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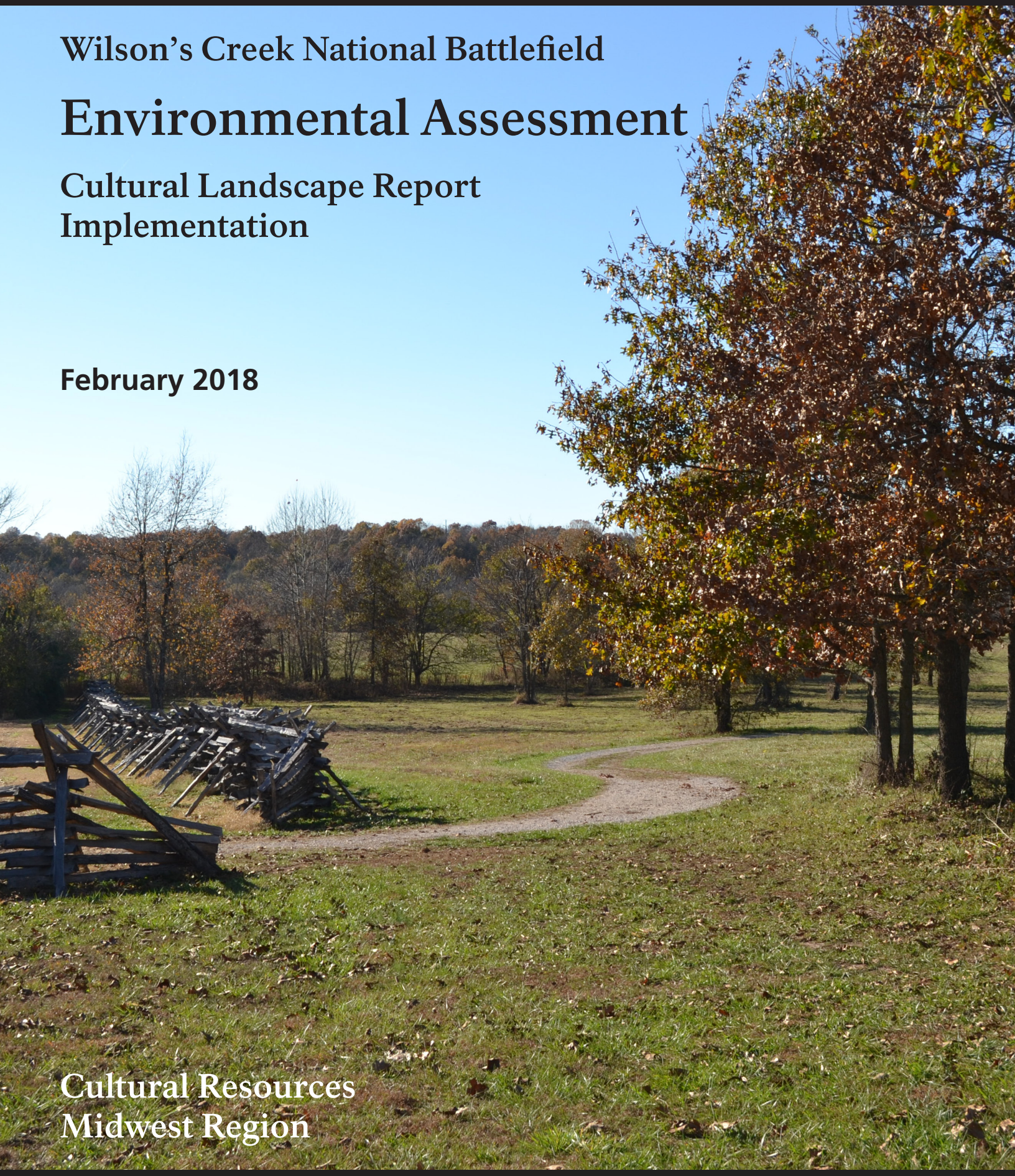
Wilson's Creek National Battlefield
Republic, Missouri

Wilson's Creek National Battlefield

Environmental Assessment

Cultural Landscape Report Implementation

February 2018



Cultural Resources
Midwest Region

Wilson's Creek National Battlefield

Republic, Missouri

Environmental Assessment

Implementation of Cultural Landscape Report Treatment Recommendations

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About the front cover: View toward Wilson's Creek from the corner of Ray Cornfield, November 14, 2016.

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FINDING OF NO SIGNIFICANT IMPACT

Environmental Assessment for Cultural Landscape Report Implementation

Wilson's Creek National Battlefield
Republic, Missouri

INTRODUCTION

In compliance with the National Environmental Policy Act (NEPA), the National Park Service (NPS) has prepared an Environmental Assessment (EA) for the purpose of satisfying the compliance requirements for the implementation recommendations from the Wilson's Creek National Battlefield *Cultural Landscape Report* (2004) (CLR). The EA documents the results of the potential environmental impacts associated with Implementation of the CLR Treatment Recommendations. Wilson's Creek National Battlefield is located at 6424 West Farm Road 182 near the town of Republic, Missouri. At the time the CLR was finalized, the park boundary was changing. Congress passed legislation authorizing a boundary expansion in 2003, and additional lands were purchased from willing sellers. Since 2004, the park has grown by approximately 280 acres. Land acquired for inclusion in the park edged the original park to the northwest, southwest, and southeast. It now extends over 2,369 acres, and spans the boundary between Christian and Greene counties.

There are three primary purposes of an EA: 1) to help determine whether the impact of a proposed action or alternative could be significant; 2) to aid in NEPA compliance when no environmental impact statement (EIS) is required by evaluating a proposal that will have no significant impact, but that may have measurable adverse impacts; and 3) to facilitate preparation of an EIS, if one is determined to be necessary.

The Council of Environmental Quality (CEQ) regulations specifically direct that "Agencies shall integrate the NEPA process with other planning at the earliest possible time to ensure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts" [40 CFR § 1501.2]. Additionally, both CEQ regulations and NPS policies direct EAs to be prepared when compliance with NEPA can be achieved and environmental analysis is sufficient such that preparation of an EIS is not necessary.

As stated in the Final EA, the proposed action would implement the CLR recommendations, provide a vision and clear direction for the protection of the park's cultural resources, and preserve the overall character of Wilson's Creek National Battlefield. The assessment and conclusions described in the EA resulted in the

determination that there will be no significant impacts from implementation of the selected alternative. This Finding of No Significant Impact (FONSI) describes the alternative the NPS has selected for implementation, provides the rationale for its selection, and explains why it will not result in significant impacts. Measures to mitigate adverse effects from implementation of project actions are presented in Attachment A of this document and a non-impairment determination is included in Attachment B. Brief descriptions of each alternative are provided below.

PURPOSE, NEED, AND OBJECTIVES

The purpose of the proposed action is to help fulfill the mandate of protection and management of fundamental park resources and values including the cultural landscape and features present at the time of the Battle of Wilson's Creek. Changes made through the implementation of treatment recommendations will provide park visitors with a stronger understanding and meaningful relationship to the Civil War Battle fought onsite. Proposed changes will also provide park visitors with additional enjoyable outdoor experiences that will coincide with enhanced stewardship of the park's significant natural and cultural resources.

The project is needed to accomplish the following objectives:

- Consideration of visitor safety needs associated with the interface of deer and visitor use of the park and surrounding roads;
- Regeneration of existing vegetation within the park in association with development of a program that reduces white-tail deer population within the park;
- Development of prioritized and aggressive management of cultural resources and features that respect the issue of sustainability;
- Consideration of haying as one of the tools of sustainable vegetation management, including within warm season grass fields;
- Development and installation of new wayside exhibits needed to convey accurate and compelling battlefield stories;
- Relocation of specific trail segments that regularly erode and require repair;
- Management of different vegetation communities through use of prescribed fire, grazing, mowing, and herbicide application in specific areas, using specific protocols;
- Management of Eastern redcedar (*Juniperus virginiana*) currently shading out glade habitat areas;
- Rehabilitation of glade areas to promote habitat for the federally-listed threatened Missouri bladderpod (*Lesquerella filiformis*);
- Management of crop exhibits and orchard exhibits with respect to deer presence in the park;
- Development and installation of new trails, interpreted viewsheds, contemplative/interpretive nodes, and exhibit design for cultural features present at the time of the battle but no longer extant.

SELECTED ALTERNATIVE

The NPS alternative selected for implementation is Alternative 2: Implementation of Remaining CLR (2004) Treatment Plan Recommendations, Proposed Deer Management Strategies, and the Interpretive Programs Indicated in the Long-Range Interpretive Plan. During alternative development, it was determined that the purpose and need for the plan could be met with a single action alternative and that other alternatives were neither feasible nor necessary. Alternative 2 is the preferred alternative because it would best address and fulfill the purpose and need of the project.

Alternative 2 would complete the implementation of recommendations provided within the CLR based on an understanding of which recommendations have been implemented, which remain viable, and which require modification to meet current park management goals. As part of an overall strategy for managing the cultural landscape, this alternative recommends developing additional connections between interpretive programming and what is known about the landscape that comprised the park at the time of the battle. The strategy includes increased vegetation management for more views; development of alternative trails; new cannon placement; additional wayside exhibit installation; and enhanced depiction of vernacular lifeways present at the time of the battle.

Rehabilitation of the landscape would also include contemplative and interpretive areas within the park that afford opportunities for the public to reflect on events of the battle. Several directed viewsheds will be cleared to support an understanding of the battlefield from contemplative and interpretive nodes and other key locations. Proposed trail extensions would be developed to provide connections with historic features not located along existing trails. Wayside exhibits would convey information about historic farmstead features at specific locations and viewpoints, providing a clear connection between the battle and the landscape.

Under Alternative 2, the key features of the existing developed core of the park will remain the same. The entrance drive, visitor center parking area, tour road, portions of the equestrian and pedestrian trails, the picnic area, visitor center/museum, and maintenance area will continue to function and have a similar appearance to that present today. Circulation throughout the park will provide, where feasible, universal accessibility on the trail system and access to visitor center exhibits and outdoor interpretive exhibits, ensuring compliance with ABAAS (Architectural Barriers Act Accessibilities Standards).

RANGE OF ALTERNATIVES CONSIDERED

In addition to the selected alternative described above, the EA analyzed a no action alternative, which included projects already implemented in the park based on the treatment recommendations in the CLR completed in 2004.

Under Alternative 1, management of the entire park would have continued in accordance with NPS policies and standards. The focus would have been on preservation of the existing character of the park and current interpretive programs. Under this alternative, there would have been no changes to the facilities that currently accommodate visitor access and interpretation, or park administration and maintenance. Proposed changes that have already been approved, such as the addition of new wayside exhibits at Bloody Hill, would

have proceeded. The existing visitor center would have continued to serve as the primary means for visitor contact and orientation. The entrance drive and associated parking lot would have remained the primary vehicular access route for visitors to experience the park's resources. Visitors would have continued to gain a majority of their knowledge of the Battle of Wilson's Creek through experiencing exhibits located within the visitor center, wayside exhibits sited at tour road stops, and along pedestrian and equestrian trails. The current picnic area would have continued to support the visitor experience and equestrian use of designated trails also would have continued. No provision would have been made for additional parking beyond the current parking areas, including the existing horse trailer parking areas. Existing patterns of spatial organization composed of clearings surrounded by generally wooded landscape, would have been perpetuated. Glade habitats would have remained overrun with Eastern red cedar trees, affecting the habitat and survival of the Missouri bladderpod, unless recommendations were implemented as a park PMIS project per the *Vegetation Management Implementation Plan* 2014. No change would have been made to the interpretation of the battlefield landscape. Views identified as important interpretive vistas, (east and west battlefield overlooks) would have continued to be managed for clear sight lines, while other views identified as important, would not have been cleared.

Alternative 1 was not selected because it would have precluded the park from meeting some of the goals of the Purpose and Need statement and resolving the list of management issues. No further exploration of ways to utilize the cultural landscape as a tool for interpreting the Battle of Wilson's Creek would have been conducted. This alternative would also have limited the park in its ability to accomplish design and management objectives including visitor safety needs associated with the interface of deer and visitor use of the park and surrounding roads; development and installation of new wayside exhibits needed to convey accurate and compelling battlefield stories; relocation and new design specifications for trail segments that regularly erode and require repair; management of different vegetation communities through use of prescribed fire, grazing, mowing, and herbicide application in specific areas; and rehabilitation of glade areas to promote habitat for federally-listed threatened Missouri bladderpod.

MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES (BMPs)

The NPS and its contractors will implement mitigation measures and best management practices to minimize the degree and/or severity of adverse effects on natural resources, historic structures, cultural landscapes, historic viewsheds, visitor use and experience, and human health and safety. The NPS may add mitigation measures and BMPs to this list in the future at its discretion if the additional measures do not cause environmental impacts. Mitigation measures and BMPs are attached in this FONSI (Attachment A).

SIGNIFICANCE CRITERIA REVIEW

This section explains why the selected alternative will not have a significant effect on the quality of the human environment. As defined in 40CFR 1508.27, significance is determined by examining the following criteria:

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

Whether taken individually or as a whole, the impacts of the Selected Alternative do not reach the level of significant adverse effects that would require preparation of an EIS. Most adverse impacts associated with implementation of the Selected Alternative would be short-term and temporary during construction activities, prescribed burns for vegetation management, and strategies to reduce deer to appropriate and manageable numbers. Mitigations and Best Management Practices are incorporated into the proposed action to ensure further reduction and minimization of adverse impacts. Both the 2003 GMP and the 2007 GMP Amendment also considered the impacts of cultural landscape rehabilitation.

When the impacts of the Selected Alternative are combined with other past, present, and reasonable foreseeable future actions in the project area, the overall impacts to cultural and natural resources within the park would be minor in the short-term and have long-term beneficial impacts. Known archeological resources are protected through ongoing processes implemented by the park, including cultural resource surveys and ground testing with the implementation of each of the actions within the project. Historic buildings and structures are currently maintained and managed to retain their historical character and expanded interpretation proposed within the selected alternative incorporates additional maintenance to building and structure sites. Cultural landscapes would benefit from vegetation management and expanded interpretation that integrates the cultural landscape into the interpretive story of the site.

There will be a number of disruptions to surface soils due to construction and grading within the selected alternative. Most impacts are associated with specific small areas of the park and would typically be short-term and limited to the time of project completion. Mitigation measures and BMPs will ensure negligible impacts to soils and geology. Long-term positive impacts to soils would be expected due to vegetation management techniques for soil stabilization, and design of trail alignments to avoid steep grades and minimize ongoing soil erosion. Existing and future land use management and vegetation management also protect prime and unique agricultural lands.

Regarding potential impacts on water resources, floodplains, and water quality, there would be long-term and substantial beneficial effects with the implementation of the selected alternative. Benefits include restoration of the riparian buffers along stream corridors, restoration of the watershed, and improvement of water quality within the springs and creeks. Short-term impacts due to implementation of the selected alternative would be mitigated through planning and scheduling all construction activities to prevent erosion and sedimentation.

There would be short-term adverse impacts on vegetation within this alternative. Mitigation measures are required to ensure the short-term adverse impacts would not become long-term adverse impacts. Actions in the selected alternative align with proposed projects in the *Vegetation Management Implementation Plan* (2014) and provide detailed guidance on the implementation of actions. The result is a long-term and positive impact on desired vegetation assemblages. Associated with vegetation is wildlife habitat which will be improved and expanded within the selected alternative, a long-term beneficial impact on wildlife within the park. The proposed vegetation management, including glade restoration and the removal of eastern red cedar will have a long-term beneficial impact on rare, threatened, and endangered species, in particular the Missouri bladderpod.

2. The degree to which the proposed action affects public safety and health.

The selected alternative will have beneficial effects on public health and safety. Overall, the selected alternative will have long-term beneficial impacts on visitor use and experience and safety due to increased interpretive opportunities, expanded education and communication, construction and realignment of trails, development of contemplative nodes with associated site furnishings and shade, and establishment of programs and strategies to manage and control the deer population.

3. Unique characteristics of the geographic area such as proximity to historic and cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas: As described in the EA, the selected alternative will not affect wild and scenic rivers, or ecologically critical areas because those resources do not exist at Wilson's Creek National Battlefield. Prime agricultural land is part of the landscape at the park. This resource is protected through existing and proposed vegetation management, including crop rotation, soil protection, and general preservation of land use with mitigation or BMPs required during short-term construction actions. The park will continue to survey for and identify potential historic properties within areas surrounding the park and proposed for ground disturbance.

4. Degree to which effects on the quality of the human environment are likely to be highly controversial.
The selected alternative is not highly controversial. No issues arose during public scoping or the preparation of the EA. No issues were brought to the park's attention during the public review period that indicated a dispute with either the methods or results of the environmental analysis.

5. Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks:
No highly uncertain, unique, or unknown risks were identified during the preparation of the EA or the public review period.

6. Degree to which the selected alternative may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
The selected alternative will not have a significant effect and does not establish a precedent for future actions with significant effects. In addition, the action will not represent a decision in principle about a future consideration with the potential for significant effects.

7. Whether the selected alternative is related to other actions with individually insignificant but cumulatively significant impacts.
No significant adverse cumulative impacts were identified in the EA. Likely future actions taken individually or collectively will result in no significant adverse effect on the human or natural environment due to phasing of projects, locations within specific small areas of the park, and use of mitigation measures during and after construction. Within some of the proposed actions, the incremental impact would be long-term and positive due to vegetation management strategies, prescribed burn procedures and mitigation, and trail removals and re-alignments that prevent ongoing and serious soil erosion. The incremental impact of the selected

alternative when added to other past, present, and reasonably foreseeable future actions will not be significant.

8. Degree to which the selected alternative may adversely affect districts, sites, highways, structures, or objects listed on the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

Effects of the selected alternative on cultural landscapes, historic buildings and structures, archeology, and historic viewsheds are long-term and beneficial. Benefits to the cultural landscape will be the reasonable balance achieved between the objectives for integration of the cultural landscape into the interpretive story and ongoing management objectives to protect and restore vegetation communities and rehabilitate glade communities. Benefits to historic buildings and structures will come from continued preservation, management, and maintenance to preserve their historical character, and expanded interpretation will incorporate additional maintenance to building and structure sites. Existing historical viewsheds will be maintained and others opened up, providing visual associations with the cultural landscape. All improvements will be designed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties,* reducing the potential for adverse impacts on the historic setting. No known archeological sites will be disturbed. To minimize potential adverse effects, surveys will be conducted prior to all ground-disturbing activities; monitoring for subsurface artifacts will be conducted during ground-disturbing activities in the park.

The park initiated consultation with the Missouri State Historic Preservation Office (SHPO) with a scoping letter sent on January 31, 2017. The SHPO was also sent an invitation to the public meeting held at the park on November 6, 2017, and received a copy of the Public Review draft of the EA for review and comment during the public review period from October 28th through November 28th, 2017. The SHPO responded with a letter of concurrence with the park determination of *no adverse effect* on historic properties in a letter dated December 7, 2017. The park also initiated consultation with the Tribal Historic Preservation Officer (THPO) in a letter dated October 13, 2017, that included maps, descriptions of the alternatives, and an invitation to comment on the Public Review EA posted on the PEPC site. Consultation was initiated with the Osage Nation, the Cherokee Nation, the Delaware Nation, the Absentee Shawnee Tribe, the Eastern Shawnee Tribe, and the Delaware Tribe. Elizabeth Toombs, Special Projects Officer for the Cherokee Nation Tribal Historic Preservation Office responded with a letter of concurrence with the park determination of *no adverse effect* on cultural resources, dated December 11, 2017.

No districts, sites, highways, structures, or objects listed on the National Register of Historic Places will be adversely impacted.

9. Degree to which the selected alternative may adversely affect an endangered or threatened species or its critical habitat.

In accordance with Section 7 of the Endangered Species Act, the park initiated consultation with the (USFWS) on January 31, 2017. The U.S. Fish and Wildlife Service offered comments pursuant to the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347),

and the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544). They provided a list of federally listed species, proposed species, candidate species and designated and proposed critical habitat identified as potentially present in Christian and Green counties (per the Service's website for the Midwest Region). The Service confirmed that the species that should be evaluated as part of the EA included: gray bat *(Myotis septentrionalis);* Indiana bat *(Myotis sodalist);* Northern long-eared bat *(Myotis septentrionalis);* Missouri bladderpod *(Lesquerella filiformis);* Virginia sneezeweed *(Helenium virginicum);* and Ozark cavefish *(Amblyopsis rosae).* The USFWS also received a copy of the Public Review Draft of the EA for review and comment. In an email response dated November 27, 2017, the USFWS concurred with the NPS finding of *no adverse effect* on threatened or endangered species.

10. Whether the selected alternative threatens a violation of federal, state, or local environmental protection law.

The selected alternative will not violate federal, state, or local environmental protection laws.

Public Involvement

Park staff at Wilson's Creek National Battlefield and resource professionals of the National Park Service Midwest Regional Office conducted internal scoping for the EA project. This interdisciplinary process defined the purpose and need, identified potential actions to address the need, determined the likely issues and impact topics, and identified the relationship of the preferred alternative to other planning efforts at the park. From previous planning efforts and development of resource documents, the park has a well-established list of stakeholders interested in the alternatives being proposed for the park. For the EA, the superintendent initiated public scoping on November 1, 2016. A news release was issued by the staff at Wilson's Creek National Battlefield on November 4, 2016 inviting the public to attend the open house and provide input in the early development of the alternatives and the subsequent EA process. The final draft of the EA went to public review for 30 days, October 28th through November 28th, 2017, and was uploaded on the NPS Planning, Environment, and Public Comment (PEPC) system website. A public meeting was held on November 6, 2017 to review the EA and the alternatives. Comments were collected from discussions and questions at the meeting, emails during the 30-day review period, and comments from the PEPC site. Comments and questions from members of the public were documented and taken into consideration as the EA was finalized. Agency review letters were received from the Missouri State Historic Preservation Office (SHPO), U.S. Fish and Wildlife Service (USFWS), and the Cherokee Nation Tribal Historic Preservation Office (THPO).

Conclusion

In light of the impacts described in the EA for the project and with guidance from NPS *Management Policies 2006,* natural and cultural resources information, professional judgment, and considering agency and public comments, the park has decided to implement the selected alternative, presented as Alternative 2 (Preferred Alternative) in the EA. Implementing the selected alternative will enhance the connection of the landscape to interpretive themes, the historic setting of the site, the visitor experience, and human health and safety, while preserving, protecting, and managing the cultural and natural resources of the park.

The selected alternative will not constitute an action that normally requires preparation of an Environmental Impact Statement (EIS) and, as noted above, impacts resulting from implementing the action will not have a significant impact on the natural, cultural, or human environment. There will not be significant impacts or effects on human health and safety, threatened or endangered species, historic properties listed on or eligible for listing on the National Register of Historic Places, or unique characteristics of the region.

No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative impacts or effects, or elements of precedence were identified during the impact assessment. Implementing the selected alternative will not violate any federal, state, or local environmental protections laws. The impacts that result from the selected alternative will not impair any park resources or values necessary to fulfill specific purposes identified in the park's enabling legislation. (See Attachment B: Determination of Non-Impairment)

I find that the preferred alternative does not constitute a major federal action significantly affecting the quality of the human environment. Therefore, in accordance with the National Environmental Policy Act of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508 et. seq.) an environmental impact statement will not be prepared for this project.

Recommended: _____ February 6, 2018

T. John Hillmer
Superintendent
Wilson's Creek National Battlefield

Date

Approved: _____ 2/13/18

Cameron H. Sholly
Regional Director, Midwest Region

Date

Attachment A: Mitigation Measures and Best Management Practices (BMPs)

Attachment B: Determination of Non-Impairment

ATTACHMENT A

MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES (BMPs)

The National Park Service (NPS) places strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts. The NPS would implement an appropriate level of monitoring throughout the construction and maintenance process, the prescribed burn management process, and the implementation strategy for control of the deer population within the park to help ensure that protective measures are being properly implemented and are achieving their intended results. These mitigation measures are applicable for contractors and park staff. The WICR staff and contractors would strive to maximize sustainable designs and management strategies to minimize potential adverse environmental effects. It is intended that the past and ongoing monitoring and mitigation measures would be continued upon implementation of the NPS-selected alternative and supplemented by those actions labeled as future monitoring guidelines and mitigation as needed.

Natural Resources

Past and Ongoing Monitoring and Mitigation Measures

- A sampling and analysis protocol established by NPS Heartland Inventory and Monitoring Network will be used to monitor the plant community over the long term.
- When sites are disturbed by maintenance or construction activities, park staff re-establishes vegetation based on inventories and monitoring by Heartland I&M, and recommendations in the *Vegetation Management Implementation Plan* (2014).
- Heartland I&M continues to monitor the white-tail deer population numbers and incidents of disease in the park. Heartland will also continue to monitor bird communities, aquatic invertebrates in Wilson's Creek, status of Missouri bladderpod, and the forest communities in the park.
- Wilson's Creek National Battlefield will continue to operate under its *Fire Management Plan* (2004). All monitoring and management procedures are outlined in detail in the management plan for prescribed burns in the park.

Future Monitoring and Mitigation Measures

- Best Management Practices (BMPs) are required to support the implementation and management of actions taken in the preferred alternative. Refer to established BMPs for forestry and water quality actions. The Missouri Department of Conservation, the Great Lakes States and U.S. and State Forest Services have well established BMPs.
- NPS will be required to monitor trail use/erosion and make adjustments on carrying capacity based on monitoring findings.
- Temporary barriers will be provided to protect existing trees and shrubs that are not identified for removal, specifically during clearing for battlefield viewsheds. Barriers will extend out to tree drip lines.

- Vegetative filter strips will be used to filter and clean sediment, organic material, nutrients, chemicals, and other pollutants from run-off water as it leaves a non-point source. Placed between pollution sources and water resources, these planted filter systems can effectively mitigate soil erosion and polluted runoff.

Cultural Resources

Past and Ongoing Monitoring and Mitigation Measures

- The condition of known archeological resources will be documented and monitored by staff for changes in condition and site-specific threats.
- Site condition assessments by a NPS-approved archeologist are part of project-specific surveys.
- Ongoing protection of archeological sites from disturbance will occur, except for investigations necessary to address important research questions, and to consider proposed new additions such as trails, interpretive exhibits, and vegetation management treatments.
- All archeological sites will be monitored to determine visitor safety and resource protection concerns.
- Water resource margins will be monitored for erosion and associated emerging archeological resources.
- Prior to all fire management activities, cultural resources will be identified and avoided to the extent possible.
- Mechanical treatments and prescribed fire will be used to reduce fuel loads near historical structures.
- Ongoing management focusing on retaining and enhancing the general historic character of the battlefield cultural landscape will be implemented.

Future Monitoring and Mitigation Measures

- Stabilization of known archeological resources affected by erosion is required by establishing and maintaining grass cover. Installation of erosion control measures such as textiles and grass using methods that do not further disturb subsurface resources are desirable. Avoid the use of material that is visually incompatible with the character of the areas, such as riprap or other large stone.
- It is required that all activities would comply with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (48 Federal register 44716, revised).
- Prior to any soil disturbing activities, a thorough geophysical baseline survey of the property is required and adequate archeological ground-truthing of the geophysical anomalies would be conducted to determine their nature, integrity, and extent.
- Known archeological resources in the vicinity of project activities will be identified and delineated for avoidance prior to project work.
- NPS will coordinate with the SHPO and tribal THPOs throughout the course of the project to protect and mitigate cultural resources affected by the action alternative.

- In establishment of viewsheds proposed in the preferred alternative, it is required that NPS engage an archeologist, natural resource specialist, and historical landscape architect to field-check the areas to be cleared and ensure that no cultural or natural resources will be adversely affected prior to removal of woodland vegetation.
- Vegetation management consistent with the National Battlefield's *Fire Management Plan* (2004), recommendations in the *Cultural Landscape Report* (2004), and the *Vegetation Management Implementation Plan* (2014), will be used in the implementation of the preferred alternative to modify the battlefield's appearance to resemble more closely the historic conditions.
- It is required that an invasive species control plan specific to the battlefield be an integral part of the actions implemented within the selected alternative.

Visitor Use and Experience

Past and Ongoing Monitoring and Mitigation Measures

- Incidences of human and wildlife interactions will be monitored.
- Visitation data will be monitored through various methods such as visitor surveys, transportation data, and concessioner data.
- Periodic visitor surveys and data collection will be used to determine visitor use patterns, visitor characteristics, visitor use conflicts, and visitor preferences and satisfactions with interpretive and recreational opportunities, programs, services and facilities.
- Resource condition surveys will be conducted as needed.
- Monitoring all prescribed fires that have the potential to impact visitor experience.
- Continued management of the battlefield cultural landscape will provide visitors with an insight in the general conditions that the combatants encountered on August 10, 1861 and would facilitate the visitor's understanding of the dynamic course of this battle.
- NPS managers will continue to monitor areas used by visitors for signs of native vegetation disturbance, trampling, trail erosion, or the development of social trials.
- Existing facilities will be retro-fitted and new facilities designed to meet Leadership in Energy and Environmental Design (LEED) standards to demonstrate the NPS commitment to protect our natural and cultural resources for future generations.

Future Monitoring and Mitigation Measures

- During establishment and clearing for viewsheds, educational and/or interpretive information will be provided to park employees and visitors on the value of clear-cutting to rehabilitate habitats and improve views important to interpreting events of the Battle of Wilson Creek.
- In interpreting missing 1861 farmsteads, it is required that vegetation be mowed, which offers the visitor a strong visual aid to understanding the location and importance of each farmstead to the 1861 battle. Split rail fencing in conjunction with mowing, or separately, will offer another strong visual aid for interpreting missing farmsteads.

- Visitor use and access to areas of highly sensitive and vulnerable cultural or natural resources requires mitigation measures. Appropriate activities in these areas will be limited to research and passive recreational uses such as hiking. Interpretive programs and exhibits will provide information and interpret ongoing research activities.

Human Health and Safety

Past and Ongoing Monitoring and Mitigation Measures

- The general public will be informed of wildland fires and prescribed fires through press releases and general interpretive presentation.
- No public access will be allowed to any areas affected by fire.
- Appropriate regulatory and/or enforcement agencies will be notified prior to any prescribed burns to assist in safely managing pedestrian, equestrian, or vehicular traffic. Warning signs will be posted along roads and trails, as necessary.
- Prior to prescribed fires, notification of nearby residents will be carried out. During burns, signs will be posted along all roads and trails, and park staff will be posted at roads that could be impacted by smoke to divert motorists to other routes.

ATTACHMENT B

DETERMINATION OF NO IMPAIRMENT

Environmental Assessment for Cultural Landscape Report Implementation

Wilson's Creek National Battlefield
Republic, Missouri

National Park Service (NPS) *Management Policies 2006 (§ 1.4)* requires analysis of potential effects to determine whether or not actions will 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, mandates the NPS 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 NPS management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of the park, although that discretion is limited by the statutory requirement that the NPS must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, will harm the integrity of park resources or values, including the opportunities that otherwise will be present for the enjoyment of those resources or values. Non-resource topics are generally not subject to impairment assessment. Whether an impact could lead to impairment depends on the particular resources that will 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 will 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 the 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 may 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.

An impairment determination is not made for all resource impact topics analyzed for the Selected Alternative. An impairment determination is not made for land use, visitor use and experience, and visitor health and safety because impairment findings relate back to park resources and values. These impact areas

are not generally considered to be park resources or values according to the Organic Act, and cannot be impaired in the same way that an action can impair park resources and values.

Soils and Geology

There would be no impact to geologic resources. There will be a number of disruptions to surface soils due to construction and grading within the selected alternative. Most impacts are associated with specific small areas of the park and impacts would be limited to the duration of project implementation and completion. Mitigation measures will ensure negligible effect on soils. Thinning and clearing of woodland is considerable in the selected alternative for establishment of interpretive nodes and historic viewsheds. Tree removal is anticipated to lead to soil disturbance and erosion, particularly for removal of woodland and management of bottomland woods. Once new savanna-like conditions are established, soil erosion and disturbance would be abated. Overall negligible or minor adverse impacts to soils would be expected. Long-term beneficial impacts to soils would be expected due to vegetation management techniques for soil stabilization, design of trail alignments, and use of filter strip and vegetated swales beside the road to slow down water infiltration and pollutant movement into the groundwater or streams. The short-term adverse effects on soils will not diminish its role in fulfilling the park's purpose of preserving and interpreting the natural and cultural history, and the natural integrity of the national battlefield. Therefore, the selected alternative will not impair geology and soil resources.

Prime and Unique Agricultural Land

Approximately 908 acres fall into the category of prime and unique agricultural land or soils of state importance. Most of the acreage that falls in the Peridge silt loam category is currently being farmed as hay fields (Sharp cornfield and Sharp stubblefield), as is some acreage that falls in the Secash-Cedargap, Wilderness, and Pembroke categories (Gibson oatfield and Ray cornfield and orchard). These existing areas of cropfield will remain within the selected alternative, thus preserving the prime agricultural soils. The remainder of the prime agricultural lands are preserved through establishment of warm season grass fields within historic crop field areas. None of the ground disturbing actions in the selected alternative would change the agricultural land use that maintains these soils, and there would be no threat to soil fertility or its natural physical features. Adverse impacts to prime agricultural lands would be negligible. Implementation of mitigation measures would ensure the viability and quality of the soils. Therefore, the selected alternative will not impair prime and unique agricultural land.

Water Resources and Floodplains

There would be long-term beneficial impacts to water resources with the implementation of the selected alternative. Contributing to the positive effects are the restoration of the riparian buffers along stream corridors and restoration of the watershed. Disturbance from proposed clearing of vegetation for expanded interpretation, trails, and trail crossings would be short-term and sediment run-off into streams would be limited once the soils are stabilized and integrated into the larger vegetation management strategies within the park. Actions within the selected alternative would not cause changes in the ability of the floodplain to convey floodwaters and effects on its values and functions would be undetectable. Actions would not contribute to enhancing flood events. With mitigation measures and monitoring and BMP strategies, there

would be negligible adverse impacts to water resources and floodplains. Thus, the selected alternative will not impair the floodplains or stream banks associated with the waterways in the park.

Water Quality

Protection of surface water and ground water is a management priority and currently water quality has shown improvement since the *Natural Resources Condition Assessment,* (2009). Protection of water resources would continue and there would be targeted efforts at restoration of the riparian buffer in the stream corridors and management for restoration of the watershed. The selected alternative provides the opportunity to further enhance water quality and ensure it meets and exceeds the standards required into the foreseeable future. Long-term beneficial impacts to water quality would be expected due to vegetation management techniques, slope stabilization, and riparian buffer restoration. Localized impacts due to specific construction projects would be minor with the incorporation of mitigation measures and project phasing. Thus, the selected alternative will not impair water quality because it will remain in its existing good condition and continue to get better and will contribute to the interpretation of the cultural landscape.

Vegetation

Actions associated with implementation of the selected alternative would have ground-disturbing actions, but resulting impacts would be short-term and minor to vegetation. Impacts would not threaten the viability of plant communities or native plant species and the sites would quickly recover from temporary disturbance. Mitigation measures are required to ensure that short-term impacts are minor and do not extend to long-term impacts. Mitigation would include selection of appropriate staging locations for equipment and materials for all projects, and erosion and sediment control measures would be incorporated during any construction. Rehabilitating savanna communities is compatible with and should be done in conjunction with rehabilitation of glades, establishment of riparian buffers, establishment of filter strips, and the re-establishment of critical viewsheds. The recommended vegetation management and park-wide coordination in the selected alternative would have long-term beneficial impacts on vegetation by establishing desired communities. At Wilson's Creek National Battlefield, invasive species have reduced species biodiversity and altered the natural systems that once sustained the native landscapes. It is required that an invasive species control plan specific to the battlefield be an integral part of the actions implemented within the selected alternative. This would have a long-term beneficial impact on desired native vegetation. The overall impact from the selected alternative will be beneficial and will modify the vegetation to improve its role in fulfilling the park's purpose of preserving or interpreting the history of the battlefield landscape and preserving unique natural resources. Thus, the selected alternative will not impair vegetation resources.

Wildlife

There would be no long-term adverse impacts on wildlife and wildlife habitat from the actions within the selected alternative. Most impacts would be associated with specific proposals for trail development, expanded interpretation and extensive vegetation management. Due to vegetation management recommendations within the selected alternative, wildlife habitats will be improved and expanded.

NPS has established a deer density goal that would be used as a target to reduce deer numbers as a part of the management action within the selected alternative. Deer density goals and subsequent management strategy for population reduction would have a beneficial impact on the overall health and condition of the

remaining herd. Target density numbers would be designed to protect the survival of the species within the park without threatening the viability of the deer population. The proposed management strategies for reduction of the deer population within the park include direct lethal reduction using fire arms or archery equipment. Actions necessary to facilitate sharp shooting may include: setting up bait stations, locating deer, sharpshooting, and processing and disposition of deer meat and carcasses. These actions are subject to mitigation measures to ensure human health and safety, the quality of the visitor experience and access to the park, and clear communication to the public of the actions taking place. These actions would have a long-term beneficial impact on the white-tailed deer population and health. Mitigation measures ensure the impacts are positive for the deer reduction as well as for visitor use, safety, and experience within the park. Thus, the selected alternative will not impair wildlife resources.

Threatened and Endangered Species

The proposed vegetation management and maintenance and the inclusion of glade restoration and removal and management of eastern red cedar will have a long-term beneficial impact on rare, threatened, and endangered species, in particular the Missouri bladderpod. Although scarcely resembling their former extent or character, the glades still retain a number of lichens and herbaceous plant species requiring conservation and should be classified as significant natural features to be protected. With proper management, these areas will become healthier, and increase the habitat potential for the endangered Missouri bladderpod. Vegetation management regimes for McElhaney branch cave and Manley Woods and other forest and woodland vegetation would have long-term beneficial impacts on the Gray bat, the Indiana Bat, the Northern long-eared bat, the Ozark cavefish, and the Virginia sneezeweed and their potential habitats within the park. Also, actions providing enhancement of riparian buffers, protection of the floodplain, and prevention of sediment runoff all improve water quality and thus the habitat for all of the rare, threated, and endangered species within the park. As a result, the selected alternative will not impair rare, threatened, or endangered species within the park.

Air Quality

Air quality in the area is generally good; the park and surrounding areas are in attainment for all National Ambient Air Quality Standards. Specific actions resulting from the implementation of the selected alternative and associated with effects on air quality include management strategies using prescribed burning for establishment and restoration of vegetation communities. The prescribed burning would have a short-term adverse impact on air quality; however, due to established guidelines and mitigation measures in the *Fire Management Plan (2004)* and the mitigation measures in the EA, there would be no long-term effects on air quality. Prescribed burns are normally of short duration and have little effect on air quality past the initial burning period. Thus, the selected alternative will not impair the air quality of the park.

Archeological Resources

The selected alternative includes some ground disturbance associated with the implementation of some of the proposed actions. Examples include: trail expansion and trail realignment; installation of interpretive waysides, cannon, and orientation exhibits; clearing vegetation for restoration of historic viewsheds; and establishment of a new tour road stop #1. Overall, known archeological resources are included in the existing policies and processes implemented by the park for protection of cultural resources. Actions in the selected

alternative would not disturb any known archeological sites that may be potentially eligible for nomination to the National Register. The ground disturbing activities within the selected alternative have the potential to encounter and adversely impact previously unknown archeological resources. Adverse effects would be minimized by pre-construction surveys and monitoring in the areas with high potential for artifacts. The EA presents mitigation measures for the protection of unknown archeological resources and for the use of prescribed burning and potential impacts on archeological resources. These mitigation measures include: efforts to avoid damage to identified resources during suppression and prescribed fire operations; involvement of archeologists or cultural resource specialists in all operations to the maximum extent feasible; development of a thorough geophysical baseline survey of the property prior to any soil disturbing activities; ground-truthing of the geophysical anomalies to determine their nature, integrity, and extent; and NPS will coordinate with the SHPO and the tribal THPOs throughout the course of the project to protect and mitigate archeological resources affected by the selected alternative. With the implementation of the mitigation measures and guidelines, the selected alternative would have no adverse effects on unknown archeological sites. Therefore, the selected alternative will not impair archeological resources within the park.

Historic Buildings and Structures

Current management regimes will continue in the selected alternative and include repair and maintenance to deteriorated historic buildings, structures, and features on the battlefield landscape. Also included is the maintenance and management of the Edgar and Manley cemeteries. Management goals are to protect and preserve the historic features that survive from the Civil War period, including the Ray house and spring house and various roads and trails. Preservation, protection, and maintenance of buildings and structures surviving form the 1861 – 1960 period of significance is ongoing. Expanded interpretation that includes historic buildings and structures within the cultural landscape would have a long-term beneficial impact on these cultural resources. The cultural landscape and historic buildings and structures are necessary to fulfill the park's purpose and are key to its cultural integrity and considered significant site resources. Thus, the selected alternative will not impair historic buildings and structures within the park.

Cultural Landscapes

Specific actions resulting from the implementation of the selected alternative accomplish objectives to protect and restore native plant communities, restore and enhance critical viewsheds, restore riparian corridors and their function, establish field and historic vegetation exhibits, and interpret missing 1861 farmsteads, all while controlling invasive vegetation within the park identified in previous documents. Impacts to the cultural landscape would be long-term and beneficial due to vegetation management and expanded interpretation that integrates the cultural landscape into the interpretive story of the site. Visitors would be able to see and understand the role of the landscape in the Battle of Wilson's Creek. Therefore, the selected alternative will not impair the Wilson's Creek National Battlefield cultural landscape.

Historic Viewsheds

Re-establishment of ten critical viewsheds associated with the Civil War landscape is proposed within the selected alternative to support the interpretation of the Battle of Wilson's Creek. Where views are particularly critical to interpreting the events of the 1861 battle, the action would proceed with clearing and thinning operations prior to vegetation community rehabilitation to establish these new corridors as soon as

possible. As other treatment actions are implemented, a strong sense of what troops saw on the landscape during the battle will become apparent. Restoration of historic viewsheds will have long-term beneficial effect on the cultural landscape as a result of expanded interpretation of the historic context of the battle, battle events, and troop movements across the landscape. Thus, the selected alternative will not impair visual resources.

Cultural Landscape Report Implementation/ Environmental Assessment
Wilson's Creek National Battlefield
Republic, Missouri

Executive Summary

The United States Department of the Interior National Park Service (NPS) is considering a series of actions in association with the treatment recommendations developed in the 2004 Cultural Landscape Report (CLR) for Wilson's Creek National Battlefield in order to balance future park requirements for protection of the battlefield through integrated cultural and natural resource management with enhancement of commemorative and contemplative qualities through installation of contemporary features and activities for visitor enjoyment, comfort, and safety. Wilson's Creek National Battlefield encompasses 2,369 acres and preserves 2,011 acres of the battleground; 172 acres are protected by Ozark Greenways, Inc., in easement outside park boundaries. The battlefield is located approximately 10 miles southwest of Springfield, Missouri in Greene and Christian counties. The purpose statement for Wilson's Creek National Battlefield was drafted through a careful analysis of its enabling legislation and the legislative history and influenced its development. The park was established when the enabling legislation adopted by Congress was signed into law on April 22, 1060. 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.

This environmental assessment (EA) describes and analyzes two alternatives. One Action Alternative was developed and the required No Action Alternative. Potential impacts and recommended mitigation measures related to their implementation were analyzed. Short-term construction-related impacts and long-term impacts, as well as cumulative impacts were addressed.

Purpose and Need for Action

The purpose of the proposed action is to help fulfill the mandate of protection and management of fundamental park resources and values including the cultural landscape and features present at the time of the Battle of Wilson's Creek or evocative of the landscape that those present at the battle would have experienced. Changes made through the implementation of the action alternative will provide park visitors with a stronger understanding and meaningful relationship to the Civil War Battle fought onsite. It will also provide park visitors with additional enjoyable outdoor experiences that will coincide with enhanced stewardship of the park's significant natural and cultural resources.

Project Objectives

The project objectives are specific steps toward fulfilling the purpose and must be achieved to a large degree for the project to be considered a success. The Park, in its examination of the issues and needs driving the project, has identified the following primary objectives for the project:

1. Consideration of visitor safety needs associated with the interface of deer and visitor use of the park and surrounding roads.

2. Regeneration of existing vegetation within in the park in association with development of a program that reduces white-tail deer population within the park.

3. Development of prioritized and aggressive management of cultural resources and features that respect the issue of sustainability.

4. Development and installation of new wayside exhibits needed to convey accurate and compelling battlefield stories.

5. Relocation of specific trail segments that regularly erode and require repair.

6. Management of different vegetation communities through use of prescribed fire, grazing, mowing, and herbicide application in specific areas, using specific protocols.

7. Management of Eastern redcedar *(Juniperus virginiana)* currently shading out glade habitat areas.

8. Rehabilitation of glade areas to promote habitat for the federally-listed threatened Missouri bladderpod *(Lesquerella filiformis)*.

9. Management of crop exhibits and orchard exhibits with deer presence in the park.

10. Development and installation of new trails, interpreted viewsheds, contemplative/interpretive nodes, and exhibit design for cultural features present at the time of the battle but no longer extant.

Alternatives

The No Action alternative and one Action alternative were analyzed for this environmental assessment.

Alternative 1: No Action – The No Action alternative consists of continuing existing and ongoing management strategies and includes CLR recommendations implemented since 2004.

Alternative 2: Action and NPS Preferred – This alternative implements remaining CLR treatment recommendations and includes a program for management of the white-tail deer population, expanded interpretive trails, waysides, cannons, viewshed, and contemplative nodes, and vegetation management strategies based on the *Vegetation Management Implementation Plan* (2014) and interpretive programs indicated in the *Long Range Interpretive Plan* (2005).

Impact Topics Analyzed

The following impact topics were analyzed in this environmental assessment to determine the potential effects that would occur as a result of implementation of each of the alternatives:

- Soils and Geology
- Prime and Unique Agricultural Lands
- Water Resources and Floodplains
- Water Quality
- Vegetation
- Wildlife
- White-tailed Deer
- Threatened and Endangered Species
- Air Quality
- Archeological Resources
- Historic Buildings and Structures
- Cultural Landscapes
- Historic Viewsheds
- Visitor Use and Experience
- Human Health and Safety

No impairment to park resources and no adverse effects per the Section 106 process is expected under the proposed alternatives. Please refer to **Table 2-1** through **2-4** for descriptions of proposed mitigation measures.

Environmental Review Process

Following public review of this plan and assessment of public comments, either a finding of no significant impact (FONSI) or a notice of intent to prepare an environmental impact statement will be prepared. If a FONSI is prepared, it would document the NPS selection of an alternative for implementation, include any necessary errata sheet(s) for factual changes required in the document and would include responses to substantive comments by agencies, organizations, and the general public. Once the FONSI is signed by the NPS regional director it would be made available to the public. Implementation of the selected action would occur as resources allow.

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Chapter 1

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1-2 The Ray House and orchard offer interpretive opportunities that enhance the visitor experience.

Chapter 2

2-1 The entrance drive, visitor center parking area, and tour road would remain the primary visitor access route to experience park resources.

2-2 Parking for equestrian trailers would remain in the current location, southeast of the Ray House.

2-3 Existing battlefield overlooks would continue to be managed for clear sight lines. No new historic viewsheds for interpretation would be cleared as part of this alternative.

2-4 Maintenance of existing landcover character and patterns would continue in this alternative.

2-5 Existing fence-lines, vegetation stands, and mown grasses would be maintained.

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3-1 View of Wilson's Creek from the tour road. The streambed in this area has steep banks edged by low vegetative cover and scattered trees.

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3-3 Ray house survives from the Civil War period.

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3-5 The visitor center at Wilson's Creek National Battlefield provides visitor orientation and exhibits.

3-6 A picnic area is located south of the visitor center.

3-7 Horseback riding is a popular recreational activity on the equestrian trails provided by the park.

3-8 Cyclists use designated lanes along the tour road within the park.

3-9 Trail surfaces are susceptible to water flow damage and could pose a safety hazard.

3-10 Park staff continually maintain trails and other furnishings, signage, and buildings for the health and safety of visitors.

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Chapter 1 – Purpose and Need

1.1 Introduction

The National Park Service (NPS) is considering a series of actions in association with the treatment recommendations developed in the 2004 Cultural Landscape Report (CLR) for Wilson's Creek National Battlefield. Implementation of these actions requires the NPS to undergo compliance and review through preparation of an Environmental Assessment (EA) to determine the potential impacts under the National Environmental Policy Act (NEPA). This document is intended to fulfill this need.

In September 2004, a CLR was prepared for the park that included treatment recommendations and guidelines to provide park staff with a long-term vision for protecting, managing, sustaining, and interpreting the park's cultural landscape. The treatment recommendations for Wilson's Creek National Battlefield provide resource protection measures for the site as well as specific guidance for individual resources. A number of treatment recommendations have been implemented since 2004 and are part of the current existing conditions within the park. Actions implemented since 2004 were determined as categorically excluded or were addressed incrementally through the NEPA compliance process and determined to have no adverse environmental impacts. (Implemented projects are described in detail in the Updated CLCR that comprises Appendix A of this document.) The CLR treatments and actions strive to balance park requirements for protection of the battlefield through integrated cultural and natural resource management with enhancement of commemorative and contemplative qualities through installation of contemporary features and activities for visitor enjoyment, comfort, and safety.

The purpose for preparing the EA is to identify and disclose the potential impacts of a reasonable range of alternatives developed to address remaining actions not yet implemented from the CLR and in association with the *Natural Resource Management and Inventory Monitoring Program* plans focused on native vegetation and white-tailed deer (*Odocoileus virginianus)* population, and the *Vegetation Management Implementation Plan* (2014). The EA facilitates identifying one "Action Alternative" plus determining the potential impacts and recommended mitigation measures related to its implementation. As part of an EA, describing a "No Action Alternative" is required by the Council on Environmental Quality (CEQ). The EA addresses short-term construction-related impacts and long-term impacts, as well as the cumulative impacts that would result from this and other projects that have been recently completed, are currently under development, or proposed within the park.

Overall actions addressed as part of the EA process include:

- Rehabilitation and restoration of the natural systems to support preservation of the site's cultural resources and historic integrity;
- Enhancement of visual accessibility through the removal of the existing weedy thickets and densely wooded areas;
- Rehabilitation of historic prairie and savanna plant communities and rehabilitation of the glade communities;
- Reduction in the number of resident deer to meet carrying capacity targets; and
- Development and installation of trails, wayside exhibits, cannons, viewsheds, and contemplative nodes;
- Construction of an equestrian parking area to enhance recreational opportunities.

The NPS has prepared the EA in compliance with NEPA [1969, as amended], CEQ regulations implementing NEPA [40 Code of Federal Regulations (CFR) 1500-1508], the National Historic Preservation Act (NHPA) [1966, as amended], NPS Director's Order 12 (as reflected in the Director's Order 12 Handbook); and Section 106 of the NHPA, and implementing regulations, 36 CFR Part 800. The NEPA process is being used to comply with Section 106.

1.2 Relationship to Park Planning Efforts

The planning team relied on the park's previous planning documents for guidance in developing the alternatives. Documents include: *CLR* (2004); *General Management Plan (GMP)* (2003); *GMP Amendment* (2007); *Long-Range Interpretive Plan* (2009); *Vegetation Management Implementation Plan* (2014); *Fire Management Plan and Environmental Assessment* (2004); and *Deer Inventory and Monitoring Data* (NPS Heartland Inventory & Monitoring Network (2005 – Present/Ongoing). Combined, these documents provide Wilson's Creek National Battlefield with a vision and clear direction for the protection of the park's cultural landscape in order to sustain long-term management and interpretation and the preservation of the overall character of the park with priorities on natural and cultural resource conditions and visitor use and experiences.

1.3 Park Background

Wilson's Creek National Battlefield encompasses 2,369 acres and preserves 2,011 acres of the battleground; 172 acres are protected by Ozark Greenways, Inc., in easement outside park boundaries. The battlefield is located approximately 10 miles southwest of Springfield, Missouri, in Greene and Christian Counties. Most visitors drive along the 4.9-mile tour road, which features eight tour stops where the major historic points of the battle are interpreted. The park is popular not only as an historic site, but for recreational uses such as horseback riding, hiking, biking, and jogging.

Interpretation and visitor services are focused at the visitor center, which offers a 30-minute film about the battle, exhibits related to the battle and the Civil War in the Trans-Mississippi theater, a gift shop, rotating interpretive exhibits, and a multipurpose room used for special programs and exhibits.

1.4 Park Purpose and Significance

The purpose statement for Wilson's Creek National Battlefield was drafted through a careful analysis of its enabling legislation and the legislative history that influenced its development. The park was established when the enabling legislation adopted by Congress was signed into law on April 22, 1960. The purpose statement was changed in the *GMP Amendment* (2007) as a result of the addition of the General Sweeny Museum collections that allowed the park to interpret the battle within the context of the Trans-Mississippi theater.



