (*Buchloe dactyloides*), and blue gramma grass (*Bouteloua gracilis*).

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 of Special Status Species

Alternative A – No Action

Under the no-action alternative, the area containing sensitive species, Bloody Hill glade, would continue to be managed as it is currently. Prescribed burns would be conducted on a 3-5 year cycle, Eastern red cedar trees would be removed, and exotic species would be controlled. This action would also continue to allow approximately 15,000 visitors a year to walk a 6 foot wide trail defined by a 2 foot tall split rail fence for a distance of 445 linear feet (0.06 acres) through a limestone glade that contains several special status species and a federally threatened plant. Because special status species would not be directly affected and changes to adjacent

habitat would be below the level of detection future population levels of the special status species would likely not be affected, this action would continue to result in long-term, negligible, adverse impacts on special status species.

Cumulative Impacts

Continued visitor and employee activities on the Bloody Hill trail near the Lyon's Marker would result in continued erosion of soils and exclusion of special status species on the trail surface, resulting in a long-term, minor, adverse impact on special status species.

Conclusion

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 – Paved (Pervious Pavement) ADA Trail, Waysides with Audio Description, Benches, Re-Location of Cannons, New Trail and Cannon Position, Boardwalk and Shade Shelter

Under this action alternative, actions would consist of constructing a shade shelter in a new location; constructing 15 resting platforms on the existing trail; paving (pervious pavement) 3,300 linear feet of existing trail and 490 linear feet of new trail as well as constructing a new 50 square foot shade shelter at a relocated Bloody Hill overlook; provide up to 12 interpretive waysides (11 new, one existing) with cell phone audio descriptions; remove 8 interpretive numbered posts; install 6 new directional signs; provide 6 cannon (5 relocated, 3 new) to mark approximate locations of historic artillery positions; provide interpretation for a historic sink hole where soldiers were buried after the battle; provide 7 park benches (1 new and 1 relocated); construct a 150 linear foot (0.02 acres) boardwalk with a 120 square foot (0.002 acres) viewing platform on existing trail across glade habitat. No excavation would be needed to install the boardwalk across the glade, however, the construction of the boardwalk would require drilling and inserting rebar into the bedrock in order to elevate the boardwalk above the ground. This alternative would prevent visitors from walking on sensitive glade habitat and would eliminate soil erosion. The area containing sensitive species, Bloody Hill glade, would continue to be managed as it is currently. Prescribed burns would be conducted on a 3-5 year cycle, Eastern red cedar trees would be removed, and exotic species would be controlled. This alternative would also provide educational waysides along the trail including two on the boardwalk/glade (around Lyon's Marker). The impact of a hardened surface on less than a tenth acre of existing trail would be negligible due to the small size. Because this action would impact less than one-tenth acre of habitat; the action would result in long-term, minor, adverse impacts on special status species.

Cumulative Impacts

Implementation of the boardwalk would result in a decrease in erosion of habitat caused by employees and visitors walking on the trail surface and would discourage off trail use, resulting in a long-term, negligible, 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 negligible, 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

Because of the actions proposed in this action alternative and the extensive habitat improvement efforts throughout the battlefield this alternative would contribute a negligible, long-term adverse component to cumulative minor, beneficial impacts on special status species.

Alternative C – Hardened ADA Trail, Waysides with Audio Description, Benches, and Re-Location of Cannon (Preferred Alternative)

This alternative would create a new trail to the Lyon Marker avoiding the sensitive species habitat on the Bloody Hill glade. By rehabilitating the 440 linear feet of abandoned trail the sensitive species would have an additional area to populate. The 320 linear feet of new trail and the new cannon position are outside of sensitive habitat. Under this action alternative, the area containing sensitive species, Bloody Hill glade, would continue to be managed as it is currently. Prescribed burns would be conducted on a 3-5 year cycle, Eastern red cedar trees would be removed, and exotic species would be controlled. This action would impact less than one-tenth acre of habitat and would result in long-term, minor, beneficial impacts on special status species.

Cumulative Impacts

Abandoning 440 linear feet of existing trail through primary sensitive species habitat would result in a decrease in erosion of habitat caused by employees and visitors walking on the trail surface and would discourage off trail use, resulting in a long-term, negligible, 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 negligible, 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

This alternative would continue to have a long-term, minor, positive 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.