Figure 1-1: *Artifacts and archival collections are housed in the Wilson's Creek National Battlefield Visitor Center and Museum.*



Figure 1-2: *The Ray House and orchard offer interpretive opportunities that enhance the visitor experience.*

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.[1]

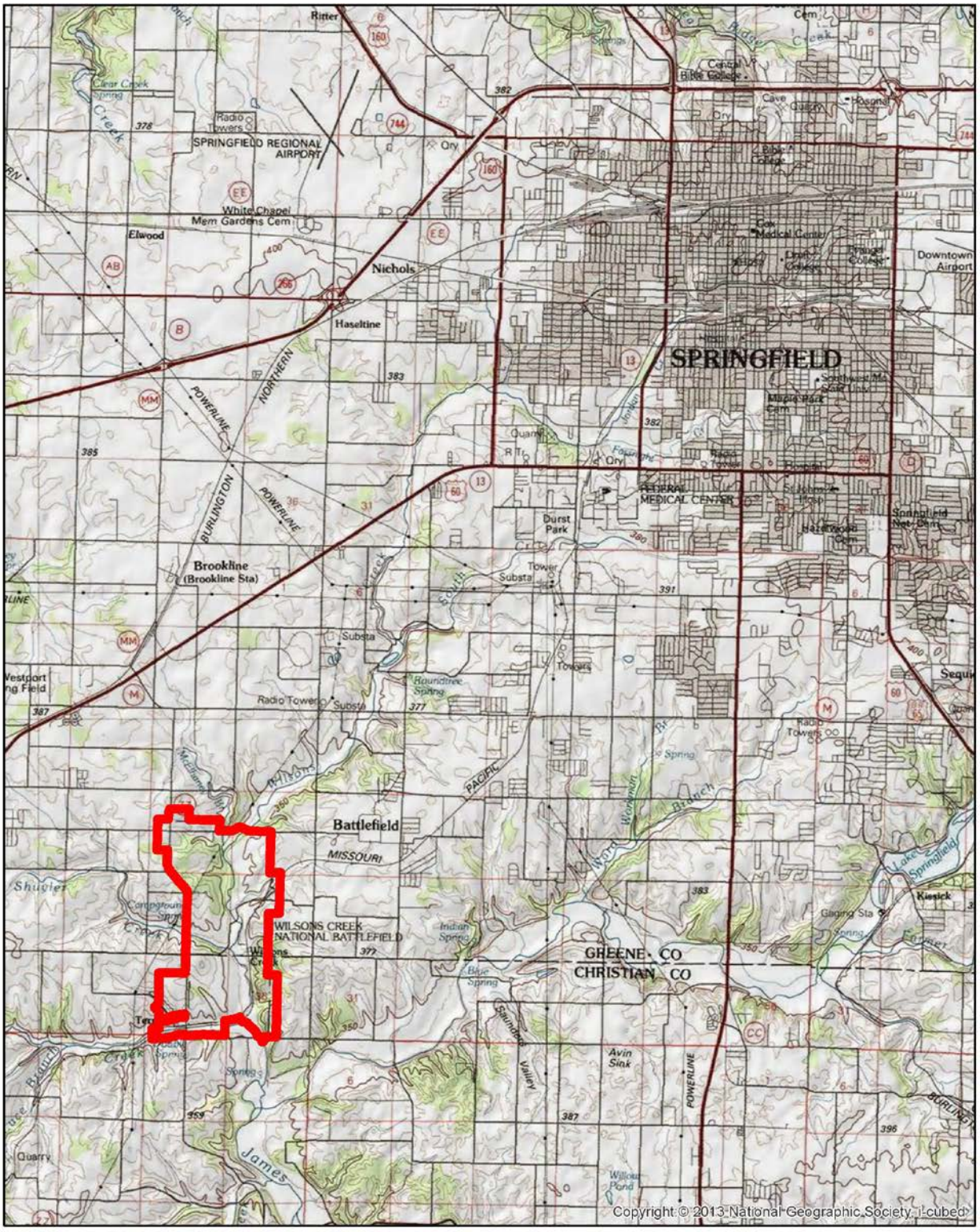
The *GMP Amendment* (2007) outlines the park's primary significance as the following:

- 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 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.

1.5 Purpose and Need for the Plan

The purpose of the proposed action is to help fulfill the mandate of protection and management of fundamental park resources and values including the cultural landscape and features present at

[1] National Park Service, *Foundation Document Wilson's Creek National Battlefield Missouri* (January 2017), 5.



Wilson's Creek National Battlefield Boundary 2017

Map 1-1 *Boundary Depicted on U.S.G.*

the time of the Battle of Wilson's Creek or evocative of the landscape that those present at the battle would have experienced.[2]

The *CLR (2004)* provided treatment recommendations and guidelines articulating a vision for Wilson's Creek National Battlefield that addressed protection of the park's cultural landscape in order to sustain long-term management and interpretation. Although the CLR was not intended to duplicate the work of a long-range interpretive plan, the connection between management of the park's cultural, natural, and historic resources and interpretation became a focus of the treatment recommendations. Changes made through the implementation of treatment recommendations will provide park visitors with a stronger understanding and meaningful relationship to the Civil War Battle of Wilson's Creek. Proposed changes will also provide park visitors with additional enjoyable outdoor experiences that will coincide with enhanced stewardship of the park's significant natural and cultural resources.

The project is needed to accomplish the following objectives:

- Consideration of visitor safety needs associated with the interface of deer and visitor use of the park and surrounding roads
- Regeneration of existing vegetation within the park in association with development of a program that reduces white-tail deer population within the park
- Rehabilitation of glade areas to promote habitat for the federally-listed threatened Missouri bladderpod (*Lesquerella filiformis*)
- Management of crop exhibits and orchard exhibits with deer presence in the park
- Development of prioritized and aggressive management of cultural resources and features that respect the issue of sustainability
- Consideration of haying as one of the tools of sustainable vegetation management, including within warm season grass fields
- Development and installation of new wayside exhibits needed to convey accurate and compelling battlefield stories
- Relocation of specific trail segments that regularly erode and require repair
- Management of different vegetation communities through use of prescribed fire, grazing, mowing, and herbicide application in specific areas, using specific protocols
- Management of Eastern redcedar (*Juniperus virginiana*) currently shading out glade habitat areas
- Development and installation of new trails, interpreted viewsheds, contemplative/interpretive nodes, and exhibit design for cultural features present at the time of the battle but no longer extant

1.6 Public Process

[2] Ibid., 7.

An internal scoping meeting was held at Wilson's Creek National Battlefield on November 14–15, 2016, and included NPS and park staff and the project team members from Commonwealth Heritage Group and Liz Sargent HLA. The meeting focused on CLR treatment recommendations implemented since 2004, implications for the EA, and park goals, objectives, and needs identified since 2004 to be accommodated in the preferred alternative. Stakeholder groups were identified in the meeting and include the following:

- Executive Director, Ozark Greenways, Incorporated, Springfield, Missouri
- Southwest Missouri Council of Governments, Springfield, Missouri
- Judith Deel, Archeologist, Missouri Department of Natural Resources (SHPO), Jefferson City, Missouri
- Missouri Department of Conservation (MDC)
- Missouri Department of Transportation (DOT), District 8
- Greene County Highway Department, Springfield, Missouri
- City Administrator, City of Republic, Missouri
- Transportation Department, City of Springfield, Missouri
- Department of Planning and Development, City of Springfield, Missouri
- U.S. Fish and Wildlife Service (USFWS)
- Tribal Historic Preservation Officers (THPO) and American Indian tribe representatives
- Springbike Bicycle Club, Springfield, Missouri
- Wilson's Creek National Battlefield Foundation
- Equestrian groups
- Republic School District
- Air Quality, Water Quality, Waste Management, City of Springfield, Missouri
- Fort Leonard Wood Training Center
- Civil War Trust
- Sons of Union Veterans
- Sons of Confederate Veterans
- Civil War Roundtable

A public open house was held at the Wilson's Creek National Battlefield Visitor Center on the evening of November 15, 2016. The purpose of the open house was to introduce the project to interested friends, neighbors, visitors, and recreational users of the park and provide the project team and park staff additional input from the community. One person attended the meeting and contributed insight and suggestions for the expansion and or realignment of some equestrian trails. The park superintendent also received email comments from members of the community unable to attend the public meeting at the park.

Informal consultation with USFWS and the Missouri SHPO was initiated on January 31, 2017. Letters were sent from the park to both agencies, serving as notification that the park had begun

the NEPA process and were proposing to have an EA available for public and regulatory review in the fall of 2017. (See Chapter 5: Consultation and Coordination for more detailed information)

Public input received during scoping was important in the development of the alternatives. The public scoping process helped the planning team understand the public's values and preferences regarding visitor experiences in the park including their concerns, issues and suggestions related to recreational use of the park, trail alignments and conditions, and deer management.

All identified stakeholders received letters of invitation to the November 6, 2017, public meeting to review the draft EA.

1.7 Impact Topics

Impact Topics Retained for Analysis

Impact topics are the resources of concern that may be affected by the range of alternatives reviewed in the EA. Specific impact topics were developed to ensure alternative comparison was based on the most relevant issues. Impact topics are derived from issues raised during scoping and from NPS guidelines concerning topics that should be taken under consideration when conducting NEPA and Section 106 analysis.

The following impact topics were retained for further analysis: soils and geology, prime and unique farmland, water resources/floodplains, water quality, vegetation, wildlife, white-tailed deer, threatened and endangered species, air quality, archeological resources, historic buildings and structures, cultural landscapes, historic viewsheds, visitor use and experience, and human health and safety. A brief rationale for the selection of each impact topic is provided and each impact topic is further discussed in detail in Chapter 3: Affected Environment.

Soils and Geology. The NPS actively seeks to understand and preserve the soil resources of parks, and to prevent to the extent possible, the erosion, physical removal, or contamination of the soil or its contamination of other resources. There is potential for soil disturbances from the implementation of the alternatives. Therefore, this topic was retained for further analysis.

Prime and Unique Agricultural Lands: Prime farmland soils and soils of statewide importance have been determined to be found at Wilson's Creek National Battlefield. Approximately 908 acres fall into the category and are currently being farmed as hayfields or other crop exhibits. Therefore, this topic was retained for further analysis.

Water Resources and Floodplains. There are six unnamed springs within the park including the Double Spring parcel added along the southwestern corner in 2006. There are also three streams resent within the park—Wilson's Creek, Terrell Creek, and Skegg's Branch. Flooding has periodic effects on the creek beds and adjacent vegetation and results in erosion and scoured or buried river banks. The watershed hydrology can be further affected by implementation of the alternatives. Therefore, this topic was retained for further analysis. Wetland mapping from USFWS shows wetlands associated only with the creeks and branches and their associated floodplains.

Water Quality. Treatment recommendations in the alternatives would impact water quality. Because of the ongoing concern for the conditions in Wilson's Creek, this topic was retained for further analysis.

Vegetation. Currently, the vegetation of Wilson's Creek National Battlefield is approximately half open grassland and shrub land and half woodland and forest, about 90 percent of which is deciduous. Small, open glades support unique plant communities, while prairie restoration efforts have helped establish native warm-season grasses in some areas. Vegetation within the picnic area and the visitor center/museum complexes is more ornamental in character, with some native and some introduced tree and shrub species. The park also contains stands of invasive non-native vegetation that has proven challenging to control. Vegetation disturbance would occur and the introduction of more invasive non-native species is possible from activities implemented in the alternatives. Therefore, this topic was retained for further analysis.

Wildlife. The landscape of Wilson's Creek National Battlefield supports a variety of wildlife. Disturbances from the implementation of the action alternative would impact critical wildlife and associated habitat. Therefore, this topic was retained for further analysis.

White-tailed Deer. Due to increased development, altered ecosystems, and concerns over visitor safety at Wilson's Creek National Battlefield, the deer population at the park has been monitored since 2005. Because of the growth in the deer population since 2005, there continues to be accidents in the park due to the collisions of deer with vehicles and bicycles. Deer also destroy vital vegetation within the cultural landscape of the battlefield. Initiation of a program that diminishes deer population in the park is prescribed within the action alternative. Therefore, this topic was retained for further analysis.

Threatened and Endangered Species. Species of concern (both flora and fauna) are present at Wilson's Creek National Battlefield. Disturbances due to the implementation of the alternatives would impact critical species on the site and within the site's regional context. Therefore, this topic was retained for further analysis.

Air Quality. Wilson's Creek National Battlefield is designated as a Class II quality area, defined as an area of the country set aside under the Clean Air Act but identified for somewhat less stringent protection from air pollution damage than Class I areas. The Missouri Department of Natural Resources Southwest Region, exempts authorized agencies in Christian and Green counties from permitting requirements for the use of prescribed fire for natural resource purposes. Due to vegetation management techniques including prescribed fire outlined in the alternatives, this topic was retained for further analysis.

Archeological Resources. Ground-disturbing construction activities and vegetation removal associated with implementation of the treatment alternatives have the potential to impact known and as yet undiscovered archeological resources. Therefore, this topic was retained as cultural resources for further analysis.

Historic Buildings and Structures. The future of historic structures within the landscape of Wilson's Creek National Battlefield are key issues. Therefore, historic buildings and structures are retained as cultural resources for further analysis.

Cultural Landscapes. The preservation and integration of the cultural landscape into visitor use and experience of the park and the interpretation of the landscape are key concerns in the CLR, which contains several treatments and actions. Some actions may require ground disturbances or removal of vegetation with potential impact to the cultural landscape of the park. Therefore, this topic was retained as cultural resources for further analysis.

Historic Viewsheds. As part of interpretation at the park, views have been maintained at the east and west battlefield overlooks, at the Ray House precinct, and in association with various interpretive waysides. Alternatives recommend more clearing of historic viewsheds to better understand the battle in the landscape and to replicate the views of soldiers at the time of battle. Maintenance of established viewsheds and recommended vegetation clearing for new viewsheds have potential impacts on the site. Therefore, this topic was retained for further analysis.

Visitor Use and Experience. The alternatives would impact overall visitor understanding of the entire landscape and the story of Wilson's Creek National Battlefield, including interpretive and educational opportunities. Therefore, this topic was retained for further analysis.

Human Health and Safety. When recommended actions are implemented, visitor use could increase and with it, the degree of regular maintenance and management of facilities, trails, bridges, and roads, to ensure the safety and welfare of the public. Natural conditions of heat and weather- related storms and subsequent damage are also ongoing. Therefore, this topic was retained for further analysis.

Impact Topics Considered but Not Retained for Analysis

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. 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.
- 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. Because no ethnographic resources or traditional cultural properties exist in the areas under consideration in this document, 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' Creek National Battlefield. Therefore, this topic has been dismissed from further analysis.

Museum Collections. The actions described in the alternatives would have no impact on museum collections. Therefore, this topic has been dismissed from further analysis.

Carbon Footprint. For the purposes of this planning effort, "carbon footprint" is defined as the sum of all emissions of carbon dioxide and other greenhouse gases, including methane and ozone, that would result from implementation of the action alternative. Understanding the carbon footprint of the alternatives is important for determining contribution to climate change. This impact topic was dismissed from further analysis for several reasons: 1) no changes would occur in the way visitors reach the project area as a result of the alternatives; 2) the minimal new developments proposed in the project area would not noticeably increase greenhouse gas emissions; and 3) newer sustainable building practices should help limit additional greenhouse gas emissions.

Natural Soundscape. An important part of the NPS mission is preservation of natural soundscapes associated with national park units as indicated in NPS Management Policies, 2006, and Director's Order 47: Sound Preservation and Noise Management. There is development south of the park around the town of Clever, MO and other areas that has contributed to increased traffic on Highway ZZ. However, the action alternative does not introduce additional noise and traffic from visitors and park staff. Because the alternative would not increase noise levels, natural soundscapes was dismissed from further analysis.

Lightscape. In accordance with NPS Management Policies, 2006, the NPS strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of

human-caused light. There has been an addition to the lightscape due to the construction of sports fields associated with the high school north of the park. The lighting is associated only with periodic events at night and are not a permanent disruption to the night sky. The action alternative would not increase any use of night lighting within the park, specifically at the visitor center and the entrance to the site. Therefore, lightscape was dismissed as an impact topic.

Natural or Depletable Energy Resource Requirements and Conservation Potential. In accordance with NPS Management policies (2006), and Executive Orders 12873 and 12902, there are requirements for NPS to improve the environmental footprint (green buying and sustainable building materials, etc.). However, individual changes at Wilson's Creek National Battlefield are unlikely to have adverse impacts to the wider universe of energy use and depletable resources. Therefore, this impact topic was dismissed from further analysis.

Chapter 2 – Alternatives

2.1 Development of Alternatives

This section describes and discusses the no action and action alternatives explored in the Environmental Assessment (EA). The EA presents two alternatives for the future management of Wilson's Creek National Battlefield.

Alternative 1 (No Action): Alternative 1 preserves existing conditions and includes the recommendations from the *Cultural Landscape Report (CLR) (2004)* implemented since 2004. There is continuation of current management strategies.

Alternative 2 (Proposed Action): This alternative implements remaining CLR treatment recommendations and includes a program for management of the white-tail deer population, expanded interpretive trails, waysides, cannons, viewsheds, and contemplative nodes, and vegetation management strategies based on the *Vegetation Management Implementation Plan* (2014) and interpretive programs indicated in the *Long Range Interpretive Plan* (2009).

The planning team relied on the park's previous planning documents for guidance in developing the alternatives. Combined, these documents provide Wilson's Creek National Battlefield with a vision and clear direction for the protection of the park's cultural landscape in order to sustain long-term management, interpretation, and preservation of overall park character, with priorities on natural and cultural resource conditions and visitor use and experience.

Public input received during scoping was important in the development of the alternatives. The public scoping process helped the planning team understand the public's values and preferences regarding visitor experiences and concerns, issues and suggestions related to recreational use, trail alignment and conditions, and deer management.

During alternative development, it was determined that the purpose and need for the plan could be met with a single action alternative and that other alternatives were neither feasible nor necessary. Identification of a preferred alternative is within the discretion of the National Park Service (NPS). The recommended preferred alternative is Alternative 2 because it would best address and fulfill the purpose and need of the project.

2.1.1 Alternative 1 (No Action Alternative):

Preserve existing conditions and continue current management strategies (Maps 2-1 and 2-2))

The no-action alternative focuses on preservation of the existing character of Wilson's Creek National Battlefield landscape and its current interpretation. Within this alternative, there would

be no changes to the facilities that currently accommodate visitor access and interpretation, park administration, and facility management. Proposed changes already approved, such as the addition of new wayside exhibits at Bloody Hill, would be permitted to proceed. The visitor center would continue to serve as the primary means for visitor contact and orientation. The entrance drive, associated parking area, and tour road would remain the primary vehicular access route for visitors to experience the park's resources. Visitors would continue to gain the majority of their knowledge of the Battle of Wilson's Creek through experiencing the exhibits located within the visitor center, wayside exhibits sited at tour road stops, and along pedestrian and equestrian trails. The current picnic area would continue to support the visitor experience. Equestrian use of designated trails would also continue.



Figure 2-1: *The entrance drive, visitor center parking area, and tour road would remain the primary visitor access route to experience park resources.*



Figure 2-2: *Parking for equestrian trailers would remain in the current location, southeast of the Ray House.*

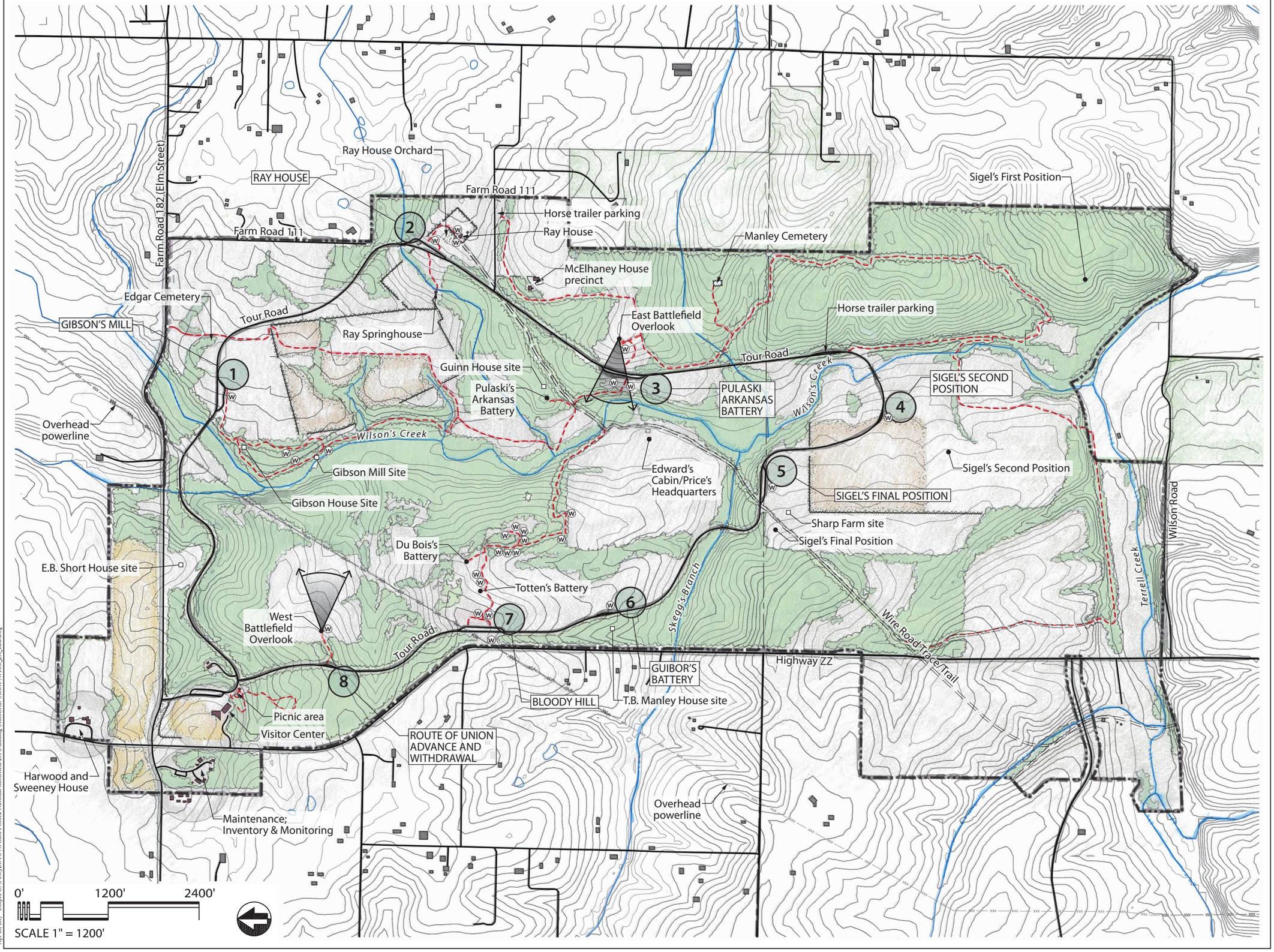
No provision would be made for additional parking beyond the current parking areas, including the existing horse trailer parking areas. Existing landscape patterns of spatial organization composed of clearings surrounded by generally wooded landscape, would be perpetuated. No further vegetation removal and thinning would be undertaken, and current mowing and vegetation removal and thinning would be undertaken, and current mowing and vegetation management regimens would continue. Glade habitats would remain overrun with Eastern red cedar trees, affecting the habitat and survival of the Missouri bladderpod unless recommendations are implemented as a park PMIS project per the *Vegetation Management Implementation Plan* (2014). No change would be made to the interpretation of the battlefield landscape. Views identified as important interpretive vistas, (east and west battlefield overlooks) would continue to be managed for clear sight lines, while other views identified as important, would not be cleared.

Proposed treatment of vegetation communities outlined in the CLR include: rehabilitation of Manley Woods and glade communities; expansion of the trail system, and adjustment of trails subject to erosion; update of the park's wayside exhibits; and addition of more cannon to improve

Environmental Assessment

for

Wilson's Creek National Battlefield



Legend

- Site Boundary
- 10' Contour
- Road
- Wire Road Trace
- Trail
- Creek
- Fence
- Building
- Wayside Exhibit
- Wooded Area
- Easement
- Crop Exhibit
- Restored Prairie
- Viewshed

Notes:

1. Dimensions and locations are approximate, based on field observations and NPS-provided GIS data.

Sources:

NPS IRMA

Missouri Spatial Data Information Service

Map 2-1.

Alternative 1

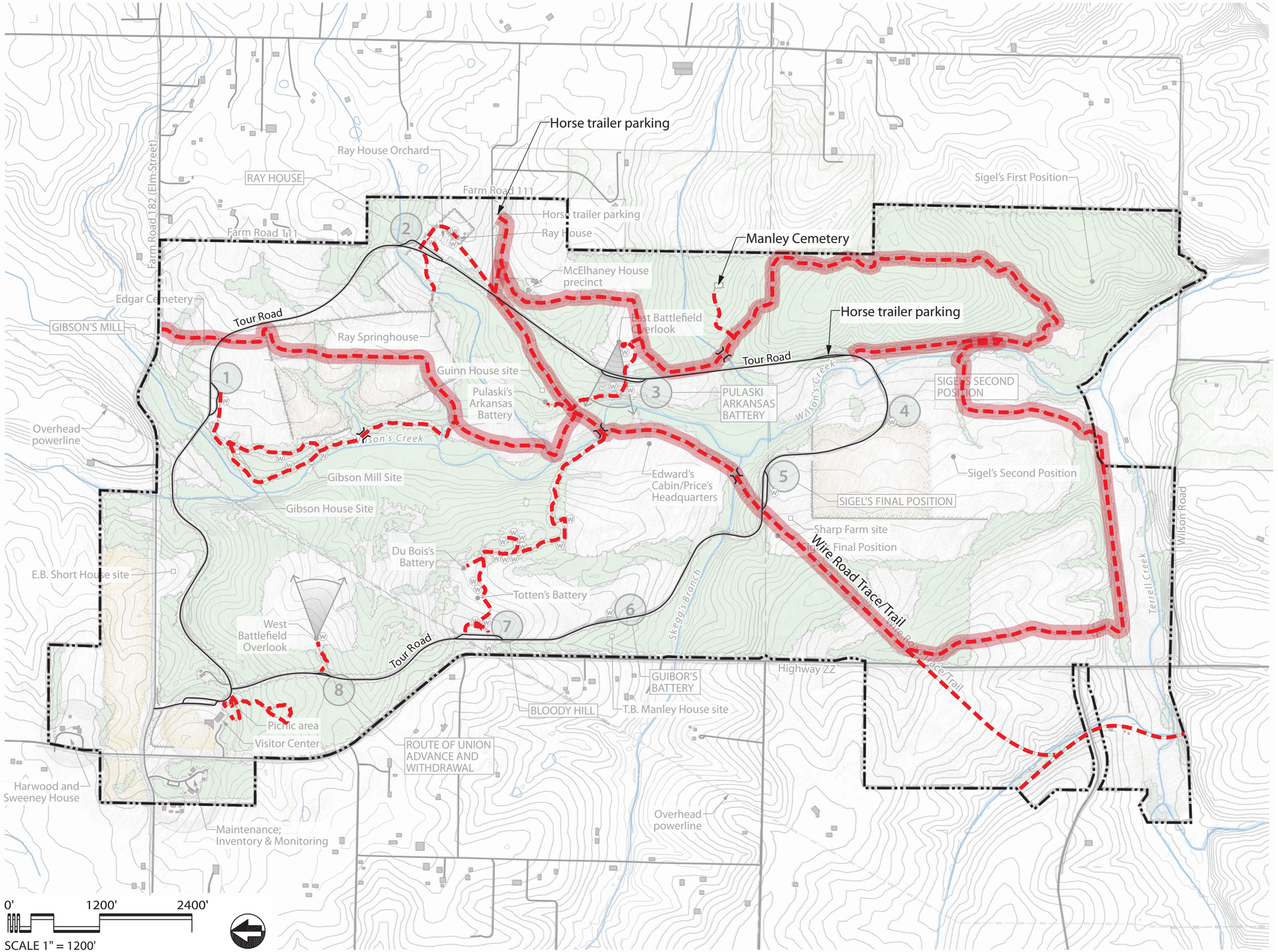
No Action Alternative: Preserve Existing Conditions and Continue Current Management Strategies (No Action)

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Environmental Assessment

for

Wilson's Creek National Battlefield



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SCALE 1" = 1200'

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Legend

- Site Boundary
- 10' Contour
- Road
- Wire Road Trace
- Equestrian and Pedestrian Trail
- Pedestrian Trail only
- Creek
- Fence
- Building
- Wayside Exhibit
- Wooded Area
- Easement
- Crop Exhibit
- Restored Prairie
- Viewshed

Notes:

1. Dimensions and locations are approximate, based on field observations and NPS-provided GIS data.

Sources:

NPS IRMA

Missouri Spatial Data Information Service

Map 2-2.

Alternative 1 Trails

No Action Alternative: Preserve Existing Conditions and Continue Current Management Strategies (No Action)



Figure 2-3: *Existing battlefield overlooks would continue to be managed for clear sight lines. No new historic viewsheds for interpretation would be cleared as part of this alternative.*

marking of the battlefield would also not occur except for the stipulation above concerning the recommendations of the *Vegetation Management Plan* (2014). Major components of the alternative include:

- Maintenance of existing landcover character and patterns.
- Maintenance of existing interpretive programs and media.
- Maintenance of existing landscape features and systems.
- Continued protection of natural and cultural resources.
- Continued repair of deteriorated features and systems



Figure 2-4: *Maintenance of existing landcover vegetation character and patterns would continue in this alternative.*



Figure 2-5: *Existing fence-lines, vegetation, and mown grasses would be maintained.*

2.1.2 Alternative 2 (Preferred Alternative):

Implementation of Remaining CLR Treatment Plan Recommendations, Proposed Deer Management Strategies, and the Interpretive Programs Indicated in the Long-Range Interpretive Plan (Maps 2-3 – 2-4 – 2-5)

As part of an overall strategy for managing the cultural landscape, Alternative 2 (action alternative) recommends developing additional connections between interpretive programming and what is known about the landscape that comprised the park at the time of the battle. The strategy includes: increased vegetation management for more views; development of alternative trails; new cannon placement; additional wayside exhibit installation; and enhanced depiction of vernacular lifeways present at the time of the battle layered with battle and troop movement information.

This alternative would complete the implementation of recommendations provided within the CLR (2004) based on an understanding of which recommendations have been implemented, which remain viable, and which require modifications to meet current park management goals and the guidance afforded in planning documents prepared after 2004.

Rehabilitation of the landscape would also include contemplative and interpretive areas within the park that afford opportunities for the public to reflect on events of the battle. Several directed viewsheds would be cleared to support an understanding of the battlefield from contemplative and interpretive nodes and other key locations. The ongoing efforts conducted by the park to manage natural resources for diversity, conservation, and historic character would serve as a foundation for interpreting the battlefield.

Proposed trail extensions would be developed to provide connections with historic features not located along existing trails. Wayside exhibits would convey information about historic farmstead features at specific locations and viewpoints, providing a clear connection between the battle and the landscape.

The remainder of the park vegetation would be managed to promote savanna, open mixed forest, and native warm-season grassland communities, with the exception of the glades and Manley Woods. The area associated with Manley Woods would be expanded in order to protect its integrity in light of ice storms, tornadoes, and other natural disturbances that impact trees. The topography around Manley Woods is rolling hills. Forest vegetation would help hold the soil in place with little maintenance, other than tracking potential exotic plants. The Wilson's Creek and Skegg's Branch stream corridors would be managed to promote water quality.

Action Items

Specific actions resulting from the implementation of this alternative include:

Land Acquisition/Assimilation

- **Complete proposed land acquisitions and conservation easement establishment.**

Proposed Viewsheds

v1. Orientation view from new Tour Stop 1
v2. West Overlook Trail
v3. Ray House to Ray Cornfield/Bloody Hill
v4. Guibor's Battery to Totten's Battery Second Position
v5. Sigel's First Position to Sharp Cornfield
v6. Reid's Battery to Tour Stop 6
v7. East Overlook to Bloody Hill
v8. Tour Stop 6 to Edward's Cabin
v9. Du Bois's Battery to Ray House
v10. Pulaski's Battery to Du Bois's Battery/Ray Cornfield

Contemplative Nodes

a. Manley Cemetery
b. Tour Stop 4
c. Tour Stop 6
d. South Overlook
e. Tour Stop 7
f. Union Field Hospital Behind Bloody Hill
g. Plummer's Crossing/Gibson's Mill
h. Pulaski's Battery/Guinn Farm Orchard
i. Wire Road Bridge
j. Sigel's First Position

Rehabilitate existing horse trailer parking area; remove parking and establish native plant communities
Ray House Orchard
RAY HOUSE
Farm Road 111
Farm Road 182 (Elm Street)
Ray House
McElhaney House precinct
Clear acquired parcel and integrate into savanna management practices
Interpret C.B. Manley House domestic precinct
Sigel's First Position
Restore orchard at Guinn House and interpret domestic precinct
Ray Springhouse
Edgar Cemetery
Tour Road
Interpret Edgar House domestic precinct
Manley Woods
Retain pull-off for parking and access to trail
GIBSON'S MILL
Overhead powerline
Wilson's Creek
Gibson Mill Site
PULASKI ARKANSAS BATTERY
SIGEL'S SECOND POSITION
Manage Wilson's Creek to promote water quality
Interpret Edward's Cabin domestic precinct
Sharp Cornfield
Sigel's Second Position
SIGEL'S FINAL POSITION
Interpret Gibson House domestic precinct
Interpret Sharp House domestic precinct
Interpret E.B Short House domestic precinct
Totten's Battery
Sigel's Final Position
Skegg's Branch
Terrell Creek
Wilson Road
ESTABLISH NEW TOUR STOP 1: BATTLEFIELD ORIENTATION
Tour Road
Highway ZZ
Establish new horse trailer parking area
GUIBOR'S BATTERY
Manage Skegg's Branch to promote water quality
BLOODY HILL
Interpret T.B. Manley House domestic precinct
Wire Road Trace Trail
Picnic area
Visitor Center
ROUTE OF UNION ADVANCE AND WITHDRAWAL
Proposed picnic area
Harwood and Sweeney House
Overhead powerline
Maintenance; Inventory & Monitoring

0' 1200' 2400'
SCALE 1" = 1200'

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Environmental Assessment
for
Wilson's Creek National Battlefield

Legend

- Site Boundary
- 10' Contour
- Road
- Wire Road Trace
- Existing Trail
- Proposed Trail
- Remove Trail
- Proposed Bridge
- Creek
- Fence
- Building
- Existing Wayside Exhibit
- Proposed or Modified Wayside Exhibit
- Wooded Area
- Easement
- Maintain and Manage Crop Exhibits
- Maintain and Manage Restored Prairie
- Preserve and Protect Manley Woods
- Rehabilitate Glade Communities
- Maintain and Manage Bottomland Woods
- Maintain and Manage Mown/Cultivated Areas
- Establish 25-Foot Deer Management Zone
- Maintain and Manage Cultural Vegetation
- Viewshed (see list)
- Contemplative Node (see list)

Map 2-3.

Alternative 2

Implementation of Remaining CLR Treatment Recommendations, Proposed Deer Management Strategies, and the Interpretive Programs Indicated in the LRIP

Proposed Viewsheds

v1. Orientation view from new Tour Stop 1
v2. West Overlook Trail
v3. Ray House to Ray Cornfield/Bloody Hill
v4. Guibor's Battery to Totten's Battery Second Position
v5. Sigel's First Position to Sharp Cornfield
v6. Reid's Battery to Tour Stop 6
v7. East Overlook to Bloody Hill
v8. Tour Stop 6 to Edward's Cabin
v9. Du Bois's Battery to Ray House
v10. Pulaski's Battery to Du Bois's Battery/Ray Cornfield

Contemplative Nodes

a. Manley Cemetery
b. Tour Stop 4
c. Tour Stop 6
d. South Overlook
e. Tour Stop 7
f. Union Field Hospital Behind Bloody Hill
g. Plummer's Crossing/Gibson's Mill
h. Pulaski's Battery/Guinn Farm Orchard
i. Wire Road Bridge
j. Sigel's First Position

Rehabilitate existing horse trailer parking area; remove parking and establish native plant communities
Ray House Orchard
RAY HOUSE
Farm Road 111
Farm Road 182 (Elm Street)
Ray House
McElhaney House precinct
Manley House precinct
Interpret C.B. Manley House domestic precinct
Clear acquired parcel and integrate into savanna management practices
Sigel's First Position
Restore orchard at Guinn House and interpret domestic precinct
Manley Woods
Retain pull-off for parking and access to trail
Ray Springhouse
Edgar Cemetery
Tour Road
Interpret Edgar House domestic precinct
GIBSON'S MILL
Overhead powerline
PULASKI ARKANSAS BATTERY
SIGEL'S SECOND POSITION
Manage Wilson's Creek to promote water quality
Wilson's Creek
Gibson Mill Site
Sharp Cornfield
Sigel's Second Position
Interpret Gibson House domestic precinct
Interpret Edward's Cabin domestic precinct
SIGEL'S FINAL POSITION
Interpret E.B Short House domestic precinct
Interpret Sharp House domestic precinct
Totten's Battery
Sigel's Final Position
Wire Road Trace/Trail
Terrell Creek
Wilson Road
ESTABLISH NEW TOUR STOP 1: BATTLEFIELD ORIENTATION
Horse trailer parking
parking area
Tour Road
Highway ZZ
GUIBOR'S BATTERY
Skegg's Branch
Picnic area
Visitor Center
BLOODY HILL
Interpret T.B. Manley House domestic precinct
Manage Skegg's Branch to promote water quality
ROUTE OF UNION ADVANCE AND WITHDRAWAL
Proposed picnic area
Harwood and Sweeney House
Overhead powerline
Maintenance; Inventory & Monitoring

0' 1200' 2400'
SCALE 1" = 1200'

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Environmental Assessment
for
Wilson's Creek National Battlefield

Legend

- Site Boundary
- 10' Contour
- Road
- Wire Road Trace
- Equestrian and Pedestrian Trail
- Pedestrian Trail only
- Remove Trail
- Proposed Bridge
- Creek
- Fence
- Building
- Existing Wayside Exhibit
- Proposed or Modified Wayside Exhibit
- Wooded Area
- Easement
- Maintain and Manage Crop Exhibits
- Maintain and Manage Restored Prairie
- Preserve and Protect Manley Woods
- Rehabilitate Glade Communities
- Maintain and Manage Bottomland Woods
- Maintain and Manage Mown/Cultivated Areas
- Establish 25-Foot Deer Management Zone
- Maintain and Manage Cultural Vegetation
- Viewshed (see list)
- Contemplative Node (see list)

Map 2-4.

Alternative 2 Trails

Implementation of Remaining CLR Treatment Recommendations, Proposed Deer Management Strategies, and the Interpretive Programs Indicated in the LRIP

Environmental Assessment

for

Wilson's Creek National Battlefield

Proposed Viewsheds

v1. Orientation view from new Tour Stop 1
v2. West Overlook Trail
v3. Ray House to Ray Cornfield/Bloody Hill
v4. Guibor's Battery to Totten's Battery Second Position
v5. Sigel's First Position to Sharp Cornfield
v6. Reid's Battery to Tour Stop 6
v7. East Overlook to Bloody Hill
v8. Tour Stop 6 to Edward's Cabin
v9. Du Bois's Battery to Ray House
v10. Pulaski's Battery to Du Bois's Battery/Ray Cornfield

Contemplative Nodes

a. Manley Cemetery
b. Tour Stop 4
c. Tour Stop 6
d. South Overlook
e. Tour Stop 7
f. Union Field Hospital Behind Bloody Hill
g. Plummer's Crossing/Gibson's Mill
h. Pulaski's Battery/Guinn Farm Orchard
i. Wire Road Bridge
j. Sigel's First Position

Ray House Orchard
RAY HOUSE
Farm Road 182 (Elm Street)
Farm Road 111
Ray House
McElhaney House precinct
Clear acquired parcel and integrate into savanna management practices
Retain and protect cultural vegetation associated with Manley Cemetery
Sigel's First Position
Ray Springhouse
Edgar Cemetery
Retain and protect cultural vegetation associated with Edgar Cemetery
Tour Road
Manley Woods
Manley glade
GIBSON'S MILL
Overhead powerline
Wilson's Creek
PULASKI ARKANSAS BATTERY
SIGEL'S SECOND POSITION
Walnut glade
Gibson Mill Site
Sharp Cornfield
Sigel's Second Position
North Bloody Hill glade
Bloody Hill glade
Terrell Creek glade
SIGEL'S FINAL POSITION
Establish 25-foot deer management zone
Retain and protect the sugar maple trees
Totten's Battery
Sigel's Final Position
Wire Road glade
Terrell Creek
Wilson Road
Establish 25-foot deer management zone
ESTABLISH NEW TOUR STOP 1: BATTLEFIELD ORIENTATION
Retain and protect the Osage orange hedgerow
Skeggs Branch
Tour Road
GUIBOR'S BATTERY
Highway ZZ
BLOODY HILL
Establish 25-foot deer management zone
Wire Road Trace Trail
Picnic area
Visitor Center
ROUTE OF UNION ADVANCE AND WITHDRAWAL
Proposed picnic area
Harwood and Sweeney House
Establish 25-foot deer management zone
Overhead powerline
Maintenance; Inventory & Monitoring

0' 1200' 2400'

SCALE 1" = 1200'

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Legend

- Site Boundary
- 10' Contour
- Road
- Wire Road Trace
- Existing Trail
- Proposed Trail
- Remove Trail
- Proposed Bridge
- Creek
- Fence
- Building
- Existing Wayside Exhibit
- Proposed or Modified Wayside Exhibit
- Wooded Area
- Easement
- Maintain and Manage Crop Exhibits
- Maintain and Manage Restored Prairie
- Preserve and Protect Manley Woods
- Rehabilitate Glade Communities
- Maintain and Manage Bottomland Woods
- Maintain and Manage Mown/Cultivated Areas
- Establish 25-Foot Deer Management Zone
- Maintain and Manage Cultural Vegetation
- Viewshed (see list)
- Contemplative Node (see list)

Map 2-5.

Alternative 2
Vegetation and Viewsheds

Implementation of Remaining CLR Treatment Recommendations, Proposed Deer Management Strategies, and the Interpretive Programs Indicated in the LRIP

- **Clear the parcel acquired to the southeast and integrate into savanna management practices.**

- **Establish a day-use/picnic area in the Double Spring parcel located west of Highway ZZ in the southwest corner of the park**. Develop a small parking area to accommodate visitors, and a modest picnic area. Plant trees to shade the picnic area. Install wayside exhibits that explain the Civil War use of this site by both Union and Confederate soldiers and the nearby free flowing spring. Consider establishing a trail that extends beneath State Highway ZZ, via existing bridge crossing of Terrell Creek to connect visitors to the picnic area and wayside exhibit. (coordinate with State of Missouri Highway department).

- **Complete natural and cultural resource inventories on the Double Springs parcel.** Several important cultural and natural resource features may exist on the property that require documentation. The 1838 General Land Office maps indicate that there may have been five to seven springs on the property at one time. Also, the Wire Road passed through this property and should be located, as well as the Gwinn land.

Roads and Parking

- **Establish an equestrian parking area north of the visitor center**. A new equestrian parking area would be established north of the existing visitor center parking area to diminish the need for horse trailers to travel the tour road. The parking area would be accessed from the park entrance road. It is estimated that the parking area would encompass approximately 1 acre of land. It would be composed of an access road, trailer parking spaces, water bib, interpretive information board, and a trailhead that connects riders to the equestrian trail system. This project was identified in the *General Management Plan* (2003) as a park goal and conveyed as a treatment recommendation in the CLR (2004). It replaces current use of the temporary horse trailer parking area located between the Ray house and McElhaney house. The relocation of the horse trailer parking area is intended to remove horse trailer traffic from the park tour road.

- **Rehabilitate the existing horse trailer parking area.** Once the new equestrian parking area is constructed, there is no further need for the existing temporary horse trailer parking facility. The existing parking area would be rehabilitated through removal of parking and establishment of native plant communities.

Pedestrian Trail System

- **Expand the existing pedestrian trail system.** Eleven new trail segments are proposed for the park to enhance the interpretive opportunities available for visitors. Trails are anticipated to be treated as back-country foot paths surfaced with hard-packed earth, or mown grass, minimally graded, and supported by limited rock work in specific problem areas. The layout of the trails would be designed and constructed to eliminate ongoing maintenance concerns. Trail widths would range from 4 to 8 feet in width.

The proposed new trails include the following:

1. *Visitor center to Bloody Hill via Short Farm (Union Advance)*. This trail follows the Union advance route from the opening shots of the battle through the point where General Lyon's advance was halted on Bloody Hill. Features include a trailhead at the visitor center parking area, waysides at the Short Farm site, and a Union artillery position. The trail would branch to follow where Captain Plummer's battalion was ordered to ford Wilson's Creek to protect Lyon's main forces from being flanked. The main branch would connect with the Union triage station behind Bloody Hill, as well as the existing primary Bloody Hill interpretive trail. The trail would also connect to the proposed new tour road stop 1.

2. *Bloody Hill to Gibson's Mill crossing*. This trail is described in the Long-Range Interpretive Plan. This trail would branch from the Union Advance Trail to the point on Wilson's Creek where Capt. Plummer's battalion forded the creek near Gibson's Mill. A pedestrian footbridge would be constructed to cross the creek as part of this trail.

3. *Gibson's Mill crossing to Ray Cornfield/Springhouse*. This Gibson's Mill crossing to Ray Cornfield/Springhouse trail continues to follow the advance of Captain Plummer's battalion toward the Ray Cornfield, crossing the existing Ray cornfield trail. The trail would connect with the existing Gibson's Mill trail.

4. *Tour road stop 3 to Reid's Fort Smith Battery*. This is a spur trail that leads south from tour road stop 3 to the position of Reid's Fort Smith Battery. Two cannon and a wayside are proposed to be added here. The trail would cross the site of the Town of Wilson Creek, a post- Civil War community; a wayside exhibit would be installed to tell the story of the town.

5. *Extension of the Pulaski Battery trail to the Guinn Farm site* (also McCulloch's Headquarters). This trail is proposed as an extension of the existing trail designed to reach the battery position, which has been determined to be located beyond the current marked site. The existing cannon and wayside exhibits would be relocated to the more accurate location along the extended trail.

6. *Tour road trailer siding to Sigel's First Position* (following clearing of the parcels acquired along the southeastern margin of the park since 2004). Since 2004, several parcels of land have been added to the park along the southeastern margin that were the site of Sigel's First Position during the Battle of Wilson's Creek. It is recommended that the existing horse trailer parking area located at the curve of the tour road south of the stop 3 serve as a parking area and trailhead for a new trail to Siegel's First Position. The existing Manley Trail would also be connected to the trail to Sigel's First Position. The site is anticipated to offer an exceptional view of the south end of the battlefield. A contemplative node is recommended for this location. Two cannon and a wayside would be placed here.

7. *Edward's Cabin to Bledsoe's Battery*. From the Edward's Cabin exhibit, a new trail would lead eastward to the plateau through the establishment of a contemplative node, and the placement of two cannon and wayside exhibits.

8. *Bledsoe's Battery to tour road stop 6* (Guibor's Battery). This trail is described in the Long-Range Interpretive Plan (2009). The trail would link Bledsoe's Battery and tour road stop 6 along the approximate position of the Confederate battle lines and parallel the Bloody Hill trail along the Union battle lines.

9. *Confederate advance route to Bloody Hill* (two alternative routes). A trail is proposed to extend between the two battle lines to interpret the battle from the Confederate soldier's experience. There are two options for the route of this trail. One possible route connects Bledsoe's Battery to the Bloody Hill trail. The other extends from a point east of tour road stop 6 to Totten's Battery.

10. *Extension of the West Battlefield Overlook trail from tour road stop 8*. This proposed trail is a spur route that trail would intersect the visitor center to Bloody Hill trail and provide a connection to the West Battlefield Overlook trail.

11. *Sigel's Advance*. From Sigel's First Position, the visitor would return via the Manley trail to a point on the old railroad grade. The trail would follow the grade to Wilson's Creek. A bridge would be constructed to cross the creek utilizing the concrete railroad abutments and pillars. After crossing the creek, the trail would continue to follow the railroad grade, access the Sharp Stubble field, link with Sigel's Second Position and conclude at tour road stop 5.

- **Enhance trailhead parking.** The visitor center and tour road stops 1, 2, 3, 5 and 7 afford opportunities to provide additional trailhead parking due to available space along the tour road margins at these locations.

- **Construct new bridges or fords to convey trails across Wilson's Creek and Skegg's Branch.** The proposed new trail segments require two crossings of Wilson's Creek and one of Skegg's Branch. New footbridges would need to be built near Gibson's Mill to accommodate crossing of Wilson's Creek associated with the new trail segments described above that lead between the Bloody Hill trail and Gibson's Mill crossing as well as from the Gibson's Mill crossing and Ray Cornfield and Springhouse. A bridge crossing of Skegg's Branch would facilitate the Wire Road crossing near tour road stop 5. A footbridge crossing of Wilson's Creek would be added in the southeastern corner of the park to support the establishment of a trail to mark the Sigel's Advance route.

- **Realign trail segments that are regularly subject to erosion.** Trail segments that are steep and regularly subject to erosion are proposed for abandonment, and realignment to follow more accommodating terrain. One of the segments proposed for abandonment is the southern half of the Manley trail between the access route to Manley cemetery and the southern end. The southern end would remain in use as a way to connect visitors to a new

interpretive/contemplative node associated with Sigel's First Position. Additional segments proposed to be abandoned include the trail that extends through the southeastern section of the Sharp Stubblefield; the trail from the Wilson's Creek valley west of the Wire Road bridge leading toward the Lyon marker; and the trail that parallels State Highway ZZ in the southwestern corner of the park. For the trail extending west from the Wire Road bridge, the new trail segment between Edwards Cabin and Bledsoe's Battery described above would serve as the replacement for this route. The materials associated with the new trail segments are anticipated to be hard-packed earth, rock edging, and water bars.

Equestrian Trail System

- **Realign sections of the equestrian trail to address erosion concerns**. Segments of the Manley trail are steep and subject to erosion. This project entails rerouting equestrians from most of the Manley trail, and establishing a new trail segment that parallels the tour road to its west between tour road stop 3 and the existing trail east of tour road stop 4. The trail as it currently extends through the Sharp Stubblefield would be removed due to steep and erodible slopes. A third segment of the trail that extends south from the Wire Road to the east of State Highway ZZ would be removed due to steep and erodible slopes. Instead equestrians would be redirected to the Wire Road via a new trail that cuts diagonally across the southwestern corner of the park, linking the trail south of the stubblefield with the Wire Road. Associated with this realigned trail are two proposed new bridges or ford crossings.

- **Add a new trail segment west of the Sharp Crop fields. E**questrians would be able to follow a loop in the southwestern corner of the park that encompasses the Wire Road, a proposed new trail segment that extends diagonally across the landscape west of the Sharp Stubblefield, and another proposed new trail segment connecting the Sharp Farm site with the diagonal trail along the edge of the Sharp Cornfield. A portion of this trail would coincide with the proposed Sigel's Advance Trail noted above. The width and surface of the trail would be designed to accommodate both pedestrian and equestrian uses. Equestrian trail widths would vary from 4 to 10 feet or more depending on the landscape setting.

- **Establish an equestrian trail between the proposed new parking area and existing equestrian trails**. This recommendation was included in the CLR (2004). It suggested the use of the Manley spur trail to connect the northern part of the park with the trail associated with the Wire Road via the Ray Cornfield. The Manley spur trail is no longer in use, however, and use of this route requires either a ford crossing of Wilson's Creek, which could be impassable during periods of high water, or an equestrian passageway be added to tour road bridge#1.

- ***Interpretive Exhibits and Features***

- **Establish a new tour road stop 1**. This proposed new tour road stop is designed to serve as a battlefield orientation opportunity for visitors. This recommendation was included in the CLR (2004) but suggested a location further west near the beginning of the tour road. The recommendation also suggested a cleared viewshed be established in toward the open field to the southeast.

- **Install 7 upright orientation exhibits at trailheads**. This recommendation was provided in the *Long-Range Interpretive Plan* (2009). The exhibits are intended to be installed with as little ground disturbance as possible, potentially including only footing installation o structural frames. The wayside exhibits are proposed at:

  1. The visitor center to Bloody Hill trail trailhead located within the visitor center parking area
  2. Existing tour road stop 1 to introduce the Gibson's Mill/Plummer's Crossing trail
  3. Existing tour road stop 2 to introduce the Ray Springhouse/Cornfield trail
  4. Existing tour road stop 3 to introduce the East Battlefield Overlook/Reid's Battery/Pulaski Battery trail
  5. Edward's Cabin
  6. Existing tour road stop 4 to introduce the trail to Sigel's First Position
  7. Existing tour road stop 6 to introduce the Confederate Advance trail

- **Install 23 trail waysides**. New wayside exhibits are proposed to interpret several topics along the new trail segments described above, as well as along some existing trails. Like the orientation waysides, these features would be installed with as little ground disturbance as possible. The topics for interpretation include:

  1. Totten's first shots, near the rock outcrop in front of the visitor center
  2. Short House site
  3. Manley cemetery
  4. Plummer's Crossing at Wilson's Creek and the proposed new footbridge
  5. Town of Wilson Creek
  6. Ray Cornfield, Union perspective
  7. Ray Cornfield, Confederate perspective
  8. McCulloch's Headquarters near the Guinn Farmstead
  9. Guinn Farmstead and orchard exhibit
  10. Quarry along the Wire Road
  11. History of the Wire Road and iron bridge
  12. Camp life of the Southern soldier
  13. Sharp House, community perspective, slavery
  14. South Overlook at the Wire Road/tree line

15. Union field hospital site and treatment of those wounded on the battlefield
16. First contact by Lyon's Army/Cawthorn's delaying action
17. Trail intersection, Plummer's order to ford the creek
18. Union order of battle
19. "Medal of Honor" recipients
20. Union Army order of battle
21. Southern Army order of battle
22. Missouri State Guard/Sterling Price
23. Double springs/military use of Wire Road

- **Install 29 new cannon.** New cannon are recommended for the park to enhance interpretation. A total of 17 cannon are recommended for Union positions, and 11 for Confederate positions. Additionally, a new cannon interpretive exhibit is proposed for the visitor center environs. Cannon would be placed directly on the ground and will cause minimal land disturbance.

  Cannon are proposed for the following locations:

  Union Positions

  1. Totten's First Position: hilltop by visitor center
  2. Totten's First Position: hilltop by visitor center
  3. Sokalski's First Position: north side of tour road between the intersection and bridge 1.
  4. Totten's Second Position: Bloody Hill trail
  5. Totten's Second Position: Bloody Hill trail
  6. Totten's Second Position: Bloody Hill trail
  7. Totten's Second Position: Bloody Hill trail
  8. Sokalski's Second Position: Bloody Hill trailhead
  9. Sokalski's Second Position: Bloody Hill trailhead
  10. DuBois' Battery: trail spur, Bloody Hill trail
  11. DuBois' Battery: trail spur, Bloody Hill trail
  12. Backof's First Position: Sigel's First Position, hilltop in southeast corner
  13. Backof's First Position: Sigel's First Position, hill top in southeast corner
  14. Backof's Second Position: west side of Sharp's Stubblefield
  15. Backof's Second Position: west side of Sharp's Stubblefield
  16. Backof's Third Position: tour road stop 5
  17. Backof's Third Position: tour road stop 5

Visitor center

18. Visitor Center Exhibit: Visitor Center walkway

Confederate Positions

19. Reid's Battery: south end of field by tour road stop 3
20. Reid's Battery: south end of field by tour road stop 3
21. Bledsoe's Battery: plateau west of Edwards Cabin
22. Bledsoe's Battery: plateau west of Edwards Cabin
23. Bledsoe's Battery: plateau west of Edwards Cabin
24. Guibor's Battery: tour road stop 6
25. Guibor's Battery: tour road stop 6
26. Guibor's Battery: tour road stop 6
27. Guibor's Battery: tour road stop 6
28. Pulaski Battery: hilltop near Wire Road/ tour stop 3. This existing cannon would be moved northeast from its present location
29. Pulaski Battery: hilltop near Wire Road/ tour stop 3. This existing cannon that would be moved northeast from its present location.

- **Install 5 artillery waysides**. Wayside exhibits would be associated with several of the new artillery positions. These include the following:

    1. Totten's First Position (visitor center)
    2. Reid's Fort Smith Battery (tour road stop 3)
    3. Sigel's/Backof's First Position
    4. Backof's Battery (tour road stop 5)
    5. Bledsoe's Battery (Confederate advance trail)

- **Install an orchard exhibit at the Guinn House site**. This recommendation was included in the CLR (2004). The orchard would be similar in size, design, amount of ground disturbance, and implementation to the orchard installed at the Ray House, which contains thirty trees of three heritage varieties, for interpretive purposes. Trunk guards were used to protect the trees from deer browse at the Ray House and should similarly be used at the Guinn House.

- **Interpret the domestic precincts of the Guinn, C.B. Manley, Sharp, Edwards, Gibson, Short, T.B. Manley, and Edgar House sites**. The CLR (2004) includes treatment recommendations for how to interpret former residential properties within the battlefield

landscape. These entail the use of mow patterns, planted features, and/or posts to delineate fields, fencelines, building foundations, and other missing farmstead elements.

- **Establish interpretive/contemplative nodes at 10 locations.** The GMP (2003) recommends the establishment of contemplative nodes at key locations on the battlefield to provide visitors with an appropriate setting in which to consider the events of the Battle of Wilson's Creek. The CLR (2004) suggests specific locations and treatments for these contemplative nodes. The *Long-Range Interpretive Plan* (2009) also expands on the concept, suggesting the park feature contemplative, orientation, and interpretive nodes (accommodation of which is conveyed herein). The orientation nodes would feature orientation signage and be located at or near trailheads. The contemplative nodes would be sited away from the tour road for quiet contemplation, in locations that afford views of important battle event locations. Interpretive nodes would be located in association with tour road stops. The nodes would be composed of a cleared area, a bench, a viewshed, a shade element, and signage. Ground disturbance for nodes would be approximately 400 square feet. Orientation nodes are discussed above. Interpretive and contemplative nodes are proposed for the following locations:

  1. Wire Road bridge (contemplative)
  2. Manley cemetery (contemplative)
  3. Plummer's Crossing /Gibson's Mill (contemplative)
  4. Pulaski Battery/Guinn Farm orchard (contemplative)
  5. Tour road Stop 3 (interpretive)
  6. Tour road stop 5 (interpretive)
  7. Tour road stop 6 (interpretive)
  8. South Overlook (contemplative)
  9. Union field hospital location behind Bloody Hill (contemplative)
  10. Sigel's First Position (contemplative)

- **Viewsheds.** Several key viewsheds are proposed to be established/maintained from visitor trails, tour road stops, and overlooks. Ten viewsheds are to be established and maintained. Clearing is addressed further as part of vegetation management discussed below. The viewsheds are as follows:

  1. Orientation view from new tour road stop 1
  2. DuBois Battery to Ray House
  3. Pulaski Battery to DuBois/Ray Cornfield
  4. East Battlefield Overlook to Bloody Hill
  5. Sigel's First to Sharp Stubblefield

6. Guibor's Battery to Totten's Battery Second Position
7. Tour road stop 5 to Edwards Cabin
8. Reid's Battery to tour road stop 5
9. Ray House to Ray Cornfield/Bloody Hill
10. View from West Battlefield Overlook

Vegetation Management

- **Clear vegetation from interpreted viewsheds.** Trees that obstruct or interfere with the viewshed locations noted above would be removed as part of this project. This was included in the CLR (2004). *The Vegetation Management Implementation Plan* (2014) also addresses the effort to re-establish critical viewsheds, suggesting the following actions would be needed:
    1. Clear ≥5.2 ha (≥12.85 acres) of Eastern red cedar woodland and forest from areas visible from three or more different observation points. Fire should be considered in the implementation of viewshed opening recommendations. (Viewsheds 1, 2)
    2. Thin canopy cover of ≥35.9 ha (≥88.71 acres) of upland deciduous woodland and forest from areas visible from four or more different observation points. Options for thinning include fire and cutting.
    3. Clear ≥10.1 ha (≥24.96 acres) of Eastern red cedar woodland and forest from areas visible from one or two different observation points.
    4. Thin canopy cover of ≥27.6 ha (≥68.20 acres) of bottomland deciduous woodland and forest. Options for thinning include fire and cutting. (Viewsheds 6, 8)
    5. Thin canopy cover of ≥92.9 ha (≥229.56 acres) of the remaining upland deciduous woodland and forest where views to critical elements of the battlefield would be improved. Options for thinning include fire and cutting. (Viewsheds 3,5,7,9)
    6. The existing viewshed associated with the East Battlefield Overlook toward Bloody Hill) and 10 and the West Battlefield Overlook would be managed by selected tree removal for retention of broad viewsheds to the landscape beyond. Existing non-exotic species would remain on the fringes of the viewshed.
    7. Maintain open viewsheds using prescribed fire.
    8. Address invasive species control by consulting the *Heartland Invasive Plant Management Plan and Environmental Assessment* while also completing an invasive species control plan that specifically addresses the issues that pertain to managing Wilson's Creek National Battlefield.

- **Install screen buffer plantings along the park boundary, around the water treatment plant, and between the proposed equestrian parking area and adjacent roads and the visitor center.** Screen buffers are proposed for portions of the park boundary to screen views of adjacent busy roads, the water treatment plant where it is visible from the tour road and other key visitor viewsheds, and around the proposed new equestrian parking

area. Buffers proposed in the CLR (2004) have been amended to include a 25-foot-wide clear zone along the park boundary to enhance visibility of deer movement (see below).

- **Establish a 25-foot-wide deer management zone along the park boundary where it abuts public highways.** A 25-foot-wide clear zone would be established through removal of woody plants, planting of native warm season grasses and forbs, and maintenance through mowing. The lower-growing vegetation would be intended to enhance the visibility of deer to passing motorists. The cleared deer management zone would be used along Elm Street (Farm Road 182) and Highway ZZ. Planting species such as buffalograss *(Buchloe dactyloides)*, that grows to a height of approximately 6 inches which would reduce the mowing regime, and short forbs like milkweed *(Asclepias spp.)*, which is an obligate food of monarch butterflies *(Danaus plexippus)* would be used.

- **Rehabilitate glade communities.** Glades are rare xeric habitats where bedrock is exposed on the surface and soils are very thin. They are typically treeless openings that provide habitat suitable for the Missouri bladderpod. The glades require prescribed fire to prevent becoming overgrown by Eastern red cedar trees. Several Eastern red cedar trees were mechanically removed in 2004 based on recommendations provided in the CLR, but effors to remove trees within the glades have since diminished. Measurable objectives for managing glade communities are indicated in the Fire Management Plan. (2004).[1] More specific actions outlined in the *Vegetation Management Implementation Plan* (2014) are as follows:
    1. Clear ≥1.6 ha (≥3.95 acres) of thin-soiled Eastern red cedar woodland from Bloody Hill glade and 1.2 ha (≥2.96 acres) from north Bloody Hill glade. Fire should be considered in the implementation of viewshed opening recommendations. Remove additional woody debris with a prescribed burn in two to five years.
    2. Clear ≥1.0 ha (≥2.47 acres) of thin-soiled Eastern red cedar woodland from walnut glade and 0.4 ha of Eastern red cedar woodland and forest from Wire Road glade. Remove woody debris using prescribed fire in two to five years.
    3. Clear ≥4.2 ha (≥10.38 acres) of thin-soiled Eastern red cedar woodland from Manley glade. Remove woody debris using prescribed fire in two to five years.
    4. Thin canopy cover of ≥3.5 ha (≥8.65 acres) of upland deciduous woodland and forest on Bloody Hill glade and ≥3.4 ha (≥8.40 acres) on north Bloody Hill glade.
    5. Thin canopy cover of ≥2.6 ha (≥6.42 acres) of upland deciduous woodland and forest on Wire Road glade and ≥0.9 ha (≥2.22 acres) on walnut glade. Also, thin canopy cover of ≥0.6 ha (≥1.48 acres) of bottomland deciduous woodland and forest on Manley glade and <0.1 ha (≥0.25 acres) on Terrell Creek glade.
    6. Thin canopy cover of ≥3.2 ha (≥7.91 acres) of upland deciduous woodland and forest on Manley glade.

[1] National Park Service, *Fire Management Plan for Wilson's Creek National Battlefield* (Republic, Missouri: Wilson's Creek National Battlefield, 2004), 1-9.

7. Maintain glade communities using prescribed fire. Work with the U.S. Fish and Wildlife Service to address the specific needs of the endangered Missouri bladderpod in terms of the season in which to burn and the frequency of burning.

- **Rehabilitate savanna and open mixed forest communities.** Specific actions for managing current areas of open mixed forest to promote savanna are in the *Vegetation Management Implementation Plan* (2014) as follows:

    1. Maintain recently opened, open, and/or thinned woodlands using prescribed fire, mowing, and/or chemical treatments. Burn, mow, and/or use chemical treatments to promote native grasses and forbs. Areas infested with invasive species that may be difficult to manage could be treated through the limited use of grazing by goats.
    2. Assess all open and thinned areas for the quality of the native herbaceous vegetation present, and other areas lacking an acceptable native herbaceous vegetation component.
    3. Convert ≥77 ha of non-native ruderal grassland to native herbaceous vegetation. Haying may be used to manage both new native restorations and cool season areas like fescue fields.

    This approach is also recommended for the parcels that have been added to the park since 2004, with the exception of the General Sweeny's Museum parcel.

- **Maintain historic cultural vegetation.** Cultural vegetation, such as the Osage orange hedgerow, the groves of trees associated with the Edgar and Manley cemeteries, and the sugar maple *(Acer saccharum)* trees near tour road stop 6, should continue to be retained and protected as indicated in the CLR (2004).

- **Manley Woods.** The CLR (2004) recommends preservation and protection of the Manley Woods plant community. A series of weather disturbance events that occurred since 2004 have created a more heterogeneous community in Manley Woods, especially with respect to the overstory, fuel loads, and ground cover structure. Previous management goals emphasized creating a savannah physiognomy based on mean canopy closure, Manley Woods is currently close to achieving that goal (savannah <30% tree cover; Nelson 2005). However, woodland plants rather than grassland plants dominated the herbaceous community. Although not consistent with the herbaceous community of a savanna, few disruptive invasive species appear to be present, and the current community is stable.[2] To ensure that the Manley Woods vegetation community remains healthy, it would need to be continually monitored and managed.

[2] Sherry A Leis and Kevin James, *Effects of multiple intense disturbances at Manley Woods, Wilson's Creek National Battlefield.* Natural Resource Technical Report NPS/HTLN/NRTR – 2008/123. Fort Collins, Colorado: National Park Service, Natural Resource Program Center, November 2008) 20.

Infrastructure

- **Relocate the high-tension electrical lines underground or outside of the park**. The CLR (2004) included this recommendation. Since (2004) the power line has been upgraded. Due to the investment in the upgrade, relocation of the line outside of the park appears unlikely. In addition, the placement of the line underground would require extensive archeological investigations and consideration of sensitive natural resources within the powerline corridor. Both relocation and undergrounding the line are evaluated herein, and remain potential future project options, but are a very low priority for the use of park funding, as costs may be prohibitive. Mitigation of potential impacts would also be required as part of this project.

Deer Management

- **Institute a program that reduces deer populations within the park.** Deer populations exceed recommended carrying capacities, and deer pose a threat to visitor safety due to conflicts with motorists and bicyclists. Over abundant white-tailed deer would be reduced at the battlefield through direct lethal reduction using fire arms or archery equipment. NPS would manage the reduction which would be carried out by qualified federal employees or authorized agents. Authorized agents may include, but are not limited to:
  - Agency and tribal personnel or contractors: NPS would use only professional sharpshooters or NPS staff for the actual shooting in cull operations;
  - Private contractors: Contractors would be required to have appropriate skills and proficiencies in the use of firearms or archery equipment;
  - Public volunteers: Would be supervised and managed in the field by NPS personnel
  - State partners or nonprofit conservation partners: Would need to demonstrate appropriate proficiency skills and abilities, depending on their intended involvement. They would also be supervised and managed in the field by NPS personnel during deer management activity.

  Actions necessary to facilitate sharp shooting may include setting up bait stations, locating deer, sharpshooting, and processing and disposition of deer meat and carcasses. The following stipulations would be required to ensure that deer reduction activities proceed in a safe controlled manner:
    - Weapons appropriate to the location and shooting situation would be used from close range in a controlled environment. Every effort would be made to kill the animals as humanely as possible.
    - Activities would comply with all federal laws particularly those administered by the Bureau of Alcohol, Tobacco, and Firearms.
    - Sharpshooting would occur during the day or night as necessary to increase efficiency and effectiveness of culling operations. Operations would occur during the late fall and winter months when deer are more visible and less visitors are in the park.
    - Operations would be designed to minimize the overall impact on visitor experience.

- Deer management exhibits would be displayed at the visitor center, and information would be posted on the park's website to inform the public about deer management actions.
- Visitor access would be limited as necessary while reductions were taking place and NPS rangers would patrol public areas to ensure compliance with area closures and public safety measures.
- Sharpshooting would not occur near occupied buildings or congested areas. Training would include the use of safety measures to protect both visitors and NPS employees. If more than one shooting location is used, these areas would be adequately separated to ensure public and participant safety.
- Bait stations could be used to attract deer to safe removal locations and would consist of small grains, apples, hay, or other food attractants placed on the ground. The stations would be placed in an area away from public use, to maximize the efficiency and safety of the reduction program. The amount of bait placed in any one location could be in the range of 20 to 100 pounds, depending on the bait used and the number of deer in the immediate area. Unconsumed bait would be removed from affected areas once culling operations are completed.

Encouragement of deer management outside the park

Hunting occurs outside the park in many areas, so deer management would continue to be encouraged outside the park to make deer management efforts within the park more effective. This would be done through cooperative efforts with other management agencies specifically the state of Missouri through the Missouri Department of Conservation.

Deer meat donation

Meat derived from culled deer would be made available for donation. In consultation with the NPS Office of Public Health an operational plan for maintaining as much venison as possible for public donation would be created. Recipients may include food banks in Missouri, Sportsman's or other non-profit groups that accept game meat to distribute to appropriate third parties, or the State of Missouri. Several non-profit sportsmen or conservation groups in Missouri may be available to assist in defraying costs associated with donation. While Chronic Wasting Disease has not been detected at the park, when donating meat for public consumption through a food bank or other cooperator, NPS would follow the guidance found in *Elk and Deer Meat from Areas Affected by Chronic Wasting Disease: A Guide to Donation for Human Consumption* (2006).

Water Resources

- **Restore Wilson's Creek watershed.** The CLR (2004) recommends that the park actively address stormwater management on site. Goals for stormwater management are toincrease direct infiltration of stormwater flow into the ground for recharge and to reduce erosion by establishing riparian buffers to diminish the flow of silt into streams and establishing filter strips along roads and parking areas that similarly slow and detain stormwater flow and increase infiltration into the ground. The *Vegetation Management*

Implementation Plan (2014) indicates the park has identified this as a project to be pursued in the future.

- **Establish riparian buffers or forests along stream corridors.** Riparian buffers are bands of trees, shrubs, and grasses along water courses that detain and slow water moving overland toward the water course. Riparian buffers exist to a degree along Wilson's Creek. Where they do not currently exist, they would be established by diminishing mowing and allowing woody plants and grasses to occupy the banks of the stream. Re-establishment of riparian forests would accomplish several goals of critical habitat, unique community-type establishment, stream bank (erosion control), and water quality enhancement, such as sedimentation control and cooler water temperatures for fish spawning and survival. The exception would be where directed views need to be maintained through clearing. In these locations, mechanical removal of woody trees and shrubs is required. Viewsheds 3,6,8, and 10 intersect Wilson's Creek or other streams and as a result, the viewshed would be maintained with low-growing vegetation maintained through mowing or burning.
- **Establish filter strips along roads and parking areas.** Filter strips and vegetated swales would be established along the downhill margins of all roads and parking areas to capture runoff, slow the water, and increase infiltration. Porous pavements in parking areas would also be introduced to slow water and increase infiltration.
- **Install porous concrete where vehicles park.** One of the Best Management Practices (BMPs) for addressing watershed issues indicated in the CLR (2004) was the use of porous pavements in association within parking areas. These would be located near the visitor center, a tour road stops, and other parking areas.

2.2 Ongoing Management Activities and Mitigation Measures for the Preferred Alternative

Congress has charged the NPS with managing the lands under its stewardship "in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations" (NPS Organic Act, 54 USC 100101 (b) et seq.). As a result, the agency routinely evaluates resources and implements mitigation measures whenever conditions are present that could adversely impact the sustainability of national park system resources.

The tables that follow detail past and ongoing monitoring guidelines and mitigation measures for each impact topic retained for analysis. It is intended that the past and ongoing monitoring and mitigation measures would be continued upon implementation of the Preferred alternative and supplemented by those actions labeled as "Future Monitoring Guidelines and Mitigation Measures."

Table 2-1: Natural Resources

Monitoring Guidelines and Mitigation Measures for Natural Resources
Past and Ongoing monitoring / mitigation guidelines and measures
▪ Use a sampling and analysis protocol established by the Heartland Inventory and Monitoring Network to monitor park plant communities over the long term. ▪ Re-establish recommended vegetation community types following site disturbance associated with maintenance or construction activities. Base community composition on inventories and monitoring protocols provided by Heartland and the recommendations in the Vegetation Management Implementation *Plan* (2014). ▪ Continue to monitor white-tailed deer populations and incidences of disease using Heartland Inventory and Monitoring Network staff and protocols. Continue to monitor bird communities, aquatic invertebrates in Wilson's Creek, status of Missouri bladderpod, and the forest communities in the park. Monitoring efforts will be increased to cover more of the landscape that is currently being monitored. ▪ Continue to follow the procedures and protocols outlined in the F*ire Management Plan* (2004). All monitoring and management procedures are outlined in detail in the management plan for prescribed fire in the park.
Future monitoring guidelines and required mitigation measures
▪ Follow recommended Best Management Practices (BMPs) as part of the implementation and management of actions outlined in the preferred alternative. Refer to Missouri Dept. of Conservation, the Great Lakes States and US and State Forest Services BMPs. ▪ Monitor trail use and erosion. Adjust trail carrying capacities based on monitoring findings. ▪ Provide temporary barriers to protect existing trees and shrubs that are not identified for removal, specifically during clearing for battlefield viewsheds. Barriers will extend out to trees' drip lines. ▪ Install vegetative filter strips will be used to filter and clean sediment, organic material, nutrients, chemicals, and other pollutants from run-off water as it leaves a non-point source. Place the filter strip between pollution sources and water resources to mitigate soil erosion and polluted run-off. ▪ Rehabilitate glades using regular prescribed fire as fuel loads permit or every five years before fall germination of Missouri bladderpod. Match the frequency of prescribed fire with those in surrounding areas. ▪ Manage savanna communities in conjunction with adjacent glade, buffer, and filter strip communities. Avoid making firebreaks at the edges of these plant communities; allow fires to run from one community to the next. Conduct prescribed fire approximately every two years until the savanna has true canopy. Reduce the fire frequency to every 4 to5 years after that to maintain the community. ▪ Conduct viewshed clearings in phases to ensure that the minimum amount of vegetation possible is removed to meet interpretive needs. ▪ Integrate natural resource management in an overall program of cultural resource management of the historical landscape. ▪ Manage exotic species to restore the battlefield's landscape to its 1861 condition; this includes the restoration of native plant habitat. ▪ Identify areas of prime and unique farmland and establish management strategies for prime soils as prt of any change in land use and associated vegetation. ▪ Minimize soil excavation, erosion, and offsite soil migration during and after any ground-disturbing activity.

Table 2-2: Cultural Resources

Monitoring Guidelines and Mitigation Measures for Cultural Resources
Past and Ongoing monitoring / mitigation guidelines and measures
▪ Document the condition of known archeological resources prior to any project work and monitor sites for changes in condition and site-specific threats. ▪ Include site condition assessments by a NPS-approved archeologist as part of any project-specific surveys. ▪ Protect archeological sites from disturbance, except for investigations necessary to address important research questions, and to consider proposed new additions such as trails, interpretive exhibits, and vegetation management treatments. ▪ Monitor archeological sites to determine visitor safety and resource protection concerns. ▪ Monitor water resource margins for erosion and the emergence of any archeological resources from streambanks. ▪ Identify cultural resources to be protected prior to all fire management activities Avoid impacts to cultural resources to the extent possible when conducting prescribed fire. ▪ Use mechanical treatments and prescribed fire to reduce fuel loads near historical structures. ▪ Retain and enhance the historic character of the battlefield cultural landscape as part of proposed activities.
Future monitoring guidelines and required mitigation measures
▪ Stabilize known archeological resources affected by erosion by establishing and maintaining grass cover on sites. Install erosion control measures such as textiles and grass cover using methods that do not further disturb subsurface resources. Avoid the use of material that is visually incompatible with the character of the areas, such as riprap or other large stone. ▪ Comply with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 Federal Register 44716, revised) when conducting all projects that might impact known or potential archeological resources. ▪ Prepare a geophysical baseline survey of any area to undergo construction prior to any soil disturbing activity. Follow the survey with archeological ground truthing of the geophysical anomalies to determine their nature, integrity, and extent. ▪ Identify known archeological resources in the vicinity of project activities and delineate them so that they can be avoided prior to commencing work. ▪ Coordinate with the SHPO throughout the course of any project to protect and mitigate cultural resources affected by the work. ▪ Engage an archeologist, natural resource specialist, and historical landscape architect to field-check the areas to be cleared for viewshed reestablishment. Ensure that no cultural or natural resources will be adversely affected prior to removal of woodland vegetation. ▪ Management vegetation in a way that is consistent with *Fire Management Plan* (2004), and follows the recommendations provided in the *CLR* (2004) and *Vegetation Management Implementation Plan* (2014). Consider managing vegetation in such a way as to more closely approximate the appearance and composition present in 1861.

Table 2-3: Visitor Use and Experience

Monitoring Guidelines and Mitigation Measures for Visitor Use and Experience
Past and Ongoing monitoring / mitigation guidelines and measures
▪ Monitor Incidences of human and wildlife interactions. ▪ Monitor visitation data through various methods such as visitor surveys, transportation data, and concessioner data. ▪ Collect visitation data to determine visitor use patterns, visitor demographics, visitor use conflicts, and visitor preferences and satisfaction with interpretive and recreational opportunities, programs, services and facilities. ▪ Conduct resource condition surveys as needed. ▪ Monitor all prescribed fire that have the potential to impact visitor experience. ▪ Continue to management the park's cultural landscape to provide visitors with insight into the general conditions experienced by the combatants during August 10, 1861, Battle of Wilson's Creek. ▪ Continue to monitor areas used by visitors for signs of vegetation community disturbance, trampling, trail erosion, and the development of social trails. ▪ Meet Leadership in Energy and Environmental Design (LEED) standards when constructing new facilities to demonstrate NPS commitment to protect natural and cultural resources for future generations.
Future monitoring guidelines and required mitigation measures
▪ Provide educational and interpretive information to the public during the establishment of viewsheds, particularly those that require clearing that conveys the value of clear-cutting in interpreting the events associated with the Battle of Wilson's Creek. Also interpret any natural resource benefits associated with viewshed clearing, such as habitat enhancement. ▪ Maintain the missing 1861 farmsteads to be interpreted through mowing to a visual understanding of historic spatial patterns. Consider also using plantings, posts, and fencing in conjunction with mowing to depict former farmstead features. ▪ Mitigate the impacts of any visitor access to sites that may be sensitive or contain vulnerable cultural or natural resources. Limit activities in such areas to research and passive recreational uses such as hiking. Provide interpretive programs and exhibits to convey information and suggest any ongoing research activities

Table 2-4: Human Health and Safety

Monitoring Guidelines and Mitigation Measures for Human Health and Safety
Past and Ongoing monitoring / mitigation guidelines
▪ Inform the general public of wildland fires and prescribed fires through distribution of press releases and interpretive information. ▪ Limit public access to any areas affected by fire. ▪ Notify appropriate regulatory and/or enforcement agencies prior to conducting any prescribed fire to support safe management of pedestrian, equestrian, and vehicular activities. Post warning signs along roads and trails to alert the public. ▪ Notify nearby residents prior to the use of prescribed fire. Post park staff and signs on roads that may be impacted by smoke and help divert motorists to other routes.
Future monitoring guidelines and required mitigation measures
▪ Continue the ongoing and required measures already in place that ensure visitor safety when implementing the actions proposed in the preferred alternative. ▪ Mitigate impacts arising from increased visitation, suburban development, and traffic within and outside the park.

Chapter 3 – Affected Environment

3.1 Introduction

This chapter discusses the resources that may be potentially impacted by implementing the proposed no action and action alternatives. The resources discussed below were identified and described as impact topics in Chapter 1 of this document. Identification was based on issues raised by agencies and the public during scoping; existing site conditions; federal laws, regulations and Executive Orders; National Park Service (NPS) Management Policies 2006; topics specified in Director's Order 12 and Handbook; and park specific resource information.

Natural resources examined in detail at Wilson's Creek National Battlefield include:

- Geology and soils
- Prime and unique agricultural lands
- Water resources/floodplains
- Water quality
- Vegetation
- Wildlife
- White-tailed deer
- Threatened and endangered species
- Air quality

Cultural resource topics evaluated include:

- Archeological resources
- Historic buildings and structures
- Cultural landscapes
- Historic viewsheds

The remaining topics examined in detail include

- Visitor use and experience
- Human health and safety

3.2 Natural Resources

3.2.1 Geology and Soils

Igneous rock in Missouri was formed during the Archeozoic and Proterozoic eras by solidification of molten magma. These rocks lie at varying depth, with surface exposure within the

region occurring only in the St. Francis Mountains. When the magma hardened, the St. Francis Mountain area was slowly upthrust to an elevation of about 2000 feet, raising the Ozark Plateau. Between the Proterozoic era and the last upthrust, which occurred during the Cenozoic era, the area settled, faulted, was covered by an inland sea, which led to deposition of minerals. The plateau was then eroded by winds and streams, resulting in the formation of the present-day Ozark Mountains. [1]

Soils identified within the park include Newtonia, Pembroke, Pearidge, Huntington, Secesh-Cedargap, and Waben-Cedargap silt loams, Wilderness and Goss cherty silt loams, Goss-Gasconade complex, and Gasconade-Roc outcrop complex. The silt loams are generally well suited to agriculture, including cropland, pasture, and trees. The cherty silt loams are moderately well suited to agriculture, particularly grass fields and pasture, and trees. The Goss-Gasconade complex is less well suited to agriculture and is used primarily for grassland pasture or is in forest. The Gasconade-Roc outcrop complex is typically maintained in successional woodland, and at best is marginally suited to pasture.[2]

3.2.2 Prime and Unique Agricultural Lands

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses meaning that the land could be cropland, pastureland, forest land, or other land, but not urban built-up land or water. Prime farmland has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed according to acceptable farming methods (Missouri NRCS Field Office 2000.)

The following prime farmland soils are present at Wilson's Creek National Battlefield:

Prime Farmland	*Acreage*	*Erosion Hazard*
1B Newtonia silt loam	52.5 acres	
2B Pembroke silt loam	72 acres	Slight
21B Peridge silt loam	164 acres	Slight
55 Huntington silt loam	182 acres	Slight
Statewide Importance	*Acreage*	*Erosion Hazard*
5C Wilderness cherty silt loam	346 acres	Slight
921 Secesh-Cedargap silt loams	91 acres	Slight

About 908 acres of the park fall into the category of prime farmland or soils of state importance. Most of the acreage that falls in the Peridge silt loam category is currently being farmed as hay fields or other crop exhibits (Sharp Cornfield and Sharp Stubblefield), as is some acreage that falls

[1] John Milner Associates, *Wilson's Creek National Battlefield Cultural Landscape Report* (Republic, Missouri: National Park Service, 2004), 3-1 – 3-3.

[2] *Ibid*.,), 3-4.

in the Secash-Cedargap, Wilderness, and Pembroke soil categories (Gibson Oatfield and Ray Cornfield and orchard).[3]

3.2.3 Water Resources / Floodplains

Springs. The water table throughout the region, first noted in the 1980s as declining sharply, has continued to drop since the Cultural Landscape Report (CLR) was published in 2004. Further investigation is needed to suggest the degree of change that has occurred in association with park springs between 2004 and 2017. The lowering of the water table continues to affect the flow of local springs. Six unnamed springs were indicated as present within the park in 2004. Since 2004, land added to the southwest of the park includes the so-called Double Spring, which was used by both Union and Confederate forces as an encampment site.

***Wilson's Creek*.** Wilson's Creek National Battlefield contains three streams—Wilson's Creek, Terrell Creek, and Skegg's Branch. Wilson's Creek, which originates in Springfield, Missouri, flows through Greene and Christian counties and is the primary water body associated with the park. Wilson's Creek is one of the largest tributaries of the James River. Wilson's Creek has a drainage area above the park of 58.3 square miles and average annual flow rates of approximately 90.9 cubic feet per second, as measured by a gauging station (07052160) near Wilson's Creek Battlefield (USGS 2010). Wilson's Creek is subject to floods. Flooding has periodic, short term effects on adjacent vegetation and results in the erosion of creek banks and other areas.

The broad floodplain of Wilson's Creek, a narrow band bordering McElhaney Branch, and narrow zone along the lower one-third mile of Skegg's Branch are developed in alluvial sediments. A narrow bank that borders either side of the floodplain of Wilson's Creek, as well as some of its tributaries, including the upper reaches of Skegg's Branch, are developed in the Elsey formation.[4]



Figure 3-1*: View of Wilson's Creek from the tour road. The streambed in this area has steep banks edged by low vegetative cover and scattered trees.*



Figure 3-2: *View of Wilson's Creek from the County Road bridge. The streambed has shallow banks edged by more trees.*

[3] *Ibid.,*3-4 – 3-5.

[4] *Ibid.,* 3-1 – 3-6.

The flora observed in association with riverbanks, low terraces, and bar communities is characterized by canopy trees such as silver maple *(Acer saccharinum),* common hackberry *(Celtis occidentalis),* sycamore *(Platanus occidentalis),* and American elm *(Ulmus americana)*. The current riverbanks and low terraces differ from the pre-settlement forms. Changes in watershed hydrology along Wilson's Creek have either buried or scoured away the landforms that comprised the low colluvial and alluvial stream margins. The majority of floodplain associated vegetation now consists of a few common species of Eurasian origin. Virginia wild rye *(Elymus virginicus),* a native grass forms near monocultures in some areas. Here and there a few older trees persist. Many of these trees are being shade-pruned by thickets of hackberry and elm, or their root systems are being undermined by the surges of floodwater that scour the riverbanks during rains.[5]

3.2.4 Water Quality

Since 2004, Wilson's Creek water quality was upgraded but there remain pollutant sources. Wilson's Creek is classified as a 303(d) stream. Sampling has shown water toxicity from unknown pollutants and bacteria are of an unknown source. Most likely it is from non-point sources such as run-off from parking areas and roads, and from developments that are not connected to the City of Springfield sewage system. Springfield has adequate sewage treatment. Studies since 1968 have shown that effluent from the wastewater treatment facility and urban runoff during storms release inorganic chemicals and nutrients into Wilson's Creek. Depleted oxygen and pollutants have reduced fish and animal populations.

3.2.5 Vegetation

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 within the park. In un-cultivated areas, blackjack oak *(Quercus marilandica)* dominated the uplands, while other species of oaks were present in smaller numbers. Black oak *(Q. velutina)*, white oak *(Q. alba),* and post oak *(Q. stellata)* were dominant overstory species in the draws and bottoms.[6]

In 1861, the savanna was used for open-range grazing of cattle, sheep, and horses. Several farmsteads were also scattered within the area that comprises the park, along with associated small fields and pasture, set within predominance of savanna and open mixed forest within upland areas.

After the Civil War, agricultural use of the land intensified, with much of the upland plowed and grazed. As agricultural activities expanded in the late 1800s and early 1900s, fire suppression also

[5] *Ibid.*

[6] National Park Service, *Wilson's Creek National Battlefield General Management Plan Amendment / Environmental Assessment / Assessment of Effect for the Civil War Museum and Addition Lands* (Republic, Missouri: Wilson's Creek National Battlefield, July 2007), 11.

increased, leading to a gradual succession of abandoned fields to early successional forest, characterized by thickets of fast-growing pioneer tree species.[7]

Currently, park vegetation is comprised of approximately 50 percent open grassland and shrub land and 50 percent woodland and forest. Forests are composed of about 90 percent deciduous species. The grasslands are mostly dominated or heavily infested by non-native and weed grasses and early successional vines and shrubs. Likewise, woodlands and forests generally contain early successional trees among the later successional species. Small, open glades support unique plant communities, while prairie restoration efforts have led to the establishment of native warm-season grasses in some areas. A study entitled *Natural Resource Condition Assessment* (2011), which was based on evaluation of data collected by the Heartland Inventory & Monitoring Network and (Heartland), indicated that the park is assessed in moderate/poor condition, with an overall condition assessment for vegetation of poor.

Ten community types and three other cover types—Developed Land, Water, and Crops—were mapped as part of the study titled *Vegetation Classification and Mapping of Wilson's Creek National Battlefield, 2013*. Of the 1,975 acres (799 hectares) addressed by the study, 93 percent of the area was indicated as semi-natural vegetation, with the rest described as developed. Of the semi-natural area, 46 percent (911.7 acres, 369 ha) is open, while 44.3 percent is in woodland or forest (875 acres, 354 ha). The remaining 2.5 percent (48 acres, 19.4 ha) is shrubland. Upland Deciduous Woodland and Forest covers 30.1 percent (595 acres,240.8 ha) of the park, while Non-native Ruderal Grassland covers 23.3 percent (462 acres, 187 ha) of the park. The open glades that cover 10.6 acres (4.3 ha) of the park are among its most important natural features. Several attempts have been made by the park to restore native grasses since the 1960s, resulting in a great diversity of grassland types in the modern landscape. Today, Restored Tallgrass Prairie covers 5.3 percent of the park (48.7 acres, 19.7 ha).[8]

In all communities, interspersed among the 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 (*Bromus hordeaceus*), downy brome (*Bromus tectorum*), and barren brome (*Bromus sterilis*), as well as Johnsongrass *(Sorghum halipense),* multiflora rose *(Rosa multiflora),* musk thistle *(Carduus nutans),* and Chinese bushclover *(Sericea lespedeza)*. Trees native to the United States but not to this region of Missouri that have proven aggressive and difficult to control within the park include Osage orange and honey locust *(Gleditsia triacanthos)*. Non- native plants currently dominate approximately 500 acres of parkland.[9]

Glade Communities. Glades are a result of years of erosion that produced treeless openings where bedrock is exposed on the surface and soils are very thin. Glades are xeric habitats often within woodland complexes, but they also occur within grasslands. Glades range in size from

[7] *Ibid*.

[8] David D. Diamond, Lee F. Elliott, Michael D. DeBacker, Kevin M. James, Dyanna L. Pursell, and Alicia Struckhoff, *Vegetation Classification and Mapping of Wilson's Creek National battlefield Project Report.* USGS-NPS Vegetation Mapping Program (Fort Collins, Colorado: National Park Service, Natural Resource Stewardship and Science, April 2013), 22–62.

[9] *Ibid.*

between 0.20 and 607.00 ha, are treeless, often occur on bedrock openings, and can contain up to 400 vascular plant species. Glades are typically found on south and west aspects of hillsides. Drought and fire tolerant plant species inhabit glades. Some glade plants grow only during the winter and spring when water is abundant and temperatures are lower.[10]

The remnant glade communities at Wilson's Creek National Battlefield are currently threatened by the encroachment of Eastern redcedar trees. The cedar trees decrease the space and water available for herbaceous cover, decreasing species richness and diversity (Amelon 1991; Jenkins et. al. 1997). In addition to shading out native species, Eastern redcedar trees cool the substrate below and alter soil chemistry. The resulting change in light availability and cooling alters the mass-heat relationship of the exposed bedrock on which native glade plant and lichen species are dependent. Under the shaded conditions, invasive Asian annual grass species, such as Japanese chess *(Bromus japonicus),* proliferate. Present-day glades, however, continue to contain several important lichens and herbaceous plant species, such as the Missouri bladderpod. Glades require conservation and are a significant natural feature to be protected within the park.

Both alternatives encompass the glade plant communities within Wilson's Creek National Battlefield. Glades that contain relatively high-quality native plant community remnants where Missouri bladderpod exists, or has the potential to exist, include Bloody Hill (6.45 ah); Manley (12.1 ha); North Bloody Hill (7.4 ha); Terrell Creek (1.1 ha); Walnut (2.5 ha); Wire Road (10.2 ha); and York (0.2 ha).[11]

3.2.6 Wildlife

Fauna associated with the park is typical of old fields and disturbed woodlands and forests of the eastern Ozark Highlands. Current records suggest 115 bird species are regular residents of the park; 97 of these are considered breeding species.[12] The most common and widely distributed species is the Indigo bunting *(Passerina cyanea)*. The Northern cardinal *(Cardinalis cardinalis)* and blue-gray gnatcatcher *(Polioptila caerulea)* occur frequently as well. Partners in Flight, a coalition of agencies and individuals whose mission is to conserve North America's declining bird populations, classifies 10 birds found at the park as species of continental importance. Two grassland obligate species have been recorded at the park—the dickcissel *(Spiza americana)* and Eastern meadowlark *(Sturnella magna)* (NPS 2010 NR Condition Assessment). Other species include the red-tailed hawk *(Buteo jamaicensis),* great blue heron *(Ardea Herodias)'* and killdeer plover *(Charadrius vociferous)*. In addition, the American crow (*Corvus brachyrhynchos*), turkey vulture (*Cathartes aura*), and various ducks and geese have been observed within the park.

An inventory of mammals observed at Wilson's Creek National Battlefield was conducted in June 2004. A list of thirty-seven known and likely species was developed for the park. Some of the mammals present in the park include the white-tailed deer, cottontail rabbit, squirrel, coyote, red

[10] National Park Service, *Vegetation Management Implementation Plan* (Republic, Missouri: National Park Service, April 2014), 11–14.

[11] *Ibid.*

[12] D.G. Peitz, *Bird Community Monitoring at Wilson's Creek National Battlefield, Missouri: Status Report.* National Resource Report NPS/HTLN/NRR – 2017/2018. Fort Collins, Colorado: National Park Service, 2017.

and grey fox, raccoon, bobcat, skunk, opossum, woodchuck, muskrat, beaver, field mouse, mole, vole, and gopher. A complete list of amphibian, reptile, bird, fish, mammal, and plant species found in the park is available at the Heartland website.[13]

3.2.7 White-tailed Deer

Since European settlement, white-tailed deer populations in North America have experienced enormous changes in size and distribution. Once abundant, deer numbers declined to near extinction by the early 1900s. However, the ability of while-tailed deer to adapt to human disturbance has aided in the recovery of this species. Urban sprawl benefits deer by fragmenting continuous blocks of forested lands into small sections with increased edge habitat favored by deer, and these are rarely available for hunting. Deer currently exhibit high rates of population growth as long as food is available in these small blocks of patchy habitat. They are also vulnerable to overpopulation, disease, and starvation in the absence of natural predators and hunting. When deer occur in high densities, diseases are transmitted more readily (NPS Heartland I&M Monitoring website).

Due to increased development, altered ecosystems, and concerns over visitor safety at Wilson's Creek National Battlefield, Heartland has continually monitored the deer population at Wilson's Creek National Battlefield since 2005. Using an index of deer density, staff have been able to calculate or estimate the deer population on an annual basis. There was a sharp decline recorded in the population between 2005 and 2007. This coincides with an outbreak of hemorrhagic disease. There was a significant increase in population size after the lowest estimation in 2007. In 2016 the index of deer density increased sharply to a record level of 158 individual deer per square kilometer. This was 191 percent above the 12-year density average. Measuring long-term trends in deer abundance helps in assessing their potential as a problem for the park. Monitoring data also help managers assess safety risks from deer-vehicle collisions and disease transmission. Long-term monitoring of deer numbers will be a critical tool for evaluating any population control measures the park may implement.

3.2.8 Rare, Threatened, and Endangered Species

The U. S. Fish and Wildlife Service (USFWS) has identified the federally-listed species, proposed species, candidate species, and designated and proposed critical habitat present or potentially present at Wilson's Creek National Battlefield. USFWS offered the comments pursuant to the U.S. Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347), and the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544). Two plants documented within the park are listed as threatened or endangered at the federal or state level. The Missouri bladderpod is listed as threatened by both the federal and state governments. Virginia sneezeweed *(Helenium virginicum)* in also listed as a federally-threatened species.

[13] National Park Service, "Inventorying and Monitoring at Wilson's Creek National Battlefield" Available at http://science.nature.nps.gov/im/units/htln/parks/wicr.cfm (accessed December 26, 2017).

The state of Missouri considers five additional plants known to exist within the park to be imperiled or critically imperiled. These include 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 near the southern bridge over Wilson's Creek; it may have been brought into the park as part of a wildflower seed mix, however.[14]

The USFWS also lists the gray bat (*Myotis grisescens*) as endangered at the federal and state level. It has been observed in the McElhaney Branch cave near Wilson's Creek east of the visitor center. Gray bats have a limited geographic range in the southeastern United States. They generally inhabit pits and caves in limestone karst regions characterized by sinks, ridges, and caverns (USFWS 2017). The gray bat was last documented in the park in 1996. An inventory of cave resources initiated by park staff led to the discovery of a small population of gray bats (less than 50 individuals) hibernating in a cave in the park. This species had not been documented in the park before. The USFWS also identified the Indiana bat *(Myotis sodalis),* Northern long-eared bat *(Myotis septentrionalis),* Ozark cavefish *Amblyopsis rosae),* and grotto salamander *(Typhlotriton spelaeus),* as species of concern to the state. These were documented in the McElhaney Branch cave.

Missouri bladderpod. The Missouri bladderpod is a small, 10 to 20 cm tall, winter annual mustard with yellow flowers. The plant has basal rosettes that first emerge in November. The rosettes remain green throughout the winter and bloom in the spring. Missouri Bladderpod grows in open cedar glades, barrens, limestone outcrops, and rock pastures.

As with other winter annuals, the size of Missouri bladderpod populations fluctuates dramatically from year to year (USFWS 2017). In some years, populations are very small or non-existent. While 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, and populations can bounce back under favorable conditions.

Estimates of Missouri bladderpod populations in Manley Woods glade have ranged from 101 plants in 2002 to 679 plants in 2007. In 2008, population size was estimated between 170 and 696 plants. In 2007, the Missouri bladderpod population in Manley Woods Glade was higher than in previous and subsequent years. The increase may reflect the effect of the use of prescribed fire in 2006. Overall, population size in Manley Woods Glade has been remarkably stable despite the effects of a tornado in 2003 and an ice storm in 2007.[15]

Bald eagle. Bald eagles are common migrants and winter residents throughout the state of Missouri and are uncommon breeders along some of the major rivers and large reservoirs. During very cold winters, when the lakes and rivers are frozen in northern Missouri, bald eagles

[14] National Park Service, *Environmental Assessment for Resource Preservation and Visitor Interpretation of Bloody Hill at Wilson's Creek National Battlefield, Greene County, Missouri* (Republic, Missouri: Wilson's Creek National Battlefield, April 2014), 29–34.
[15] *Ibid.*

occasionally perch on trees along Wilson's Creek. The eagles typically stay one or two days each year, although there are winters when they do not visit the park at all.[16]

3.2.9 Air Quality

Air quality is an important environmental issue facing many national parks. Data collected through NPS air quality programs demonstrate that park units are not islands isolated from urban, agricultural, and industrial pollutants. Manmade and natural air pollutants are transported long distances and have been detected at all NPS monitoring sites. Air pollution affects natural and cultural resources throughout much of the National Park System through visibility reduction, biological and human health effects, and degradation of historic structures and artifacts.[17]

Under the terms of the 1990 Clean Air Act amendments, Wilson's Creek National Battlefield is designated as a Class II quality area. By definition, Class II areas are set aside under the Clean Air Act but identified for somewhat less stringent protection from air pollution damage than Class I areas. The primary means by which the protection and enhancement of air quality is accomplished is through implementation of National Ambient Air Quality Standards (NAAQS). These standards address six pollutants known to harm human health including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxides. The state of Missouri, except for the St. Louis area, is in attainment for all NADQS (EPA 2002).

3.3 Cultural Resources

3.3.1 Archeological Resources

Like all federal agencies, the NPS is obligated by the National Historic Preservation Act (NHPA) [section 110 (a) (2)], Executive Order 11593, and section 14 of the Archeological Resources Protection Act to identify, evaluate, preserve, and protect historic properties, including archeological sites (NPS 2008 Battlefield Archeology at Wilson's Creek National Battlefield). Archeological investigations at Wilson's Creek were first conducted in the 1960s and have continued periodically since. All the investigations have been conducted in response to specific management issues or in support of achieving compliance with Section 106 of the NHPA, as amended.

Wilson's Creek National Battlefield contains a substantial number of known archeological resources that contribute to the significance of the property. For the purposes of this EA, archeological resources are broadly defined to include both subsurface artifacts and features as well as above ground features such as architectural ruins, milldams and races, cemeteries, and road systems.

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[16] National Park Service, *Fire Management Plan for Wilson's Creek National Battlefield* (Republic, Missouri: Wilson's Creek National Battlefield, 2004), 3-7 – 3-9.

[17] Gust M. Annis, Michael D. DeBacker, David D. Diamond, Lee F. Elliott, Aaron J. Garringer, Phillip A. Hanberry, Kevin M James, Ronnie D. Lee, Michael E. Morey, Dyanna L. Pursell, and Crain C. Young, *Wilson's Creek National Battlefield Natural Resource Condition Assessment.* Natural Resource Report NPS/HTLN/NRR–2011/427 (Fort Collins, Colorado: National Park Service, Natural Resource Stewardship and Science, July 2011),39–40.

All known historic archeological sites within Wilson's Creek National Battlefield generally fall into three broad categories: house or home sites; cemeteries and burial sites; and industrial sites, such as mill complexes, quarries, and corporate towns. Archeological sites retain integrity of location, setting, and association. Each of the properties located within the battlefield landscape can also be tied to nearby features such as views, road systems and fencelines.

The large number of known archeological sites and broad representation of site types contribute substantially to the integrity and significance of the larger park landscape. Archeological sites within Wilson's Creek National Battlefield are integral to park interpretation and help convey integrity of feeling for the 1861 period of significance. Known archeological resources help illustrate to the park visitor where battle events occurred. The locations of former house sites document where battlefield headquarters were stationed or troops were positioned, road corridors document how troops moved through the battlefield, and informal grave sites document where soldiers were buried.[18]

3.3.2 Historic Buildings, Structures, and Other Features

The only buildings and structures that survive from the Civil War period include the Ray House and Springhouse, and possibly the Short Springbox. There are no buildings that survive from the commemorative period of significance. There are also no known buildings or structures associated with the pre-Civil War-era landscape.

During the early European-American settlement period of the 1830s and 1840s, several homesteads were established within the park landscape, including the Ray House. The majority of these were residences and associated outbuildings that related to agricultural use of the land. The homesteads thought to have been present at the time of the battle include: the Ray, C.B. Manley, Sharp, Edwards, Gwinn, Gibson, Short, T.B. Manley, and Edgar family properties. Industrial uses were also represented during this period at the Gibson property, which included a millrace, mill, and wool carding factory by the Civil War. Little is known about the character of these properties.

The Ray House, constructed in 1852, has been continuously occupied since the 1850s. It has been altered since the Civil War by subsequent residents to accommodate evolving needs. The Ray Springhouse structure is also considered to survive from the Civil War period. A third structure located within the park thought to survive from the Civil War period is the Edwards Cabin. This structure, however, was moved to the park from its original location in 1965 to mark the location of a cabin present during the war used by General Price as his headquarters during the Battle of Wilson's Creek.

Other historic buildings present within the park are associated with the McElhaney Farm complex. The primary features of the complex were built in 1911 and has been little altered since its original construction. One historic structure that post-dates the Civil War within the park is the Wire (County) Road) bridge over Wilson's Creek in 1910. Another important historic feature is the Lyon marker, erected in 1928, that survives from the commemorative period. It replaced a

[18] John Milner Associates, *Cultural Landscape Report,*.3-71 – 3-72.

rock cairn established in the 1860s to honor General Lyon, but later lost when visitors removed the stones.[19]

The remaining buildings and structures currently located within Wilson's Creek National Battlefield are associated with mid-to late-twentieth-century park development and are not considered historically significant.



Figure 3-3: Ray House survives from the Civil War period.



***Figure 3-4**: The Edwards Cabin was also built prior to the Civil War but moved into the park from its original location.*

3.3.3 Cultural Landscapes

National Register of Historic Places Status

As noted in the 2004 CLR, Wilson's Creek National Battlefield was administratively listed in the National Register of Historic Places (NRHP) in 1966 based on passage of the NHPA. NRHP documentation was prepared for the park in 1976, and the nomination accepted by the Missouri State Historic Preservation Office (SHPO) and the Washington office of the National Register. The 1976 nomination addressed the lands located within Wilson's Creek National Battlefield, which at the time extended over 1,749 acres.

Since preparation of the 1976 nomination, as well as the *CLR* (2004), new scholarship has suggested that the extent of the battlefield was greater than indicated in the nomination. The *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields* (2011) identified an expanded area as eligible for listing in the NRHP. Overall, this expanded area encompasses more than 5,109 acres, as indicated in Figure 3-5, including the area of the park as enlarged since 2004, as well as land outside current park boundaries. A large part of the eligible battlefield property falls on privately held property.