Impacts on Vegetation

Affected Environment

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 over story

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

The following information related to vegetation in the project area is from Nelson (2005) and the Cultural Landscape Report (2004). Vegetation on Bloody Hill glade includes chinquapin oak (*Quercus muehlenbergii*), post oak (*Quercus stellata*), black jack oak (*Quercus marilandica*), black oak (*Quercus velutina*), fragrant sumac (*Rhus aromatica*), Eastern red cedar (*Juniperus virginiana*), little bluestem (*Schizachyrium scoparium*), side oats grama (*Bouteloua curtipendula*), Japanese chess (*Bromus japonicus*), green milkweed (*Asclepias viridiflora*), stiff aster (*Aster ptarmicoides*), slender sandwort (*Arenaria patula*), downy gentian (*Gentiana puberula*), hop- clover (*Trifolium hybridum*), Missouri bladderpod (*Lesquerella filiformis*), evening primrose (*Oenothera triloba*), hispid wild quinine (*Parthenium hispidum*), and glade greenthread (*Thelesperma trifidum*).

Limestone glades are globally imperiled in Kansas, Missouri, and Arkansas. The glades are generally small (< 100 acres); isolated; and vary in quality given their variable histories of overgrazing, red cedar invasion, fire suppression and development. Major threats include continued invasion by red cedar and exotic species, overgrazing, and lack of fire (Nelson, 2005). The natural glade habitat of Missouri bladderpod is threatened with residential development, overgrazing, and competition from encroaching woody and non-native grasses (FWS Missouri Bladderpod Fact Sheet, March 6, 2012).

Vegetation in the remainder of the project area is primarily limited to species that re-established

naturally or could be easily re-planted since. This portion of the project area had been in cultivation prior to 1960 and was re-vegetated in the late 1970's with a limited number of native grass species. Species include chinquapin oak (*Quercus muehlenbergii*), post oak (*Quercus stellata*), black jack oak (*Quercus marilandica*), black oak (*Quercus velutina*), fragrant sumac (*Rhus aromatica*), Eastern red cedar (*Juniperus virginiana*), little bluestem (*Schizachrium scoparium*), big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*), sericea lespedeza (*Lespedeza cuneata*), bull thistle (*Cirsium vulgare*), tall fescue (*Festuca elatior*), sericea lespedeza (*Lespedeza cuneata*), Kentucky bluegrass, sulfur cinquefoil (*Potentilla recta*), multiflora rose, coralberry, common dandelion, hop-clover (*Trifolium hybridum*), and common mullein (*Verbascum thapsus*).

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), and 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 confining visitors to a 6 foot trail through Bloody Hill glade. 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).

- Point estimates for the Missouri bladderpod population in MWG have ranged from 101

plants in 2002 to 679 plants in 2007.

- 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.

Definitions for intensity levels for Vegetation:

Negligible: Impacts to vegetation would be localized and at the lowest levels of detection. Future success of plant communities would likely not be affected by the actions proposed in the alternative.

Minor: Impacts to vegetation would be localized and slightly detectable but would not affect the future success of any plant community.

Moderate: Impacts to vegetation would be clearly detectable and could have an appreciable effect on individual species, communities, and/or natural processes

Major: Impacts to vegetation would be highly noticeable, and would have a substantial influence on the future success of vegetation, including impacts on individuals or groups of species, communities, and/or natural processes.

Impacts

Alternative A – No Action

Under the no-action alternative, vegetation in the Bloody Hill area would continue to be managed as it is currently. Prescribed burns would be conducted on a 3-5 year cycle, Eastern red cedar trees would be removed, and exotic species would be controlled. This action would also allow approximately 15,000 visitors a year to walk a 6 foot wide trail for a distance of 3,300 linear feet (0.5 acres) through a re-vegetated savanna and a limestone glade. This no-action alternative requires no changes to existing trails and vegetation management actions that are beneficial to vegetation. The impact to vegetation would be localized and at the lowest levels of detection. Future success of plant communities would likely not be affected, this action would continue to result in long-term, negligible, minor impacts on special status species.