Civil War Sites Advisory Commission Report Update

Wilson's Creek was identified in the 1993 *Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields* as a priority III battlefield, suggesting that it was in need of additional protection. The 2011 update to the report suggests that Wilson's Creek, one of seven Missouri battlefields listed in the NRHP, should be considered for a nomination update to

[19] John Milner Associates. *Wilson's Creek National Battlefield Cultural Landscape Report*. 2004. p.3-39–3-43.

address proposed boundary expansion to recognize the 3,300 acres of historic battlefield land that fall outside of the park not addressed by the 1976 nomination.[20] The study suggests there are a total of 2,968.48 unprotected, intact acres remaining within the Wilson's Creek study area.[21]

The park retains some, but not all, of the features that comprised the site's rural and agricultural early settlement character on August 10, 1861. It also retains the natural resources and systems that played an important tactical role in the battle, including Wilson's Creek; Skegg's, Manley's, Short's and McElhaney's Branches; numerous springs; prominent landforms such as Bloody Hill; and open fields formerly associated with active agriculture. The site's landscape features were important factors in determining military strategy and the events that unfolded over the course of the battle and continue to retain the ability to convey this information. The park's strong rural character and interpreted agricultural component also support its ability to convey mid-nineteenth-century conditions.[22]

3.3.4 Historic Viewsheds

During the Civil War Battle of Wilson's Creek, views were a critical component of the tactics of the military commanders. Views from Bloody Hill were important to the siting of the Union artillery. The Pulaski Battery was positioned to guard the Wire Road before the battle. Fortuitously for the Southerners, this provided visual access to Union artillery on Bloody Hill. Other aspects of the battle relied on the open nature of the Sharp and Ray Farm fields, and the fields to the west of the Edwards Cabin.

Little is known about the importance of views within the Wilson's Creek battlefield landscape during the post-Civil War period. It is likely that views from Bloody Hill were a desirable component of commemorative activities and events held there after the war.

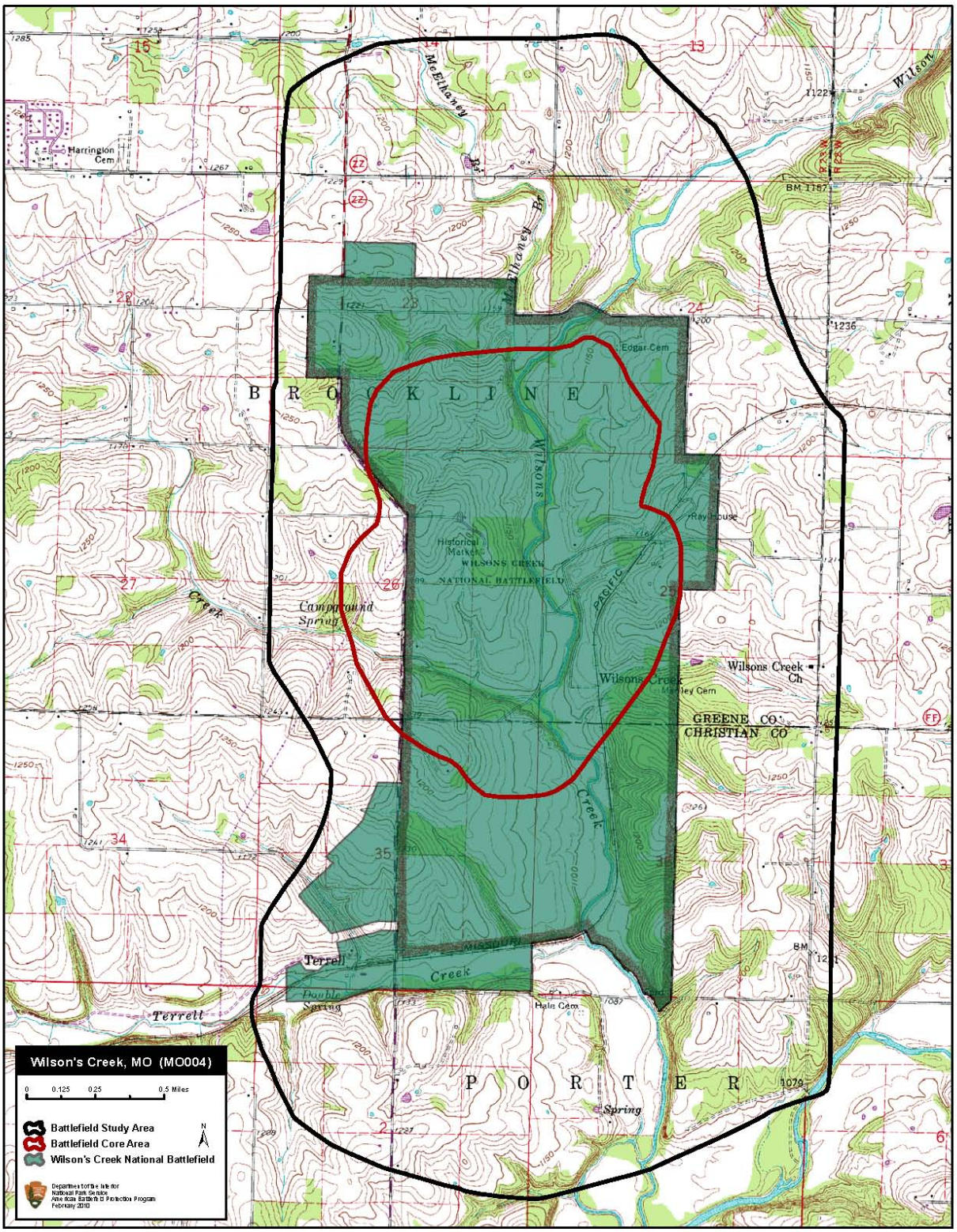
As part of park interpretation of the battlefield, views have been maintained at the east and west battlefield overlooks, at the Ray House precinct, and in association with various interpretive waysides sited to take advantage of directed vistas across the battlefield toward important landscape features. None of the views currently afforded within the park, however, sufficiently approximates the views available during the Civil War and commemorative periods.[23]

[20] National Park Service, *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields; State of Missouri*(Washington, D.C.: American Battlefield Protection Program, March 2011), 15.

[21] National Park Service, Update Report, 24–25.

[22] *Ibid*.

[23] John Milner Associates, *Cultural Landscape Report*, 3–68.



Map 3-1*: American Battlefield Protection Program (ABPP) map of the core and study areas associated with Wilson's Creek National Battlefield, and the National Register-eligible property included in the 2011 Update to the Civil War* Sites *Advisory Commission Report on the Nation's Civil War Battlefield* prepared for the state of Missouri. *(Source: ABPP).*

3.4 Visitor Use and Experience

Affected Environment. The actions described in the alternatives fall 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 park. Wilson's Creek National Battlefield, which includes 75 percent of the actual battleground, 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. Exhibits within the visitor center display the nation's premier collection of Trans-Mississippi Civil war artifacts. There is also a 12,000 volume Civil War library available to the public for research. 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 Newtonia, in interpreting the overall Civil War experience in southwest Missouri.[24]

Visitor Use: Between 1967 and 2010, recreational visits to the battlefield ranged from 33,900 (1973) to 351,658 (1988), which is an average of 180,024 recreational visits per year. 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; approximately half of the visitors have been to the park before. In addition, approximately 50 percent of the visitors are from the greater Springfield metropolitan area and surrounding counties.

The most popular visitor activities at Wilson's Creek National Battlefield include:

- Exercising on the trails and the tour road
- Driving the tour road
- Viewing exhibits at the visitor center
- Viewing the battle map
- Viewing the film
- Shopping in the visitor center bookstore.

Wilson's Creek National Battlefield also provides open space for the greater Springfield metropolitan area where many residents regularly enjoy recreational activities such as horseback riding, bicycling, exercising their pets, jogging, or physical conditioning. Non-local visitors more commonly cite the opportunity to learn about the Battle of Wilson's Creek and the Civil War as their primary reason for visiting. Recreational visits exceed resource-based visits by an estimated ratio of 2 to 1.

[24] National Park Service, *Bloody Hill EA,* 42–46.

Visitor Experience and Interpretation. Many visitors to Wilson's Creek National Battlefield begin their visit at the visitor center, located near the park entrance at the northwest corner of the park. The visitor center is accessible by wheelchair from the parking area. At the visitor center, visitors can receive an orientation to the park, talk with a Park Ranger, buy materials at the cooperating association sales area, and view exhibits about the battle. A 30-minute video presents an overview of the battle. In addition, a 6-minute program conducted on fiber-optically-lighted map illustrates the events of the battle. An excellent Civil War research library containing 12,000 volumes is located in the visitor center. It is open to visitors and researchers on an advanced-reservation basis.



Figure 3- 5: *The visitor center at Wilson's Creek National Battlefield provides visitor orientation and exhibits.*



Figure 3-6: *A picnic area is located south of the visitor center.*

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 "Arts in the Park', the "Memorial Luminary Driving Tour", 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 for the restrooms. Repeat visitors typically begin their park experience by proceeding directly to the tour road, while recreational users often park in the visitor center parking area, and begin their walk, jog, or bicycle ride there.

Equestrian users generally park in the equestrian parking area behind the Ray House. A 7-mile trail system is available for horseback riding and hiking from the tour road. Although highways and roads edge the park along most margins, traffic noise is not terribly intrusive in most visitor use areas except at Bloody Hill, which is near Highway ZZ. The 4.9-mile paved tour road features eight interpretive stops at significant battle locations as part of a self-guided automobile tour of the battlefield. The tour road receives considerable use by bicyclists, joggers, and walkers. Although bicyclists, pedestrians, and motorized vehicles often use the tour road at the same time, there is a lane designated for bicycle use that is also used by pedestrians.

In addition to the tour road, there are five walking trails that vary in length from one-quarter to three-quarters of a mile. These are accessible to visitors from the tour road and provide access to



Figure 3-7: *Horseback riding is a popular recreational activity on the equestrian trails provided by the park.*

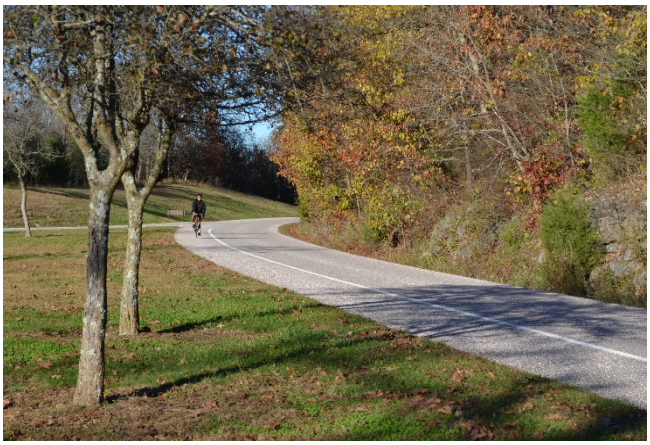


Figure 3-8: *Cyclists use designated lanes along the tour road within the park.*

additional sites related to the battle. One of these leads to the Ray House, an antebellum structure in the northeastern corner of the park used during and after the battle as a temporary field hospital for Confederate soldiers. The body of Gen. Nathaniel Lyon was brought to the house after he was killed in battle. The bed on which the general's body was placed remains on exhibit in one of the rooms. The Ray House is closed during the off-season but open daily during the summer. During the off-season, tourists can learn about the battle by reading wayside exhibits. Interpretive trails extending from the tour road are both informal and not designed for wheelchair use or were constructed before current universal accessibility standards were established.

3.5 Human Health and Safety

Numerous conditions within the park require continual attention by management personnel to ensure the safety of visitors. Park personnel are vigilant about anticipating visitor safety issues such as the potential for severe summer weather—heat and humidity, hailstorms, and tornadoes—and the presence of biting insects, poisonous snakes, caves, and the water quality of Wilson's Creek (NPS 2004 CLR). Ongoing maintenance of trails, roads, exhibits, site furnishings, buildings, and vegetation is only part of the comprehensive work required to ensure the health and safety of the public. Park personnel also monitor and maintain signage that addresses the separation of equestrian and pedestrian use.

Vegetation management strategies conducted within the park, such as the use of prescribed fire, can be extremely hazardous and life-threatening to humans. Park personnel and a variety of other agencies associated with fire management plans work to ensure the safety of the public during such management action. Current federal fire management policies emphasize that firefighter and public safety is the first priority of all strategies.



Figure 3-9: *Trail surfaces are susceptible to water flow damage and could pose a safety hazard.*



Figure 3-10: *Park staff continually maintain trails and other furnishings, signage, and buildings for the health and safety of visitors.*

The large deer population within and surrounding the park is a concern to park personnel due to the safety hazard for visitors driving on Farm Road 182 and on Highway ZZ as well as on the park tour road of the park. Heartland monitors the deer population within the park.

Chapter 4 – Environmental Consequences

4.1 Overview

The National Environmental Policy Act (NEPA) requires that environmental documents discuss the environmental impacts of a proposed federal action, feasible alternatives to that action, and adverse environmental effects that cannot be avoided if a proposed action is implemented. In this case, the proposed federal action is the implementation of treatment recommendations contained in the 2004 Cultural Landscape Report for Wilson's Creek National Battlefield and the identification and disclosure of potential impacts and effects of the alternatives in order to fulfill all compliance requirements. This chapter analyzes and compares the environmental impacts on natural resources, cultural resources, visitor use and experience, and human health and safety. This analysis is the basis for comparing the positive and adverse effects of implementing the alternatives. By examining the environmental consequences of the alternatives on an equivalent basis, decision-makers can evaluate which approach would create the most desirable combination of benefits with the fewest adverse effects on the park.

This chapter begins with a brief explanation of general methods and assumptions for analyzing impacts, followed by a discussion of how cumulative impacts are analyzed for the alternatives. The impact analysis follows. Each of the alternatives, including the no-action alternative (continuation of current management), is analyzed for adverse or positive changes that would occur to the existing conditions of each impact topic as presented in the affected environment chapter of this document. After describing the impacts of the alternatives, the cumulative effects on each impact topic are discussed.

4.2 General Methods and Assumptions for Analyzing Impacts

This section describes the environmental impacts and their significance for each alternative. The analysis assumes that the monitoring and mitigation measures identified in Chapter 2 of this document, would be implemented for the action alternative. Overall, the National Park Service (NPS) based its impact analyses and conclusions on review of existing literature and park studies, information provided by experts within the park and other NPS personnel, other agencies, professional judgment, park staff insights, and public input.

In accordance with Council of Environmental Quality (CEQ) regulations, direct, indirect, and cumulative impacts are described (40 CFR 1502.16), and the impacts are assessed in terms of context and intensity (40 CFR 1508.27). Where appropriate, mitigating measures for adverse

impacts are described and incorporated into the evaluation of impacts. The specific methods used to assess impacts for each resource may vary and, therefore, are described as part of each impact topic.

The following terms are used in the discussion of environmental consequences to assess the impact intensity threshold and the nature of impacts associated with each alternative.

- ***Type.*** Impacts can be positive or adverse. A positive impact is an impact that would result in a favorable change in the condition or appearance of the resource. An adverse impact is an impact that causes an unfavorable result to the resource as compared with the existing conditions.
- ***Context*****.** The significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, the locality, and the park. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance usually would depend on the effects in the locale rather than in the world as a whole. In many cases, the term "localized" is used, intending to provide the context that impacts would only occur within a relatively small area (i.e., a few acres) as opposed to throughout the park or into neighboring areas. The term "local" is used to reference the entire park. Both short-and long-term effects are also relevant.
- ***Duration*****.** Duration of impact is analyzed independently for each resource because impact duration is dependent on the resource being analyzed. Impacts may last for the implementation period, a single year or growing season, or longer. Impact duration is described as short-term, long-term, or permanent for each resource. For the purposes of this analysis, short-term and long-term impacts are defined for each resource.
- ***Direct and Indirect Impacts*****.** Effects can be direct, indirect, or cumulative. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later or further away but are still reasonably foreseeable. Direct and indirect impacts are considered in this analysis. Cumulative effects are discussed in the next section.
- ***Intensity.*** This refers to the severity of impact. The following should be considered in evaluating intensity:
    - Impacts that may be both positive and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be positive.
    - The degree to which the proposed action affects public health or safety.
    - Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
    - The degree to which the effects on the quality of the human environment are likely to be highly controversial.
    - The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

- The degree to which the action may establish a precedent for future actions having significant effects or represents a decision in principle about a future consideration.
- Whether the action is related to other actions that have individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
- The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in, or eligible for listing in, the National Register of Historic Places (NRHP) or may cause loss or destruction of significant scientific, cultural, or historical resources.
- The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
- Whether the action threatens a violation of federal, state, or local law or requirements imposed for protection of the environment.

For each impact topic analyzed, an assessment of the potential impacts according to context and intensity is provided in the "Conclusion" section that follows the discussion of the impacts under each alternative. The intensity of the impacts is presented using the relevant factors from the preceding list. Intensity factors that do not apply to a given resource topic and/or alternative are not discussed.

4.3 Climate Change

The impacts of climate change on Wilson's Creek National Battlefield are not expected to vary by alternative. The lack of certainty about regional climate change adds to the difficulty of predicting how these impacts would be realized. Furthermore, management actions that are inherently part of each alternative would not fundamentally change with the anticipated added impacts of climate change. However, there may need to be flexibility in some of the proposed actions, specifically in the need or ability to use prescribed fire as frequently and over as extensive an area as proposed in alternative 2. Climate change is one factor among many that cause similar outcomes between the alternatives, so management actions would not likely be taken due to climate change alone. Given this complexity, the potential influences of these changes on the park environment are not analyzed in detail with respect to each alternative in this chapter. Refer to the discussion of the carbon footprint topic in the Chapter 1 section, "Impact Topics Considered but Not Retained for Full Analysis."

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

In this Environmental Assessment (EA), impacts on cultural resources are described in terms of type, context, duration and intensity, which is consistent with the regulations of the CEQ that

implement NEPA. These impact analyses are intended, however, to comply with the requirements of both NEPA and Section 106 of the National Historic Preservation Act (NHPA). Section 106 of the 1966 NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (Advisory Council) a reasonable opportunity to comment. In accordance with Advisory Council regulations related to Section 106 (36CFR Part 800, *Protection of Historic Properties),* impacts on cultural resources are 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 NRHP; (3) applying the criteria of adverse effect to affected NRHP-listed or eligible 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 be made for affected NRHP-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 NRHP, 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 NRHP.

CEQ regulations and the NPS's *Conservation Planning, Environmental Impact Analysis and Decision Making* (Director's Order 12) also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g., reducing the intensity of an impact from major to moderate or minor.

Any resultant reduction in intensity of impact due to mitigation; however, is an estimate of the effectiveness of mitigation only under NEPA. 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, actions determined to have an adverse effect under Section 106 may be mitigated but the effect can remain 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 NRHP-listed or eligible cultural resources only, based upon the criterion of adverse effect and no adverse effect found in the Advisory Council's regulations.

4.5 Cumulative Impacts Analysis Method

Definition

CEQ regulations require assessment of cumulative impacts in the decision-making process for federal projects. A cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for all alternatives, including the no-action alternative. Cumulative impacts can result from individually minor, but collectively positive or adverse actions taking place over a period of time.

Methods for Assessing Cumulative Impacts

Cumulative impacts were determined by combining the impacts of the action alternative and the no-action alternative with other past, present, and reasonable foreseeable future action. Past actions include activities that influenced and affected the current conditions of the environment near the park. Ongoing or reasonably foreseeable future projects near the park or the surrounding region might contribute to cumulative impacts. The geographic scope of the analysis includes actions within the park as well as other actions in the park or surrounding lands, where overlapping resource impacts are possible. Once identified, past, present, and reasonably foreseeable actions are then assessed in conjunction with the impacts of the alternatives to determine if they would have any added adverse or positive impacts on a particular resource, human health and safety, or visitor use and experience. The impacts of past, present and reasonably foreseeable actions vary for each resource. Cumulative impacts are considered for each alternative and are presented in the environmental consequences discuss for each impact topic.

4.6 Actions and Projects Inside Wilson's Creek National Battlefield

In order to determine the potential cumulative impacts, the following existing and anticipated present and future projects at Wilson's Creek National Battlefield were taken into consideration:

- Past, present, and ongoing vegetation management strategies including proposed mowing treatment; prescribed fire treatment; proposed herbicide treatment in designated corn fields; and chemical treatment of invasive exotic plants
- Past, present and future projects associated with expanded interpretation and replacement of tour road waysides
- Past, present and future projects associated with improvements to accessibility to primary visitor use facilities
- Future projects associated with the demolition of Double Springs structures and rehabilitation of the farm site
- Past, present, and ongoing water resource management including erosion control, sediment load reduction, pollutant reduction, and groundwater table assessment especially related to springs and vegetation requirements

4.7 Actions and Project Outside Wilson's Creek National Battlefield

The park is planning to remove a 25-foot-wide strip forest and woodland vegetation along the two sides of the park that are edged by major roadways—the north and west. This can be considered an outside project as it pertains to traffic/deer interactions on roads outside the park.

No additional projects outside Wilson's Creek National Battlefield were identified by park staff. Reasonably foreseeable impacts from projects outside the park might be associated with road expansion along the park boundaries and development of the land that surrounds the park.

4.8 Natural Resources

4.8.1 Soils and Geology

ALTERNATIVE 1 (NO-ACTION)

Impacts

Within alternative 1, there are no changes to current conditions. Existing management or maintenance strategies would remain in place and include controlling trail erosion and deposition of sediment, limiting visitor access, and avoiding construction of new features or facilities that might cause soil conditions or stability to change or accelerate. No further clearing would be undertaken and current mowing and vegetation management regimes including the use of prescribed fire would continue. Mitigation measures for sensitive natural resources in the current *Fire Management Plan* (2004) will remain in place and include soils and geology. There would be no adverse impacts to soils and geology resources with the implementation of this alternative.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed to occur within the park, none of which have an adverse impact on soils and geology. The incremental impact of this alternative when added to other past, present, and reasonably foreseeable future actions would be negligible.

Conclusion

The no-action alternative would not modify the existing soils or geology conditions at Wilson's Creek National Battlefield. No adverse impacts to soil and geologic resources would be expected.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Specific actions resulting from the implementation of this alternative and associated with potential impacts on soils and geology include clearing of the newly acquired parcel to the southeast and integration into savanna management practices, establishment of a day-use picnic area in the Double Spring parcel; equestrian parking re-location; expansion of existing pedestrian trails; realignment of pedestrian and equestrian trail segments with ongoing severe erosion; construction of trail fords or bridges across various creeks and streams; establishment of a new tour road stop 1 in conjunction with a cleared viewshed; installation of an orchard and limited

crop field exhibits at the Guinn House site; establishment of ten contemplative/interpretive nodes; clearing vegetation for ten new viewsheds and associated interpretation; installation of buffer plantings; rehabilitation of glade communities; restoration of the watershed, and establishment of riparian buffers along stream corridors.

Surface soils in the vicinity of proposed waysides, contemplative nodes, and cannon placement, and along proposed new trail alignments and stream crossings or modifications would be disturbed during the construction period. There would be some cut and fill required on trails with a switchback alignment. Cut and fill requirements would not be substantial and would result in short-term, localized, and minor adverse impact to soils. Recovery and stabilization time for soils would be minimal and soil fertility or natural physical features would not be reduced or lost. Required mitigation measures, coupled with phasing of projects, would ensure the viability of the soils in the vicinity of the trail alignments. The switchback alignment in the long-term would have a positive impact on soils due to prevention of erosion on trails with steep slopes. Removal of trail segments on steep slopes would also have long-term positive impacts on soils.

Other construction activities associated with expanded interpretation would have short-term adverse impacts on surface soils until stabilization occurs after clearing of woodlands and minimal grading to shape contemplative nodes and the day-use picnic area in the Double Spring parcel. Required mitigation measures, coupled with phasing of projects, would ensure adverse impacts are negligible.

Construction of trail crossings over streams and creeks range from a basic low-water unvented improved ford, to a low water bridge. Trail management objectives should be formulated before locating a new crossing or deciding to fix or replace an existing one. Formulating such objectives requires analyzing the entire trail location. Choosing the type of structure for any crossing is highly site-dependent. Depending on the site, the main advantages of low-water crossing over culverts and bridges may include lower construction and maintenance costs; less channel and floodplain blockage; adaptability; and stormproofing. Low-water crossings are generally less expensive to construct. More often than not, designs are less complicated, construction is quicker, and fewer material are involved. Although the initial cost of more complex low-water crossings may exceed those of simple culvert installations, the lower long-term maintenance and repair costs may still make selecting a low-water crossing more economical. Economic evaluation should take into consideration all lifecycle costs including maintenance, repairs, user costs, and environmental impacts. With proper planning and design of the improved ford as part of the entire trail system, and incorporation of mitigation measures, both short-term and long-term adverse impacts to soils would be minor.

Low-water bridges are structures supported by piers or spread footings that leave a natural stream channel bottom. Although low-water bridges are usually the most expensive type of low-water crossing structure, they can maintain the best channel function and have the least adverse impact on natural resources. With proper planning and design of the low-water bridge as part of the entire trail system and incorporation of mitigation measures, both short-term and long-term direct adverse impacts to soils would be minor.

Although difficult to quantify, adverse impacts can be kept minor by applying thorough engineering design and good judgment, using good and suitable materials, and using an interdisciplinary process. Examining existing or current structures that are (or are not) performing well and taking a broad view of the stream and its function can significantly improve project judgement and help reduce the risk of problems. Low-water crossings can be very cost-effective structures when the attendant risks are controlled and minimized. Like most hydraulic structures, low-water crossings require attention to both design detail, and compatibility with the hydrologic and natural setting into which the structure will go.[1]

Mitigation

- In order to minimize the potential for temporary erosion impacts to soils during construction, erosion and sediment control measures would be implemented for each construction project.
- In order to minimize the potential for long-term impacts to soils, strategies would be developed for implementation priorities and the proposed actions phased to allow sufficient time for re-stabilization of soils after completion of each phase.
- When soil excavation is an unavoidable part of an approved facility development project, the NPS will minimize soil excavation, erosion, and offsite soils migration during and after the activity.
- For selected trail crossings, an erosion control plan would be created before staring the project. The specific practices to be implemented for controlling erosion and preventing management-caused sediment from reaching the drainage would be included in the plan. Compliance would be ensured through frequent inspections.
- Crossings would be designed to be perpendicular to the channel, on a straight stretch, whenever possible. Although difficult when retrofitting old crossings or working with certain landforms, this positioning would reduce the effects of streamflow energy on the structure itself as well as impacts resulting from the redirection of flow against channel banks.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an adverse impact on soils and geology. The incremental impact of the action alternative when added to other past, present, and reasonably foreseeable future actions would be negligible due to phasing of projects, locations within specific small areas of the park, and use of mitigation measures during and after construction. Within some of the proposed actions, the incremental impact would be long-term and positive due to vegetation

[1] U.S. Department of Agriculture and U.S. Forest Service, *Low-water Crossings: Geomorphic, Biological, and Engineering Design Considerations* (U.S. Forest Service National Technology and Development Program, October 2006), 4-1.

management strategies, the use of prescribed fire procedures and mitigation, and trail removals and re-alignments that prevent ongoing and serious soil erosion.

Conclusion

There would be a number of disruptions to surface soils due to construction and grading within the proposed actions of alternative 2. Most impacts are associated with specific small areas of the park and would last for the most part through the time of project completion. Mitigation measures will ensure negligible impacts to soils and geology.

Thinning and clearing of woodland is extensive in this alternative for establishment of interpretive nodes and historic viewsheds. Tree removal is anticipated to lead to soil disturbance and erosion, particularly through removal of woodland and management of bottomland woods. Once new savanna-like conditions are established, soil erosion and disturbance would be abated.

Construction of trail crossings would have short-term minor impacts to soils due to construction of low structures or the restoration of existing fords. Subsequent stabilization through design and engineering of any crossing alternative and incorporation of mitigation measures would ensure no substantial consequence to soil fertility or natural physical features. Therefore, impacts to soils and geology would be long-term and minor.

Overall, minor adverse impacts to soils and geology would be expected. Long-term positive impacts to soils would be expected due to vegetation management techniques for soil stabilization, design of trail alignments to prevent steep grades and minimization of ongoing soil erosion maintenance associated with the trail system and use of filter strips and vegetated swales beside the road to slow down water infiltration and pollutant movement into the groundwater or streams.

4.8.2 Prime and Unique Agricultural Land

ALTERNATIVE 1 (NO-ACTION)

Impacts

Within alternative 1, there are no changes to current conditions. Existing management or maintenance strategies remain in place and include controlling trail erosion and deposition of sediment, limiting visitor access, and avoiding construction of new features or facilities. No further clearing would be undertaken within this alternative and current mowing and vegetation management regimens would continue. Prime and unique agricultural lands are recognized and included in natural resource mapping for the park and vegetation management strategies are in place for these areas. Strategies include keeping the areas of Peridge silt loam farmed as hayfields or other crop exhibits (Sharp Cornfield and Stubblefield); and Secash-Cedargap, Wilderness, and Pembroke categories farmed with corn, oats and orchard (Gibson Oatfield, Ray Cornfield and Orchard). Implementation of this alternative would result in negligible adverse impacts to prime and unique agricultural land.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park. Those related to the disturbance or the landscape or soils include demolition of Double Spring structures and rehabilitation of the Farm Site; replacing tour road waysides, and improvement of accessibility to a primary visitor use facility. None of these projects would have an impact on prime and unique agricultural land. The incremental impact of the no-action alternative when added to other past, present, and reasonably foreseeable future actions would be negligible.

Conclusion

Alternative 1 would not modify prime and unique agricultural land at Wilson's Creek National Battlefield. Negligible adverse impacts to this resource would be expected.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Approximately 908 acres fall into the category of prime farmland or soils of state importance. Most of the acreage that falls in the Peridge silt loam category is currently being farmed as hay fields (Sharp Cornfield and Stubblefield), as is some acreage that falls in the Secash-Cedargap, Wilderness, and Pembroke categories (Gibson Oatfield and Ray Cornfield and Orchard). Existing areas of cropfield will remain within this alternative and proposed actions would have no adverse impact on the prime farmland and soils of state importance.

The remainder of the prime farmland or soils of importance in the park are mapped and discussed within the *Natural Resource Condition Assessment Study* (2011). Also, the *Vegetation Management Implementation Plan* (2014) prescribes vegetation management procedures for the establishment of native warm-season grass fields within historic crop field areas. Native warm-season grass fields preserve the prime farmland and soils of state importance. They can be established using a modicum of soil amendments. Once established, they require few or no additional applications of herbicides or pesticides. Native warm-season grass field can also be cut over for hay production, perpetuating historic agricultural land uses, or burned.

Specific actions within this alternative such as expansion of existing pedestrian trails; realignment and removal of pedestrian and equestrian trail segments with ongoing severe erosion on steep slopes; installation of an orchard exhibit at the Guinn house site; establishment of vegetation management practices and prescribed fire; and clearing vegetation for ten new viewsheds and associated interpretation would have a negligible overall impact due to the limited amounts of surface soils with prime and unique qualities that would be disturbed by localized projects. None of the actions would change the agricultural land use that maintains these soils and there would be no threat to soil fertility or its natural physical features. Establishment of ten interpretive/contemplative nodes would result in permanent changes in land use from prime agricultural land to non-agricultural use. The total acreage is minimal so the impact is minor and will not change the character and quality of prime and unique agricultural land within the battlefield. Mitigation measures ensure the stabilization and preservation of these soils.

Establishment of an orchard at the Guinn house site would be a positive impact on prime farmland, by ensuring appropriate land use in an area of prime agricultural lands. These soils are recognized and included in natural resource mapping for the park and vegetation management strategies are in place for these areas. Therefore, adverse impacts to prime and unique agricultural land would be negligible. Implementation of mitigation measures would ensure the viability and quality of the soils.

Mitigation

- In order to minimize the potential for temporary erosion impacts to soils during construction, erosion and sediment control measures would be implemented for each construction project undertaken.
- Identification of specific areas of prime and unique agricultural land would be required, along with the establishment of management strategies for the soils in conjunction with changing land use and associated vegetation.
- The NPS would actively seek to understand and preserve soil resources, and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources. Natural soil resources and processes would function in as natural a condition as possible, except where special considerations are allowable under policy. When soil excavation is an unavoidable part of an approved facility development project, the NPS would minimize soil excavation, erosion, and offsite soils migration during and after the activity.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an impact on prime and unique agricultural land. The incremental impact of alternative 2, when added to other past, present, and reasonably foreseeable future actions would be positive as additional appropriate land use is established and vegetation management recommendations are implemented.

Conclusion

There would be negligible adverse impacts to prime and unique agricultural lands in this alternative. Project phasing and location in specific areas within the park and implementation of mitigation measures are recommended to minimize impacts from project-specific construction over a limited time period. Land use management and vegetation management protect these soils and preserve them due to their unique qualities and potential for crop development. Proposed expansions associated with interpretation, circulation, and vegetation management would be carefully surveyed and designed to avoid these unique soils.

4.8.3 Water Resources/Floodplains

ALTERNATIVE 1 (NO-ACTION)

Impacts

Protection of floodplains will continue with the current management and maintenance strategies in place. The current landscape patterns of spatial organization, composed in part by riparian woodlands along stream corridors and floodplains, would also be perpetuated. Within this alternative, there is no comprehensive management strategy that would address the stabilization of the stream banks or the removal of invasive species or other dead or unhealthy vegetation within the floodplains of the streams and springs. Maintenance and management of existing water systems and features would continue, as well as protection of creeks and springs. Current and ongoing management does not address restoration of the watershed or establishment of riparian buffers or forests along stream corridors. The location and number of springs would need to be verified in the field and integrated into existing management of natural resources.

Implementation of this alternative would result in the potential for undesirable changes to water quality, abundance of aquatic life or floodplain morphology. If the changes occur, the impact to water resources and floodplains would be long-term and adverse. Mitigation measures would be required to ensure short-term and minor adverse impacts associated with the continuation of water management strategies within this alternative.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an impact on water resources and floodplains. The incremental impact of the no-action alternative, when added to other past, present, and reasonably foreseeable future actions would be short-term and minor due to lack of management strategies for watershed restoration, stream bank stabilization, and riparian buffers or forests along the stream corridors and in the floodplain.

Conclusion

Implementation of alternative 1 over time would have an adverse impact on water resources/floodplains due to the lack of management strategies associated with watershed restoration, stream bank stabilization, and riparian buffer and or forest vegetation along stream corridors. Mitigation measures would be required.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Specific actions resulting from the implementation of this alternative and associated with potential impacts on water resources and floodplains include restoration of the Wilson's Creek watershed; establishment of riparian buffers or forests along stream corridors; establishment of filter strips along roads and parking areas; and potential construction of trail fords or bridge crossings across Wilson's Creek and Skegg's Branch. Construction of trail crossings over streams and creeks range from a basic low-water unvented improved ford, to a low water bridge. Trail management objectives should be formulated before locating a new crossing or deciding to fix or replace an existing one. Formulating such objectives requires analyzing the entire trail location. Choosing the type of structure for any crossing is highly site-dependent. Depending on the site,

the main advantages of a low-water crossing over culverts and bridges may include lower construction and maintenance costs; less channel and floodplain blockage; adaptability; and storm proofing. Low-water crossings are generally less expensive to construct. More often than not, designs are less complicated, construction is quicker, and fewer material are involved. Although the initial cost of more complex low-water crossings may exceed those of simple culvert installations, the lower long-term maintenance and repair costs may still make selecting a low-water crossing more economical. Economic evaluation should take into consideration all lifecycle costs including maintenance, repairs, user costs, and environmental impacts. With proper planning and design of the improved ford as part of the entire trail system, and incorporation of mitigation measures, both short-term or long-term adverse impacts to water resources and floodplains would be negligible. Changes in floodplain morphology would be negligible.

Low-water bridges are structures supported by piers or spread footings with a natural stream channel bottom. Although low-water bridges are usually the most expensive low-water crossing structures, they can maintain the best channel function and have the least adverse impact on natural resources. With proper planning and design of the low-water bridge as part of the entire trail system and incorporation of mitigation measures, both short-term (construction disturbances through the life of the project) and long-term (daily use by equestrian groups) direct adverse impacts to water resources would be minor.

Use of natural or unimproved fords would result in negligible impacts to water resources. No significant changes to creek or stream surface elevations would be expected. Mitigation measures would be implemented.

According to the National Wetlands Inventory, there are no delineated wetlands in the vicinity of the proposed actions within the park. Riverine wetlands are indicated along a segment of Wilson's Creek. Threats to these wetlands are usually from reduced waterflow; introduced animals such as horses, cattle and pigs; introduction of fish; weeds; pollution from urban industrial and agricultural products; and livestock grazing around waterways. None of these conditions exist within the proposed actions of this alternative. There would be a negligible impact on riverine wetlands with the implementation of this alternative.

Mitigation

- Wide active floodplains that are frequently inundated often have high ecological value as groundwater reservoirs and as specialized habitats for wildlife. In addition to economical and other objectives, crossing objectives at sites like this should include minimizing the degree to which the trail and crossing obstruct flows on the floodplain.
- All construction activities would be planned and scheduled to prevent erosion and sedimentation, which could cause possible adverse impacts to water resources and floodplains.
- When feasible, activities would be scheduled in and near the channel during the dry season, or for a time period when precipitation and runoff are unlikely. Construction would not occur during times when soils are too wet for equipment to operate without increasing the potential for water resource degradation.

- Destruction, loss, or degradation of wetlands and floodplains would be minimized, and their natural and beneficial values protected.
- Impacts on riverine wetlands would be avoidable. No wetland fill would occur without authorization from the U.S. Army Corps of Engineers and appropriate permitting under the Clean Water Act.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an impact on water resources and floodplains. The incremental impact of alternative 2, when added to other past, present, and reasonably foreseeable future actions would be long-term and positive due to management strategies for watershed restoration, stream bank stabilization, and riparian buffers or forests along the stream corridors and in the floodplain. Short-term adverse impacts within alternative 2 would not contribute to a cumulative adverse impact.

Conclusion

There would be long-term positive impacts to water resources with the implementation of this alternative. Contributing to the positive impacts are the restoration of the riparian buffers along stream corridors and restoration of the watershed. Other BMP strategies proposed in this alternative would also contribute to positive impacts. The proposed clearing of vegetation for expanded interpretation, trails, and trail crossings would be localized and short-term and sediment run-off into streams would be limited once the soils are stabilized and integrated into the larger vegetation management strategies within the park. Proposed viewsheds would have a long-term impact as the vegetation would be permanently changed from riparian forest to more open, short, grassland vegetation. Clearing would be localized and impacts negligible to water resources/floodplains. Action projects within this alternative would not cause changes in the ability of a floodplain to convey floodwaters and its values and functions would be undetectable. Actions would not contribute to enhancing flood events.

4.8.4 Water Quality

ALTERNATIVE 1 (NO-ACTION)

Impacts

Protection of surface water and groundwater is a management priority. Water quality has shown improvement since the *Natural Resource Condition Assessment Study* (2011). Protection would continue with the current management and maintenance strategies in place. Wilson's Creek and other streams on the battlefield landscape are continually monitored for waterflow patterns and physical interaction among a stream, its streambed, and the surrounding land. Levels of salts, nutrients, contaminants, and sediments are also monitored to ensure standards are met for water quality. There is also continuous maintenance for trails to prevent sediment runoff from erosion and strategic mowing near the water's edge to prevent additional sediment loading into the creek. There would be no adverse impacts to water quality with the implementation of this alternative.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an impact on water quality. The incremental impact of the no-action alternative when added to other past, present, and reasonably foreseeable future actions would be negligible.

Conclusion

Alternative 1 would not modify water quality at Wilson's Creek National Battlefield, with current management and maintenance strategies continuing in place. No direct or adverse impacts to water quality would be expected. Protection of water resources would continue, but there would be no restoration of the riparian buffer in the stream corridors or management for restoration of the watershed or any other planned projects that target the improvement of water quality. This limits the opportunity to further enhance water quality and ensure it meets and exceeds the standards required.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Specific actions resulting from the implementation of this alternative and associated with potential impacts on water quality include restoration of the watershed and establishment of riparian buffers along stream corridors; establishment of filter strips along roads and parking areas, extensive clearing of vegetation for establishment of viewsheds, trail expansion and interpretive/contemplative nodes to enhance the visitor experience, and construction of trail fords or bridge crossings across Wilson's Creek and Skegg's Branch.

Riparian buffers help to protect water quality by filtering overland run-off and pollutants. Vegetative buffers proposed to edge watercourses for a minimum of 30 meters on either side would help maintain good water quality by controlling erosion, sediment, and the flow of pollutants into watercourses.[2] Healthy riparian communities can contribute to various important functions such as sediment filtering, bank stabilization, water storage and release, and aquifer recharge. The action alternative recommends that the park establish and manage Resource Protection Areas--margins of creeks, rivers, and other bodies of water—and Resource Management Areas—isolated wetlands, floodplains, highly erodible soils, and highly permeable soils—to protect water quality.[3]

Vegetative filter strips (also called grass filter strips or grass buffer strips) are used to filter and clean sediment, organize material, nutrients, chemicals, and other pollutants from run-of water as it leaves a non-point source. Sources within the park include crop fields, equestrian staging areas, the tour road and tour road stops and parking areas. Planted with densely growing or clump-forming grasses, filter strips are particularly crucial at locations edging drainages, streams,

[2] National Park Service, *Vegetation Management Implementation Plan* (Republic, Missouri: National Park Service, April 2014), 6.

[3] *Ibid.*

sinkholes, drainage wells, ponds, or wetlands to protect surface water. Laced between pollution sources and water resources, these planted filter systems can effectively mitigate soil erosion and polluted run-off.[4]

For these reasons, positive impacts to water quality would be expected within the context of the park and region with the implementation of the actions within this alternative.

Actions associated with construction projects including expanded interpretation, trail and trail crossings, clearing of vegetation, and development of a new tour stop and interpretive/ contemplative nodes would have localized minor adverse impacts on water quality. Incorporation of mitigation measures, phasing of projects and limited duration of disturbances, and proper planning and design of the low-water bridge or natural ford ensure that both short-term and long-term impacts to water quality would be minor. Water would remain well within quality standards or criteria and within historic or desired water quality conditions.

Mitigation

- NPS would be required to monitor trail use/erosion and make adjustments in carrying capacity based on monitoring findings.
- Best Management Practices (BMPs) would be required to support the implementation and management of the actions.
- Vegetative filter strips would be used to filter and clean sediment, organic material, nutrients, chemicals, and other pollutants from run-off water as it leaves a non-point source. Placed between pollution sources and water resources, planted filter systems can effectively mitigate soil erosion and polluted run-off.
- To best protect water quality, a general erosion-control plan and a project plan should be developed, incorporating specific structure design elements aimed at preventing bed and bank erosion and local scour, and implementing BMPs. BMPs exist for a wide variety of management activities, including those both in and near the channel.
- Construction projects would be planned for the dry season or periods of low flow as possible.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an impact on water quality. The incremental impact of alternative 2, when added to other past, present, and reasonably foreseeable future actions would be long-term and positive due to management strategies for watershed restoration, stream bank stabilization, and riparian buffers or forests along the stream corridors and in the floodplain. Short-term adverse impacts within alternative 2 would not contribute to a cumulative adverse impact.

Conclusion

[4] *Ibid.,* 28.

There would be long-term positive impacts to water quality due to actions proposed in the alternative. Protection of water resources would continue and there would be a targeted effort at restoration of the riparian buffer in the stream corridors and management for restoration of the watershed. This alternative provides the opportunity to further enhance water quality and ensure it meets and exceeds the standards required into the foreseeable future. Long-term positive impacts to water quality would be expected due to vegetation management techniques, slope stabilization, and riparian buffer restoration. Localized impacts due to specific construction projects would be minor with the incorporation of mitigation measures and project phasing.

4.8.5 Vegetation

ALTERNATIVE 1 (NO-ACTION)

Impacts

Vegetation management at Wilson's Creek National Battlefield is currently guided by the *Vegetation Management Implementation Plan* (2014), which is consistent with previous planning efforts for the park including *Vegetation Classification and Mapping of Wilson's Creek National Battlefield* (2013)*; Fire Management Plan* (2004); *Cultural Landscape Report (CLR)* (2004); *General Management Plan* (*GMP*) (2003); and *GMP Amendment* (2007).

Current mowing and vegetation management and maintenance regimes within this alternative would remain in place. Deciduous forest would continue to move through successional stages to a closed-canopy, climax forest typical of the region. Riparian forests would remain in small areas abut would not be expanded to cover a larger area along the banks of Wilson's Creek and other streams. Existing restored prairie would continue to be monitored and maintained with the use of prescribed fire. Ruderal grasslands would continue to be mowed.

Current regimes do not include glade restoration, clearing of cedars that overrun glade habitat, extensive management of invasive species, or clearing for additional historic viewsheds associated with interpretation within the context of the cultural landscape. Current viewsheds will be maintained and existing landcover character and patterns will be maintained. Projects proposed in the *Vegetation Management Implementation Plan* (2014) would become part of ongoing and future park planning as funding becomes available.

As part of the no-action alternative, current vegetation management that does not address enhancing the habitat of plant species of conservation concern, such as glades that support the Missouri bladderpod, would continue, while no additional efforts would be expended to control invasive species. Continuing with current management would have a direct and long-term adverse impact on the Missouri bladderpod and other species of concern.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, some of which have short-term adverse impacts on select vegetation. Long-term effects on many of the other plant communities will be negligible with this alternative. The incremental impact of the no-action alternative when added to other past, present, and

reasonably foreseeable future actions would result in long- term and adverse impacts due to lack of implemented management strategies for restoration of the glades, clearing of cedars, and extensive control of invasive species.

Conclusion

Implementation of this alternative would have long-term adverse impacts on vegetation due to the lack of management strategies associated with specific vegetation species of concern and its habitat and with invasive species. There would be incremental positive impacts to vegetation in this alternative, if projects within the *Vegetation Management Implementation Plan* (2014) are developed in the future.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

The *Vegetation Management Implementation Plan* (2014) defines treatments and identifies pathways, based on current vegetation, for accomplishing objectives to protect and restore native plant communities, restore and enhance critical viewsheds, restore riparian corridors and their function, establish field and historic vegetation exhibits, and interpret missing 1861 farmsteads. The 2014 plan also identifies methods for controlling invasive vegetation. The proposed actions in this alternative are based on the projects outlined and described in the *Vegetation Management Implementation Plan* (2014). The plan provides a vehicle for implementation of many of the actions within alternative 2.

Specific actions resulting from the implementation of this alternative and associated with potential impacts on vegetation include clearing of newly acquired parcel to the southeast and integration into savanna management practices; establishment of a day-use picnic area in the Double Spring parcel; relocation of equestrian parking; rehabilitation of the existing horse trailer parking area; expansion of existing pedestrian trails; realignment of pedestrian and equestrian trail segments with ongoing severe erosion on steep slopes; establishment of a new tour road stop 1 in conjunction with a cleared viewshed; installation of an orchard exhibit at the Guinn House site; establishment of ten interpretive/contemplative nodes; clearing vegetation for ten new viewsheds and associated interpretation; installation of buffer plantings; rehabilitation of glade communities; establishment of a cleared 25-foot-wide deer management zone between the edge of the woodline and the park boundary fence along Elm Street (Farm Road 182) and State Highway ZZ; rehabilitation of savanna and open mixed forest communities; preservation and protection of the Manley Woods plant community; and cultural vegetation such as the Osage orange hedgerow, the groves of trees associated with the Edgar and Manley cemeteries, and the sugar maple trees near tour road stop 5; and restoration of the watershed and establishment of riparian buffers along stream corridors.

Actions associated with construction or realignment of trails and trail crossings, a new tour stop, a day-use picnic area on the Double Spring parcel, buffer plantings, and a new equestrian parking lot, would be localized within the park and disturbance would occur only during the time of the project implementation. Impacts would not threaten the viability of plant communities or native

plant species and the site easily recover from temporary disturbance. Mitigation measures are required to ensure that short-term impacts are minor and do not extend to long-term impacts. Mitigation would include selection of appropriate staging locations for equipment and materials for all projects, and erosion and sediment control measures would be incorporated.

Some savannas and most of the open mixed forest at Wilson's Creek National Battlefield are overcrowded with pole-sized, evenly-aged trees, which are growing at densities far higher than those recorded historically on the Springfield Plateau. These communities have lost their native groundcover due to extensive shading, overgrazing, and competition from invasive species. Restoration of these areas is critical to the stabilization of the water courses of Skegg's Branch, Terrell Creek, and Wilson's Creek.

Savanna and open mixed forests communities are scattered across Wilson's Creek National Battlefield. A relatively high-quality remnant of savanna exists along the west-facing bluffs of Wilson's Creek, above the old railroad bed. Rehabilitating savanna communities should be considered for all areas of the park not specifically identified in other treatments. Rehabilitating savanna communities is compatible with, and should be done in conjunction with, glade rehabilitation, establishment of riparian buffers, establishment of filter strips, and the re-establishment of critical viewsheds.[5] The recommended vegetation management and park-wide coordination in this alternative would have long-term and positive impacts on establishing desired vegetation communities.

At Wilson's Creek National Battlefield, invasive species have dramatically reduced species biodiversity and altered the natural systems that once sustained the native landscape. A well-developed invasive species control plan specific to the park is needed as an integral part of the actions implemented within this alternative. This would have a long-term and positive impact on desired native vegetation.

Mitigation

- Temporary barriers extending to tree driplines are required to protect existing trees and shrubs that are not identified for removal, specifically during clearing of battlefield viewsheds.
- BMPs would be followed for vegetation removal and thinning. Cutting or thinning would occur in the fall and winter. The use of heavy vehicles would be minimized and their use restricted to times when soil is firm. If felled trees are to be removed, they would not be dragged across the ground, which can result in gouging of the soil. Prescribed fire would be used to remove felled trees (fuel loads) when feasible, thus reducing the labor required to mechanically remove felled trees.
- Measures would be employed to stabilize soil and minimize erosion.
- Work would be performed in phases to ensure that the minimum amount of vegetation possible is removed to meet interpretive needs.

[5] *Ibid.,* 16.

- Thinning and gradual removal of trees would be used instead of clear-cutting in most areas. One exception would be the Eastern redcedar stands within glades where clear-cutting would be appropriate.
- Monitoring for the appearance of invasive plants would occur following clearing and the introduction of new plantings and seed.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, some of which have short-term adverse impacts on vegetation. The incremental impact of alternative 2 when added to other past, present, and reasonably foreseeable future actions would be long-term and positive due to implementation of management strategies for restoration of the glades, clearing of Eastern redcedar trees, and extensive control of invasive species. Short-term and minor impacts within alternative 2 resulting from actions associated with construction activity and clearing of vegetation would not contribute to a cumulative adverse impact.

Conclusion

There would be short-term adverse impacts on vegetation within this alternative. Mitigation measures are required to ensure the short-term adverse impacts would not become long-term adverse impacts. Actions in this alternative align with proposed projects in the *Vegetation Management Implementation Plan* (2014) and provide detailed guidance on the implementation of actions within this alternative. These actions would have a long-term and positive impact on desired vegetation assemblages.

4.8.6 Wildlife

ALTERNATIVE 1 (NO-ACTION)

Impacts

Existing habitat that supports the current diversity of bird, mammal, and reptile populations that inhabit the park landscape will remain within this alternative. Over time, the existing successional woodland would continue to mature promoting growth in some wildlife habitat and populations. Guidance is afforded for fire management activities through the existing *Fire Management Plan* (2004) with objectives that include rehabilitation and preservation of oak savanna, prairie and glade habitats; enhancement of native species; protection and enhancement of Missouri bladderpod; reduction of encroachment of species such as Eastern redcedar, sericea (*Lespedeza cuneata*), and Japanese chess; and encouragement of proliferation of native plants and historic densities of those plants. Within this alternative, plan guidance would help to maintain wildlife diversity and create new habitat. Implementation of the no-action alternative would result in no adverse terrestrial impacts. However, since water quality would not be improved with this alternative, the polluted water of Wilsons' Creek will continue to have negative impacts on wildlife and wildlife habitat.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, some of which have short-term adverse impacts on wildlife. The incremental impact of the no-action alternative when added to other past, present, and reasonably foreseeable future actions would be negligible.

Conclusion

Alternative 1 would not change existing conditions of the water in Wilson's Creek that impacts wildlife due to their need of clean water for drinking and bathing. Minor adverse impacts to wildlife would be expected, with no change in water quality. This impact may cause harm to localized or individual wildlife species, but the viability of the wildlife populations and communities if left alone, would recover.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Specific actions resulting from the implementation of this alternative and associated with potential impacts on wildlife and wildlife habitat include expansion of the existing trail system; realignment of trail segments subject to erosion; installation of an orchard exhibit at the Guinn House site; establishment of interpretive/contemplative nodes at ten locations; clearing of vegetation for viewsheds; rehabilitation of glade communities; rehabilitation of savanna and open mixed forest communities; prescribed fire for vegetation management; preservation and protection of Manley Woods; restoration of the watershed; and establishment of riparian buffers along stream corridors. These actions would be localized in small areas of the park and undertaken in phases in order to minimize impacts. There would be no permanent displacement of wildlife species nor would there be any threat to the viability of the species community. Long-term impacts would be negligible and mitigation measures used to ensure the stabilization, preservation, and expansion of wildlife habitat within the battlefield landscape.

Clearing of the parcel acquired to the southeast and integration into savanna management practices will have long-term positive impacts for obligate grassland bird species as it will create new habitat. It will also have long-term negative impacts to obligate interior forest bird species due to habitat disturbance. The impact would not threaten the viability of obligate interior forest bird species communities but could displace them to other areas of forest in the surrounding landscape. Implementation of the vegetation management recommendations within this alternative, which are based on the *Vegetation Management Implementation Plan* (2014), will ensure wildlife habitat diversity and the preservation of wildlife species within the park. Specific recommendations for vegetation management that have a positive impact on wildlife and wildlife habitat include rehabilitation of savanna and open mixed forest communities; rehabilitation of glade communities; preservation and protection of the Manley Woods community; establishment of riparian buffers or forest along stream corridors, and improvement of water quality through reduced sediment and pollutant loading.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, some of which have short-term adverse impacts on wildlife. Projects such as the demolition of structures on the Double Spring parcel and rehabilitation of the farm site, replacing tour road waysides, and mowing, fire, and herbicide treatments would have localized and short-term impacts on birds and small mammals due to temporary habitat disturbance. The incremental impact of alternative 2, when added to other past, present, and reasonably foreseeable future actions would be long-term and positive for the desired future conditions of the park.

Conclusion

There would be no long-term adverse impacts on wildlife and wildlife habitat from implementation of this alternative. Most impacts would be localized and associated with specific proposals for trail development, expanded interpretation, and extensive vegetation management. Due to vegetation management recommendations within this alternative that are based on the *Vegetation Management Implementation Plan* (2014), wildlife habitats will be improved and expanded, a positive impact on wildlife and their habitats within the park.

4.8.7 White-tailed Deer

ALTERNATIVE 1 (NO-ACTION)

Impacts

Within this alternative, there would be no strategy for the reduction of the white-tailed deer population at Wilson's Creek National Battlefield. Deer become vulnerable to overpopulation, disease, and starvation in the absence of natural predators and hunting. When deer occur in high densities, diseases are transmitted more readily as well.[6]

Due to increased development, altered ecosystems, and concerns over visitor safety at Wilson's Creek National Battlefield, Heartland Inventory & Monitoring Network (Heartland) has continually monitored deer population at Wilson's Creek National Battlefield since 2005. Using an index of deer density, Heartland staff are able to identify annual changes in the deer population. There was a sharp decline recorded in the population between 2005 and 2007. This coincided with an outbreak of hemorrhagic disease. There has been a significant increase in population size after the lowest estimation in 2007. The 2016 index of deer density increased sharply from the previous index to a record level of 158 individual deer per square kilometer. The 2016 deer density in the survey areas was 191 percent above the twelve-year average. Long-term trends in deer abundance provide one measure of assessing their potential as a problem for the park. Monitoring data also help managers assess safety risks from deer-vehicle collisions and disease transmission. Long-term monitoring of deer numbers is critical in evaluating any population control measures the park may implement.

Cumulative Effects

[6] National Park Service, Heartland Inventory & Monitoring Network, "Wildlife; White-Tailed Deer," available at https://science.nature.nps.gov/im/units/htln/monitor/wildlife.cfm?tab=2 (accessed December 28, 2017).

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, some of which have an impact on the white-tailed deer. The additional forest in alternative 1 provides over-winter cover and seasonal sanctuary from hunting pressures outside the park. As forests are converted to savanna this cover will be diminished. The incremental impact of the no-action alternative when added to other past, present, and reasonably foreseeable future actions would be regional, direct and adverse due to the unchecked population growth of the deer within the context of this alternative.

Conclusion

Within the no-action alternative, there would be significant (health and safety issues to the public and direct impacts on the human environment) adverse impacts to the park and the land surrounding the park boundaries if the deer population is not reduced. If current numbers remain or increase, the threat of disease is high. This presents a high survival threat for individual deer and thus negative impacts. The issues associated with collisions with deer will increase with the increasing population. At risk would be the safety and well-being of the public and visitors to Wilson's Creek National Battlefield. There are also direct and adverse impacts on the cultural landscape due to destruction of vegetation by the deer population.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Deer Density Goal

The Heartland team has established a white-tailed deer density goal that is within a range between the lower ecological carrying capacity (one to four deer per square kilometer) and the upper biological carrying capacity (seventy-seven deer per square kilometer). This density range would be used as a target to reduce deer numbers as a part of the management action. Deer density goals and subsequent management strategy for population reduction would have a positive impact on the overall health and condition of the remaining herd. As such, it is important that the number of deer be reduced to the targets identified in support of *CLR* (2004) treatment plan implementation. Target densities numbers would be designed to protect the survival of the species within the park without threatening the viability of the deer population.

The proposed management strategies for reduction of the deer population within the park include direct lethal reduction using firearms or archery equipment. Actions necessary to facilitate sharp shooting may include setting up bait stations, locating deer, sharpshooting, and processing and disposition of deer meat and carcasses. These actions are subject to mitigation measures to ensure human health and safety, the quality of the visitor experience and access to the park, and clear communication to the public of the actions taking place and the effects of these actions on the visitor experience. These actions would have a long-term positive impact on the white-tailed deer population and health. Mitigation measures ensure the impacts are positive for the deer reduction as well as for the visitor use, safety and experience within the park.

Mitigation

- Personnel engaged in direct reduction of deer for this plan would have appropriate skills and proficiencies in the use of firearms or archery equipment for the removal of wildlife and the protection of public safety.
- NPS would use only professional sharpshooter, contractor personnel, volunteer nonprofit groups, public volunteers or NPS staff for the actual shooting in cull operations.
- All volunteers and partners would be supervised and managed in the field by NPS personnel during deer management actions.
- Sharpshooting would occur during the day or night as necessary to increase efficiency and effectiveness of culling operations.
- Operations would occur during the late fall and winter months when deer are more visible and less visitors are in the park.
- Management exhibits would be displayed at the visitor center, and information would be posted on the park's website to inform the public about deer management actions.
- Visitor access would be limited as necessary while reductions were taking place and NPS rangers would patrol public areas to ensure compliance with area closures and public safety measures.
- Bait stations would be placed in an area away from public use, to maximize the efficiency and safety of the reduction program.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an impact on the deer population. The incremental impact of alternative 2, when added to other past, present, and reasonably foreseeable future actions, would be long-term, direct and positive to deer herd health due to implementation of strategies to reduce population numbers within the context of this alternative.

Conclusion

Within the proposed actions of alternative 2, there would be a positive impact to the white-tailed deer species due to the reduction of the population. Growing deer populations will have adverse impacts on their own species by limiting the quantity and quality of available food resources and increasing susceptibility to disease and starvation during severe winters. Results include a healthier herd of animals with reduced numbers to meet carrying capacity that also meets goals for protection of other park resources. Actions necessary to implement the deer reduction management program would have short-term and negligible impacts on human health and safety, the quality of the visitor experience, and restoration of vegetation.

4.8.8 Threatened and Endangered Species

ALTERNATIVE 1 (NO-ACTION)

Impacts

During informal consultation with the U.S. Fish and Wildlife Service (USFWS), the following comments were given to the park pursuant to the Fish and Wildlife Coordination Act (16 U.S.C.661 et seq.), NEPA of 1969 (42 U.S.C. 4321-4347), and the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544). Federally listed species, proposed species, candidate species and designated and proposed critical habitat associated with Wilson's Creek National Battlefield include the gray bat, Indiana bat, Northern long-eared bat, Missouri bladderpod, Virginia sneezeweed, and Ozark cavefish.

Within this alternative, existing habitat that supports the Missouri bladderpod will continue to diminish in size and quality due to lack of glade restoration and the proliferation of the Eastern redcedar trees within the glade communities. Current fire management regimes as prescribed in the *Fire Management Plan* (2004) will continue within this alternative and help somewhat in clearing glade areas and protecting the Missouri bladderpod. Based on the current delineation of glades, Missouri bladderpod occurs on six glades at Wilson's Creek National Battlefield: Bloody Hill glade; Manley Woods glade; North Bloody Hill glade; Northwest Bloody Hill glade; Terrell Creek glade; Walnut glade; and Wire Road glade.

Current management regimes protect the McElhaney Branch cave, habitat for the endangered gray bat, last documented there in 1996, the Indiana bat, the Northern long-eared bat, and the Ozark cavefish, all of which have not been identified or recorded within the battlefield. Current protection of the cave and its hydrology ensures provision of habitat if these species should migrate to the battlefield landscape. Current management would also include monitoring for the presence of these species within the park. Virginia sneezeweed populations have not been identified within the park.

Current cyclical management would continue to provide opportunities for this species to develop and thrive within the park. Major threats to this species include agriculture and residential land development, which does not occur within the park. Current management would also include monitoring for the presence of Virginia sneezeweed within the park.

Current and continuing management practices for protection of endangered species listed above from USFWS will continue within this alternative. Within this alternative, there is direct and long-term adverse impact on rare, threatened, and endangered Species due to the continued reduction of the glade communities and thus the habitat for the Missouri bladderpod.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an impact on rare, threatened, or endangered species. The incremental impact of the no-action alternative, when added to other past, present, and reasonably foreseeable future actions, would be long-term and adverse due to lack of implemented management strategies for restoration of the glades and reestablishment of the habitat of the Missouri bladderpod. There would be no incremental adverse impact on the remainder of the species discussed above.

Conclusion

Implementation of the no-action alternative would have long-term, and direct adverse impacts on rare, threatened and endangered species due to the lack of management strategies associated with glade restoration and removal of Eastern redcedar trees, thus diminishing the habitat and survival rates for the Missouri bladderpod.

Implementation of the no-action alternative would have no adverse impact for three bat species, the Ozark cavefish, or the Virginia sneezeweed due to existing management practices. There would be some positive impacts to rare, threatened, and endangered species in this alternative, if projects within the *Vegetation Management Implementation Plan* (2014) are developed in the future. The positive impact from this plan would be for the Missouri bladderpod with restoration of the glade habitat.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Specific actions resulting from the implementation of this alternative and associated with potential impacts on rare, threatened, and endangered species include specific vegetation management recommendations. Based on the *Vegetation Management Implementation Plan* (2014) this alternative recommends the rehabilitation of glade communities; rehabilitation of savanna and open mixed forest communities; prescribed fire vegetation management; preservation and protection of Manley Woods; and establishment of riparian buffers or forests along stream corridors.

Once nearly treeless, the remnant glade communities at Wilsons' Creek National Battlefield are now threatened by a proliferation of Eastern redcedar trees. Left unmanaged, cedars encroach in glades thereby decreasing space for herbaceous cover and eventually dominate the canopy, decreasing species richness and diversity. The cedars shade out native species, cool the substrate below, deplete available water, and alter soil chemistry. This change in light availability and cooling effect changes the mass-heat relationships of the exposed bedrock on which native glade plant and lichen species are dependent. The shaded conditions have allowed for a proliferation of invasive Asian annual grasses such as Japanese chess *(Bromus japonicus)*, which in addition to the cedars, will require management to control.

Although scarcely resembling their former extent or character, the glades still retain a number of lichens and herbaceous plant species requiring conservation and should be classified as significant natural features to be protected. With proper management, these areas will become healthier; increasing the habitat potential for the park's endangered plant species, in particular the Missouri bladderpod. [7]

For the re-establishment of glade communities, measurable objectives for managing glade communities are indicated in the *Fire Management Plan* (2004) and in the *Vegetation Management Implementation Plan* (2014).

[7] National Park Service, *Vegetation Management Implementation Plan,* 11.

Current management regimes protect the McElhaney Branch cave, a potential habitat for the endangered gray bat, the Indiana bat, the Northern long-eared bat, and the Ozark cavefish. Current and continuing management practices for protection of these endangered species will continue within this alternative. Actions within alternative 2 will have a positive impact on these species due to the protection and enhancement of the stream riparian buffers, protection of the floodplain, enhancement of water quality including the cave stream, and vegetation management that ensures enhancement of the forest and woodland vegetation.

The actions proposed in alternative 2 have a direct, long-term and positive impact on rare, threatened, and endangered species.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an impact on rare, threatened, or endangered species. The incremental impact of alternative 2 when added to other past, present, and reasonably foreseeable future actions would be long-term and positive due to implementation of management strategies for restoration of the glades and reestablishment of the habitat of the Missouri bladderpod; implementation of management regimes for protection of the McElhaney Branch cave, habitat for the endangered bats and Ozark cavefish, and implementation of vegetation management regimes that preserve and enhance Manley Woods and other forest and woodland vegetation.

Conclusion

The proposed vegetation management and maintenance and the inclusion of glade restoration and removal and management of Eastern redcedar will have a long-term and positive impact on rare, threatened and endangered species, in particular the Missouri bladderpod.

Vegetation management regimes for McElhaney Branch cave and Manley Woods and other forest and woodland vegetation would have a long-term and positive impact on the gray bat, the Indiana bat, the Northern long-eared bat, the Ozark cavefish, and the Virginia sneezeweed and their potential habitats within the park. Also, actions providing enhancement of riparian buffers, protection of the floodplain, and prevention of sediment runoff all improve water quality and thus the habitat for all of the rare, threatened, and endangered species. There would be a positive impact on these species.

4.8.9 Air Quality

ALTERNATIVE 1 (NO-ACTION)

Impacts

Air quality in the area is generally good; the park and surrounding areas are in attainment for all National Ambient Air Quality Standards. Current prescribed fire activities based on the *Fire Management Plan* (2004) would continue within this alternative and do not result in adverse impacts air quality. Growth of residential areas near park boundaries requires attention to smoke issues. Mitigation measures in the current *Fire Management Plan* (2004) will remain in place and

include measures specific to air quality. There would be no adverse impacts to air quality with the implementation of this alternative.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an adverse impact on air quality. The incremental impact of the no-action alternative, when added to other past, present, and reasonably foreseeable future actions, would be negligible.

Conclusion

The no-action alternative would not modify air quality at Wilson's Creek National Battlefield. No direct or adverse impacts to air quality would be expected.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Specific actions resulting from the implementation of this alternative and associated with potential impacts on air quality include management strategies using prescribed fire for establishment and restoration of vegetation communities. The use of prescribed fire would have a short-term adverse impact on air quality. Due to the established guidelines and mitigation measures prescribed in the *Fire Management Plan* (2004), there would be no long-term adverse impacts.

The area is a Class II air quality location and visibility is generally good. Residential development north, east and west of the unit is increasing and those receptors are critical because of their proximity to prescribed fires. Additionally, the outer limits of the City of Springfield is only 6 miles to the northeast, in line with expected transport wind direction. The ability of the airshed to disperse the volume of smoke produced can be impaired occasionally. Due to the topography of the park, there is a tendency for residual smoke to settle into the creek bottoms, potentially affecting visitors, employees and residents. The use of prescribed fire occurs normally for a short duration and has little effect on air quality past the initial burning period.[8]

Mitigation

The *Fire Management Plan (2004)* provides mitigation measures developed to address potential impacts to air quality and would apply to the use of prescribed fire in association with this alternative.

- In order to mitigate potential impacts of fuel treatment projects park staff will suppress all wildland fires; and maintain a continuous corridor of trees at the very least a few trees deep (based on the canopy of a typical mature, bottomland, hardwood species) on both sides of Wilson's Creek.

[8] National Park Service, *Fire Management Plan for Wilson's Creek National Battlefield* (Republic, Missouri: Wilson's Creek National Battlefield, 2004), 57.

- Prescribed fires to improve resource values will have a smoke dispersion component in the prescription. If smoke creates a prolonged hazard or significant nuisance, appropriate actions will be taken to mitigate the condition causing the problem or the fire will be suppressed.
- Planned prescribed fire ignitions in sensitive areas will be conducted either when visitation is low, or the Superintendent will restrict entry to areas potentially impacted by smoke.
- When a fire has burned for an extended period of time and generated a lot of residual smoke, the NPS will consider appropriate actions to minimize additional smoke production.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, most of which have no impact on air quality. There would be the continued use of prescribed fire as part of ongoing vegetation maintenance and management. The incremental impact of alternative 2, when added to other past, present, and reasonably foreseeable future actions, would be minor, as prescribed fire would produce short-term adverse impacts and would be required to follow precise mitigation measures to prevent long-term adverse impacts.

Conclusion

There would be no long-term adverse impacts on air quality from implementation of this alternative. Short-term adverse impacts would be mitigated based on recommendations prescribed in the *Fire Management Plan* (2004). With the mitigation measures in place for the park, there would be no long-term adverse impact to air quality.

4.9 Cultural Resources

4.9.1 Archeological Resources

ALTERNATIVE 1 (NO-ACTION)

Impacts

Under alternative 1, there would be no new ground-disturbing activities that would potentially affect known archeological resources within this alternative. Current management and monitoring is based on a substantial amount of archeological investigation performed within the park. Because extensive survey and archeological sampling have been performed on a limited number of targeted, mostly historic sites, little is known about the archeological potential of the greater park landscape. Protection of archeological sites from prescribed fire is currently outlined in the *Fire Management Plan* (2004) and is part of existing management regimes within this alternative. Park management of archeological resources would also rely on the information provided in an archeological inventory of Civil War-era sites currently under development to identify and protect currently unknown archeological sites. There would be no adverse impacts to archeological resources.

Section 106 Summary

Section 106 regulations apply only to properties that meet the eligibility requirements of the NRHP. Therefore, the assessment of NHPA section 106 effects applies only to those historic structures and cultural landscape features that are listed in, or eligible for listing in, the NRHP. The application of the Advisory Council criteria of adverse effects (36 CFR 800.5 "Assessment of Adverse Effects") has been completed. The NPS has already commissioned a NRHP nomination update that will consider inclusion of the expanded battlefield boundary articulated in the *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields; State of Missouri* (2011). For purposes of Section 106 compliance there would be **no adverse effect** on Archeological Resources.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an adverse impact on archeological resources. The incremental impact of the no-action alternative, when added to other past, present, and reasonably foreseeable future actions, would be negligible.

Conclusion

Overall, treatment of known archeological resources occurs as part of the existing policies and processes in place at the park intended to protect cultural resources. The no-action alternative would have no adverse impact on any archeological sites that may be eligible for listing in the NRHP. Further investigation is needed to locate additional sites and plan for the protection of archeological resources during routine maintenance, management, and future projects. Under alternative 1, no direct or adverse impact on archeological resources is expected.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Implementation of alternative 2 entails limited ground disturbance associated with some of the proposed actions. These include trail expansion and trail realignment; clearing the parcels southeast of the original park acquired since 2004 of secondary growth thickets and implementation of savanna management practices; establishment of a day-use picnic area at the Double Spring parcel; relocation of equestrian parking; revegetation of the existing equestrian parking area; establishment of a new tour road stop 1; installation of interpretive waysides, cannon, and orientation exhibits; installation of an orchard exhibit at the Guinn House site; establishment of ten interpretive/contemplative nodes; clearing vegetation to establish and maintain ten recommended viewsheds; installation of buffer plantings; rehabilitation of glade areas and the introduction of prescribed fire; rehabilitation of savanna and open mixed forest communities; relocation of high-tension electrical lines underground or outside the park; establishing filter strips along roads and parking areas; and installation of porous concrete in parking areas. Known archeological sites would not be disturbed within this alternative.

The ground-disturbing activities associated with alternative 2 have the potential to encounter and adversely impact previously unknown archeological resources. Potential adverse impacts would be minimized by pre-construction surveys and monitoring in the areas with high potential for artifacts. There is also potential for adverse impacts from the prescribed fire used as a tool for vegetation restoration and management. The *Fire Management Plan* (2004) presents mitigation measures for the use of prescribed fire and potential impacts on archeological resources. These mitigation measures include 1) in all locations every effort will be made to avoid damage to identified resources during suppression and prescribed fire operations; and 2) archeologists or cultural resource specialists will be involved in all operations to the maximum extent feasible. With mitigation measures and guidelines, this alternative would have no adverse impact to archeological resources.

Section 106 Summary

NHPA section 106 regulations apply only to properties that meet the eligibility requirements of the NRHP. Therefore, the assessment of NHPA section 106 effects applies only to those historic structures and cultural landscape features that are listed in, or eligible for listing in, the NRHP. The application of the Advisory Council criteria of adverse effects (36 CFR 800.5 "Assessment of Adverse Effects") has been completed. The NPS has already commissioned a NRHP nomination update that will consider inclusion of the expanded battlefield boundary articulated in the *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields; State of Missouri* (2011). For purposes of Section 106 compliance there would be **no adverse effect** on archeological resources.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an adverse impact on known archeological resources. The incremental impact of alternative 2, when added to other past, present, and reasonably foreseeable future actions, would be long-term and positive.

Conclusion

Overall, known archeological resources are part of the existing policies and processes maintained by the park for protection of cultural resources. Alternative 2 would have no effect on any archeological sites that may be eligible for listing in the NRHP. The identification of additional sites is needed in order to protect archeological resources during routine maintenance, management, and future projects. Alternative 2 would not modify known archeological resources at Wilson's Creek National Battlefield. No direct or adverse impacts to archeological resources would be expected.

4.9.2 Historic Buildings and Structures

ALTERNATIVE 1 (NO-ACTION)

Impacts

Current management regimes within this alternative would continue under alternative 1. These include repair and maintenance of deteriorated historic buildings, structures, and features within the battlefield landscape, and maintenance and management of the Edgar and Manley cemeteries. Current management goals associated with this alternative are to protect and preserve the historic features that survive from the Civil War period, including the Ray House and Springhouse and various roads and trails. Within this alternative, preservation, protection, and maintenance of buildings and structures surviving from the 1861–1960 period of significance is ongoing. The alternative would limit the park's ability to rehabilitate the cultural landscape and its associated buildings and structures to enhance and expand interpretation of the Battle of Wilson's Creek. This alternative would have long-term and positive impacts on historic buildings and structures.

Section 106 Summary

Section 106 regulations apply only to properties that meet the eligibility requirements of the NRHP. Therefore, the assessment of NHPA section 106 effects applies only to those historic structures and cultural landscape features that are listed in, or eligible for listing in, the NRHP. The application of the Advisory Council criteria of adverse effects (36 CFR 800.5 "Assessment of Adverse Effects") has been completed. The NPS has already commissioned a NRHP nomination update that will consider inclusion of the expanded battlefield boundary articulated in the *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields; State of Missouri* (2011). For purposes of Section 106 compliance there would be **no adverse effect** on historic buildings and structures.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, some of which have a beneficial impact to historic buildings and structures. The incremental impact of the no-action alternative, when added to other past, present, and reasonably foreseeable future actions, would be long-term and positive.

Conclusion

Current management and maintenance of historic buildings and structures and park goals of preservation of the rural and historical character of the park would result in no modifications to existing historic buildings and structures. Therefore, implementation of the no-action alternative would result in no adverse impacts to historic buildings and structures.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Current management regimes associated with alternative 2 would continue. These include repair and maintenance of deteriorated historic buildings, structures, and features within the battlefield landscape, and maintenance and management of the Edgar and Manley cemeteries. Current management goals within this alternative are to protect and preserve the historic features that survive from the Civil War period, including the Ray House and Springhouse and various roads

and trails. Within this alternative, preservation, protection, and maintenance of buildings and structures surviving from the 1861-1960 period of significance is ongoing.

The historic buildings and structures at Wilson's Creek National Battlefield would also be associated with expanded interpretation of the landscape context for the Battle of Wilson's Creek and the domestic precincts of the Guinn, C.B. Manley, Sharp, Edwards, Gibson, Short, T.B. Manley, and Edgar House sites. Expanded interpretation of these missing features within the cultural landscape as part of alternative 2 would have a long-term positive impact on historic buildings and structures.

Section 106 Summary

Section 106 regulations apply only to properties that meet the eligibility requirements of the NRHP. Therefore, the assessment of NHPA Section 106 effects applies only to those historic structures and cultural landscape features that are listed in, or eligible for listing in the NRHP. The application of the Advisory Council criteria of adverse effects (36 CFR 800.5 "Assessment of Adverse Effects") has been completed. The NPS has already commissioned a NRHP nomination update that will consider inclusion of the expanded battlefield boundary articulated in the *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields; State of Missouri* (2011). For purposes of Section 106 compliance there would be **no adverse effect** on historic buildings and structures due to proposed actions in alternative 2.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, some of which have a positive impact to historic buildings and structures. The incremental impact of alternative 2, when added to other past, present, and reasonably foreseeable future actions, would be long-term and positive.

Conclusion

Historic cultural resources within the park are currently maintained and managed to retain their integrity and historical character. Expanded interpretation proposed within this alternative would entail additional maintenance for buildings and structures and associated landscape features, resulting in a positive impact on cultural resources. Alternative 2 would not modify historic buildings and structures at Wilson's Creek National Battlefield. No direct or adverse impacts to these resources would be expected.

4.9.3 Cultural Landscape

ALTERNATIVE 1 (NO-ACTION)

Impacts

Current management and maintenance practices associated with alternative 1 focus on preservation of the existing rural and historic character of the Wilson's Creek National Battlefield cultural landscape and related interpretive programs. Exploration of ways to utilize the cultural landscape as a tool for interpreting the historical context of the battle, coupled with an updated

understanding of some battle events and troop movements based on recent scholarship, would not be incorporated into park management within this alternative. Visitors would continue to gain most of their knowledge of the Battle of Wilson's Creek through the exhibits located within the visitor center and along the tour road, at tour road tour stops, along pedestrian trails, and through associated wayside exhibits. This alternative would limit the park in its ability to explain the historical context of the battle through additional visual depiction of historic conditions that would provide enhanced interpretation of the cultural landscape. There is no direct physical impact to the cultural landscape within this alternative, but there are limitations to its use in expanded interpretation of the battlefield. The increasing white-tailed deer population would cause a direct and significant impact to the cultural landscape due to heavy browsing of vegetation and subsequent loss of character-defining features.

Section 106 Summary

Section 106 regulations apply only to properties that meet the eligibility requirements of the NRHP. Therefore, the assessment of NHPA section 106 effects applies only to those historic structures and cultural landscape features that are listed in, or eligible for listing in, the NRHP. The application of the Advisory Council criteria of adverse effects (36 CFR 800.5 "Assessment of Adverse Effects") has been completed. The NPS has already commissioned a NRHP nomination update that will consider inclusion of the expanded battlefield boundary articulated in the *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields; State of Missouri* (2011). For purposes of Section 106 compliance there would be **no adverse effect** on the cultural landscape.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, some of which have a positive impact to the cultural landscape. The incremental impact of the no-action alternative, when added to other past, present, and reasonably foreseeable future actions, would be long-term and positive.

Conclusion

Current management and maintenance of the cultural landscape and park goals of preservation of the rural and historical character of the park would result in no modifications to the existing cultural landscape. Therefore, implementation of the no-action alternative would result in no adverse impacts to the cultural landscape.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Specific actions resulting from the implementation of this alternative, and those associated with potential impacts to the cultural landscape include clearing of the parcels acquired since 2004 to the southeast of the original park, and implementation of savanna management practices; establishment of a new tour road stop 1; installation of orientation exhibits at trailheads, trail waysides, cannon, artillery waysides, an orchard exhibit at the Guinn House site; interpretation of

several domestic precincts; establishment of ten interpretive/contemplative nodes; establishment of ten viewsheds; deer population management; and vegetation restoration and management. These actions accomplish objectives to expand interpretation and better integrate the cultural landscape into the visitor experience understanding the Battle of Wilson's Creek. Actions also accomplish objectives to protect and restore native plant communities, restore and enhance critical viewsheds, restore riparian corridors and their function, establish field and historic vegetation exhibits, interpret missing 1861 farmsteads, and control invasive vegetation within the park. Impacts to the cultural landscape would be long-term and positive, due to the vegetation management and expanded interpretation that integrates the cultural landscape into the interpretive story of the battlefield. With these actions, visitors would be able to see and understand the role of the landscape in the Battle of Wilson's Creek. Also, due to deer population management associated with this alternative, the integrity, variety, and character of the cultural landscape would be protected from excessive deer browsing, trampling, and non-native seed dispersal. This would be a long-term and positive impact to the cultural landscape.

Section 106 Summary

Section 106 regulations apply only to properties that meet the eligibility requirements of the NRHP. Therefore, the assessment of NHPA section 106 effects applies only to those historic structures and cultural landscape features that are listed in, or are eligible for listing in, the NRHP. The application of the Advisory Council criteria of adverse effects (36 CFR 800.5 "Assessment of Adverse Effects") has been completed. The NPS has already commissioned a NRHP nomination update that will consider inclusion of the expanded battlefield boundary articulated in the *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields; State of Missouri* (2011). For purposes of Section 106 compliance there would be **no adverse effect** on cultural landscapes.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, some of which would have a positive impact to the cultural landscape. The incremental impact of alternative 2, when added to other past, present, and reasonably foreseeable future actions, would be long-term and positive.

Conclusion

With implementation of the proposed actions in alternative 2, there would be a long-term and positive impact on the cultural landscape of Wilson's Creek National Battlefield. Proposed actions are based on the *CLR* (2004) and the *CLR Update* (2017) (See Appendix A). Implementation of proposed actions will also follow specific guidelines prescribed in the *Vegetation Management Implementation Plan* (2014).

4.9.4 Historic Viewsheds

ALTERNATIVE 1 (NO-ACTION)

Impacts

The historic viewsheds associated with the East and West Battlefield Overlooks would be maintained and managed within alternative 1. No additional clearing for identified historic viewsheds would occur, and existing historic viewsheds would not be modified. There is no management strategy to clear more historic viewsheds for expanded interpretation and enhancement of the visitor experience of the battlefield site. This alternative would limit the park in its ability to explain the historical context of the battle through visual association and enhanced interpretation of the cultural landscape. No direct or adverse impacts to historic viewsheds would be expected.

Section 106 Summary

Section 106 regulations apply only to properties that meet the eligibility requirements of the NRHP. Therefore, the assessment of Section 106 effects applies only to those historic structures and cultural landscape features, including historic viewsheds, that are listed in or eligible for listing in the NRHP. The application of the Advisory Council criteria of adverse effects (36 CFR 800.5 "Assessment of Adverse Effects") has been completed. The NPS has already commissioned a NRHP nomination update that will consider inclusion of the expanded battlefield boundary articulated in the *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields; State of Missouri* (2011). For purposes of Section 106 compliance there would be **no adverse effect** on historic viewsheds.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which would have an impact on historic viewsheds. The incremental impact of the no-action alternative, when added to other past, present, and reasonably foreseeable future actions, would be negligible.

Conclusion

Historic viewsheds at the East and West Battlefield Overlooks and associated interpretive wayside exhibits would be managed and maintained within this alternative. Current management and maintenance of the viewsheds and park goals of preservation of the rural and historical character of the park would result in no modifications to the existing historic viewsheds. Therefore, implementation of the no-action alternative would result in no adverse impacts to historic viewsheds.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Reestablishment of ten critical viewsheds associated with the historic battlefield landscape is proposed within alternative 2 to support the interpretation of the Battle of Wilson's Creek. While this may be accomplished through woodland thinning in the short-term, it is recommended that the park reevaluate the quality of key views as other actions within this alternative, such as rehabilitation of glades and savanna are initiated and crop field exhibits are expanded, to adjust the scope of viewshed clearing. Viewshed reestablishment would involve the removal of woody

thickets that currently obscure views. Where views are particularly critical to interpreting the events of the 1861 battle, clearing and thinning operations would occur as a priority project, rather than waiting for vegetation community rehabilitation to establish the desirable view corridors. As these and other *CLR* (2004) treatment actions are implemented, visitors would have a much better sense of what Civil War-era troops witnessed in terms of terrain and landscape elements during the battle.[9] Vegetation management in selected areas on the battlefield offers the best opportunity to improve critical views from multiple observer points within the park. Restoration of historic viewsheds will have a long-term positive impact to the cultural landscape as a result of expanded interpretation of the historical context of the battle, battle events, and troop movements across the landscape. Impacts to existing historic viewsheds are positive as they are maintained and managed as part of the proposed action of re-establishment of ten additional historic viewsheds.

Mitigation

- When clearing or disturbing an area's vegetation there is always the chance for introducing invasive, exotic plant species. Mitigation would require monitoring and implementation of the Updated Invasive Species Control Plan as outlined in the *Vegetation Management Implementation Plan* (2014) in order to identify invasive species as early as possible to diminish the extent of control measures.

Section 106 Summary

Section 106 regulations apply only to properties that meet the eligibility requirements of the NRHP. Therefore, the assessment of Section 106 effects applies only to those historic structures and cultural landscape features, including historic viewsheds, that are listed in or eligible for listing in the NRHP. The application of the Advisory Council criteria of adverse effects (36 CFR 800.5 "Assessment of Adverse Effects") has been completed. Under alternative 2, the action alternative, viewsheds associated with the Civil War landscape conditions would be reestablished to enhance visitor understanding of the battle as it unfolded. For purposes of Section 106 compliance there would be **no adverse effect** on historic viewsheds.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, none of which have an impact on historic viewsheds. The incremental impact of the action alternative, when added to other past, present, and reasonably foreseeable future actions, would be long-term and positive due to the reestablishment of critical viewsheds, in conjunction with the changes in vegetation communities articulated in the *Vegetation Management Implementation Plan* (2014).

Conclusion

Restoration of historic viewsheds in association with other interpretive additions within this alternative would have a long-term positive impact on the overall interpretive experience through

[9] National Park Service, *Vegetation Management and Implementation Plan,* 31.

visual associations with the cultural landscape that expand the understanding and knowledge of the Battle of Wilson's Creek. Overall, alternative 2 carefully considers and sensitively addresses the issue of clearing of historic viewsheds to expand interpretation and provide visitors with a more complete understanding of the cultural landscape and how it looked in 1861. The impact of the action alternative on historic viewsheds would be long-term and positive.

4.10 Visitor Use and Experience

ALTERNATIVE 1 (NO-ACTION)

Impacts

Within alternative 1, there would be no additions to visitor facilities. Visitors would continue to access the park at the main entrance, park at the visitor center, experience exhibits, park rangers, and the research library within the building, and drive along the tour road, stopping at the tour road stops that serve as nodes of interpretation. Programs and interpretation guided by the *Long-Range Interpretive Plan* (2009) would continue. The park would continue to manage and maintain the existing tour road and tour stops, as well as and pedestrian and equestrian trails. No new visitor amenities would be added, and there would be no expansion of interpretation using the cultural landscape as a tool for conveying the events of the battle. The park would continue to offer the current array of opportunities and experiences that enhance visitor understanding of the significance of the battlefield landscape and its role in the Civil War west of the Mississippi River. The no-action alternative would continue to have minor impacts on the visitor experience due to limited interpretation, limited visual access to the battlefield landscape as it existed during the Civil War, and the limited access afforded by the existing trail system.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, which have short-term positive impacts, associated with maintenance and management, to the visitor experience at Wilson's Creek National Battlefield. The incremental impact of the no-action alternative, when added to other past, present, and reasonably foreseeable future actions, would be long-term and adverse as the overall visitor experience would remain the same, without expanded interpretation and use of the cultural landscape to help understand the full story of the Battle of Wilson's Creek.

Conclusion

Within this alternative, there would be no additions of waysides and cannon, no creation of viewsheds identified as important in the interpretation of the battle, and no expanded knowledge of the full extent of the Battle of Wilson's Creek by bringing the entire landscape into the interpretive program. The park would be limited in its ability to explain the historical context within which the battle occurred as a result of limitations on the addition of new wayside exhibits to address current scholarship surrounding battle events and troop movements. Visitors would experience some eroded trail segments due to current steep locations that currently require constant maintenance. This alternative would have minor adverse impacts on the visitor

experience due to the limitations of existing interpretation and use of the cultural landscape to tell the story of the Battle of Wilson's Creek.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Specific actions resulting from the implementation of this alternative that may be associated with potential impacts on visitor use and experience include expansion of the pedestrian and equestrian trail system and re-alignment of steep and erodible trail segments; establishment of a new tour road stop 1; installation of upright orientation exhibits, trail waysides, cannon, artillery waysides, and an orchard exhibit; expanded interpretation of domestic precincts; establishment of interpretive/contemplative nodes; establishment of ten new historic viewsheds; vegetation restoration and management; establishment of a 25-foot-wide deer management zone along the northern and western park boundaries; and institution of a program that diminishes deer populations within the park. Most actions proposed in this alternative strengthen and expand interpretation within the park and integrate the cultural landscape in telling the story of the Battle of Wilson's Creek. Proposed interpretive/contemplative nodes provide visitor comforts such as seating and shade. The deer management zone and the program for diminishing the deer population also enhances the visitor experience and directly addresses the ongoing issue of concern for visitors to the park. The proposed actions have a long-term positive impact to visitor use and experience at Wilson's Creek National Battlefield.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, which have short-term positive impacts, associated with maintenance and management, to the visitor experience at Wilson's Creek National Battlefield. The incremental impact of alternative 2, when added to other past, present, and reasonably foreseeable future actions, would be long-term and positive for visitor use and experience at the Battlefield.

Conclusion

Overall, this alternative would have long-term positive impacts on visitor use and experience. Due to increased interpretive opportunities and features, improved and expanded education and communication, construction of new trails and realignment of others, development of interpretive/contemplative nodes with associated site furnishing and shade, and establishment of programs and strategies to manage and control the deer population, visitor use would expand and the visitor experience would be improved.

4.11 Human Health and Safety

ALTERNATIVE 1 (NO-ACTION)

Impacts

Under Alternative 1, park personnel would remain vigilant about protecting visitor safety from a variety of concerns, including issues associated with severe summer weather, heat and humidity,

hail storms, and tornadoes, and ongoing management and maintenance of trails, roads, exhibits, site furnishings, buildings, and vegetation. Park personnel would also continue to monitor and maintain signage that delineates equestrian and pedestrian use of existing trails. The *Sign Inventory and Assessment* completed in 2016 would be used to guide sign policies associated with safety. Deer population monitoring by Heartland would continue. It is anticipated that as the population continues to grow, the number of incidents involving collisions between deer and vehicles as well as bicycles will also climb and remain a safety issue of concern. Using the *Fire Management Plan* (2004), the park would continue to work with interested agencies to protect the public during the use of prescribed fire for vegetation management.

The no-action alternative would not include an overall strategy for deer management and control of the growing deer population would not occur within the park. Even with ongoing monitoring, there would be long-term and significant impacts to human health and safety associated with the deer population within the park.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, which have short-term positive impacts associated with maintenance and management to human health and safety at Wilson's Creek National Battlefield. The incremental impact of the no-action alternative, when added to other past, present, and reasonably foreseeable future actions, would be long-term and adverse due to the continued issue of visitor safety associated with the deer population within the park.

Conclusion

Within this alternative, there would be significant (immediate and unaddressed threats to human safety) adverse impacts on human health and safety. Continuing erosion of trails would remain a safety hazard for both pedestrians and equestrians. The over-abundant population of deer within the park would not be reduced, and potential for collisions with vehicles and bicycles would remain high.

ALTERNATIVE 2 (PROPOSED ACTION AND PREFERRED)

Impacts

Specific actions resulting from the implementation of alternative 2 associated with potential impacts on human health and safety include realignment of steep or eroded trail segments, and removal of steep and eroding trail segments; establishment of a 25-foot-wide deer management zone between the park boundary and adjacent roads to the north and west; and institution of a program that diminishes the white-tailed deer population within the park. Trail improvements within this alternative would have a positive impact on human health and safety. Elimination of dangerously steep trail segments and realignments of other segments prevents serious soils erosion and destabilization of trail surfaces. This is a positive impact for both equestrian riders and pedestrians along the interpretive trails.

The 25-foot-wide deer management zone between the park boundary and adjacent roads, as well as the initiation of a management program for reductions in the deer population has a direct and long-term positive impact on the health and safety of visitors to the park. The over-abundant population of deer would be reduced along with the potential for collisions with vehicles and bicycles.

Cumulative Effects

There are a number of past, ongoing, and reasonably foreseeable projects occurring or proposed within the park, which have positive impacts to human health and safety at Wilson's Creek National Battlefield. The incremental impact of alternative 2, when added to other past, present, and reasonably foreseeable future actions, would be direct, long-term, and positive. The reduction of the deer population and subsequent downturn in collisions with vehicles and bicycles would have a long-term positive impact on human health and safety as would trail re-alignments and stabilization of trail surfaces for equestrians and pedestrians.

Conclusion

Overall, long-term positive impacts to human health and safety would occur as a result of the implementation of proposed actions associated with this alternative. Management of the deer population and the establishment of a 25-foot-wide deer management zone would result in a decline of vehicle and bicycle collisions with the deer along the tour road and the roads that edge the park to the north and west. Additional positive impacts include realignment of trails currently experiencing ongoing and severe erosion and establishment of contemplative/interpretive nodes for overall comfort, health, and safety of visitors to the park.

Chapter 5 – Consultation and Coordination

5.1 Introduction

National Park Service (NPS) Director's Order 12 requires the NPS to make "diligent" efforts to involve the interested and affected public in the National Environmental Policy Act (NEPA) process. This chapter documents the scoping process for the Environmental Assessment (EA) as well as interagency consultation and coordination with the U. S. Fish and Wildlife Service (USFWS), the Missouri Department of Natural Resources, Missouri State Historic Preservation Office (SHPO) and other natural and cultural resource agencies. Included in this chapter is the list of recipients who received notice of the project undertaking and the planned stakeholder meetings.

5.2 Scoping Process and Public Involvement

***Start-Up Meeting*.** To officially initiate this project, a kick-off meeting was held on November 14 and 15, 2016. Project team members from Commonwealth Heritage Group and Liz Sargent HLA met with park and regional NPS personnel at the Wilson's Creek National Battlefield Visitor Center to initiate work on the EA. This internal scoping meeting included the following participants:

- Marla McEnaney, Historical Landscape Architect, NPS Midwest Regional Office
- Ted Hillmer, Superintendent, Wilson's Creek National Battlefield
- Gary Sullivan, Chief, Resources and Facility Management, Wilson's Creek National Battlefield
- John Sutton, Chief, Interpretation and Visitor Services, Wilson's Creek National Battlefield
- Connie Langum, Historian, Wilson's Creek National Battlefield
- Shawn Pearce, Chief of Maintenance, Wilson's Creek National Battlefield
- Mike Debacker, Network Program Manager, Heartland Inventory & Monitoring Network (Heartland)
- David Peitz, Wildlife Ecologist, Heartland
- Sherry Leis, Fire Ecologist, Heartland
- Jane Jacobs, Consultant, Commonwealth Heritage Group
- Liz Sargent, Consultant, Liz Sargent HLA

The meeting focused on treatment recommendations implemented since 2004 based on the Cultural Landscape Report (2004), park objectives, and needs identified since 2004,



Figure 5-1: *Internal scoping meeting included NPS park and regional staff, Heartland managers and ecologists, and the consultants.*



Figure 5-2: *The project team toured the battlefield after the internal scoping meeting.*

to be accommodated in the preferred alternative, and the structure and content of the EA stakeholder groups. Identified stakeholders include the following:

- Executive Director of Ozark Greenways, Incorporated, Springfield Missouri
- Southwest Missouri Council of Governments, Springfield, Missouri
- Judith Deel, Archeologist, Missouri Department of Natural Resources (SHPO), Jefferson City, Missouri
- MDC (Missouri Department of Conservation)
- Missouri Department of Transportation (District 8)
- Greene County Highway Department, Springfield, Missouri
- City Administrator, City of republic, Missouri
- Transportation Department, City of Springfield, Missouri
- Department of Planning and Development, City of Springfield, Missouri
- U.S. Fish and Wildlife Service (USFWS)
- THPO/Tribe representatives
- Bicycle Club, Springfield, Missouri
- Wilson's Creek Foundation
- Public School District
- Equestrian Riders
- Air Quality, Water Quality, Waste Management, City of Springfield, Missouri
- Fort Leonard Wood Training Center
- Civil War Trust

- Sons of Union Veterans
- Sons of confederate Veterans
- Civil War Roundtable

Public Open House. Staff at Wilson's Creek National Battlefield issued a news release on November 4, 2016, announcing an Open House to be held at the park visitor center on November 15, 2016. The public was invited to attend the open house to learn about the EA and to provide input in the early development of the alternatives. Interested stakeholders who could not attend the meeting were encouraged to send in email comments to the park staff. A community member who enjoys horseback riding in the park and its equestrian trails was the only attendee at the open house. The Superintendent also received telephone and email comments about the EA prior to and after the Open House.



Figure 5-3: *Equestrian users of park trails were interested in variations to equestrian trail alignments and or expansions.*



Figure 5-4: *Equestrians on the trail near the overflow parking for the large horse trailers.*

Public Meeting. All identified stakeholders received letters of invitation to a public meeting scheduled for November 6, 2017, to review the draft EA. The public was afforded the opportunity to convey comments about the draft EA during the meeting, as well as by submitting comments via U.S. mail, by hand, and electronically using the NPS Planning, Environment, and Public Comment (PEPC) system website. The final draft of the EA went to public review for 30 days, October 28th through November 28th, 2017. Comments were collected from discussions and suggestions at the meeting, from emails during the 30-day review period, and from comments on the PEPC site. Comments and questions from members of the public were documented and taken into consideration as the EA was finalized.

5.3 Consultation

NPS contacted Amy Salveter, Field Supervisor with the USFWS through a letter dated January 31, 2017. The letter served as notification that the park had begun the NEPA process and was proposing to have an EA available for public and regulatory review later in the year. In addition, the letter served as a record that the NPS was initiating informal consultation with USFWS pursuant to Section 7 of the Endangered Species Act of 1973, which requires that a federal agency

consult with the USFWS or the National Marine Fisheries Service on any action that may affect endangered or threaten species or candidate species or that may result in adverse modification of critical habitat.

The National Historic Preservation Act (NHPA); NEPA; NPS Organic Act; NPS Management Policies 2006; Director's Order 12: Conservation Planning, Environmental Impact Analysis and Decision-making; and Director's Order 28: Cultural Resources Management Guideline require the consideration of impacts on cultural resources, either listed in or eligible to be listed in, the National Register of Historic Places. The National Park Service notified the Missouri Department of Natural Resources, State Historic Preservation Office (SHPO) through a letter dated January 31, 2017. In accordance with Section 800.8(3)(c) of the Advisory Council on Historic Preservation's regulations, this letter informed the office of the SHPO of the park's intention to use the EA to meet its obligations under Section 106 of the NHPA. It also stated that the EA will contain an Assessment of Effect for all cultural resources potentially affected by the proposed alternatives and the draft EA document would be available for their review and comment in the summer of 2017.

The SHPO, THPOs, and USFWS were sent invitations to the public meeting held at the park on November 6, 2017 and all received draft copies of the EA for review. The SHPO responded with a letter of concurrence with the NPS determination of **no adverse effect** on historic properties in a letter dated December 7, 2017. Special Projects Officer for the Cherokee Nation Tribal Historic Preservation Office responded with a letter of concurrence with NPS determination of **no adverse effect** on cultural resources, dated December 11, 2017. The USFWS concurred with the NPS finding of **no adverse effect** on threatened or endangered species in an email dated November 27, 2017.

Chapter 6 – Preparers, Consultants, and References

6.1 List of Preparers and Consultants

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6.2 References

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Appendix A:

Cultural Landscape Report Update



Wilson's Creek National Battlefield

Cultural Landscape Report Update – March 2018

Wilson's Creek National Battlefield

CULTURAL LANDSCAPE REPORT UPDATE

To

Accompany the Environmental Assessment

For

Cultural Landscape Report Implementation

Prepared for:
National Park Service
Midwest Regional Office
Omaha, Nebraska
and
Wilson's Creek National Battlefield
Republic, Missouri

Prepared by:
Commonwealth Heritage Group, Inc.
And
Liz Sargent HLA
Charlottesville, Virginia

March 2018

Wilson's Creek National Battlefield

Cultural Landscape Report Update

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Figure 1. Entrance, Wilson's Creek National Battlefield. (Source: Liz Sargent HLA (LSHLA))

Introduction

Background

Wilson's Creek National Battlefield (fig. 1) is a unit of the National Park System that protects the historic landscape associated with the August 10, 1861, Civil War Battle of Wilson's Creek. The Battle of Wilson's Creek was the war's second major battle, following the First Battle of Bull Run on July 21, 1861, in Virginia, and the first in the Trans-Mississippi West. The battle is notable as the location where the Union army lost its first general—Nathaniel Lyon—and for its impact on Missouri's status as a border state.

Wilson's Creek National Battlefield Park was established by Congress on April 22, 1960, to preserve and commemorate the Battle of Wilson's Creek.[1] In 2007, following acquisition of an important collection of Civil War artifacts, the park's purpose was updated in a General Management Plan (GMP) Amendment to address this change. The park's current purpose 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."[2]

Federal protection of the battlefield in 1960 followed private efforts conducted by a group of local businessmen and community leaders to secure the key terrain associated with one of the most important areas of combat—so-called Bloody Hill—and to commemorate the events of the battle. The group formed the Wilson's Creek Battlefield Foundation (Foundation) in 1950; through successful fund-raising efforts, the Foundation was able to acquire 60 acres of Bloody Hill in 1951. The land acquired by the Foundation included a monument, erected in 1928, marking the site where Union Gen. Nathaniel Lyon was killed during the battle. After Congress established Wilson's Creek National Battlefield Park, the Foundation transferred

1. National Park Service, *Wilson's Creek National Battlefield General Management Plan Amendment / Environmental Assessment / Assessment of Effect for the Civil War Museum and Addition Lands* (July 2007), i. Public Law 86-434 established the property as Wilson's Creek National Battlefield Park. It was re-designated Wilson's Creek National Battlefield on December 16, 1970.
2. National Park Service, *General Management Plan Amendment*, 4.

ownership of the land to the federal government. Following land acquisition procedures, the park encompassed a total of 1,749.49 acres; land acquisition was based on National Park Service (NPS) assessment of the area considered to be essential to understanding the events of the battle. Since 1960, the Wilson's Creek Battlefield Foundation has remained a partner of the federal government in protecting the battlefield, and is recognized as one of the oldest private-sector support groups of the NPS.[3]

The park is a significant cultural landscape, listed in the National Register of Historic Places (NRHP) for its association with the events of the August 10, 1861, Battle of Wilson's Creek. NPS management of significant cultural landscapes like Wilson's Creek National Battlefield is often guided by a planning document referred to as a cultural landscape report (CLR). In 1998, the NPS engaged the services of John Milner Associates, Inc., a historic preservation consultant firm, to prepare a CLR for Wilson's Creek National Battlefield. Completed in 2004, the CLR considered the historical evolution, existing composition, and NRHP significance and integrity of Wilson's Creek National Battlefield. The CLR also included a treatment plan designed to guide long-term management of the historic battlefield landscape. The treatment plan addressed specific park objectives conveyed to the consultant team involving resource protection, management, and interpretation. Since 2004, park personnel have worked to implement the recommendations for managing the historic landscape indicated in the CLR, employing the Section 106 compliance process to assess the potential impacts of each individual project. In 2016, the NPS decided to prepare an Environmental Assessment (EA) to more efficiently address the compliance needs for the remaining recommendations of the treatment plan. For continuity, the NPS engaged a team of consultants to prepare the EA that was led by CHG, a firm that acquired JMA in 2014. The team also included Liz Sargent of Liz Sargent HLA, who had served as the project manager for the 2004 CLR while employed with JMA.

This CLR Update was prepared in support of the EA that accompanies this document. It documents changes that have occurred within the park since 2004, and indicates which aspects of the treatment plan have been implemented in order to allow for an understanding of what recommendations still needed to be assessed as part of the EA. By recording the changes that have occurred within the park since 2004, the CLR Update helped to establish the basis for the "no-action" alternative evaluated in the EA. The CLR Update also records the park's current management goals and objectives, helping to establish modifications to the original treatment plan that form the basis for the "action" alternative evaluated in the EA.

Statement of Work and Methodology

The statement of work provided to the CHG team by the NPS to prepare the EA to address implementation of the Wilson's Creek National Battlefield CLR, which led to preparation of this CLR Update, included the following statement of purpose:

> This project involves the development of an Environmental Assessment (EA) for the purpose of satisfying the compliance requirements for the implementation of the Wilson's Creek National Battlefield Cultural Landscape Report (2004)(CLR). The purpose for preparing the EA is to identify and disclose the potential effects of a reasonable range of alternatives developed to address the implementation actions in the report including but not limited to vegetation treatments, orchard restoration, open fields management, trail system layout, deer management, viewshed management and visitor services like interpretive waysides.

3. Wilson's Creek National Battlefield Foundation, "About Us" Available at http://wilsonscreek.com/about (accessed April 9, 2017).