Cumulative Impacts

Continued visitor and employee activities along the Bloody Hill trail would result in continued erosion of habitat, resulting in a long-term, minor, adverse impact on vegetation.

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 vegetation. This alternative's contribution would be a modest part of the overall cumulative impact.

Conclusion

Continuing with the allowance of employees and visitors to walk along the Bloody Hill trail would have long-term, minor, adverse impacts on vegetation and would have a non-adverse effect on vegetation and would not affect the future success of any plant community.

Alternative B – Paved (Pervious Pavement) ADA Trail, Waysides with Audio Description, Benches, and Re-Location of Cannons, New Trail and Cannon Position, Boardwalk and Shade Shelter

Under this action alternative, actions would consist of constructing a shade shelter in a new location; constructing 15 resting platforms on the existing trail; paving (pervious pavement) 2,750 linear feet of existing trail and 490 linear feet of new trail; as well as constructing a new 50 square foot shade shelter at a relocated Bloody Hill overlook; provide up to 12 interpretive waysides (11 new, one existing) with cell phone audio descriptions; remove 8 interpretive numbered posts; install 6 new directional signs; provide 6 cannon (5 relocated, 3 new) to mark approximate locations of historic artillery positions; provide interpretation for a historic sink hole where soldiers were buried after the battle; provide 7 park benches (1 new and 1 relocated); construct and harden 120 square foot (.003 acres) viewing platform adjacent to the Lyon marker on the existing trail in glade habitat. The construction of the boardwalk would require drilling and inserting rebar into the glade on Bloody Hill in order to elevate the boardwalk above the ground. This alternative would prevent visitors from walking on sensitive glade habitat and would eliminate soil erosion. This action would result in long-term, minor, adverse impacts on vegetation.

Cumulative Impacts

Paving the existing trail would result in a decrease in direct impacts to vegetation caused by employees and visitors walking on the trail surface and the boardwalk with the viewing

platform would discourage off trail use. This would result in a long-term, minor, adverse impact on vegetation. Because of the actions proposed in this action alternative and the extensive habitat improvement efforts throughout the battlefield this alternative would contribute a negligible, long-term adverse component to cumulative minor, beneficial impacts on vegetation. This alternative's contribution would be a modest part of the overall cumulative impact.

Implementation of the boardwalk, as well as a paved trail would result in a decrease in erosion of habitat caused by employees and visitors walking along the trail, resulting in a long-term, negligible, adverse impact on vegetation. Because of the actions proposed in this action alternative and the extensive habitat improvement efforts throughout the battlefield this alternative would contribute a negligible, long-term adverse component to cumulative moderate, beneficial impacts on vegetation. This impact would minimize the impacts on the vegetation by utilizing an area with minimal vegetation. This alternative's contribution would be a moderate part of the overall cumulative impact.

Conclusion

Paving the existing trail; constructing a new shade shelter, interpretive waysides, directional signs, boardwalk and viewing platform, cannon batteries, and park benches are additions that would have a long-term, minor, adverse impact on the vegetation of the cultural landscape (i.e. Bloody Hill) and have a non- adverse effect on vegetation and would not affect the future success of any plant community.

Drilling and inserting of rebar into the Bloody Hill glade would have long-term, negligible, adverse impacts on vegetation. Paving the existing trail would have long- term, moderate, adverse impacts on vegetation. Because of the actions proposed in this action alternative and the extensive habitat improvement efforts throughout the battlefield this alternative would contribute a negligible, long-term adverse component to cumulative minor, beneficial impacts on vegetation. This alternative's contribution would be a modest part of the overall cumulative impact.

Alternative C – Hardened ADA Trail, Waysides with Audio Description, Benches, and Re-Location of Cannon (Preferred Alternative)

This alternative would construct 320 linear feet of new trail to a new cannon position. Existing trail would be used to access the Lyon Marker avoiding sensitive species habitat on the Bloody Hill glade. Approximately 440 linear feet of trail would be abandoned trail through sensitive species habitat and allowed to re-vegetate. Under this action alternative, the area containing sensitive species, Bloody Hill glade, would continue to be managed as it is currently. Prescribed burns would be conducted on a 3-5 year cycle, Eastern red cedar trees would be removed, and exotic species would be controlled. This action would also harden the existing trail. Because positive vegetation management activities would continue in the Bloody Hill area and 440 linear feet of existing trail through sensitive species habitat would be allowed to re-vegetate, this action would have a long-term, negligible, adverse impact on the cultural landscape.