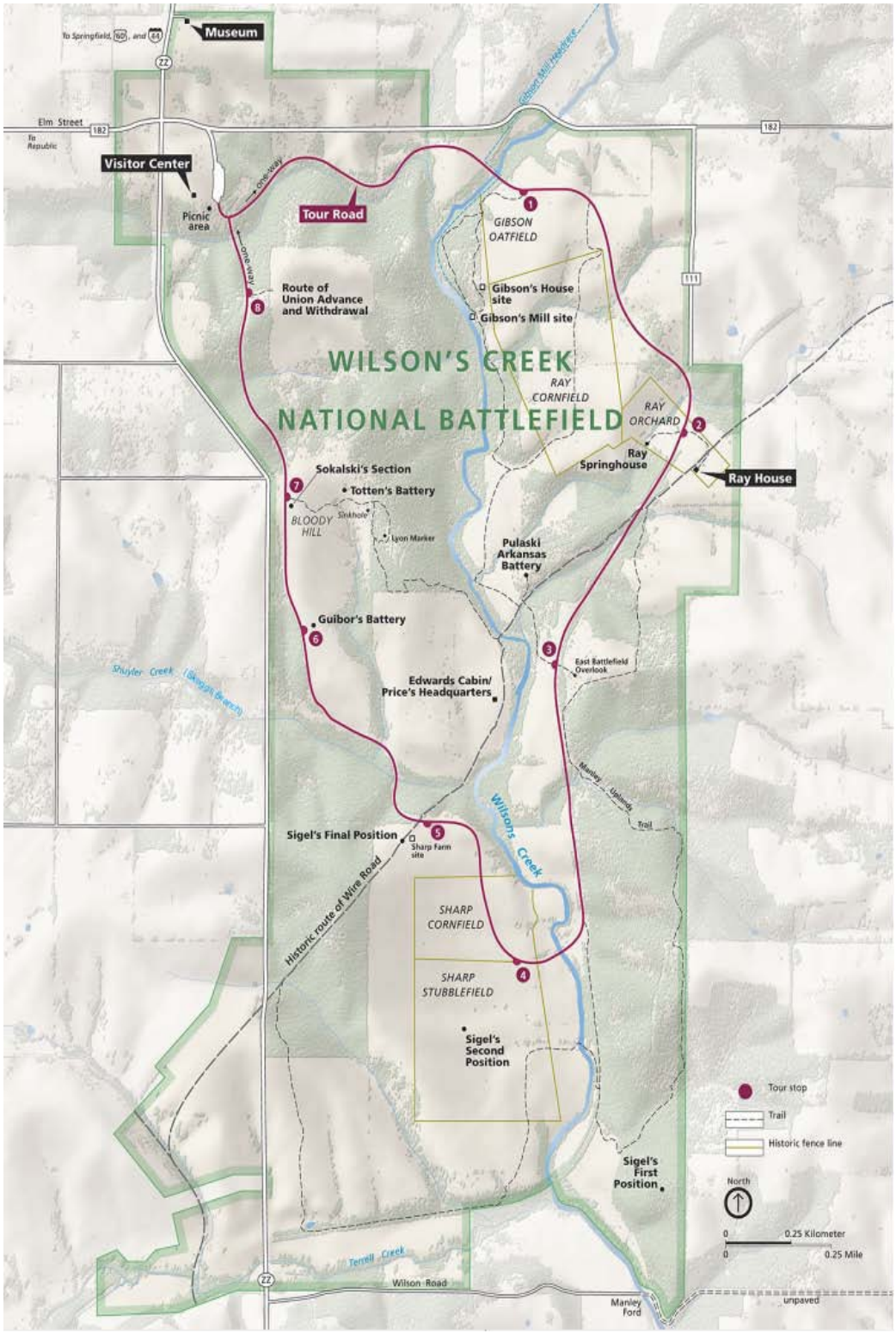
> This project consists of executing National Environmental Policy Act (NEPA) compliance, in the form of an EA, for treatment recommendations found in the 2004 CLR. In September of 2004 Cultural Landscape treatment recommendations and guidelines were prepared to provide Wilson's Creek NB with a vision for the protection of the park's cultural landscape in order to sustain long-term management and interpretation. The recommendations were created over a five year period of time and are a synthesis of work undertaken by John Milner Associates, Inc. and their sub-contractors. Although the CLR was not intended to duplicate the work of a Long-Range Interpretive Plan, the connection between management of the park's cultural, natural, and historic resources and interpretation became a focus of the treatment recommendations, particularly as they addressed the objectives of the GMP's preferred management alternative.[4]

Study Area

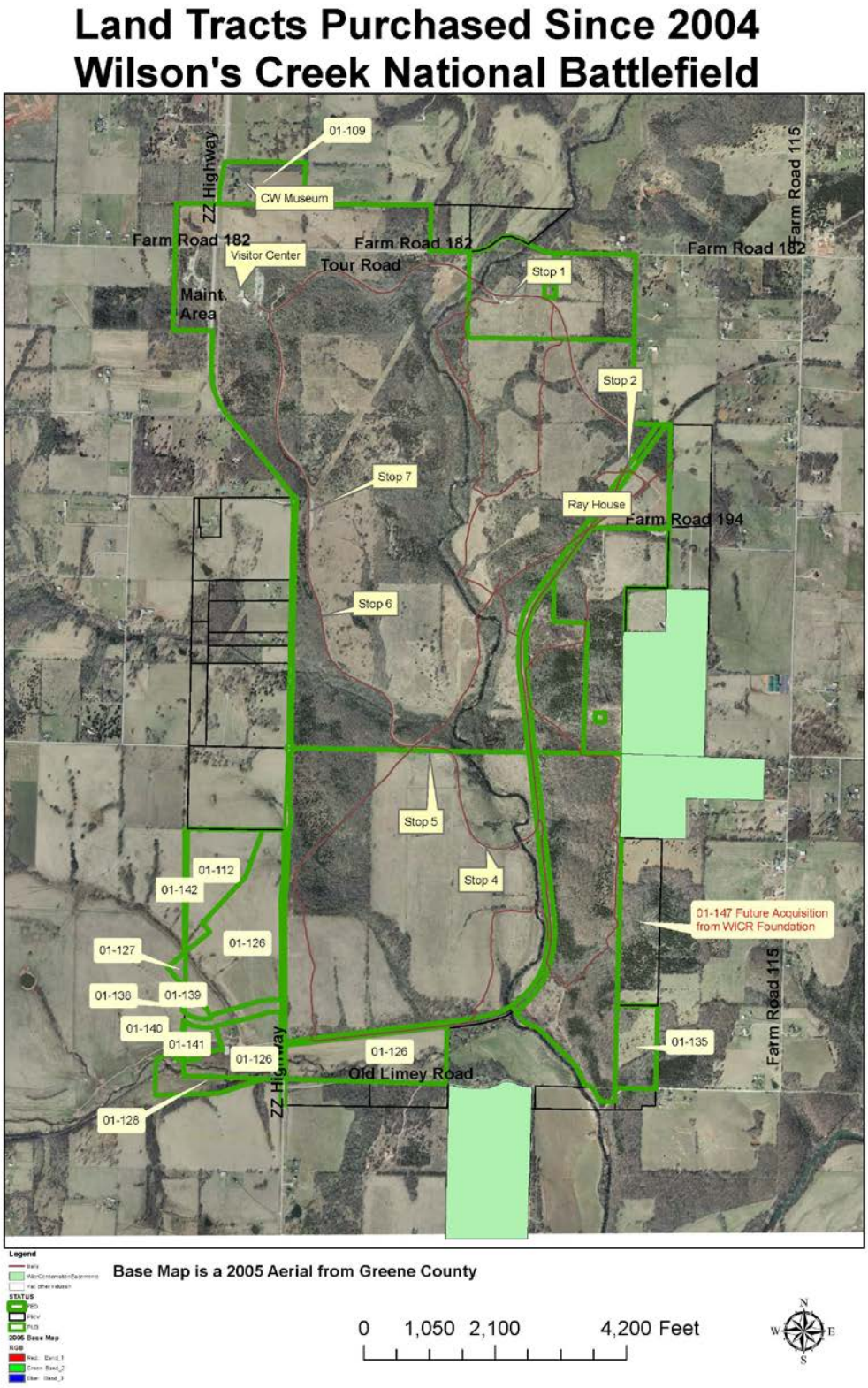
Wilson's Creek National Battlefield is located at 6424 West Farm Road 182 near the town of Republic, Missouri. The park extends over 2,029 acres, and spans the boundary between Christian and Greene counties. Farm Road 182 edges and passes through a portion of the park along the northern boundary. Farm Road 111 forms a portion of the park's eastern boundary, while Wilson Road edges part of the park's southern boundary. Missouri Highway ZZ edges and passes through portions of the park along its western boundary (map 1a).

Since 2004, the park has grown by approximately 280 acres. The land acquired for inclusion in the park since 2004 edges the original park to the northwest, southwest, and southeast (map 1b). Because some of this land fell outside of the authorized boundary of the park, it could not be added until U.S. Congress passed legislation authorizing a boundary expansion. The legislation was passed in 2004 following completion of the CLR.[5]

4. National Park Service, Midwest Regional Office, "Statement of Work" Wilson's Creek National Battlefield Environmental Assessment (July 2016), 1.
5. Wilson's Creek National Battlefield Boundary Adjustment Act of 2004. Public Law 108-394, October 30, 2004.



Map 1a. Unigrid map of Wilson's Creek National Battlefield, illustrating several of the parcels acquired since 2004. Additional parcels have been added to the park since this map was prepared. (Source: NPS)



Map 1b. Map of land tracts added to the park since 2004. (Source: Wilson's Creek National Battlefield)



Figure 2. View of a cannon positioned to interpret the Battle of Wilson's Creek. (Source: LSHLA)

Summary of Findings

Several changes of note have been made to the physical landscape of Wilson's Creek National Battlefield since 2004. These changes have included land acquisition and the addition of features designed to enhance visitor access and interpretation based on the recommendations provided in the 2004 CLR. Several of the land management strategies recommended in the 2004 CLR have also been implemented. These changes are documented in the chapters that follow. Also documented are current park management goals and objectives, the studies and reports relating to historic and natural resources prepared since 2004, current park planning initiatives, and changes that have occurred in association with the park's setting.

Several of the updated management goals and objectives have resulted in modifications to the recommendations provided in the 2004 CLR. One of the most important is the need to address deer management. High populations of white-tailed deer have led to concerns for visitor safety and the ability of the park to implement many of the remaining treatment plan recommendations related to vegetation. Deer management is addressed by the EA.

Park changes documented herein that have guided development of alternatives considered by the EA include:

- Since 2004, the park has expanded by 280 acres to a size of 2,029 acres. An additional 172 acres of battlefield land has been placed under conservation easement since 2004. Much of the recently acquired land was located outside of the legislated authorized boundary established in 1960. In order for this land to be added to the park, Congress authorized a boundary expansion in 2004. The CLR Update includes documentation of the land that has been added since 2004, and applies the treatment principles espoused in the 2004 CLR for inclusion in the EA. The CLR Update also considers the guidance afforded in the park's 2007 GMP Amendment in addressing treatment of these parcels.

- One of the parcels acquired by the park is located north of Farm Road 182 near the park entrance. The property formerly served as the General Sweeny Museum and housed a renowned private collection of Civil War artifacts. The artifacts are now included in the park's collection, while the

property is being used for park storage and office space. The NPS still needs to develop an approach to managing this property.

- CLR treatment recommendations implemented since 2004 include the planting of an orchard exhibit at the Ray House; construction of period appropriate fences around the Ray and Sharp Cornfields; establishment of crop exhibits; rehabilitation of the Edwards Cabin/Price's Headquarters site to interpret an important element of the battlefield; repaving of the tour road to diminish its visual impact within the landscape; protection of the glade landscape from visitor access at Bloody Hill; improvement of the picnic area; and enhanced vegetation management to improve the health of native plant communities and water resources.

- Expanding on the guidance afforded in the 2004 CLR, the park has enhanced interpretation of the Bloody Hill landscape through the addition of several new wayside and cannon (fig. 2) exhibits, parking spaces, trail alignments, and contemplative node features.

- The park has increased the use of prescribed fire in the management of vegetation based on an updated 2004 Fire Management Plan. Prescribed fire is an important tool to implement several of the treatment plan recommendations included in the 2004CLR involving the control of invasive species, undesirable tree species, and the promotion of native warm-season grass and forb fields and savanna communities. Fire was also indicated in the 2004 CLR as one of the tools that might be used to reestablish historic views within the landscape that will help visitors better understand battle events.

- The visitor center has been expanded to include a larger library, multi-purpose room, bathroom, offices, and lunch room, and houses exhibits that have benefitted from the inclusion of artifacts from the former General Sweeny Museum.

- An update to the Civil War Sites Advisory Commission *Report on the Nation's Civil War Battlefields* was prepared for Missouri in 2011. Based on consideration of new scholarship and assessment of the battlefield, the report recommends that the NRHP-listed property be considered for a boundary expansion to encompass an additional 3,300 acres beyond the former park boundary of 1749.49 acres.[6]

- Park interpretive staff have developed recommendations for trail expansion, viewshed enhancement, interpretive and contemplative node development, wayside exhibit replacement, and cannon siting in support of the visitor experience and interpretation of the Battle of Wilson's Creek. The recommendations are consistent with the 2004 CLR, but also expand on or amend them based on current scholarship. These are articulated in the park's 2009 Long-Range Interpretive Plan.

- The white-tailed deer population within Wilson's Creek National Battlefield is considered overabundant and beyond the accepted carrying capacity for the species. Deer pose a threat to the safety of visitors within the park, and to motorists traveling along the roads that edge the park. Deer have caused numerous accidents on adjacent roads, leading to injuries to motorists and animals, and damage to vehicles. Deer browse is also negatively affecting the health and vigor of the park's native plant communities and the effectiveness of crop exhibits. The park needs to develop deer management strategies that result in a reduction in the deer population.

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6. National Park Service, *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields State of Missouri* (Washington, D.C.: American Battlefield Protection Program, March 2011),15.



Figure 3. Detail, N.C. Wyeth, "Battle of Wilson's Creek," 1920. (Missouri State Capitol)

Update to Chapter Two: Site Physical History

Background

This chapter provides information about the physical changes that have occurred at Wilson's Creek National Battlefield since 2004 within the park's cultural landscape and other areas used by visitors. The changes are indicated in chronological order. In addition to the physical changes documented herein, this chapter lists the studies and reports prepared to address and support resource management and interpretation, including recent scholarship related to the Battle of Wilson's Creek.

Recent Scholarship, Battle of Wilson's Creek and Park Development

The August 10, 1861, Battle of Wilson's Creek (fig. 3), known to the Confederacy as the Battle of Oak Hills, was the second major battle of the Civil War. It resulted from efforts on the part of both the Union and Confederacy to control the border state of Missouri. Although the majority of Missouri residents wished to remain neutral in the conflict, Governor Claiborne Fox Jackson actively worked to lead Missouri into secession. As a result, the Missouri State Guard engaged in skirmishes with Union troops deployed within the state in June and July 1861. In addition to the Missouri State Guard, Confederate troops were also present within the state during the summer of 1861. In July, a popularly elected state convention, which had rejected secession in March 1861, reconvened and declared the governor's office vacant as a result of his actions; Jackson, however, refused to accept the decision and continued to act as governor.

In early August, Union Brig. Gen. Nathaniel Lyon's Army of the West was stationed near Springfield, Missouri. At the time, a Southern coalition army composed of a brigade under the command of Confederate Army Brig. Gen. Benjamin McCulloch, a brigade of Arkansas State Troops under the command of Gen. Nicholas B. Pearce, and the Missouri State Guard under the command of Maj. Gen. Sterling Price was traveling through the area. Upon learning of Lyon's presence, the coalition army decided to approach the

Federals. Lyon, recognizing the potential threat to his troops, decided not to wait for the approach, but to take the offensive and attack the approaching forces.

With the Southern coalition army camped along Wilson's Creek, 12 miles southwest of Springfield, on the night of August 9, Lyon decided to attack early on the morning of August 10. After the initial surprise of Lyon's early morning attack wore off, the Southerners moved to attack the positions that Lyon's forces had established. Although they attempted the maneuver three times, they remained unsuccessful in breaking the Union line. However, the Battle of Wilson's Creek, which pitted 5,400 troops under Lyon's command against a coalition of Southerners totaling 12,000, was still a defeat for the Union as General Lyon was killed in action, while Col. Franz Sigel's column was routed south of Skeggs Branch. Following these disastrous events, the Union troops decided to withdraw and retreat toward Springfield.

With the victory, the Southerners were able to gain a foothold in southwest Missouri. Emboldened by their success, the Southerners conducted several efforts to increase their territory to the north. These efforts were unsuccessful, however, and the foothold was short-lived. The Union would eventually gain control of the majority of Missouri, and maintain it for the remainder of the war.

Since the CLR was completed in 2004, new scholarship has emerged to deepen our understanding of the events of the Battle of Wilson's Creek. In addition to the two principal sources that were available in 2004—*Wilson's Creek: The Second Battle of the Civil War and the Men Who Fought It*, and *Kansans at Wilson's Creek; Soldiers' Letters from the Campaign for Southwest Missouri*, both co-authored by William Garrett Piston and Richard W. Hatchett III, several additional books have recently been published on the battle. This emerging scholarship has helped to refine the park's understanding of troop movements and the role of the landscape in the battle, including areas that lie outside of the legislated park boundary. Sources of recent scholarship indicated as of interest by the park include:

- Patrick, Jeff. *Campaign for Wilson's Creek: The Fight for Missouri Begins*. Abilene, Texas: McWhiney Foundation Press, May 2011.

- _____. "Missouri's Bloody Hill; Civil War Erupts at Wilson's Creek." *Hallowed Ground Magazine,* Summer 2011.

- Hess, Earl J., Richard W. Hatcher III, William Garrett Piston, and William L. Shea. *Wilson's Creek, Pea Ridge, and Prairie Grove*. Lincoln: University of Nebraska Press, 2006.

- Langum, Connie. "The Battle for Wilson's Creek; Creation and Evolution of a National Park." In *Hallowed Ground Magazine,* Summer 2011.

Physical Changes associated with the Park's Cultural Landscape following Completion of the 2004 CLR, and Studies Prepared to Support Resource Management

2003 (not documented in the 2004 CLR)

In April, the visitor center was expanded to include a 7,200-square-foot library annex.

In May, an F2 tornado crossed the park, destroying 3,500 feet of split rail fencing and 6,400 feet of boundary fencing. Downed trees were recorded as blocking 6,450 feet of the park's trail system.

2004

Professor William Garrett Piston, co-author of *Wilson's Creek: The Second Battle of the Civil War and the Men Who Fought It*, and *Kansans at Wilson's Creek; Soldiers' Letters from the Campaign for Southwest Missouri,* testified before the Congressional House Subcommittee on National Parks regarding the need to expand the authorized boundary of Wilson's Creek National Battlefield. Piston's testimony contributed to passage of the **Wilson's Creek National Battlefield Boundary Adjustment Act** of 2004.[1]

A 102-acre parcel was placed under **conservation easement** through the Farm and Ranch Lands Protection Program (since renamed) administered by the U.S. Department of Agriculture (U.S.D.A.). Funding for the easement was provided by the U.S.D.A., private donors, and monies raised by the Wilson's Creek National Battlefield Foundation.

The park completed its first Strategic Plan, supported by input from all employees.

Two projects were completed within the park in September that addressed the historic landscape and other areas visited by the public.

The first entailed replacement of the thermal windows in the park **visitor center** (PMIS project 41751). The second entailed painting the **Ray House** (PMIS project 97849), indicated as a 5-year cyclical project.

In December, the park completed a **Fire Management Plan** and associated **Environmental Assessment**. The plan addressed park goals associated with the protection of threatened and endangered plant species; identified measures to avoid and mitigate adverse impacts associated with wildland fire; indicated the appropriate use of prescribed fire for fuel management and to increase the distribution and abundance of the federally endangered Missouri bladderpod (*Physaria filiformis*); and how fire would be used to manage natural resources as part of a broader effort involving rehabilitation and interpretation of the battlefield landscape. The Fire Management Plan also addressed measures that would be used to maintain the ecological integrity of desirable habitat, including glades. Finally, the Fire Management Plan described how prescribed fire would be used to reduce exotic species distribution and abundance. It also provided suggestions for measures to address the park's goal of increasing public awareness about the role that fire plays in natural processes, the restoration of natural habitat, and the rehabilitation of the cultural landscape.

1. H.R. 4481, amending Public Law 86-434 establishing Wilson's Creek National Battlefield.

2005

Wilson's Creek National Battlefield, with the support and assistance of the Wilson's Creek Foundation, acquired the 19.84-acre General Sweeny's Civil War Museum property (Tract 01-109) , which included the museum and its Civil War memorabilia and artifact collection, for approximately $4.5 million. The museum housed one of the most outstanding private collections of Civil War artifacts and memorabilia in the world. Created by Dr. Tom Sweeney in the early 1990s, the museum was named for his ancestor, Gen. Thomas Sweeny, who fought in the Mexican-American and Civil Wars, including the Battle of Wilson's Creek. Acquisition of the property followed passage of the Wilson's Creek National Battlefield Boundary Adjustment Act of 2004 that authorized expansion of the park boundary.

The Civil War Trust included Wilson's Creek on its list of most endangered Civil War battlefields due to developer proposals to construct a 1,500-unit residential subdivision west of the park. Concerns were raised that the subdivision might serve to attract additional development.[2]

Five projects involving repair and construction that addressed the historic landscape and other areas visited by the public were completed during 2005.

In March, the wood stringers associated with the **Wire Road (County) bridge** were replaced after being assessed as unsafe for ongoing pedestrian and equestrian use during a Federal Highway bridge inspection (PMIS project 102730). The inspection indicated the presence of deteriorated structural members resulting from debris and water becoming trapped behind the bridge after heavy rain storms. The bridge, built in 1910, is one of the few remaining metal truss bridges in the local area. It is an important feature of the Wire (or Telegraph) Road that extends through the park. The Wire Road was used as a means to transport military equipment and troops throughout the Civil War. It can also be tied to the Civil War military engagements at Dug Springs and Pea Ridge. The repair project, completed by a contractor, entailed the removal, disposal of, and replacement of all wood decking, runners, and stringers. For safety purposes no more than one-third of the bridge was dismantled at any one time. New oak bridge timbers, including approximately 100 runners, 50 decking planks, and 24 stringers, all of which employed full-dimension lumber, replaced the deteriorated elements of the structure. The decking was fastened using new hardware consisting of 30 Penney nails. Stringers were fastened with new hardware of the same size, dimensions, and strength as the original.

In May, the **McElhaney Smokehouse** was rehabilitated (PMIS project 102734). The building was painted and reroofed, the foundation was patched, and the doors and windows were rebuilt and replaced.

In July, the park completed emergency stabilization of the **McElhaney Barn** (PMIS project 87561). Work entailed completion of a project initiated in 2000 that was placed on hold after structural problems were found to be more extensive than previously thought. The park repaired sills, support beams, and exterior siding. Two rotted support beams were replaced, while four others were repaired. Stairs in the northwest corner of the barn that did not meet code were also replaced, along with several sills. Holes in the siding were repaired. A ramp was constructed to provide access to the front door. Emergency stabilization was conducted to correct the drainage problems that had contributed to the deterioration of the barn's structural wood beams and sills. A culvert was installed to redirect the overland flow of stormwater, while the ground was graded to help water drain away from the building foundation.

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2. Civil War Trust, "Civil War Preservation Trust Unveils Most Endangered Battlefields List" (February 24, 2005), Available at http://www.civilwar.org/aboutus/news/news-releases/2005-news/civil-war-preservation-trust-3.html (accessed April 12, 2017).

Another project completed in July 2005 was stabilization of the **Edwards Cabin** (PMIS project 106302). The cabin, which was built c. 1850 elsewhere, was moved to the park c. 1965 and placed near the location of the original Edwards Cabin that stood during the Civil War Battle of Wilson's Creek. The original Edwards Cabin, which is no longer extant, served as General Price's headquarters during the battle. In 2004, the cabin sat on a dolly, protected under plywood sheathing, while the park decided how to treat it. The 2004 CLR recommended that the park rehabilitate the cabin and interpret it as a placeholder for the cabin used as Price's Headquarters. The current cabin represents implementation of this recommendation. Work associated with this project entailed taking the cabin apart, digging and placing footings, installing roof trusses, framing, and shingles, and replacing several support logs. The cabin was then reassembled, the logs chinked and white washed, and windows and doors installed. Finally, the park added a porch, fireplace and chimney, plastered the interior, constructed a floor, and fabricated steps and a ramp for universal accessibility. The Wilson's Creek National Battlefield Foundation funded 75 percent of the project, estimated at $40,000.

In December, the park worked to remove hazards associated with pedestrian use of the **Wire Road trail** (PMIS project 111416). The work entailed replacing 120 square feet of asphalt and adding a culvert across a spring branch where a wash-out had occurred near the Shuyler Creek low-water crossing. Vegetation was removed along the margins of the Wire Road for approximately 1 mile. The park also repaired 4,200 linear feet of ruts associated with the route, some of which were as much as 1 foot wide and 8 inches deep.

2006

The park acquired three parcels totaling **157.03 acres** (Tracts 01-126, 01-127, and 01-128) in 2006**.** The acquisition included land between the southern boundary and Old Limey Road, as well as land to the west of Highway ZZ near the park's southwestern corner.

Also secured in 2006 was an **easement for a 70-acre parcel** to be administered by the U.S.D.A. as part of their Farm and Ranch Lands Protection Program.

In August, the park prepared its first Business Plan. The document was used to clearly communicate the park's financial status with principles and stakeholders.[3] The business plan articulated goals for several projects related to resource management, including restoration of the cultural landscape and maintenance of historic buildings and structures.

The park completed eight projects that addressed the historic landscape and other areas visited by the public.

The first entailed the removal of hazards to pedestrians associated with the **Ray Springhouse trail** (PMIS project 111418) that connects visitors with the Ray Springhouse and Cornfield, including the installation of two culverts to address stormwater management, and construction of an earthen path to replace a washed out boardwalk/bridge structure.

In July, the **Ray House** roof was replaced (PMIS project 102763). The project was designed to address structural deficiencies ranging from cupping and breaking of the shake shingles to problems with leaking. As part of the project, the park removed and replaced all wood shakes; removed the old nails from the sheathing; replaced five damaged sheathing boards and damaged flashing and grout; installed zinc roofing strips to prevent moss buildup; and installed a fall protection system to provide safe roof access for future roof maintenance. Eight new lightning rods were also mounted on the roof. During the project, a covered

3. National Park Service, "Wilson's Creek National Battlefield—FY 2005 Business Plan" (2006).

walkway was constructed to provide safe visitor access to the building during the project. The roof had last been replaced in 1984; the need for replacement had been identified during a site inspection by National Park Service (NPS) regional architect, Al O'Bright, in 2000.

In September, the landscape around the visitor center was updated (PMIS project 102822). The project included replacement of **four benches** near the visitor center entrance, and 1,300 linear feet of deteriorated **split rail fencing** nearby. The new benches were selected for low maintenance characteristics to reduce cyclic maintenance costs. The park was able to use Youth Conservation Corps (YCC) labor to implement the project.

In October, foundation cracks in the **McElhaney Stormcellar** were repaired (PMIS project 102976). As part of the project, 160 square feet of concrete wall was repaired and a wooden door replaced. The work helped to establish a dry interior so that the structure could function as an emergency tornado shelter.

Additional work conducted in October included elimination of hazards associated with the **Ray Cornfield trail (**PMIS project 111415). The project involved filling ruts for a distance of approximately 1 mile. Some of the ruts were up to 12 inches deep. After the ruts were filled, waterbars were added in four locations, and the trail was surfaced with chat. Vegetation found to be encroaching on the trail was removed or trimmed. Two deteriorated directional signs were also replaced.

In November, fire suppression systems were replaced in the **Ray House, McElhaney House, and visitor center** (PMIS projects 77435, 77427, 77441). The new fire alarm system was connected to the security system and the obsolete system removed.

Additional work conducted in November included repair of **tornado damaged facilities** (PMIS 108424) resulting from the May 2003 storm that had caused extensive damage to vegetation, fencing, cemetery features, trails, and bridge abutments. The project entailed removal of downed and standing hazardous trees from 4,400 feet of boundary fence and 6,450 feet of trail; establishment of a 6,500 foot fire break; replacement of 3,613 feet of boundary fence and 3,500 feet of split rail fence; repair of a damaged cemetery and stone fence; removal of logs threatening bridge abutments; and the reopening of equestrian and pedestrian trails. Park staff removed hazardous trees and made repairs to the Manley cemetery; removed hazardous trees from the entire Manley Uplands trail (2.2 miles), including 3,000 feet of the trail that had been completely blocked due to downed trees; moved trees from 3,500 feet of boundary fence; moved logs threatening the bridge; and rebuilt approximately 3,600 feet of split rail fence. The project also funded construction of a 4,000-foot-long, 50-foot-wide fire line. Over 225 loads of hazardous fuels were taken out of the park by truck. Standing dead trees were downed along a 50-foot strip of land inside of the fire line. The work took a contractor approximately three months to complete.

In December, twenty-three defective **traffic signs** were replaced (PMIS project 113091), including four "Reduced Speed Ahead," three "Speed Limit," two directional, two boundary, five "Stop," six "One-Way," and one parking sign.

2007

The principal accomplishment of 2007 was completion of a **General Management Plan (GMP) Amendment and Environmental Assessment (EA) / Assessment of Effect for the Civil War Museum and Additional Lands** resulting from the park boundary expansion act of 2004. As noted in the document,

> The 2003 *General Management Plan / Environmental Impact Statement* for Wilson's Creek identified important resources associated with the Battle of Wilsons Creek that are not managed or protected by the National Park Service and recommended adjusting the national battlefields boundaries in number of areas to protect these critical resources and enhance opportunities for public enjoyment. A portion of the recommended lands were added to the national battlefield in 2004.
>
> This *General Management Plan Amendment / Environmental Assessment / Assessment of Effect* proposes management alternatives for two of the areas identified in the boundary assessment—the Civil War Museum and its surrounding 20-acre site and a 154-acre area that adjoins the national battlefield's southwestern boundary. Two action alternatives are compared with the no-action alternative (Alternative A) that describes the continuation of existing conditions.
>
> - Alternative B - Relocate the Civil War Museum Collections into an Addition to the Wilsons Creek National Battlefield Visitor Center (Preferred Alternative). Under this alternative, the existing Civil War Museum would be closed and the museum collections moved into an addition to the visitor center built for curatorial storage and exhibit space Most NPS administrative functions would remain in the visitor center.
>
> - Alternative C - Move the Civil War Museum Collections into Existing Administrative Space in the Visitor Center. Under this alternative, existing space in the visitor center would be rehabilitated for curatorial and exhibit space for the museum collections. Most NPS administrative functions would then move into buildings previously used as residence and museum on the 20-acre site which would be rehabilitated for this purpose.
>
> - Under both action alternatives, the 154 acres adjacent to the southwestern boundary would be managed consistent with the management zoning on the adjacent lands. Limited visitor parking and pedestrian trails could be developed, including the potential for link to the national battlefield. Sensitive cultural and natural resources in this area would receive high level of protection. Any construction or operational activities would be done in sustainable manner to minimize adverse impacts on natural and cultural resources.[4]

The entire park was declared a Federal disaster area following damage caused by an **ice storm** that began on January 12, 2007. During the evening of January 12 ice formed on trees and power lines. The park and approximately 75 percent of the employees duty-stationed at Wilson's Creek and Missouri State University lost power to their residences. By January 13, power was out to most park buildings, while downed trees and limbs blocked roads, buildings, and trails. Ice and rain continued to fall on January 13 and 14, with a total accumulations exceeding 1.5 inches. The park was closed January 13 due to the presence of hazardous trees and limbs. Three buildings in the park had no power for two weeks; critical systems were operated with generators. Park staff, supported by Fire Pro and maintenance staff from

4. National Park Service, *Wilson's Creek National Battlefield General Management Plan Amendment/Environmental Assessment/Assessment of Effect for the Civil War Museum and Addition Lands* (July 2007), i.

Buffalo National Riverways and Ozark Scenic Riverways, worked to establish emergency routes to critical areas of the park and to clear hazardous material from the visitor center and maintenance area. The visitor center reopened on January 19.

Work to remove **hazardous trees and limbs** from 6 miles of roads, three trails, and emergency routes to an additional 10 miles of trail continued for months. The 4.9-mile tour road, associated tour stops, and the three primary trails (Ray House, Ray Springhouse, and Bloody Hill) reopened on February 5. Archeological compliance was required for a 1-acre site that was disturbed at the Ray House due to uprooted trees exposing the soil. Funding for some of the work was secured through PMIS project 136056.

Overall, approximately 1,800 hazardous trees were cut and cleared, while hazardous limbs were removed from approximately 750 trees along 9 miles of trail and 6 miles of roads, as well as within 28 acres associated with the visitor center, Civil War Museum, Sweeny House, Ray House, and tour road stop 5. Trees and limbs were removed from boundary fences, and the fences themselves subsequently repaired as needed. Approximately thirty stumps were ground, and approximately 30 cubic yards (5 dump truck loads) of brush were hauled to an off-site disposal site. Approximately 30,000 cubic yards of brush was burned, while 180 cubic yards of brush was chipped, on site. Trees were later replanted in some locations.

Four construction-related projects were completed during 2007 that addressed the historic landscape and other areas visited by the public.

In August, cracks associated with the **tour road** were repaired (PMIS project 25523). Specific tasks involved repair of one bridge approach and departure, scrub seal along 6-miles of road and within 10 parking areas, and restriping of all roads and parking areas. The tour road and parking areas were closed for approximately two weeks while the work was completed.

In October, the **Ray House porch and door** were repaired (PMIS project 114104). Rotted wood associated with six original solid walnut porch support posts was replaced. The project entailed demolition of 25 linear feet of damaged porch railings and spindles, installation of in-kind materials, and sanding and painting of the new wood. Door repairs was directed to address problems with the door frame, jam, threshold, and facing. The corner trim boards in five areas of the house were also replaced, sanded, and painted.

Also in October, four **abandoned wells** were documented and filled for safety (PMIS project 118526) in accordance with Missouri State Law 10 CSR 23-2.110. The law stipulates that abandoned wells be plugged for safety and to prevent contamination of water resources. To address the need, the park first located the historic wells. The wells were hand-dug and stone-lined, measured 2.5 feet in diameter, and varied in depth from 10 feet to 25 feet. The park photographically documented the wells and engaged NPS archeologists to complete Section 106 compliance. The wells were then filled with sand and a clay cap over the top 2 to 4 feet.

In November, the concrete associated with the **visitor center parking area** was repacked. The work entailed refilling all of the joints on the parking area and islands where the asphalt meets the concrete curbing. Filling the joints and cracks helps to prevent water infiltration, which can result in damage due to freeze/thaw conditions.

2008

In 2008, the park acquired **six parcels totaling 42.39 acres** (Tracts—01-112; 01-138; 01-139; 01-140; 01-141; and 01-142) located along the park's southwestern boundary. **Easements** were also secured on four other parcels located south of the park and Old Limey Road, as well as east of the park to the north and south of the Greene-Christian County line.

Four construction-related projects were completed in 2008 that addressed the historic landscape and other areas visited by the public.

In March, the park **entrance road shoulder** was rehabilitated (PMIS project 113995). The project entailed demolition of 720 square feet of the damaged shoulder, and its replacement with bituminous concrete. Bermuda grass (*Cynodon dactylon*) growing through the shoulder pavement was found to be the cause of the deterioration. The grass was treated with herbicide as part of an effort to eradicate it from the area and to prevent similar problems from occurring in the future. The project was critical to prevent the road base from eroding in a location where asphalt is required because portions of the slope are too steep to maintain grass, and the shoulder is often used as a pull off where visitors photograph the park entrance sign.

In September, 2-1/2 miles **park trails and overlooks** were rehabilitated (PMIS project 102804) to address resource and safety deficiencies. The trails that were the focus of the project included the Southwest trail, Jeff's trail, Pulaski trail, Guibor trail, and the East and West Battlefield Overlook trails. Many of the trails had been previously impacted by the heavy equipment used to remove tornado-damaged trees and debris, but were also deteriorated due to years of visitor use. The efforts conducted on behalf of the project included repair of trail alignments, tread surfaces, signage, bridges, drainage, and retaining structures. As part of the effort, thirteen railroad ties and landscape timbers were removed where previously used as waterbars. The timbers had become tripping hazards, while those treated with creosote were also of environmental concern. Bridges and overlook stairs were also repaired through the replacement of decking boards and safety railings, and then sanded, and painted. Three bridges were rebuilt with recycled plastic. Trail drainage structures were also repaired. Positive drainage was effected in some locations using fill. Elsewhere, holes were filled. After the repairs were completed, crushed stone was spread on the trails, and encroaching vegetation was removed. Related site furnishing projects included the repair, sanding, and painting of five wayside exhibits, replacement of one trail sign, and repair, sanding, and painting of benches.

In September, additional **hazardous trees** were removed (PMIS project 118462). The effort entailed cutting and removing 5 acres of trees and brush up to 6 inches in diameter, and brush hogging 2.5 acres of woody thickets where they impeded motor vehicle sightlines near twenty-four entrance and exit points. An additional 100 hazardous trees were removed along the 4.9-mile tour road. This effort followed previous work conducted in response to the January 2007 ice storm. After the work was completed, only the nature trail remained closed.

Also completed in September was a project to replace **picnic area benches and tables** (PMIS 118500). As part of the effort, thirty-three wooden picnic tables and seven benches were added to the picnic area, and twenty-six existing tables and seven benches were removed. The new picnic area furnishings were fashioned from recycled plastic and designed to meet accessibility standards. The picnic tables being replaced were more than twelve years old, and consisted of metal frames with CCA-treated wooden planks. The wood components of the existing picnic tables and benches were often split, warped, and rotting. Several had already been removed due to concerns for visitor safety. The CCA-treated wood was no longer an acceptable material for playground areas or for use as an eating surface.

2009

One of the most important accomplishments of 2009 was completion of the park's **Long-Range Interpretive Plan** in June. The plan outlined recommendations for future interpretive services, facilities, and media. It identified interpretive themes, described visitor experience goals, and recommended a wide variety of personal and non-personal interpretive services and outreach activities intended to communicate the park's purpose, significance, and themes, while recommending implementable actions anticipated to occur over a seven- to ten-year period. Plan highlights include:

Visitor Center

- Plan, design and fabricate new exhibits that combine the artifacts from the Civil War Museum with the current visitor center exhibits. Create one visitor flow pattern, one cohesive message and a unified visitor experience that provides a seamless museum exhibit experience. The exhibit plan must address current themes, remove ineffective messages, and upgrade the exhibits to meet NPS exhibit standards.

Education Program

- Hire a Park Ranger for Interpretation and Education Coordination.

- Limit the number of formal programs offered and provide self-service options for those schools that are not able to participate allowing the staff to have better control of the program and to provide quality programs.

Bloody Hill

- Improve the visitor experience at Bloody Hill by emphasizing its importance during the Battle of Wilson's Creek. New wayside exhibit panels, artillery placement, a shade structure, realignment of the trail network and new artwork will create more opportunities for visitors to engage in the resource.

Tour Road

- Establish a new first stop where the Short Farm was located to emphasize the lives of the residence more effectively. The first combat action between the Federals and the Southerners occurred near their house. Change Gibson's Mill tour stop to Plummer's Crossing. This is where the Union entered the Ray Cornfield and provides more context for the tactics of the battle.

Terrell Creek Acquisition

- Create a Double Spring day-use picnic area where the Wire Road crosses the creek so that visitors can view a place where both armies are known to have camped and rested. A modest picnic area and wayside exhibits could be placed here.

Special Events

- Plan for and participate in the 2011–2015 Civil War Sesquicentennial.

- Plan for and participate in 2016 NPS Centennial.[5]

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5. National Park Service, *Wilson's Creek National Battlefield Long-Range Interpretive Plan* (Republic, Missouri: Midwest Regional Office, Harpers Ferry Center Interpretive Planning, June 2009), n.p.

Also completed in 2009 was a **Land Protection Plan** for the park, which provides direction regarding the protection of cultural resources related to the park's mission.[6]

In addition, the park conducted six construction projects that addressed the historic landscape and other areas visited by the public.

In March, the park **entrance gates** were replaced (PMIS project 119600). Work entailed demolition of deteriorated existing gates, posts, and signs. New gates were constructed with bolts and plates made of galvanized steel and wood members fashioned from treated Southern yellow pine. The gates were supported by concrete bases inset with 8X8 wood posts. The concrete around the posts was rounded so water would not collect around them. The posts extended for 4 feet above the grade of the concrete. The gate arms were made of 6X6 Southern yellow pine. All wood was held together by steel pins, steel bolts, steel rods, formed steel plates, screws, and washers. New NPS identity and hours signs were also posted on the front of the entrance gate, while the vehicle counter was demolished. A solar panel system was installed to light the entrance and visitor center signs.

In April, the **tour road and parking area** were restriped (PMIS project 142134).

In September, four **roadside ditches** were rehabilitated (PMIS project 113274). The project was intended to address previous problems where water had begun flowing over park roads due to sedimentation, vegetative growth, and failure of stormwater management structures. Ditch rehabilitation was conducted along Farm Road 194, McElhaney Road, and to the north and east of the Ray House parking area. As part of the project, woody vegetation and sediment and rock removed, and culverts installed where problems associated with standing water were identified. The ditches were subsequently sodded and seeded.

Also in September, the **Ray House exterior was painted** (PMIS project 128430) to address envelop deficiencies that were contributing to deterioration of historic building fabric. The project entailed scraping away loose paint, sanding, priming with latex primer, and painting with latex paint. Approximately 150 square feet of deteriorated wooden siding was removed, with new siding fabricated and installed. The new siding was stamped with a contemporary date on the backside to clarify the change for future investigators. The siding was sealed with 25-year latex caulk. The area around the exterior chimney was repointed with new mortar. The threshold of the south-facing door was replaced with a custom-fabricated oak threshold. Two windows were also reglazed. Several loose chimney cap stones were remortared on the rear chimney, while approximately 40 square feet of the foundation was repointed. A new handicap ramp was built out of recycled plastic lumber and installed at rear entrance.

Another project completed in September was the **repointing of the Ray Springhouse** (PMIS projects 133044 and 102961).The project entailed repointing mortar joints on 310 square feet of the structure, including the roof and principal facade. All loose mortar was scraped away and replaced. The Portland cement mortar mixture was consistent with the formula developed as part of a rehabilitation project conducted in 1986 (ASTM C150, Type II, white non-staining; lime: ASTM C207, Type S; and sand: C144, natural or manufactured). The color was matched as nearly as possible to the existing. Missing stones were replaced with stone from a local quarry and matched to the original.

In November, the **Manley trail** was rehabilitated (PMIS project 106211). The project was designed to address health and safety deficiencies on the 2.2-mile trail. It entailed backfilling holes to eliminate tripping hazards, removal of overhead limbs, and repair and replacement of deteriorated and displaced

6. National Park Service, *Land Protection Plan Wilson's Creek National Battlefield* (Republic, Missouri: Wilson's Creek National Battlefield, July 2009).

waterbars. The project resulted from impacts to the trail caused by the heavy equipment used to remove tornado damaged trees and debris. The trail surface was found to be rutted throughout. Because equestrians often avoid ruts by going around them, the trail had become wider, increasing the area requiring repair. After the ruts were filled, twelve new waterbars were installed, while another thirty waterbars were repaired. Aggregate was then spread on the trail surface, and encroaching vegetation removed.

2010

Four construction projects were completed that addressed the historic landscape and other areas visited by the public in 2010.

In January, the **picnic area retaining walls** were replaced, along with 140 linear feet of deteriorated wood safety railing (PMIS project 113986). The retaining wall, a deteriorated twenty-year-old, 6-foot-high creosote-treated railroad tie structure used to establish a level base for a group picnic site and three additional picnic sites, was removed. A replacement wall was built from precast concrete interlocking block. A new galvanized railing was added to replace a deteriorated wooden safety railing.

In March, the **bike racks and parking blocks** associated with the tour road were replaced, while the **bollards** at the tour stops were stained (PMIS project 113400). The project was designed to address concerns regarding rotting bike racks and warped parking blocks. Five bike racks were replaced with recycled plastic racks, while 127 parking blocks were replaced with recycled rubber blocks. In addition, 98 bollards were restained.

In April, thirty trees were planted west of the Ray House to implement the CLR recommendation to add an **orchard** as an interpretive aid for visitors. The orchard was designed to recall a historic feature of property during the Civil War era. Three apple cultivars were planted as part of the exhibit—'Gold Rush,' 'Enterprise,' and 'Jona Free.'

In November, the **McElhaney House and Wellhouse** were rehabilitated (PMIS project 102961). Used for law enforcement, resource management, and interpretive personnel offices, the McElhaney House and associated well house are the only restroom and potable water supply features available to employees and volunteers inside the park. The McElhaney House was in needs of several repairs, including shoring up of 40 linear feet of foundation; replacement of twenty inadequate foundation piers in order to support the sagging first floor; fastening of building sills to the foundation; replacement of a deteriorated rear stoop and stairs; removal and replacement of deteriorated shingles, felt, guttering, and downspouts; replacement of the existing propane furnace with a high efficiency furnace; replacement of all HVAC ducts with rigid insulated ducts; painting of the exterior of the house, front porch, and stairs; replacement of 40 square feet of deteriorated 3-inch lap siding; and various interior rehabilitation projects. Four exterior doors were also repaired, while three new doors were installed. The septic tank and leach field were also replaced.

The McElhaney Wellhouse rehabilitation resulted from deficiencies documented by Robert J. Reiss in a Public Health Assessment dated May 13, 2004. As the only water supply for the McElhaney House kitchen and restroom, the building is required to be kept in good condition, and comply with sanitation standards. The building was found to have rotted siding and to exhibit evidence of rodent use and damage. The insulation was found to be torn up or missing, and the roof deteriorated and leaky. The chlorinator was found to be leaking solution onto the floor, while the pressure tank was rusted and in danger of failing. Wiring and controls were found to be in need of replacement. Heat was provided with a plug-in type electric heater that was considered insufficient to protect the pressure tank from freezing,

which would lead to a lack of flow of water within the McElhaney House. Work entailed removal of encroaching tree limbs, followed by demolition of the 63-square-foot building. Using the existing concrete slab, a new foundation was dug, forms were constructed, and a concrete foundation 8 inches thick by 24 inches deep poured for the 32.5-foot perimeter. The new building was constructed of concrete block walls to a height of 8 feet. Rafters and a roofing system were then added, along with 36-by-84-inch double insulated steel doors, a new chlorinator, pressure tank, controls, wiring, install a permanent heater, and a 4-by-6-foot tall steel cabinet for supplies.

In December, **hazard tree and limb removal** was conducted along trails and in visitor use areas (PMIS project 152050). The project entailed removal and disposal of approximately 100 hazardous trees up to 12 inches in diameter, and numerous hazardous limbs. The work was conducted along 2,200 feet of the nature trail, 6 miles of road, and 7.6 acres of developed zone around thirty-five buildings, and twenty-two picnic sites. These efforts were part of the ongoing work to address damage caused by the 2007 ice storm.

2011

In March, the American Battlefield Protection Program (ABPP) prepared an **Update to the Civil War Sites Advisory Commission Report** that addressed the significance and protection status of battlefields located within the state of Missouri, including Wilson's Creek. Park Historian Connie Langum was the battlefield surveyor for the project.[7] The update was prepared as a result of the Civil War Battlefield Protection Act of 2002, which directed the Secretary of the Interior, through the NPS, to update the original Civil War Sites Advisory Commission report published in 1993. Congress obligated funding for the effort in 2005 and 2007.

The report notes that "The National Park Service owns about 1,970 acres at Wilson's Creek, but other portions of the battlefield remain unprotected outside of the park's boundaries."[8] The report also indicates that

> Private landowners have also begun to protect battlefield land. At Wilson's Creek, a private family has voluntarily placed conservation easements on 172 acres of historic land outside of the National Battlefield's boundary. A local land trust holds the easement in perpetuity and monitors the condition of the properties. The easements, executed in 2003 and 2006, are the first ever placed on Civil War battlefield land in Missouri. Many other states provide tax credits for private property owners who donate conservation easements that will permanently protect historic land. Further exploration of this powerful preservation tool is appropriate in Missouri.[9]

The 1993 report focused on prioritizing the protection needs associated with the nation's Civil War battlefields, while documenting consistently, for the first time, the boundaries, core and study areas, and historic features associated with each historic battlefield. Wilson's Creek was identified in the original 1993 study as a priority III battlefield (requiring additional protection).

The 2011 report provides updated ratings for Missouri battlefields, as well as revised boundaries and study areas and core areas, and a new boundary indicating the area potentially eligible for listing in the National Register of Historic Places (NRHP). The revised boundaries were based on the new standardized survey methodologies devised by the ABPP, which incorporate U.S. Army military terrain

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7. National Park Service, *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields* (Washington, D.C.: American Battlefield Protection Program, March 2011), 3.
8. National Park Service, *Update to the Civil War Sites Advisory Commission Report*, 5.
9. *Ibid*., 6.

analysis principles known as KOCOA.[10] A manual prepared by ABPP in 2007 explains the survey methods used in the update. At the time the 1993 report was prepared, survey methodologies were in the process of being developed, and preceded completion of the National Register Bulletin: *Guidelines for Identifying, Evaluating, and Registering Historic Battlefields*, prepared by Patrick Andrus of the NPS.

The 2011 study suggests that Wilson's Creek, one of seven Missouri battlefields already listed in the NRHP, should be considered for a boundary expansion to recognize the 3,300 acres of the delineated battlefield that fall outside of the National Park unit and current documentation.[11] The study suggests that a total of 2,968.48 unprotected, intact acres remain within the Wilson's Creek battlefield study area.[12]The report indicates that the Wilson's Creek study area extends over 5,109.74 acres, while the core area is 1,021.26 acres in size. The potential National Register eligible property is indicated as coincidental with the battlefield study area. Currently, only 1,749.91 acres of the battlefield are listed in the NRHP.[13]

The report also notes that

> At Wilson's Creek, residential development has begun to alter the battlefield's nationally significant landscape. Within the last ten years, dense subdivisions have been built within a mile of the northwest corner of the battlefield, and large lot estate homes have been built on the eastern portion of the battlefield just beyond the boundary of Wilson's Creek National Battlefield. Unless steps are taken by local governments to direct development away from the battlefield, or public-private partnerships can be forged to protect historic land outside of the national battlefield, it is entirely plausible that the park will be surrounded by development within two or three decades.[14]

The study also recognized the value of the Wilson's Creek Battlefield Foundation, active since 1950.[15] It indicated ongoing protection concerns related to the land west of the park boundary where a residential development was proposed. Construction of a new public high school to the north of the park and an associated increase in traffic were also considered problematic. Highway ZZ, also known as Wilson's Creek Boulevard, was widened to accommodate the larger volume of traffic generated as a result of the new high school.

An electronic device application relating to the Civil War **Sesquicentennial** was developed to recognize the impending anniversary. The effort was modeled in part on the Battle App developed by the Civil War Trust to guide visitors through battlefield tours using GPS. The Sesquicentennial App developed for Missouri was developed by local groups and agencies, including Wilson's Creek National Battlefield and the Springfield-Greene County Library District. The Springfield-Greene County Library District had recently completed a "Community & Conflict" digitization project in 2009 that explored the Civil War's impact on soldiers and civilians in Missouri, Arkansas, Kansas, and Oklahoma. It was made possible through a Library Services and Technology Act Digital Imaging Grant funded by the Institute of Museum and Library Services coordinated by the Missouri State Library. The project was designed to expand public understanding of the Civil War in the Trans-Mississippi Theater by providing access to historical collections and promoting scholarship. One outcome was the interactive virtual museum for the Trans-Mississippi Theater funded by a Challenge Cost Share Grant from the NPS and a donation from the

10. KOCOA is an acronym that stands for Key Terrain, Observation and Fields of Fire, Cover and Concealment, Obstacles, and Avenues of Approach.
11. National Park Service, *Update to the Civil War Sites Advisory Commission Report*, 15.
12. *Ibid*., 24-25.
13. *Ibid*., 21.
14. *Ibid*., 19-20.
15. *Ibid*., 28.

Wilson's Creek National Battlefield Foundation. The virtual museum and digital archive was based on the digitizing of Wilson's Creek National Battlefield's collections. The digital gallery addressed such topics as guerilla warfare, medicine, naval warfare, the role of women, and the experiences of Native American, African American, and German American soldiers.

The park celebrated the **Sesquicentennial of the Battle of Wilson's Creek** in August.

Park Historian Connie Langum conducted a **personal interview with Dorothy McElhaney** and her daughter Glenna. The three toured the Ray House together. Mrs. McElhaney, who was born in 1910, provided personal memories of the Ray House and conveyed stories told to her by her parents about the Battle of Wilson's Creek.

In July, a **Natural Resource Condition Assessment** report was completed for the park.[16]

Three construction related projects were completed during 2011 that addressed the historic landscape and other areas visited by the public.

In September, **bracing was installed in the McElhaney Barn** to prevent the structure from collapsing (PMIS project 142061).The project entailed installation of eight lateral braces to stop exterior supports from moving outward. The braces featured 3/4 inch threaded rod with turn buckle connections on exterior columns. Four were placed in the first floor and four in the second floor. At the same time, three deteriorated wooden window frames and glass were replaced with new material of the same type and dimension to prevent weather infiltration, and the building exterior was repainted.

In November, the park completed **emergency repairs associated with the tour road** (PMIS project 119329). The project was developed in response to field review and inspection conducted in May 2005 by Federal Highways geotechnical personnel. The inspection identified concerns regarding the stability of the rock outcropping overhanging a section of the tour road. The outcropping was the result of construction of a railroad line through the area in the 1890s. Portions of the rock outcropping were found to be eroding and ready to fall or shift toward the road. Sections recommended for stabilization through removal measured approximately 14 feet high, 10 feet wide, and 400 feet long. In addition to removal of 650 cubic yards of rock and soil, the project entailed clearing several acres of small brush along the top of the rock cut. A 4-foot-wide ditch was excavated to address drainage concerns. After these efforts were completed, the area was backfilled, graded, and sodded between the tour road and the rock outcropping.

In a related effort, the asphalt tour road was found to have settled 6 to 8 inches on both ends of a **box culvert** located near the rock outcropping. To address the problem, the park removed a 20-foot section of asphalt on the approaches to the box culvert, added 4 inches of base rock, replaced the asphalt, removed wooden forms causing spalling on the box culvert, patched cracks in the concrete and box culvert, and repaired the road. The road was closed while the repairs were completed.

16. Gust M. Annis, Michael D. DeBacker, David D. Diamond, Lee F. Elliott, Aaron J. Garringer, Phillip A. Hanberry, Kevin M. James, Ronnie D. Lee, Michael E. Morey, Dyanna L. Pursell, and Craig C. Young, *Wilson's Creek National Battlefield Natural Resource Condition Assessment.* Natural Resource Report NPS/HTLN/NRR–2011/427 (Fort Collins, Colorado: National Park Service, Natural Resource Stewardship and Science, July 2011).

2012

Three construction-related projects were completed within the park in 2012 that addressed the historic landscape and other areas visited by the public.

In May, wood elements associated with the **Wire Road bridge** were replaced (PMIS project 102769). The stringers, decking, and steel substructure on the bridge were identified as requiring replacement during previous Federal Highways bridge inspections. This project is a five-year cyclic need. The project entailed removal of the decking and stringers, priming and painting the steel substructure, and replacement of forty wooden stringers, ninety-six deck timbers, and thirty-three deck runners.

Also completed in May were projects involving the reroofing and replacement of HVAC systems at the **General Sweeny Museum** (PMIS project 133614). The building, which measures 8,000 square feet, was moved to its current location in 1964. It was acquired in 1988 by Tom and Karen Sweeney, who established the Civil War Museum in the building in 1991.

In August, new **wayside exhibits were installed on Bloody Hill** (PMIS project 65086). Bloody Hill, as its name implies, was a key area of the combat associated with the Battle of Wilson's Creek, where approximately 85 percent of the 2,500 battle casualties occurred. Visitors access the site via a trail that extends between tour road stop 7 and the Lyon marker. Prior to implementation of this project, visitors used a printed trail guide tied to numbered posts to learn about the battle. The 2009 Long-Range Interpretive Plan suggested the addition of new waysides at Bloody Hill. Based on the plan, fourteen new waysides were installed as follows:

- Trailhead Orientation
- Bloody Hill Overview
- Solkalski's Section
- Totten's Battery
- The Confederate Line
- Entering the Glade
- General Lyon's Death
- Commemoration on the Battlefield
- Sturgis Takes Command
- Price's Headquarters
- Third Arkansas
- No Man's Land
- The Sinkhole
- The Battle's Outcome

2013

In April, a study documenting **Vegetation Classification and Mapping of Wilson's Creek National Battlefield** was completed for the park.[17]

The *Heartland Invasive Plant Management Plan and Environmental Assessment* was also completed. The document specifies the protocols to be used by the park to control invasive plant species.[18]

Three construction projects were completed in 2013 that addressed the historic landscape and other areas visited by the public.

In May, several **bridges** were repaired (PMIS project 152036). This project entailed removal and disposal of soil and debris at bridges 2 and 4; provision of additional rip rap; replacement of broken and deformed safety cables, replacement of a stringer and rivets, and adjustment of a stringer bracket, on the Wire Road bridge; and repair of erosion at the ends of the north wing walls on bridge 4. Deficiencies had been documented in a Federal Highways bridge inspection conducted in 2006. These were compounded by flooding in March 2008 that resulted in a Federal Disaster Area Declaration (FEMA 1749-DR) for Greene and Christian Counties, including the battlefield. The tour road bridge was repaired through removal of debris; repair of erosion and removal of asphalt on the four corners; and relocation of a sign that had been mounted on the bridge to a pole in the ground. Vegetation was cut back approximately 10 feet from the bridge.

In August, the **windows in the McElhaney Barn** were replaced (PMIS project 152122).

In December, **historic structure repairs** were completed at the Ray and McElhaney Houses (PMIS project 161364). Work entailed deep repointing of 75 square feet of the Ray House foundation using a soft mortar mixture; removal, disposal, and replacement of the Ray House roof, composed of approximately 1,900 square feet of rough cut, 18-inch, fire treated, cedar shakes; installation of zinc strips every fifth row to prevent algae growth; removal of lichens from the limestone chimney of the Ray House; improvement of the drainage around the Ray Springhouse by providing an additional 2 yards of fill, grading, and seeding; power washing and painting of the exterior of McElhaney Barn and associated replacement of 300 linear feet of furring strips and paint.

2014

In February, the park completed an **Environmental Assessment for Resource Preservation and Visitor Interpretation of Bloody Hill.**[19] The purpose of the EA was to identify solutions, define outcomes, and find ways to protect sensitive resources while also enhancing interpretation for visitors to Bloody Hill. Fifty acres of the 200-acre landform were designated a resource preservation zone in order to protect sensitive natural resources. Another 100 acres were designated a battlefield landscape enhancement zone in which the general historic character of the battlefield is to be retained and enhanced. The final 50 acres

17. David D. Diamond, Lee F. Elliott , Michael D. DeBacker, Kevin M. James, Dyanna L. Pursell, and Alicia Struckhoff, *Vegetation Classification and Mapping of Wilson's Creek National Battlefield Project Report.* USGS-NPS Vegetation Mapping Program (Fort Collins, Colorado: National Park Service, Natural Resource Stewardship and Science, April 2013).
18. Sherry A. Middlemis-Brown and Craig C. Young, *Heartland Invasive Plant Management Plan and Environmental Assessment.* Natural Resource Data Series, NPS/MWR/HTLN/NRDS–2013/XXX (Philadelphia, Pennsylvania: National Park Service, 2012).
19. National Park Service, *Environmental Assessment for Resource Preservation and Visitor Interpretation of Bloody Hill at Wilson's Creek National Battlefield; Greene County, Missouri* (Republic, Missouri: Wilson's Creek National Battlefield, February 2014).

were designated an interpretive focus zone designed to accommodate interpretive programs, such as demonstrations, guided tours, and special events. The goals for interpretation enhancement included the protection of threatened plant species through installation of a boardwalk, the placement of new wayside exhibits and cannon, and improvements to site amenities through the construction of a shade shelter. Consideration was also paid to rendering the trail universally accessible, or alternately establishing a new accessible trail.

In April, the park completed a **Vegetation Management Implementation Plan**.[20] Twelve vegetation management treatments were indicated for various areas of the park. The treatments were based on the recommendations provided in the 2004 CLR.

Several construction projects were completed in 2014 that addressed the historic landscape and other areas visited by the public.

In March, **traffic signs** were replaced in the vicinity of the visitor center and along the tour road, while repairs made to the visitor center (PMIS project 161393). Building repairs entailed routing and sealing of 200 linear feet of cracks in the exterior of a concrete building wall and repair of spalling.

In addition to traffic signs, **new park entrance signage** was installed. The signs included two 14- by 64-inch park entrance signs and two 214-by-64-inch park identity signs. The new signs were fabricated from routed and painted western red cedar.

In July, projects involving the **cleaning of grave markers**, **installation of gutters on the Ray House**, and **repointing of the Ray Springhouse** were completed (PMIS project 191946).

At the Ray Springhouse, loose mortar was removed using hand tools. The stone work of the front and top of the building was then repointed using a historic lime mortar mix.

Grave markers at the Edgar cemetery were cleaned; lichens were removed from masonry features using D2 Biological Solution. Natural or man-made fiber brushes were used in the process after spot tests were conducted to ensure the procedures did not result in damage to the stones.

At the Ray House, approximately 65 linear feet of guttering and two downspouts were installed in the rear of the building to help alleviate persistent problems with water damage. This was based on Midwest Region Historical Architect Al O'Bright's recommendation that gutters be added to this portion of the house to address water infiltration problems that had plagued park managers since the building was rehabilitated in 1983. The gutters were 5-inch half-round galvanized steel, and the downspouts 3-inch.

In September, **four bridges were repainted** (PMIS project 152058), including the Skeggs bridge railings, and three Gibson Mill Trail bridges.

In October, **siding, trim, and doors** were repaired in association with several park buildings (PMIS project 152129), including the visitor center.

20. National Park Service, *Wilson's Creek National Battlefield Vegetation Management Implementation Plan* (Republic, Missouri: Wilson's Creek National Battlefield, April 2014).

2015

In 2015, the Civil War Trust acquired a **20-acre parcel** (Tract 01-135)with the intention of transferring it to the federal government for inclusion within the park.

Three construction-related projects were completed within the park during 2015 that addressed the historic landscape and other areas visited by the public.

In July, the **sidewalks** were chip sealed (PMIS project 161388). Cracks in the asphalt were filled, and all sidewalks associated with the eight parking areas along the tour road were sealed with brown rock chips to match the existing pavement surface. Approximately seventy-five parking blocks were removed and replaced as part of the project.

In October, the **split rail fences** at the visitor center were replaced (PMIS project 161558). These fences define the entrance to the park and are the first thing the visitor sees when entering the park. The project entailed replacing a total of 2,400 oak split rails, comprising 1,078 linear feet of fence around the visitor center precinct. This fencing had last been replaced in 2006. The rails were stacked to a height of 3.5 feet, using 4 rails per segment. Nails were used sparingly to facilitate repairs after wind events. The removed rails were reutilized as firewood.

In July, **cracks in the road** were repaired (PMIS project 171583). The cracks were repaired along the 6 miles of the park's asphalt road and the asphalt parking areas. Repairs entailed application of hot rubberized asphalt to the cracks; broom sealing; and restriping with 2 coats of latex traffic paint. The project was intended to maintain the value of this asset until the Federal Highway Administration incorporates the road into their pavement preservation program, planned for 2017.

2016

The park completed its first **Park Sign Inventory and Assessment**, a document that identified all signs in the park and their locations.

Also completed was a **trail assessment** that provided key information for the park to use in improving trails.[21]

Six construction-related projects were completed within the park during 2016 that addressed the historic landscape and other areas visited by the public.

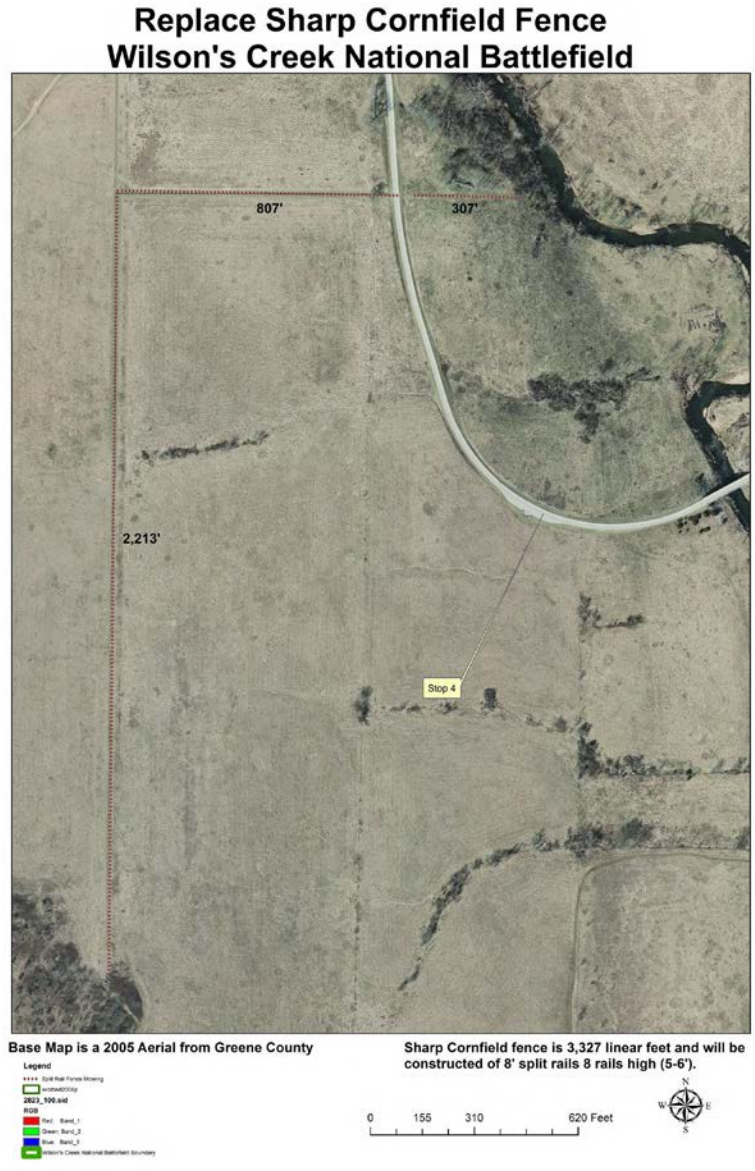
The recycled plastic **bike rack** was replaced with a powder-coated steel bike rack unit.

In May, **waterbars and ruts** were repaired on the Southwest trail, while failing **split rail fencing was** replaced around the Sharp Cornfield (PMIS project 161557). Along the Southwest trail, waterbars are required on two steep sections of trail to ensure that water is directed away from the trail surface to prevent erosion. Existing waterbars had been compromised by regular use of the trail by shoed horses, coupled with several instances of heavy rainfall. In total, twenty-two waterbars were replaced or reworked and hardened to withstand horse traffic. The depth and angle of each waterbar was adjusted to

21. Logan Park, *Assessment of Equestrian Recreation at Wilson's Creek National Battlefield: Final Report.* Accomplished by a cooperative agreement between the National Park Service and Forest Recreation and Park Management, Department of Forestry, Southern Illinois University (Carbondale, IL: Southern Illinois University, Department of Forestry, 2016).

direct drainage off the trail. Each waterbar measures between 20 and 25 feet in length, is 24 inches wide, and 8 to 10 inches deep.

In addition, **ruts** were filled along approximately 5,000 linear feet of trail. The fill was a mixture of clay and crushed rock. Small waterbars were also constructed to divert water off trail.



Map 2. Map illustrating the fencing replaced at the Sharp Cornfield. (Source: Wilson's Creek National Battlefield)

At the **Sharp Cornfield**, approximately 3,306 linear feet of oak split rail fencing was demolished and replaced (Map 2). The new rails were installed using historic fence construction methods that incorporated the limited use of nails so repairs can be made more easily after storm events. The fence was indicated as a treatment recommendation in the 2004 CLR. It provides a critical reference for visitors to understand historic field patterns present during the Battle of Wilson's Creek. Split rails were last installed in 2005. Fence rails are considered to have a maximum life span of ten years.

In June, **new exhibits were added at the visitor center** (PMIS project 174798). The exhibits replaced older museum exhibit cases, enhanced security, and improved accessibility within the existing main gallery of the visitor center. A cohesive interpretive story was developed for the new exhibits that

incorporated the findings of current research and scholarship. The new exhibits offer multiple topical perspectives through the display of select artifacts and primary sources from the Civil War collection derived from acquisition of the General Sweeny Museum.

In September, the **Edwards Cabin** was reroofed (PMIS project 152166).

2017

The park completed a **Foundation Document** as required by the Washington Support Office. This document provides basic guidance for planning and management decisions for the park.[22]

22. National Park Service, *Foundation Document Wilson's Creek National Battlefield* (January 2017).



Figure 4. View of park interpretation of the position of Backoff's Battery. (Source: LSHLA)

Update to Chapter Three: Existing Conditions Documentation

Introduction

This chapter provides information about the current physical character and composition of Wilson's Creek National Battlefield, focusing on changes that have occurred since the CLR was completed in 2004. Specific changes that can be attributed to park efforts to implement the CLR treatment plan are indicted as such. Wherever possible, photographs used in the 2004 CLR are compared with images taken in 2016 during field investigations conducted on behalf of the Environmental Assessment (EA) to illustrate these changes.

The chapter is organized into three sections—park expansion, guidance afforded by the 2009 Long-Range Interpretive Plan, and changes made within the park since 2004.

Park Expansion

At the time the CLR was completed in 2004, Wilson's Creek National Battlefield protected 1,749.91 acres of historic battlefield land (fig. 4). Since 2004, the park has expanded by 280 acres and now encompasses 2,029 acres. An additional 172 acres of battlefield land have been placed under conservation easement. These easements protect the land in perpetuity from development that would negatively impact battlefield integrity.

Boundary Adjustment Act

In 2004, Congress passed the Wilson's Creek National Battlefield Boundary Adjustment Act, which was signed into law by President George W. Bush. The Act revised the authorized boundary of the park to include "lands and interests therein consisting of six parcels totaling 615 acres."[1] Based on the legislation, land located within the expanded authorized boundary area are permitted to be added to the park through donation, from willing sellers with donated or appropriated funds, or by exchange.

The first land acquired by the park as a result of the legislation was the 19.84-acre parcel located north of the visitor center. Acquired in 2004, the parcel contains General Sweeny's Museum, which houses a notable collection of Civil War artifacts and memorabilia. Acquisition of the collection was identified as desirable in the 2003 General Management Plan (GMP) as an appropriate addition to the park for its potential to enhance interpretation.

In 2006, three additional tracts totaling 157.03 acres were acquired along the southwestern edge of the park. These parcels contained the Civil War encampment site associated with Double Spring, which had also been identified as a desirable addition to the park in the 2003 GMP for its connection to the Battle of Wilson's Creek. Additional parcels totaling 42.39 acres were added west of Highway ZZ in 2008, while two additional parcels totaling 60 acres were added to the southeastern corner of the park in 2015 and 2016.

Between 2004 and 2006, nearby land owners agreed to establish conservation easements on land totaling 172 acres. The 2004 CLR recommended this approach as an alternative to fee simple land acquisition that would serve to protect battlefield resources outside of the park. The easements were developed with the assistance of the U.S. Department of Agriculture as part of their Farm and Ranch Lands Protection Program.[2]

An additional 13.97 acres of land have been acquired by private groups for future inclusion in the park. This land, however, lies outside of the authorized park boundary. A second Congressional boundary expansion act would be required to allow this land to be transferred to the federal government for inclusion in Wilson's Creek National Battlefield.

Each of the land acquisitions and easements is described in more detail below.

General Sweeny's Museum

In 2004, General Sweeny's Museum was a privately-run enterprise located along the park's northern boundary. The property also served as a residence for owners, Dr. and Mrs. Tom Sweeney. Dr. Sweeney established General Sweeny's Museum in order to exhibit his outstanding collection of Civil War artifacts and memorabilia. Dr. Sweeney is a descendant of Union Gen. Thomas Sweeny, who fought in the Battle of Wilson's Creek.

The park's 2003 GMP established the framework for acquisition of the General Sweeny's Museum property by indicating it as a desirable addition to the park. As noted, the 19.84-acre General Sweeny Museum parcel was acquired for inclusion in the park in 2005 following passage of the Wilson's Creek National Battlefield Boundary Adjustment Act in 2004.

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1. Public Law 108-394.
2. The Agricultural Act of 2014 established the Agricultural Conservation Easement Program, which replaced the Farm and Ranch Lands Protection Program.

In a 2007 GMP Amendment, the property was described as follows:

> This 20-acre site, which is north of the original national battlefield boundary, was included in the national battlefield to enhance the ability of the national battlefield to fulfill its mission to preserve and commemorate the Battle of Wilson's Creek. The primary goal was to acquire, preserve, and interpret the museum collections. This collection was determined to be one of the finest private Civil War collections in the United States. In addition to the collections, the site consists of the Civil War Museum building and other buildings. Portions of the Union columns marched across these lands on their way to attack the Confederate forces camped along Wilson's Creek.[3]

The addition of the museum's collection of Civil War material allowed the park to expand the story available to the visitor. As a result, the park's purpose statement was modified as documented in the 2007 GMP Amendment to include interpretation of the battle within the context of the Civil War in the Trans-Mississippi West.[4]

Southwest Additions

In 2006, the park acquired another three parcels totaling 157.03 acres near the southwestern boundary. Tract 01-126 measured 145.28 acres, and included land between the southern boundary and Old Limey Road as well as to the west of Highway ZZ. Tracts 01-127 and 01-128 together totaled 11.75 acres. These were also located west of Highway ZZ near the park's southwestern corner. The land was initially acquired by the Wilson's Creek Battlefield Foundation, and subsequently donated to the federal government for inclusion in the park. These three parcels contain natural and cultural resources that can be tied to the Battle of Wilson's Creek. Troops of both sides are known to have camped on the land at different times. During the battle, Southern troops passed through this area.

The 2007 GMP Amendment notes that:

> Preservation and interpretation of this area would enhance visitor understanding of the role that transportation played in the Battle of Wilson's Creek and the impact of the battle on the lives of civilians. The primary goal was to preserve and interpret the Wire and York Roads, Guinn farm site, and Double Spring.[5]

In 2008, six additional parcels totaling 42.39 acres were added west of Highway ZZ. These included Tracts 01-112, 01-0138, 01-139, 01-140, 01-141, and 01-142.

In total, the parcels acquired since 2005 west of Highway ZZ contain approximately 135 acres of fescue hayfields, two buildings, five building foundations, two cold water springs, Terrell Creek, riparian areas, and approximately 5 acres of limestone glade habitat. The park has conducted aquatic surveys within the creek; to date, no federally listed species have been found.

In 2009, the Long-Range Interpretive Plan identified parcels acquired along the southwestern boundary as a possible future day-use picnic area. The parcels contain a trace of the Wire Road, as well as the springs known to have supported both Union and Southern troops during the Civil War. The area was envisioned as

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3. National Park Service, *Wilson's Creek National Battlefield General Management Plan Amendment / Environmental Assessment / Assessment of Effect for the Civil War Museum and Addition Lands* (July 2007), 3–4.
4. National Park Service, *General Management Plan Amendment,* 3.
5. Ibid., 4.

featuring a modest picnic area, parking area, and wayside exhibits featuring interpretation of area's use as a camp site by both armies.[6]

Southeast Additions

In 2015, the Civil War Trust acquired a 20-acre parcel (Tract 01-135) along the southeastern edge of the park. Later that year the federal government purchased the parcel from the Civil War Trust for inclusion within the park. In 2016, another 40 acres (Tract 01-147) were acquired along the southeastern edge of the park by the Wilson's Creek Foundation. This land has since been donated to the park.

Conservation Easements

A total of 172 acres of battlefield land have been placed under conservation easement since 2004. Land under easement is located to the east and south of the park. The first easement was secured in 2004, while the second easement was secured in 2006. In 2008, conservation easements were secured for four additional parcels. As of 2017, additional conservation easements are in the process of being acquired for land located southeast of the park.

Future Land Acquisition

In order to initiate the process of boundary adjustment and expansion, parks are required to prepare a Land Acquisition Plan that identifies land areas of interest for their potential to support the mission of the park, including resource protection, interpretive goals, or administrative needs.

However, because land can only be acquired from willing sellers, expansion of a park's authorized boundary does not always result in acquisition of all parcels of interest. The 2004 Wilson's Creek National Battlefield Boundary Adjustment Act authorized the park's expansion by more than 600 acres. Although Wilson's Creek National Battlefield currently has funds available for land acquisition, much of the land remains in private ownership due to a lack of willing sellers.

As noted above, another 13.97 acres have been acquired for inclusion within Wilson's Creek National Battlefield, but a second boundary expansion would need to be authorized by Congress for this land to be added to the park since it falls outside of the current authorized boundary.

Guidance Afforded by the 2009 Long-Range Interpretive Plan

As part of a broader effort to improve interpretation at Wilson's Creek National Battlefield, the park refined the interpretive goals outlined in the 2003 GMP and the 2007 GMP Amendment by preparing a Long-Range Interpretive Plan in 2009.[7] The report was prepared by the park in collaboration with the region and the Harpers Ferry Center, while also taking into consideration recommendations provided in the 2004 CLR. The plan articulated and refined the interpretive goals outlined in the 2003 General Management Plan, as well as the 2007 General Management Plan Amendment, and also considered the treatment recommendations provided in the 2004 Cultural Landscape Report.

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6. National Park Service, *Wilson's Creek National Battlefield Long-Range Interpretive Plan (*Republic, Missouri: Midwest Regional Office, Harpers Ferry Center Interpretive Planning, June 2009).
7. National Park Service, *Long-Range Interpretive Plan*.

Several themes were identified in the plan that now serve as the foundation for park interpretive programs and media:

- Because Missouri was a western border state, social, economic, ethnic, and political differences fueled animosities between groups, ultimately leading to civil war.
- The strategic importance of Missouri and the personalities, decisions, and motivations of political and military leaders greatly influenced the military campaign and battle.
- Many interrelated factors—leadership, tactics, weaponry, landscape and terrain features, and the use of volunteer forces—contributed to the outcome of the battle and resulted in an unusually hard-fought and bloody military engagement.
- While the Union's battlefield defeat, the death of General Lyon, and the potential loss of southwest Missouri by Federal troops forced the North to reassess its commitment to the war in the Trans-Mississippi, the victory at Wilson's Creek gave hope and confidence to the South.
- The residents along Wilson's Creek found themselves engulfed in the violence of battle and subjected to guerilla warfare and severe military policies that they resented long after the war ended.
- The preservation and commemoration of the battlefield reflects the desire of people to remember and honor the dedication to duty, patriotism, and personal sacrifices of our ancestors.[8]

The Long-Range Interpretive Plan also recommends a series of actions anticipated to impact the park's cultural landscape:

- Prepare a sign master plan to address the need to replace outdated identity and orientation signs.
- Provide bulletin boards at the following possible locations: 1) horse trailer parking; 2) overflow horse trailer parking; 3) rest area near the beverage machines; 4) picnic area.
- Establish a new tour road stop 1 near the Short Farm site to introduce visitors to the battle's opening combat action, and Lyon's objectives in attacking the Confederate camp. Include interpretation of how the battle impacted the lives of local residents.
- Change tour road stop 2 (Gibson's Mill) to Plummer's Crossing.
- Add wayside exhibits at tour road stop 3 that address the men serving in the Missouri State Guard near Wilson's Creek and the Edwards Cabin.
- Add a wayside exhibit at the East Battlefield Overlook that includes a map so that visitors can better understand battlefield terrain from this high point.
- Add a wayside exhibit at tour road stop 5 using an 1880s photo of Bloody Hill that illustrates the open nature of the terrain at the time of the battle, as compared with the contemporary wooded landscape.

8. National Park Service, *General Management Plan Amendment,* 7.

- Add a wayside exhibit at tour road stop 6 focusing on the Confederate battle line. Incorporate a new trail system on Bloody Hill that follows the route traveled by the soldiers.

- Establish tour road stop 7 (Bloody Hill) as the most important stop for visitors. Include new trail alignments, wayside exhibits, interpretive panels, fixed artillery, and a shade shelter.

- Emphasize the withdrawal of Lyon's forces at tour road stop 8 (West Battlefield Overlook).

- Develop a trail plan that will create a trail network that allows visitors to walk the battle lines and better understand troop movements and the outcome of the battle.

- Improve the system with specific new segments that provide an interconnected system of trails, new upright orientation exhibits at each trailhead, and footbridges as needed to cross stream corridors. Specific trail recommendations include:

    - Add a short trail to interpret "Lyon's Approach" from the visitor center to the proposed new tour road stop 1. The trail should continue towards Bloody Hill, with a branch connecting to Plummer's Crossing site of Wilson's Creek. Provide a footbridge to cross the creek.

    - Add a trail from Wilson's Creek to approximate the route used by Plummer's battalion to reach the Ray Cornfield.

    - Add a trail and footbridge crossing of Skegg's Branch to provide access to the Wire Road and Edwards Cabin.

    - Reroute the Bloody Hill trail away from Missouri bladderpod (*Physaria filiformis*) habitat.

    - Add a secondary spur trail to the Lyon marker.

    - Add a trail from tour road stop 6 to follow the route soldiers used to charge the hill. Include a segment from the Edwards Cabin that passes Bledsoe's Battery.

    - Add a trail along the route traveled by Sigel's column at the Sharp Farm site, and link Sigel's first, second, and last positions.

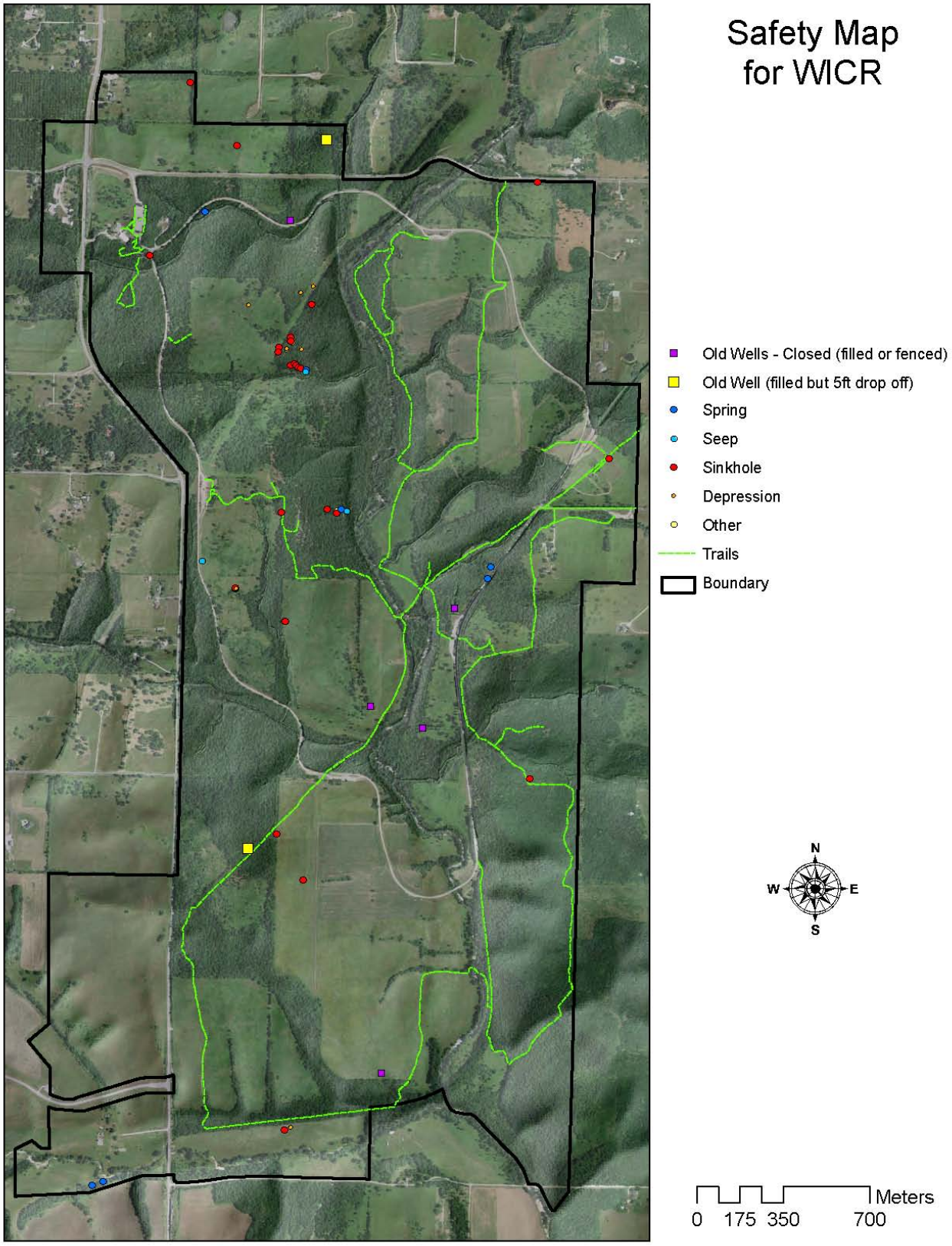
- Establish interpretive aids for visitors at the Ray House that include a visual aid to link the house with Bloody Hill. Create footprint outlines of missing buildings behind the Ray House to help tell the family and hospital use story.

- Create a day-use picnic area at Double Spring that features wayside exhibits.

The plan also identifies specific waysides indicated as already in the planning stages, such as one for the Edwards Cabin (PMIS 111917), and a new collection of waysides to be installed at Bloody Hill. It also identifies cultural landscape treatments to be implemented in support of interpretation, such as clearing vegetation to open historic viewsheds and for scene restoration purposes.[9]

9. National Park Service, *Long-Range Interpretive Plan*, 30–39.

Changes Made within the Park since 2004



Map 3. Map illustrating springs, sinkholes, and wells, and their proximity to park trails. (Source: Wilson's Creek National Battlefield)

Natural Features and Systems

Wilson's Creek water quality. At the time the CLR was completed, water quality associated with Wilson's Creek was considered poor, with several unhealthful conditions indicated. Evaluation of the water quality associated with Wilson's Creek in 2009 indicated that it remained poor. As part of the evaluation, the Missouri Department of Natural Resources classified Wilson's Creek as a 303(d) stream. Sampling conducted as part of the evaluation indicated problems with toxicity resulting from unknown pollutants and bacteria introduced upstream at the City of Springfield from point sources such as a wastewater treatment facility and non-point sources such as urban stormwater.

Wilson's Creek watershed restoration. The 2004 CLR provided several recommendations relating to restoring the health of the Wilson's Creek watershed. The recommendations included stormwater Best Management Practices (BMPs) intended to minimize on-site and off-site hydrologic and water quality impacts due to run-off. Several of the BMPs overlap with vegetation management recommendations discussed in the CLR, such as promoting the health and diversity of native vegetation communities and adding filter strips along the margins of paved and cultivated areas. The BMPs also included installation of features such as green roofs, bioswales, filter strips, naturalized detention, rain gardens, vegetated swales, porous pavements, rain barrels, and cisterns within the park landscape. Recommendations for riverbank stabilization were also provided in the 2004 CLR to address erosion and undercutting of banks. The park's plans for implementing the 2004 CLR recommendations are outlined in a 2014 Vegetation Management Implementation Plan prepared by park personnel.[10] To date, recommendations related to restoration of the Wilson's Creek watershed have not been implemented.

Springs. The water table within the Springfield area has been declining for several decades. The drop in the water table is attributed to increased water use associated with development. The decline in the water table has had a negative impact on the flow of local springs, due to the way these water sources are fed by the limestone geology. Many of the springs described as present historically are no longer active. The decline in the water table has also affected the amount of ground water available for plants.

The park has mapped several springs using Global Positioning System (GPS) equipment and Geographic Information System (GIS) software. In 2004, the park identified six unnamed springs within the battlefield landscape for discussion as part of the CLR. The park now records a total of eight unnamed springs, and is aware of at least two additional springs located within park caves. Four of the springs are named—Rey (or Ray), Pipeline, Skegg's, and Double Spring (map 3). Double Spring is located on land acquired by the park since 2004. Further research is needed to track changes in spring flow over time, and to compare this information with historic records to determine the impact that the declining water table is having on these resources.

Sinkholes. Several sinkholes are present within the park (map 3). Sinkholes generally form as a result of changes in underlying geology. The park's limestone geology is subject to dissolution when exposed to water that has become acidified. The lowering of the water table, and possible introduction of acidified water, appears to have contributed to the presence of sinkholes within the park.

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10. National Park Service, *Vegetation Management Implementation Plan* (Republic, Missouri: National Park Service, April 2014).



Figure 5. The tour road showing where rockwork was conducted in 2011 (Source: LSHLA)

Limestone rock outcroppings along the tour road. A portion of the tour road follows the alignment of a former rail line. Construction of the line required leveling of the corridor using a combination of grading and rock blasting. The rock outcropping visible between tour road stops 3 and 4 was exposed as part of the rail line construction. Inspection of the Tour Road conducted in May 2005 by Federal Highways Geotechnical personnel revealed that a portion of the rock outcropping was in danger of failing. To address the safety concerns associated with the possible failure of the rock, the park completed emergency repair work in 2011, removing an overhanging section of rock that measured 14 feet in height, 401 feet in length, and 10 feet in width (fig. 5). As part of the project, a culvert associated with the road near the rock removal project.

Responses to Natural Resources

Abandoned residential wells. Seven abandoned wells are located within the park. At the time the CLR was prepared, only one was recorded. Four of the wells were filled by the park in 2007 to address safety concerns and meet the requirements of Missouri state law (map 3).

Ditches and gutters. The tour road and other park roads are edged by ditches that convey stormwater away from the pavement and into streams and creeks. During the mid-2000s, the park determined that many of the ditches were functioning at a low level, contributing to problems with roadway flooding. To address the problem, the park cleared silt and vegetation from several ditches associated with McElhaney Road, Farm Road 194, and the Ray House parking area, as well as nearby sections of the tour road in 2009.

Circulation

Highway ZZ. Since 2004, Highway ZZ, which edges the park to the west, has been improved to accommodate the increase in traffic associated with construction of Republic High School to the north.



Figure 6. Tour road c. 2000 (left) and 2016 (right), illustrating the change in paving material and reflectivity that has occurred as part of the implementation of the CLR treatment plan. (Source: Liz Sargent, left, LSHLA ,right)

Tour road and tour stops. In 2015, the highly reflective road surface of the tour road, indicated as problematic in the 2004 CLR, was repaved with an asphalt mix that contained 50 percent granite chips. The road is now far less visually intrusive (fig. 6).

Wire Road. In 2005, a washed out section of the Wire Road was repaired at the Schuyler Creek low water crossing. Elsewhere, ruts were filled to diminish potential trip hazards.

Trails. Several park trails were heavily impacted by tree removal operations that followed an ice storm in 2007. In 2008, repairs were made to trail drainage structures, bridges, and trail surfaces, and additional vegetation found to be encroaching on the trails was removed. The routes undergoing repairs included the Southwest trail, Jeff's trail, Pulaski trail, Guibor trail, and the East and West Overlook trails. The nature trail was repaired the following year.

In 2016, a condition assessment of all park trails was completed as part of a cooperative agreement with Southern Illinois University.[11] The information provides a detailed understanding of trail segments in need of repair, including where erosion is occurring. The park plans to use this information to reroute trail segments that repeatedly experience erosion and wash-outs.



Figure 7. Bloody Hill trail c. 2000 (left) and 2016 (right), illustrating improvements made to protect Missouri bladderpod habitat, and to enhance interpretation. (Source: Liz Sargent, left, LSHLA ,right)

11. Logan Park, *Assessment of Equestrian Recreation at Wilson's Creek National Battlefield.* Accomplished by a cooperative agreement between the National Park Service and Forest Recreation and Park Management, Department of Forestry, Southern Illinois University **(Carbondale, IL: Southern Illinois University, 2016).**

Bloody Hill trail. In 2012, several improvements were made to the interpretive trail system at Bloody Hill. The trail was realigned to avoid sensitive Missouri bladderpod habitat, while wayside exhibits and cannon were added to support enhanced interpretation. As recommended in the 2004 CLR, a contemplative node was added near tour road stop 7 where visitors are able to consider the events of the battle with quiet reflection (fig. 7). The improvements also followed plans outlined in the 2009 Long-Range Interpretive Plan. Compliance to consider the potential impacts of the proposed changes to the historic landscape completed as part of an Environmental Assessment.[12]

Manley spur trail. The Manley spur trail, which appeared on park maps at the time the CLR was completed in 2004, has been closed and is no longer in use.

Ray Cornfield trail. In 2006, the Ray Cornfield trail was repaired through the filling of ruts, installation of waterbars, and removal of encroaching vegetation. Portions of the trail were identified as problematic due to repeated evidence of erosion and may be rerouted.

Manley trail is the park's most popular equestrian trail. It provides access to two horse parking areas, the Wire Road, and the Manley Farmstead site and cemetery. The trail allows equestrian users to make a 5-mile loop through the park and return to the horse trailer parking area. In 2009, the trail was rehabilitated to fill ruts, spread aggregate, remove encroaching vegetation, and replace waterbars. Portions of the trail have been assessed as subject to repeated erosion and may be rerouted.

The **Southwest trail** is a popular equestrian trail that provides access to the Wire Road and the Sharp Cornfield. The trail is part of the 5-mile loop used by equestrians within the park. The Southwest Trail is also part of the route followed by approximately 9,000 hikers and equestrians each year as part of the Missouri State Guard and Southern Civil War camp experience. It follows the route of one of the Union artillery's notable advances during the Battle of Wilson's Creek. In 2007, a tornado struck the park, uprooting and damaging hundreds of trees. The park worked to address safety concerns associated with the trail in 2009. The Southwest trail was heavily impacted by the equipment used to remove the dead and damaged trees and debris after the tornado. Work was completed in 2016 to repair ruts and waterbars. Like the Ray Cornfield trail and Manley trail, the park has identified the need to reroute problematic segments of the trail that traverse two areas of steep slopes and are repeatedly subject to erosion.

Jeff's trail provides the only pedestrian connection between the Price Headquarters site, marked by Edwards Cabin, the Wire Road, and Bloody Hill. The trail was repaired in 2009 to address problems such as a loss of the gravel surfacing due to erosion, and the presence of trip hazards. Portions of this trail have been assessed as subject to repeated erosion and may be rerouted.

The **Pulaski trail** and overlook provides a view of the Price Headquarters site and access to a historic battery location. Portions of this trail have been assessed as subject to repeated erosion may be rerouted. The Pulaski overlook consists of a boardwalk with safety railings. Decking boards and safety rails require regular replacement to ensure visitor safety from trip and fall hazards.

The **Guibor Trail** includes a short footpath and footbridge that originates at tour road stop 6. It terminates at the historic location of Guibor's Battery, marked by a cannon and an interpretive wayside.

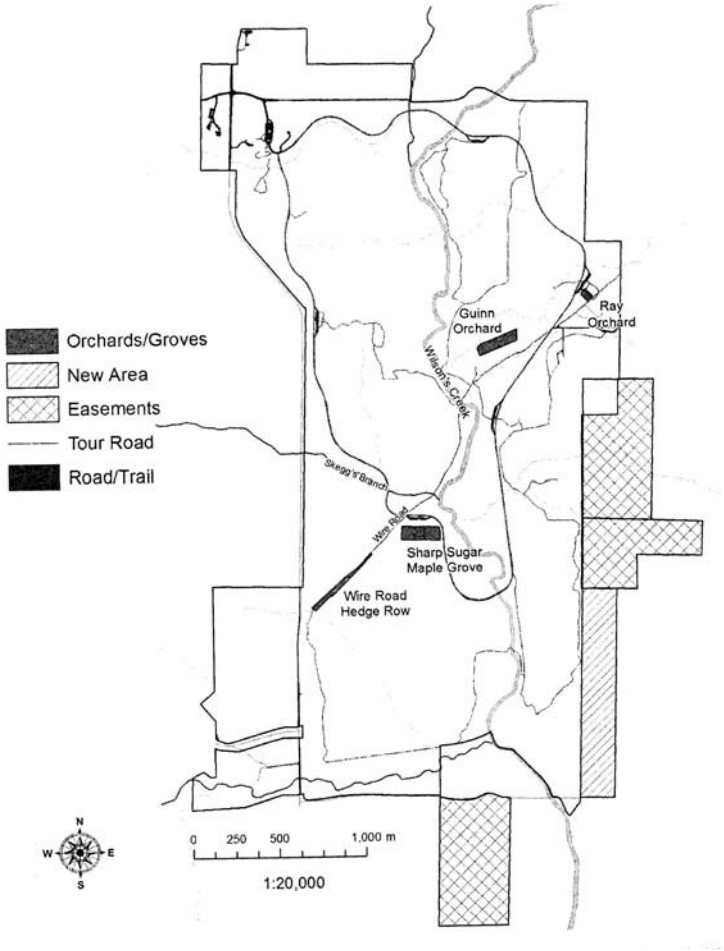
12. National Park Service, *Environmental Assessment for Resource Preservation and Visitor Interpretation of Bloody Hill at Wilson's Creek National Battlefield; Greene County, Missouri* (Republic, Missouri: Wilson's Creek National Battlefield, February 2014).

Portions of this trail have been assessed as subject to repeated erosion and may be rerouted. The footbridge has deteriorated decking boards that require replacement and is in need of new paint.

The **West Battlefield Overlook** and **East Battlefield Overlook trails** provide access to two of the best views of the battlefield within the park. The West Battlefield Overlook trail is experiencing erosion near the footbridge approaches and around tree roots. The erosion may present a tripping hazard for visitors. The trail needs to be repaired through the addition of fill at the bridge approaches and around tree roots. The East Battlefield Overlook trail is accessed via a footbridge and stairs. The wood decking of the footbridge is in need of replacement. Portions of this trail have been assessed as subject to repeated erosion and may be rerouted.

Vegetation

Cultural Vegetation Features and Exhibits



Map 4. Historic cultural vegetation as indicated in the 2014 Vegetation Management Implementation Plan. (Source: Wilson's Creek National Battlefield)



Figure 8. Photographs of the front of the Ray House c. 2000 (left), and in 2016 (right) showing the orchard exhibit added in 2010. (Source: Liz Sargent, left, LSHLA, right)

Orchard exhibits. Based on a recommendations included in the 2004 CLR treatment plan, an orchard exhibit was planted at the Ray House in 2010 (fig. 8, map 4). Thirty trees were planted, including sixteen 'Enterprise,' seven 'Gold Rush,' and seven 'Jona Free' varieties. The trees were protected from deer browse using trunk guards.

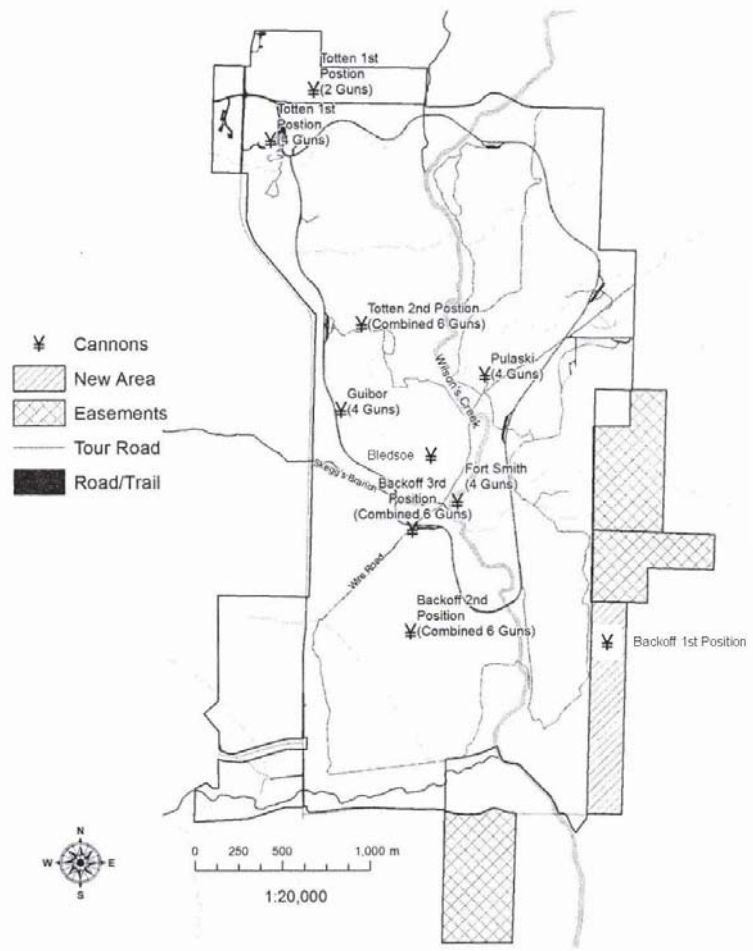
The 2004 CLR also recommended that an orchard exhibit be planted at the Guinn Farm. This recommendation has not yet been implemented, but is conveyed in the 2014 Vegetation Management Implementation Plan (map 4).[13]

Crop exhibits. Based on recommendations included in the 2004 CLR, crop exhibits were planted in the Ray and Sharp Cornfields. A similar treatment was also proposed for the Gibson Oatfield that has not yet been implemented.

Wire Road hedgerow. The 2004 CLR recommends that the Osage orange (*Maclura pomifera*) hedgerow that edges the Wire Road be retained and maintained. The hedgerow feature remains as documented in the 2004 CLR (map 4).

Sharp sugar maple grove. Similarly, the 2004 CLR recommends that the sugar maple (*Acer saccharum*) grove located near the Sharp Farm site (tour road stop 5) be retained and maintained. The grove remains as documented in the 2004 CLR (map 4).

13. National Park Service, *Vegetation Management Implementation Plan*, 43–44.



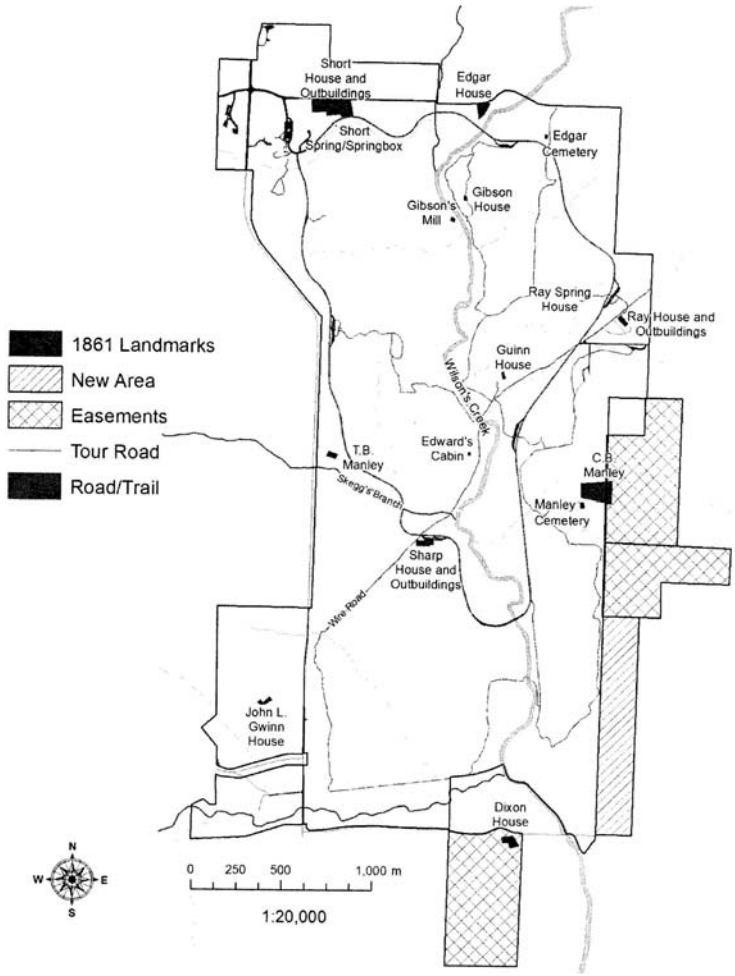
Map 5. Map illustrating cannon locations where clearing would be used to help visitors understand historic events associated with the Battle of Wilson's Creek. (Source: National Park Service, Vegetation Management Implementation Plan, 34, amended by LSHLA)

Viewshed clearing. The 2004 CLR recommends the reestablishment of critical views associated with the landscape at the time of the Battle of Wilson's Creek, particularly those that were important to the tactics and troop movements associated with the military event.

Since 2004, the park has focused viewshed maintenance and clearing on the East and West Battlefield Overlooks. Future work to address the CLR recommendations for viewshed clearing is articulated in the 2014 Vegetation Management Implementation Plan.[14] Actions indicated in the plan include clearing of views from observation points at the Ray House, East and West Battlefield Overlooks, and three vistas identified by the park—1) from the beginning of the tour road; 2) from a point near tour road stop 3; and 3) from the Manley trail. Additionally, the Vegetation Management Implementation Plan suggests that sight lines be established at each cannon installation, including Backoff's 1st position (2 guns), Backoff's 2nd position (2 guns), Backoff's 1st position (4 guns), Backoff's 2nd position (combined 6 guns), Ft. Smith (4 guns), Bledsoe (3 guns), Guibor (4 guns), Pulaski (4 guns), Totten 1st position (2 guns), Totten's 1st position (4 guns), and Totten's 2nd position (combined 6 guns) (map 5).

14. *Ibid.*, 31–37.

Efforts to reestablish viewsheds would include removal of woody vegetation that obscures the desired view, and planting of native warm-season grasses that can be maintained through mowing.