Cumulative Impacts

Constructing 320 linear feet of new trail and abandoning 440 linear feet of trail through glade habitat would result in a decrease in direct impacts to vegetation caused by employees and visitors walking on the trail surface and would discourage off trail use, resulting in a long-term, negligible, adverse impact on vegetation. Because of the actions proposed in this action alternative and the extensive habitat improvement efforts throughout the battlefield this alternative would contribute a negligible, long-term adverse component to cumulative minor, beneficial impacts on vegetation. This alternative's contribution would be a modest part of the overall cumulative impact.

Conclusion

This alternative would continue to have a long-term, minor, adverse impact on vegetation. Because of the actions proposed in this 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 vegetation.

Conclusion

Abandoning 440 linear feet of existing trail and constructing 320 linear feet of new trail would have long-term, negligible, adverse impacts on vegetation. Hardening the existing trail would have long-term, moderate, adverse impacts on vegetation. Because of the actions proposed in this action alternative and the extensive habitat improvement efforts throughout the battlefield this alternative would contribute a negligible, long-term adverse component to cumulative minor, beneficial impacts on vegetation. This alternative's contribution would be a modest part of the overall cumulative impact.

Impacts on 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 30-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 exhibits are under development to display the Nation's premier collection of Trans-Mississippi Civil War artifacts in the visitor center. The park also maintains partnerships with local municipal and county governments, the Springfield/Greene County Library; and other Civil War related sites, such as Pea Ridge, Fort Scott, and the Battle of Newtonia.

Visitor Use

Over the last 43 years (1967-2010) recreational visits to the Battlefield have ranged from 33,900

(1973) to 351,658 (1988) and averaged 180,024 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 December, January, and February, 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 greater 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
- 5) Shopping in the museum bookstore.

Wilson's Creek National Battlefield also provides open space for the greater 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 30-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 utilized the visitor center to view the video, exhibits, or fiber-optic 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 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 area from which they begin walking, jogging, or bicycling. Equestrian users also generally park in the visitor center's parking area or in other areas of the park, including the overflow area 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. Interpretive trails off the tour-road loop are both primitive and not designed for wheelchair use, or were constructed many years ago and do not meet current ADA guidelines (i.e. the Ray House and Bloody Hill).

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 interpretation 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

A variety of past, present, and reasonably foreseeable actions would have affected and would continue to affect visitor use at the battlefield. Before its establishment in 1960, Wilson's Creek Battlefield was privately owned and visitation was restricted accordingly. Following establishment of the 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 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, and the re-display of these artifacts in 2013 will enhance the visitor experience at the battlefield. As the regional population grows, visitor use of the battlefield will likely increase and visitation also might grow. Wayside exhibits on Bloody Hill would have long term beneficial impact on visitor use and experience in the region and at the national battlefield.

Alternative A – No Action

Under the no-action alternative, approximately 15,000 visitors a year visitors would continue to walk to a 6 foot wide unpaved non ADA compliant trail for a distance of 3,300 linear feet. The elevations on the existing trail do not meet current ADA guidelines for trails. The likelihood that a substantial number of visitors would not enjoy the full range of potential experiences would continue to have a long-term, negligible, adverse impact on visitor use and experience.

Cumulative Impacts

The no-action alternative would contribute a negligible, long-term, adverse component to the overall cumulative long-term, moderate, beneficial impacts on visitor use and interpretation 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 negligible, long-term, adverse impact on visitor use at the battlefield. The no-action alternative would contribute a negligible, long term, adverse 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 – Paved (Pervious Pavement)ADA Trail, Waysides with Audio Description, Benches, and Re-Location of Cannons, New Trail and Cannon Position, Boardwalk and Shade Shelter

Under this action alternative, action would construct resting platforms and pave existing trail to create a trail surface that meets ADA guidelines. This action would provide visitors with an ADA trail for viewing the Lyon's Marker. This alternative would also provide access to and interpretation of the Dubois Battery. The Boardwalk would also provide enhanced interpretation of the view shed and the federally threatened plant species. Furthermore, educational insights into the land they are observing would be provided by waysides; a shade structure for visitors and volunteers. The addition of each element would enhance the visitor experience at the national battlefield, resulting in moderate, long-term, beneficial impact on visitor use and experience.

Cumulative Impacts

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

Conclusion

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

Alternative C – Hardened ADA Trail, Waysides with Audio Description, Benches, and Re-Location of Cannon (Preferred Alternative)

Under this action alternative, action would construct resting platforms and hardening existing trails. This action would provide visitors with an ADA trail for viewing the Lyon's Marker. This alternative would also provide access to and interpretation of the Dubois Battery. Furthermore, educational insights into the land they are observing would be provided by waysides. The addition of each element would enhance the visitor experience at the national battlefield, resulting in moderate, long-term, beneficial impact on visitor use and experience.

Cumulative Impacts

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

Conclusion

This alternative would contribute a moderate, long-term beneficial component to the overall cumulative long-term, major 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.

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 visitor use and experience of Wilson's Creek National Battlefield.

Appendix I: References

Gremaud, Gregory K. 1986. Wilson's Creek National Battlefield A Plan for the Restoration of the Historic Vegetation. Including appendices. Prepared for the National Park Service. Jefferson City, Missouri: Natural History Section, Missouri Department of Conservation.

Hickey, E. E. 1988. A four county survey for acceptable habitat and occurrence of *Lesquerella filiformis* Rollins. Unpublished report. Missouri Department of Conservation.

Missouri Department of Conservation. 2005. Endangered species guidesheet: Missouri bladderpod. Available <http://www.conservations.state.mo.us/nathis/endangered/endanger/bladder/>. (Accessed: February 1, 2005).

Morgan, S.W. 1986. A study of populations of *Lesquerella filiformis* Rollins in Missouri. Unpublished report.

National Park Service, 2003 Wilson's Creek National Battlefield Final General Management Plan / Environmental Impact Statement. Denver Service Center, Denver, CO.

National Park Service, 2004. Wilson's Creek National Battlefield, Republic, Missouri, Cultural Landscape Report, Part I and II. Prepared for National Park Service, Midwest Regional Office, Omaha, Nebraska. Prepared by John Milner Associates, Inc., Charlottesville, Virginia; Rivanna Archaeological Consulting, Charlottesville, Virginia; Conservation Design Forum, Elmhurst, Illinois; Bahr Vermeer & Haecker, Architects, Lincoln, Nebraska. 385 p.

National Park Service, 2004 Fire Management Plan for Wilson's Creek National Battlefield.
National Park Service, 2006. NPS Management Policies. Washington, D.C.
National Park Service, 2007. General Management Plan Amendment. Denver Service Center, Denver, CO.

Rollins, R. C. and E. A. Shaw. 1973. The genus *Lesquerella* (Cruciferae) in North America. Harvard University Press, Cambridge, Massachusetts.

Scott, Douglas D., Roeker, and Carlson-Drexler, 2006. "The Fire Upon Us Was Terrific:" Battlefield Archeology of Wilson's Creek National Battlefield, Missouri. Midwest Archeological Center, National Park Service, United States Department of the Interior.

Thomas, L.P. and J.R. Jackson. 1990. Population ecology and management recommendations for *Lesquerella filiformis* at Wilson's Creek National Battlefield, Republic, Missouri. Unpublished report. National Park Service.

Thomas, L.P. and G.D. Willson. 1992. Effect of experimental trampling on the federally endangered species, *Lesquerella filiformis* Rollins, at Wilson's Creek National Battlefield, Missouri. *Natural Areas Journal* **12**: 101-105.

United States Access Board, 2009. Draft Final Accessibility Guidelines for Outdoor Developed Areas.

Young, C.C. and J.L. Haack. 2007. Missouri Bladderpod Status Report for Six Populations at Wilson's Creek National Battlefield. Natural Resource Technical Report NPS/ HTLN/NRTR-2007/031. National Park Service, Fort Collins, Colorado.