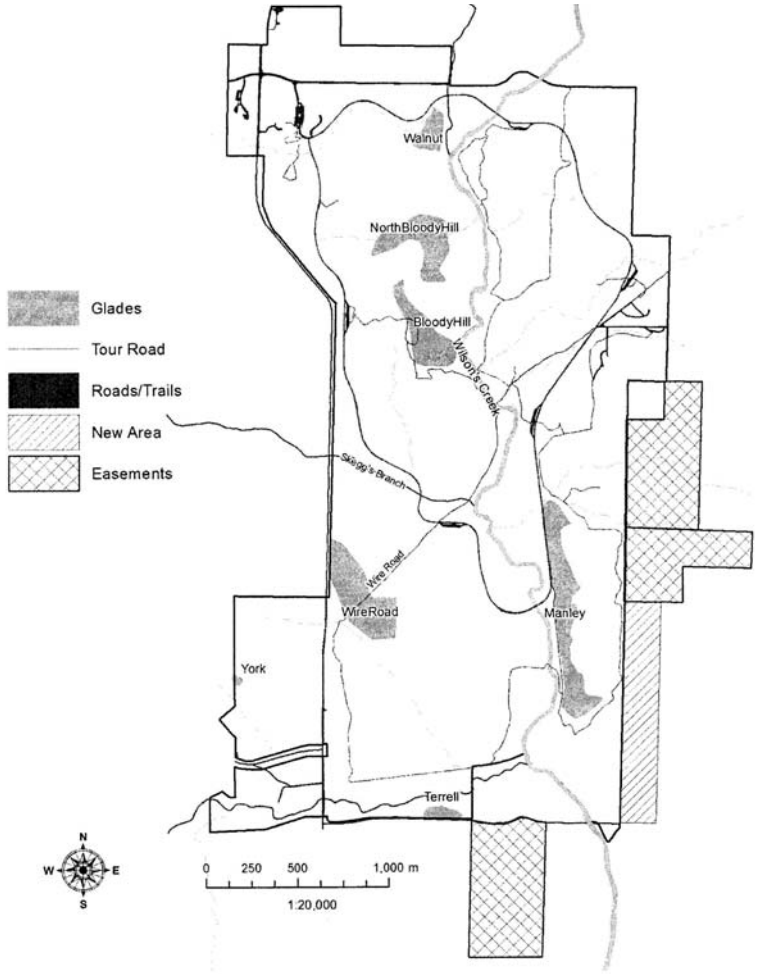
Map 6. House sites present in 1861. (Source: National Park Service, Vegetation Management Implementation Plan, 40)

Farmstead interpretation. Several farmsteads were present within the area encompassed by the park at the time of the Battle of Wilson's Creek. Currently only the Ray and Sharp Houses and Gibson's Mill sites are interpreted. The 2004 CLR recommends additional interpretation of former farmstead sites, which would potentially include visual aids such as foundation outlines, fencing, orchards, and outlines of fields, be implemented at additional house sites to enhance interpretation of the battlefield landscape. The house and farm sites that were the focus of this recommendation include the Short House and outbuilding, Short spring and springbox, Edgar House, Edgar cemetery, Gibson House, L.D. Guinn House, T.B. Manley House, C.B. Manley House, J.L. Gwinn House, and Dixon House (map 6).

None of these farmsteads has yet been marked in this way, but implementation of this recommendation is indicated in the 2014 Vegetation Management Implementation Plan.[15]

15. *Ibid.,* 38–39.

Vegetation Community Management

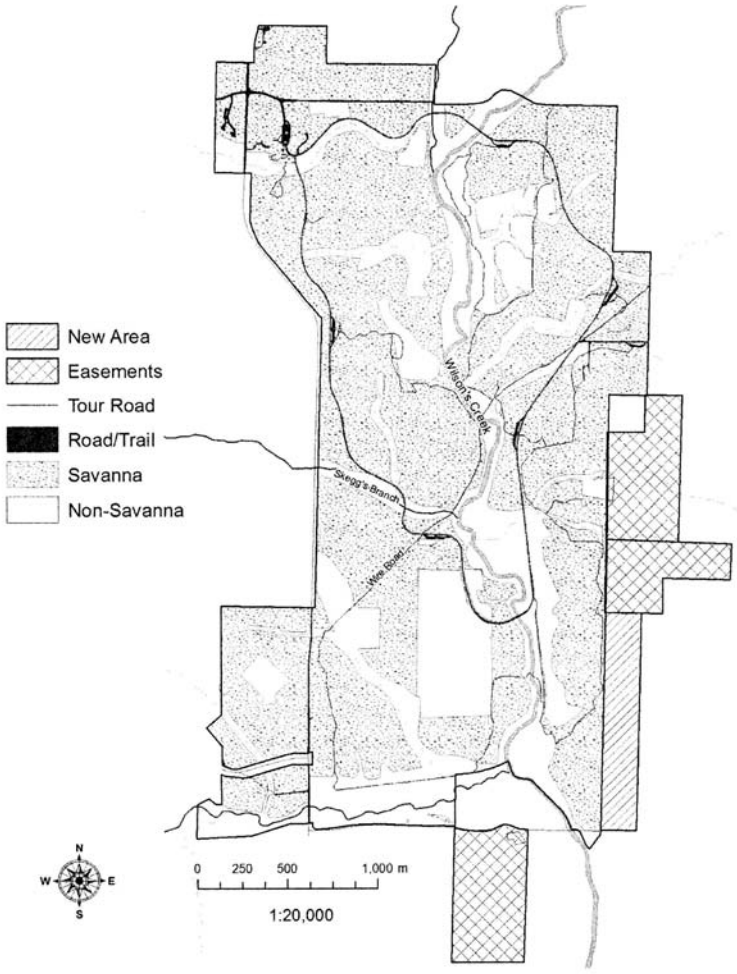


Map 7. Glade communities within Wilson's Creek National Battlefield. (Source: National Park Service, Vegetation Management Implementation Plan, 13)

Glade communities. The 2004 CLR provided specific recommendations for managing limestone glade habitat within the park. This rare habitat supports the Missouri bladderpod, a federally-listed endangered plant species. Without the introduction of fire, which helps to remove encroaching species such as Eastern redcedar (*Juniperus virginiana*) trees, the habitat degrades and cannot support the needs of the Missouri bladderpod. Limestone glades are also very sensitive to disturbance and compaction. Glade habitat is present on Bloody Hill, including the area where the Lyon marker is located. The 2004 CLR indicated a need to both relocate visitors from the sensitive areas of Bloody Hill, as well as managing the habitat to promote the needs of the Missouri bladderpod using mechanical clearing as well as prescribed fire to remove the Eastern redcedar trees and other undesirable plants.

Following the publication of the 2004 CLR, the park conducted mechanical removal of several Eastern redcedar trees on Bloody Hill within glade habitat. These efforts ended in 2006, and little follow-up tree removal has occurred since. The 2014 Vegetation Management Implementation Plan indicates that the park plans to continue implementing the CLR recommendations for managing glade habitat both at Bloody Hill and elsewhere. The areas where treatments are anticipated to occur include Bloody Hill (15.94 acres), Manley Woods (29.9 acres), North Bloody Hill (12.29 acres), Terrell Creek (2.72 acres), Walnut (6.12 acres), Wire Road (25.2 acres), and York (0.5 acres) (map 7). Actions anticipated to occur include:

- Removal of Eastern redcedar trees outside of the Missouri bladderpod growing season
- Removal of all non-native vegetation and control invasive species
- Seeding with native grasses
- Introduction of regular prescribed fire, as fuel loads permit, or every five years, before fall germination of the Missouri bladderpod[16]



Map 8. Proposed savanna restoration areas within Wilson's Creek National Battlefield. (Source: National Park Service, Vegetation Management Implementation Plan, 17)

Savanna and open mixed forest communities. The 2004 CLR recommends that much of the park landscape be managed to promote savanna plant communities similar to what was present at the time of the Civil War Battle of Wilson's Creek. Savannas are composed of native grasslands and open grown trees, primarily oaks, maintained through regular fire. During the 1860s, the Wilson's Creek landscape included both savanna and areas of denser open mixed forest. Restoration of both vegetation types requires the removal of advantageous tree species that are present today, but were not an important part of the historic forest. Many of these have grown up as a result of fire suppression. The 2004 CLR provided

16. *Ibid.*, 11–14. While this is a goal, it is recognized that it will be difficult to achieve.

recommendations for managing for savanna and open mixed forest communities using a combination of mechanical removal, prescribed fire, planting of desirable species, and invasives control. The park has begun to implement this recommendation by introducing a more regular regime of prescribed fire to larger areas of the park since 2004.

Future plans, articulated in the 2014 Vegetation Management Implementation Plan, include implantation of the 2004 CLR recommendations over approximately 1,222.38 acres of the park (map 8). Implementation is anticipated to be coordinated with related projects, such as glade community management, establishment of riparian buffers and filter strips, and reestablishment of critical viewsheds. Specific tasks associated with implementation include:

- Removal of specific native tree species that were not historically part of the landscape (such as Eastern redcedar, honeylocust (*Gleditsia triacanthos*), Siberian elm (*Ulmus pumila*), American elm (*Ulmus americana*), red elm (*Ulmus rubra*), wild black cherry (*Prunus serotina*), hackberry (*Celtis occidentalis*), black walnut (*Juglans nigra*), and red mulberry (*Morus rubra*).

- Promotion of other tree species, particularly oaks, and removal of encroaching vegetation.

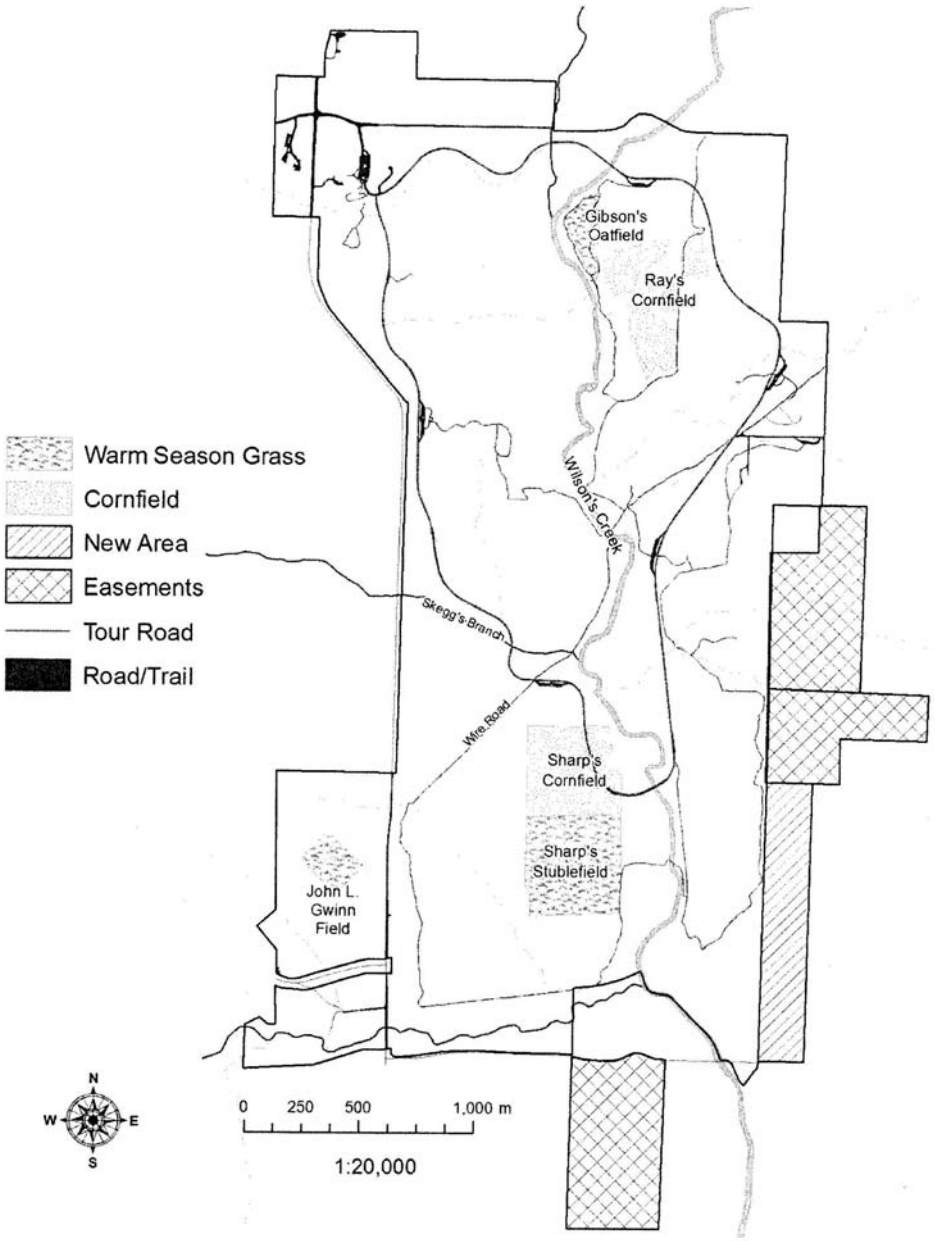
- Regular use of prescribed fire.

- Replacement of non-native cool-season grasses with native warm-season grasses and forbs.[17]

Manley Woods. The 2004 CLR recommends that the high quality mature forest associated with Manley Woods be maintained through control of invasive species and other undesirable conditions, such as soil erosion and crowding of mature trees by fast growing species that have proliferated as a result of fire suppression. This recommendation has not yet been implemented by the park.

Prairie. A native prairie was planted in the environs of the visitor center during the 1990s. The 2004 CLR recommends that this feature be treated similar to the recommendations for native warm-season grass and forb fields. The park has made few interventions in the prairie since 2004. It is maintained through periodic mowing.

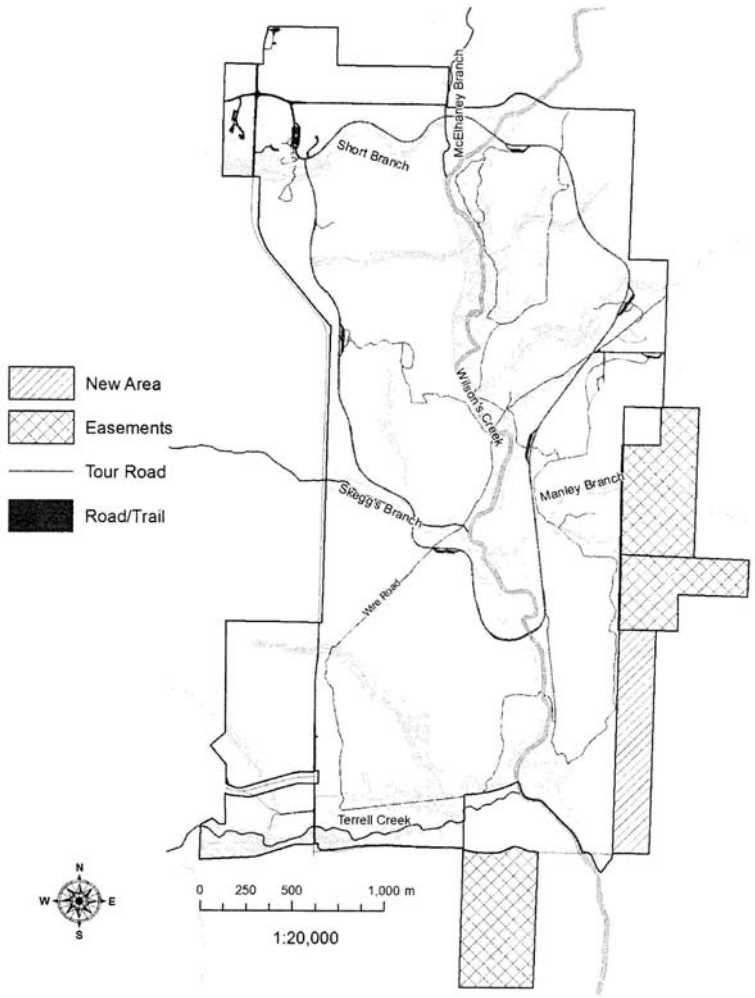
17. *Ibid.*, 15–21.



Map 9. Fields present at the time of the battle, and proposed vegetation management approaches. (Source: National Park Service, Vegetation Management Implementation Plan, 24)

Native warm-season grass fields. The 2004 CLR recommended that portions of the historic crop field areas be converted from fescue to native warm-season grass fields to improve habitat and reduce the presence of non-native plant species. The native warm-season grass fields would support interpret the spatial patterns associated with historic crop fields for interpretive purposes, but would require less labor to maintain than crop field exhibits. It does not appear that this recommendation has as of yet been acted upon. The 2014 Vegetation Management Implementation Plan indicates that the areas planned for this treatment include the Sharp Stubblefield (43.73 acres), Gibson Oatfield (8.27 acres), and Gwinn field (9.09 acres) (map 9).[18]

18. *Ibid.*, 22–26.



Map 10. Map showing the locations of riparian stream buffers to be established at Wilson's Creek National Battlefield. (Source: National Park Service, Vegetation Management Implementation Plan, 8)

Riparian stream buffers. The 2004 CLR included recommendations for the establishment of riparian buffers along all stream corridors as a measure intended to protect water quality by filtering overland run-off and pollutants. To date, this recommendation has not been implemented. The 2014 Vegetation Management Implementation Plan indicates the protocols and locations where this recommendation will be implemented in the future. Buffers will be established along Manley Branch (7.9 acres), McElhaney Branch (6.42 acres), Shorts Branch (28.41 acres), the main stem of Skegg's Branch (17.54 acres), Terrell Creek (84 acres), and Wilson's Creek (184.58 acres) (map 10).[19]

Filter strips. The 2004 CLR recommends that the park establish filter strips along paved roads, parking areas, waterways, drainages, and slopes that edge open areas managed as crop fields. Filter strips are intended to filter and clean sediment, organic material, chemicals, and other materials from stormwater run-off before it reaches an open waterway. This recommendation has been partially implemented around exhibits of row crop agriculture, such as at the Ray Cornfield, but they have not yet been established in many of the other areas where recommended. The 2014 Vegetation Management Implementation Plan provides a detailed discussion of the goals associated with filter strip establishment, including the fact that they constitute a BMP for reducing run-off of some agricultural non-point source

19. *Ibid.*, 5–10.

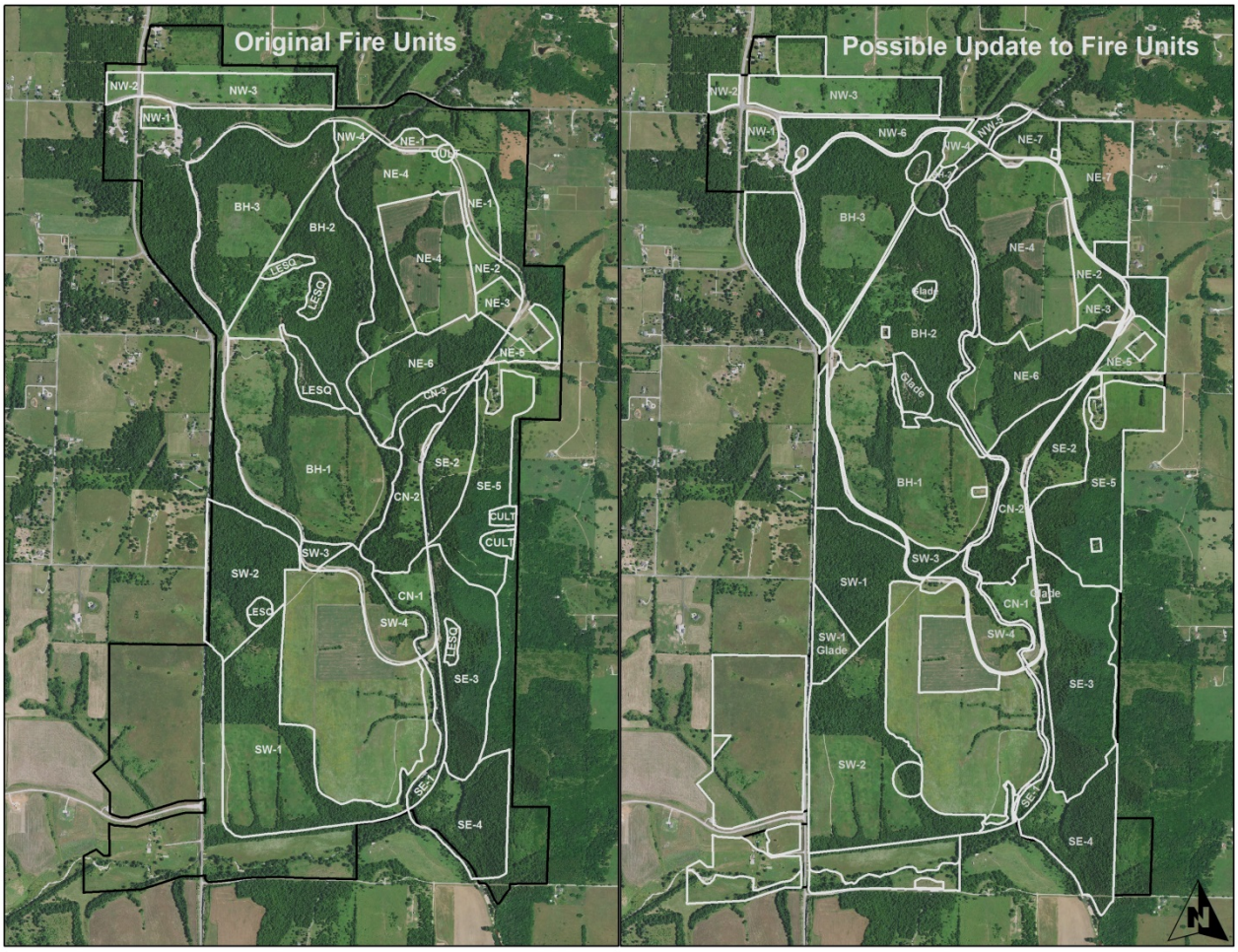
contaminants and are part of an overall program of land conservation. Additional filter strips are indicated as needed around parking areas, the tour road and tour road stops and pull-offs, equestrian parking and staging areas, waterways, drainages, and slopes that edge open areas where crop field or historic vegetation exhibits are implemented.[20]

Invasives control. The 2004 CLR recommended that the park update its invasive species control plan in order to complement the other recommendations regarding restoration of the historic scence through vegetation management. The park continues to address invasive species through several methods, including mechanical clearing (mowing), chemical treatments, and prescribed fire.

In 2013, the Heartland Inventory & Monitoring Network, which is based at Wilson's Creek, prepared the Heartland Invasive Plant Management Plan and Environmental Assessment. This plan is not specific to Wilson's Creek, but addresses invasive species control for a wider area of the Midwest. It is currently being used to guide invasive species control at Wilson's Creek National Battlefield. The 2014 Vegetation Management Implementation Plan indicates that "invasive species control is very complex, so treatment will be addressed partly in the 2013 Heartland Invasive Plant Management Plan and Environmental Assessment. However, it is imperative that a well-developed invasive species control plan specific to Wilson's Creek National Battlefield be an integral part of future [vegetation management programs at the park]."[21]

It is anticipated that protocols for invasive species control will continue to evolve. It is possible that grazing animals, such as goats, may be employed in the future to address stands of invasive species in areas that are difficult to access with equipment and machinery.

20. *Ibid.*, 28–29.
21. *Ibid.,* 27–28.



Map 11. Current and proposed future burn units within Wilson's Creek National Battlefield. (Source: Wilson's Creek National Battlefield)

Prescribed fire. Many of the vegetation communities within the park are managed using prescribed fire. A Fire Management Plan prepared in December 2004 identified burn units that coincided with the recommendations in the CLR. The burn units are in the process of being updated to reflect more up-to-date mapping capabilities and knowledge of vegetation communities. The current and proposed future burn units are indicated on map 11.[22]

22 National Park Service, *Environmental Assessment Wilson's Creek National Battlefield Fire Management Plan* (Republic, Missouri: Wilson's Creek National Battlefield, December 2004).

BUILDINGS AND STRUCTURES



Figure 9. Ray House c. 2000 (left) and 2016 (right) illustrating the character of the structure following several repairs. (Source: Liz Sargent,left, LSHLA, right)

Ray House. The Ray House, built circa 1852, is the oldest standing structure, and the most significant, in the park. Several structural and preservation maintenance projects have been completed at the Ray House since 2004 (fig. 9). The Ray House has been repainted twice since the CLR was completed, first in 2004, and again in 2009. In 2006, the roof was replaced. The work generally entailed in-kind replacement, although zinc roofing strips were added to prevent moss buildup, and new lightning rods were installed. At the same time, the fire suppression system was upgraded. In 2007, portions of the porch were repaired or rebuilt, while the door was repaired and corner trim boards were replaced. In 2013, the Ray House foundation was repointed, and the roof was again replaced. Gutters were installed in the rear in 2014.



Figure 10. Ray Springhouse c. 2000 (left) and 2016 (right) illustrating changes to the trail providing access to the structure, and work that has been done to address preservation of the structure. (Source: Liz Sargent,left, LSHLA, right)

Ray Springhouse. The Ray Springhouse was originally constructed circa 1855. The park first conducted preservation repairs and rehabilitation on the structure in 1986. In 2009, the limestone masonry was repointed using an appropriate mortar mixture. As part of the project, missing stones were replaced with stone from a local quarry and matched as closely as possible to the original in terms of color.

In 2006, drainage associated with the Ray Springhouse was improved through the addition of two culverts to convey the flow of an adjacent spring beneath the path leading to the structure. The culvert replaced former use of a boardwalk present at the time the 2004 CLR was completed (fig. 10).



Figure 11. Edwards Cabin c. 2000 (left) and 2016 (right) following rehabilitation of the structure for interpretive purposes. (Source: Liz Sargent,left, LSHLA, right)

Edwards Cabin. In 2005, the mothballed structure referred to as the Edwards Cabin, which had been moved to the park in 1965 to mark the location of a cabin present during the war used by General Price as his headquarters, was rehabilitated for interpretive purposes. From the cabin, views are afforded of Bloody Hill, making it an important focus of battle interpretation. The rehabilitation project entailed taking the cabin apart; digging and placing footings; installing roof trusses, a framework, and shingling the structure; replacing several support logs; and reassembling the log structure. Finish work entailed chinking and white washing the logs; installing windows and doors; constructing a porch, fireplace, and chimney; plastering the interior; constructing a floor; and fabricating two new doors, steps, and a ramp. A wooden hitching post and wayside exhibit were also added nearby for visitors. The roof was replaced in 2016 (fig. 11).

House, General Sweeny Museum property. The "Sweeney" residence, which measures 8,000 square feet, was built circa 1890 in Springfield, Missouri. Key aspects of the original structure—doors, walnut paneling, stair cases, and floors—were moved to its current location in 1964 after it was threatened by demolition as part of the expansion of Cox Hospital. The owner, O.K. Armstrong, sold the house to Dr. Thomas and Mrs. Karen Sweeney in 1988. The Sweeneys are known to have replaced the asphalt roof, propane furnaces and air conditioners, and expanded the house through construction of an addition during their period of ownership. They established a museum in the house in 1991.

McElhaney Farm complex. Several projects have been conducted to repair and rehabilitate structures associated with the McElhaney Farm complex. The **McElhaney House**, which is used for law enforcement, resource management, and interpretive offices, was rehabilitated in 2010 to address structural deficiencies. The fire suppression system had been previously upgraded in 2006. The **McElhaney Barn** required emergency stabilization involving repair and replacement of sills, support beams, and exterior siding, and correction of drainage problems that included installation of a culvert. In 2011, bracing was installed to prevent the structure from failing, while three failing wooden windows were replaced in 2012. The **McElhaney Smokehouse** was rehabilitated in 2005. Work included painting, roof replacement, and replacement of the doors and windows. The windows were replaced in 2013. The **McElhaney Wellhouse** was completely rebuilt in 2010 to upgrade the water supply and storage system and ensure that the restrooms and potable water supply to the McElhaney House was protected following a Public Health Department assessment. Cracks in the **McElhaney Stormcellar** were repaired in 2006 to allow for use as a tornado shelter.



Figure 12. Visitor center c. 2000 (left) and 2016 (right) after expansion. (Source: Liz Sargent,left, LSHLA, right)

Visitor center expansion. The park's visitor center was expanded through construction of a new library addition. Although dedicated in April 2003, the addition post-dated the documentation phase of the 2004 CLR and was not recorded therein. The core of the library collection was donated by Springfield attorney, John K. Hulston, and his wife Ruth Hulston. The addition includes a large conference room (fig. 12).

Tour road bridges. In 2013, the tour road bridges were repaired to address deficiencies identified in a Federal Highways bridge inspection of 2006, and resulting from flooding that occurred in 2008. As part of the repair effort, debris lodged behind the bridge abutments was removed, and erosion problems were repaired.

Trail bridges. All of the trail bridges within the park are contemporary features; many were built in the 1980s. Several bridges have undergone repairs since 2004, including sanding and repainting, and minimal replacement of materials as needed. Examples include those associated with Skegg's Branch, the Gibson Mill trail, and the Wire Road.

In 2005, the wood stringers, decking, and runners associated with the **Wire Road bridge** were replaced based on deterioration noted in a Federal Highways bridge inspection. Work was again completed to replace deteriorated wooden structural members associated with the bridge in 2012. Stringers, decking, and the steel substructure of the bridge were again identified as requiring repair during Federal Highways bridge inspections conducted in 2010. In 2013, the Wire Road bridge underwent additional repairs that included the provision of rip rap along the banks of Wilson's Creek, replacement of broken and deformed safety cables, adjustment of a stringer bracket, and removal of encroaching vegetation.



Figure 13. Picnic area c. 2000 (left) and 2016 (right) indicating the changes that have been made to the retaining wall and railing. (Source: Liz Sargent, left, LSHLA, right)

Picnic area. In 2010, the picnic area retaining walls and safety railings were replaced. The creosote treated railroad ties that formed the wall as documented in 2004 were replaced with a concrete interlocking retaining wall system. The wooden safety railing was replaced with galvanized steel railing and fencing (fig. 13).

Split rail fencing at the park entrance and visitor center. Split rail fencing was replaced in the vicinity of the visitor center in 2006. The project entailed construction of 1,300 linear feet of 4-rail-high split rail fencing. The split rail fencing at the visitor center was replaced again in 2015.



Figure 14. Split rail fencing at Sharp cornfield, 2016. (Source: LSHLA)

Split rail fencing, Ray Cornfield, Sharp Cornfield. Split rail fencing edges the Ray and Sharp Cornfields. These fields were described in battle accounts, and are an important interpretive feature of the park. Historic split rail fencing conveys the feeling of the landscape at the time of the battle. These fences were replaced in 2005 as well as 2016 (fig. 14). As part of the project, approximately 3,306 linear feet of oak split rail fencing was demolished and new rails installed using historic fence construction methods. As part of the project, the park avoided using nails both to convey an authentic historic appearance and to facilitate repairs following storm events. The fencing was discussed as a key interpretive feature in the 2004 CLR.

Small-scale Features



Figure 15. Park entrance sign c. 2000 (left), and as replaced in 2014 (right). (Source: Liz Sargent, left, LSHLA, right)

Park entrance sign. A new park entrance sign was built near the entrance to the park along Farm Road 182 in 2014. The sign measures 214 by 64 inches. It includes a wooden panel constructed of double-sided western red cedar with routed graphics, a painted finish, western red cedar arrowhead, and c-channel steel mounting. The new sign was set atop the stone base associated with the previous entrance sign (fig. 15).



Figure 16. Gates at the park entrance 2016. (Source: LSHLA)

Gates at the park entrance. The park entrance gates were replaced in 2009. The new wooden gates were incorporated into the existing stone pier system along with a photovoltaic arrowhead sign located to either side (fig. 16).



Figure 17. Lyon marker on Bloody Hill, c. 2000 (left), and with new fencing and wayside exhibit, 2016. (Source:Liz Sargent, left, LSHLA, right)

Wayside exhibits. Fourteen new wayside exhibits were added along the Bloody Hill trail in 2012 based on the recommendations provided in the Long-Range Interpretive Plan and an Environmental Assessment prepared for proposed improvements. Additional waysides are planned for future installation in association with the site of the DuBois Battery position (fig. 17).

Lyon marker. The Lyon marker is located within the area that has been improved through the addition of new wayside exhibits. The character of the area where the marker is located has been altered since 2004 with the addition of the new wayside exhibits as well as split rail fencing that edges the trail to the marker. The fencing is designed to protect the sensitive glade habitat around the marker from access by visitors (fig. 17).

Benches. In 2006, four benches near the visitor center were replaced with recycled plastic seating intended to reduce maintenance costs.

Several wooden benches located along the park's trail system were sanded and painted in 2008.

Picnic tables and benches. In 2008, thirty-three wooden picnic tables and seven benches were added to the picnic area, replacing twenty-six wooden tables and seven wooden benches that had been present in 2004, but were in poor condition. The new picnic furniture is fabricated from recycled plastic. It is designed to be universally-accessible.

Bike racks. All five bike racks associated with the tour road were replaced in 2010. Wooden racks were replaced with recycled plastic racks.

Hitching rails. Hitching rails, present in 2004, have been removed from several tour road stops. These features were likely removed as part of the tour stop upgrade projects conducted in 2010. Bollards remain in place and were stained in 2010.



Figure 18. Wheelstops associated with tour road parking c. 2000 (left) and 2016 (right) illustrating changes that have been made to the paving and parking spaces. (Source: Liz Sargent,left, LSHLA, right)

Wheelstops. The wheelstops present in association with the tour stop parking areas in 2004 were replaced with 127 recycled rubber features in 2010 (fig. 18).

Cannon. New cannon were proposed as an interpretive aid in the 2009 Long-Range Interpretive Plan. Several cannon were added along the rehabilitated Bloody Hill trail in conjunction with the new wayside exhibits in 2012.

Grave markers. Grave markers in the Edgar Cemetery were the focus of a cleaning project in 2014.

UTILITIES



Figure 19. KAMO overhead electrical transmission lines c. 2000 (left) and 2017 (right) showing the replacement of the poles and lines. (Source: Liz Sargent, left, LSHLA, right)

Overhead electric transmission line. The KAMO overhead transmission line that extended through the park as part of a utility easement as noted in the 2004 CLR has since been replaced with a higher voltage line. The 2004 CLR noted that the line was scheduled to be removed or relocated in support of restoration of the park's historic viewshed. The proposed relocation was found to be more visually intrusive since the new alignment would have crossed the visitor center area and part of Bloody Hill. To avoid this visual intrusion, the line was instead upgraded using higher voltage lines. The wooden poles

present in 2004 were replaced with a weathering steel in the same locations by KAMO in c. 2003–2004. An archeologist conducted shovel tests for the project, which was reviewed by the Missouri State Historic Preservation Office for compliance (fig. 19).



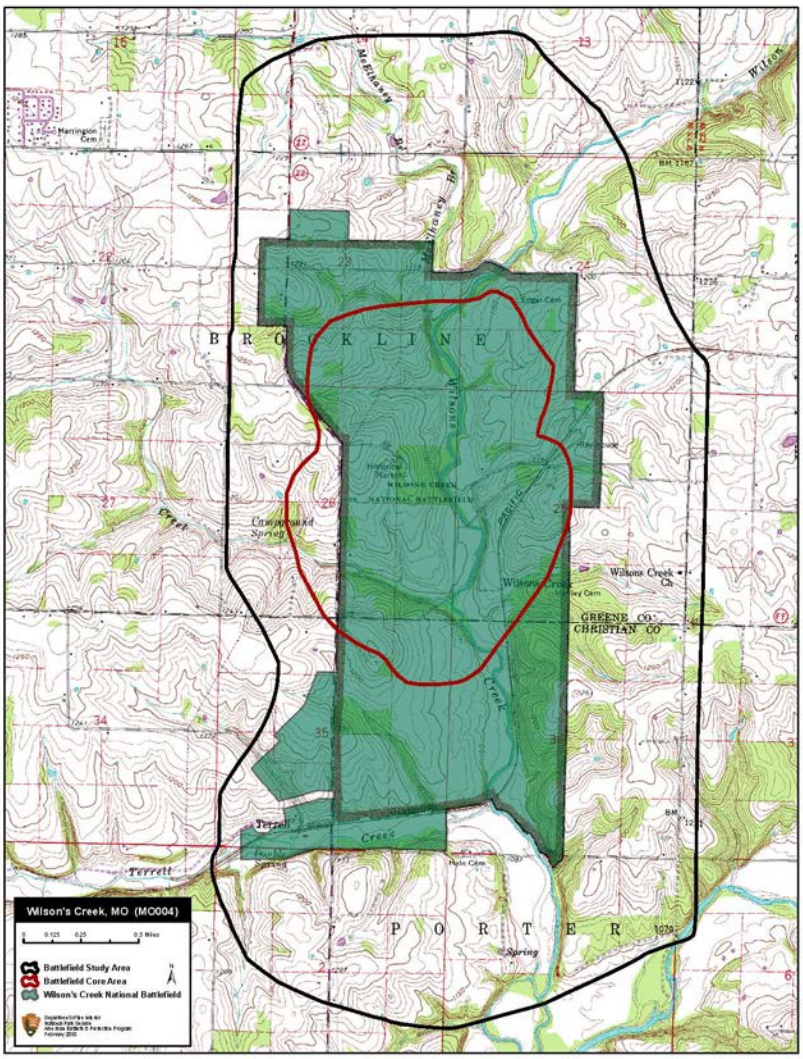
Figure 20. View across the Sharp Stubblefield from tour road stop 4. (Source: LSHLA)

Update to Chapter Four: Analysis and Evaluation

National Register of Historic Places Status

As noted in the 2004 CLR, Wilson's Creek National Battlefield was administratively listed in the National Register of Historic Places (NRHP) in 1966 based on passage of the National Historic Preservation Act (NHPA). NRHP documentation was prepared for the park in 1976, after which the nomination was signed and accepted by the Missouri State Historic Preservation Office (SHPO) and the Washington office of the NRHP. The 1976 nomination addressed the lands located within Wilson's Creek National Battlefield, which at the time extended over 1,749 acres.

Since preparation of the 1976 nomination as well as the 2004 CLR, new scholarship has emerged to indicate that the landscape area associated with the Battle of Wilson's Creek is more extensive than originally thought. A 2011 Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields identified an expanded area as eligible for listing in the NRHP. Overall, this expanded area encompasses more than 5,109 acres, as indicated in Map 12, including the area of the park as enlarged since 2004, as well as land outside current park boundaries. A large part of the eligible battlefield property falls on privately held property. The park in its entirety falls within the area indicated as eligible for listing in the NRHP.



Map 12. Map prepared in support of the 2011 Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields *for the state of Missouri. (Source: American Battlefield Protection Program)*

Civil War Sites Advisory Commission Report Update

Wilson's Creek was identified in the original 1993 Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields as a priority III battlefield. Priority III battlefields were those needing additional protection due to threats posed by development and other changes to landscape character and composition. In 2011, an update of the study was prepared for battlefields in the state of Missouri. The 2011 report suggested an expansion of the battlefield study area, which is the location where battle-related actions, such as encampment and transportation, occurred, as well as the core area, which is generally defined as where combat and other battle actions took place, based on recent scholarship. The study area was calculated to encompass approximately 5,109.74 acres, and the core area approximately 1,021. 26 acres.

Unlike the 1993 report, the updated study addressed the eligibility of battlefields for listing in the NRHP. The 2011 Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields suggests that the Wilson's Creek battlefield nomination be updated to include a boundary expansion in order to recognize the 3,300 acres of battlefield land falling outside of the National Park unit and current NRHP

documentation.[1] The 2011 study also calculated 2,968,48 acres falling within the Wilson's Creek study area that were considered to retain sufficient integrity to convey historic battle associations in support of a boundary expansion.[2]

National Register Nomination Update and Boundary Adjustment

Since 2011, the National Park Service has commissioned a NRHP nomination update to propose inclusion of the expanded boundary for the property based on the 2011 Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields.

The nomination will also consider the park's acquisition of the General Sweeny's Museum artifact and memorabilia collection and its inclusion in the park's museum collection. These

> . . . artifacts and archival records. . . represent a nationally prominent and comprehensive documentation of the Civil War in the Trans-Mississippi West.[3]

Comparative Analysis

The comparative analysis of historic and existing landscape conditions conveyed in the 2004 CLR remains current and up-to-date, including the resources identified as contributing, non-contributing, and missing. Some of the non-contributing features described in 2004 have since been replaced with other non-contributing resources. Site furnishings, and parking and picnic area features are among the non-contributing resources that have been replaced. Additionally, new wayside exhibits and cannon have been added to enhance interpretation at Bloody Hill. These also constitute non-contributing features.

1. National Park Service, *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields; State of Missouri* (Washington, D.C.: American Battlefield Protection Program, March 2011), 15.
2. National Park Service, *Update to the Civil War Sites Advisory Commission Report*, 24–25.
3. National Park Service, *Wilson's Creek National Battlefield General Management Plan Amendment / Environmental Assessment / Assessment of Effect for the Civil War Museum and Addition Lands* (July 2007), 4.

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Appendix B:

Consultation Letters and Communication

Comment Analysis Report

NPS Response to Public and Agency Comments
And
Eratta Sheets For the Public Review Draft of the
Environmental Assessment / Implementation of the Cultural Landscape Report
Wilson's Creek National Battlefield
Republic, Missouri
January 2018

PUBLIC MEETING, NOVEMBER 6, 2017: *(Public Review Period for Draft EA was October 28th to November 28th, 2017)*

Public Comment:
Two members of the public commented verbally at the public meeting. They commented that since the park intended to clear a deer buffer along the state ZZ highway, that the buffer could also be used for an equestrian trail. They pointed out that this would create a large loop that equestrian users could ride.

NPS Response:
The location of the buffer/trail would have required the construction of a trail from the Wire road north along the west boundary that connects back to the visitor center equestrian parking area. The suggestion was discussed and evaluated and was found to be difficult to implement for several reasons: first, the terrain that would have to be traversed from the Wire road north along the west boundary is very steep; and second, the slopes near Skeggs branch (Shuyler creek) are very steep and both locations would likely create additional and significant erosion problems and maintenance costs. *Therefore, no change was made to the proposed trail for the NPS Preferred Alternative in the Public Review Draft Environmental Assessment (EA).*

Public Comment from the PEPC Site:
"I would very much like to hear about ideas for managing the deer population…adding a predator? A special hunt that would certainly bring publicity to the park? It seems either one would bring press and recognition to the park. What about regular historic shooting demonstration to move deer out of the park and into the surrounding areas? It seems without hunting and gunfire the deer certainly are likely to stay."

NPS Response:
Page 33 of the Public Review Draft EA states that over abundant white-tailed deer would be reduced at the battlefield through direct lethal reduction using firearms or archery equipment. This action would be carried out by qualified federal employees or authorized agents. We have no plans to introduce predators at Wilson's Creek National Battlefield. *Therefore, no change was made to the NPS Preferred Alternative in response to this comment.)*

AGENCY REVIEW: *(Draft EA Public Review Period was from September 28th to October 28th, 2017) Emailed responses are included in the Appendix of the Final Environmental Assessment.*

Paul McKenzie/Karen Herrington, Field Supervisor, U.S. Fish and Wildlife Service

Comment:
"We have reviewed the information provided on the potential impact of management actions to federally listed species discussed on pages 49-50, 91-94, and those on pages 46-47 regarding vegetation community

management. In particular, we have reviewed the potential impact of management on the federally threatened Missouri bladderpod *(Lesquerella filiformis)*. We are in complete agreement that prescribed fire is proven to be the most effective tool in managing bladderpod but question the need to seed areas following burning with native grasses. Missouri bladderpod can have explosive responses with an abundance of flowering following prescribed fire, especially those conducted in late summer. The seeding of native grasses following burns could compete with bladderpod and reduce the seedbank for successive generations. Additionally, most bladderpod sites are characterized by thin-soiled substrates that are not particularly well suited to enable warm season grasses to become established. Lastly, it is likely that glades that are burned will have a seed bank of native species or have sufficient areas adjacent to these habitats to regenerate areas disturbed by fire. Thus, the planting of native grasses is likely not needed and could compete with bladderpod for space and growth. We are in agreement, that to the maximum extent possible, prescribed fires should be conducted at a minimum of once every five years. In conclusion, we concur with your determination that actions outlined in your report and vegetation management plan are not likely to adversely affect any federally listed species and concur that these techniques will enhance habitat for the Missouri bladderpod.

NPS Response:
Page 84, Impacts to Alternative 2, the NPS Preferred Alternative under Vegetation – Lines 29-31 should read: "Rehabilitating Savanna communities are compatible with and should be done in conjunction with establishment of riparian buffers, establishment of filter strips, and the re-establishment of critical viewsheds.
(removed: "in conjunction with rehabilitation of glades")

Page 94, Impacts to Alternative 2, the NPS Preferred Alternative under Threatened and Endangered Species – Line 3 shall have the following added after the period. "Prescribed fire is the most effective tool in managing bladderpod in the glades. Bladderpod can have explosive responses with an abundance of flowering following prescribed fire, especially those conducted in late summer. The seeding of native grasses following burns could compete with bladderpod and reduce the seedbank for successive generations. Thus, the planting of native grasses is not needed in association with the rehabilitation of the glades, removing any competition with bladderpod for space and growth."

Judith Deel, Compliance Coordinator, Missouri State Historic Preservation Office

Comment:
"The Missouri SHPO has reviewed the draft Environmental Assessment for the Cultural Landscape Report Implementation. Overall, we concur that implementation should have "no adverse effect" on Wilson's Creek National Battlefield, a property listed on the National Register of Historic Places."

"We do encourage you to be sure to take into consideration the effects of the various activities on the prehistoric archeological sites that have been identified, such as avoiding routing walking trails near or over such sites, and to assess the adequacy of the survey for prehistoric sites."

NPS Response:
The above considerations requested are addressed on page 38 of the EA in **Table 2-2 Cultural Resources: Future Monitoring Guidelines and Required Mitigation Measures.**
(No changes were made to the Public Review Draft EA.)

Elizabeth Toombs, Special Projects Officer, Cherokee Nation Tribal Historic Preservation Office

Comment:

"Please allow this letter to serve as the CN's interest in acting as a consulting party to this proposed project. The CN concurs with the Monitoring guidelines and Mitigation Measures for Cultural Resources provided in the EA, and requests that Tribal Historic Preservation Officers are also included to coordinate the protection and mitigation of cultural resources affected by the action alternative."

NPS Response:
Page 38 of the EA in **Table 2-2: Cultural Resources: Future Monitoring Guidelines and Required Mitigation Measures,** an additional bullet point shall be added stating:
"NPS will coordinate with Tribal Historic Preservation Officers to coordinate the protection and mitigation of cultural resources affected by the action alternative."

Comment:
"The action alternative expands existing trails. Thus, the CN recommends that a cultural resources survey is conducted before any ground disturbing activities."

NPS Response:
Page 38 of the EA in **Table 2-2: Cultural Resources: Future Monitoring Guidelines and Required Mitigation Measures,** bullet number three shall be expanded to say: "Prior to any soil disturbing activities, a cultural resources survey will be conducted including a thorough geophysical baseline survey of the property and adequate archeological ground truthing of the geophysical anomalies to determine their nature, integrity, and extent."

Comment:
"Also, the CN requests that the NPS halt all project activities immediately and re-contact our offices for further consultation if items of cultural significance are discovered during the course of the project."

NPS Response:
Page 38 of the EA in **Table 2-2: Cultural Resources: Future Monitoring Guidelines and Required Mitigation Measures** the following bullet point shall be added: "Upon discovery of items of cultural significance during surveys and or ground disturbing activities, NPS will halt all project activities immediately and contact both Missouri State Historical Preservation Offices and the Tribal Historic Preservation Officers.

Comment:
"The CN suggests that Indian Tribes are considered in the development of content for wayside signs to address ancestral homelands, the Trail of Tears, and involvement during the Civil War."

NPS Response:
Section 2.1.2: Alternative 2 (NPS Preferred Alternative) Description, Page 17, Lines 11-17 shall be changed to say:
"As part of an overall strategy for managing the cultural landscape, Alternative 2 (Action Alternative) recommends developing additional connections between interpretive programming and what is known about the landscape that comprised the park at the time of the battle. The strategy includes: increased vegetation management for more views; development of alternative trails; new cannon placement; additional wayside exhibit installation; development of content for wayside signs to address ancestral homeland, the Trail of Tears, and involvement during the Civil War in consultation with the Indian Tribes, and enhanced depiction of vernacular lifeways present at the time of the battle and layered with battle and troop movement information.

Gary

United States Department of the Interior

NATIONAL PARK SERVICE
Wilson's Creek National Battlefield
6424 W. Farm Road 182
Republic, Missouri 65738-9514

COPY

Sent Jane Jacobs
copies via
Fed Ex 1/31/17

January 31, 2017

Judith Deel
Missouri Department of Natural Resources
State Historic Preservation Office
PO Box 176
Jefferson City, MO 65102

Re: Environmental Assessment for Cultural Landscape Report (HPP Log Number R2877)
Wilson's Creek National Battlefield (Wilson's Creek NB)
Park Notification of Combination NEPA/Section 106 Compliance

Dear Ms. Deel:

Wilson's Creek National Battlefield is located five miles southwest of Springfield, Missouri, and three miles east of Republic, Missouri, in the southwest corner of the state. The county line between Greene and Christian counties bisects the 2,029-acre park, which includes 75% of the actual battleground. The battlefield is the site of an important battle for control of the state of Missouri during the first year of the Civil War. The park features a 4.9 mile, one-way auto tour route with interpretive stops at all the major historic points on the battlefield. The visitor center at the beginning of the tour route has interpretive displays, including an animated map depicting the sequence of the battle, a video presentation and museum exhibits. Trails and a picnic area are also available. The park is popular not only as an historic site, but for recreational uses such as hiking, biking, and running by local residents. The legislative history of the park establishes its importance as an historic site, with an abundance of natural and cultural resources. Also, it establishes the need for adequate interpretation to support the purpose established by the enacting legislation of making the site available for the enjoyment and benefit of the public. Wilson's Creek National Battlefield was automatically listed on the National Register of Historic Places as part of the National Historic Preservation Act of 1966. National Register nomination documentation was prepared by Thomas Busch of the Midwest Regional Office of the NPS in 1976. The nomination indicates the Wilson's Creek NB is a nationally significant district under Criterion A as the site of the Civil War Battle of Wilson's Creek on August 10, 1861 which had a profound impact on the course of events associated with the Civil War history of Missouri.

A National Park Service (NPS) contractor is preparing an Environmental Assessment (EA) for the purpose of satisfying the compliance requirements for the implementation of the Wilson's Creek National Battlefield Cultural Landscape Report (2004) (CLR). Cultural landscape treatment recommendations and guidelines were prepared to provide Wilson's Creek NB with a vision for the protection of the park's cultural landscape in order to sustain long-term management and interpretation. Although the CLR was not intended to duplicate the work of a Long-Range Interpretive Plan, the

connection between management of the park's cultural, natural, and historic resources and interpretation became a focus of the treatment recommendations, particularly as they addressed the objectives of the General Management Plan's preferred management alternative.

The treatment recommendations for Wilson's Creek NB provide resource protection measures for the site as well as specific guidance for individual resources. The concept for cultural landscape treatment at Wilson's Creek NB is to balance the park's requirement to protect and enhance the battlefield's commemorative and contemplative qualities with the need to establish contemporary features and activities that support the comfort, enjoyment, and safety of the public.

The EA will look at a reasonable range of alternative actions to implement the treatment recommendations in the CLR. Issues that may be addressed as part of this planning process include:

- Rehabilitation and restoration of the natural systems to support preservation of the site's cultural resources and historic integrity and respect the issue of sustainability;
- Enhancement of visual accessibility through the removal of the existing weedy thickets and densely wooded areas and rehabilitation of historic prairie and savanna plant communities;
- Reduction in the number of resident deer to a more natural density;
- Management of prescribed burning;
- Development and or realignment of trails, exhibits and interpretation;
- Management of vegetation; and
- Cultural resource management

In order to comply with the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) of 1966, as amended, an Environmental Assessment (EA) must be developed that will assess impacts of the proposed action alternatives on natural and cultural resources. In accordance with section 800.8(3)(c) of the Advisory Council on Historic Preservation's regulations (36 CFR 800), I am notifying your office in advance of the park's intention to use the EA to meet its obligations under Section 106 of the NHPA. This EA, which will contain an Assessment of Effect for all cultural resources potentially affected by the proposed alternatives, will be available for your review and comment later this year.

This letter also serves as notification that we have begun the NEPA compliance process requiring information collection of existing resources within the project area, shown on the attached USGA Quadrangle map. At this early stage, we are seeking information on any cultural resource restraint or concern that may be a possible planning issue. Extensive documentation of cultural and natural resources at Wilson's Creek NB is found in previous planning documents including the *Cultural Landscape Report* (CLR) (2004), the *General Management Plan* (GMP) (2003) and *GMP amendment* (2007), *Battlefield Archeology of Wilson's Creek National Battlefield, Missouri* (2008 Midwest Archeological Center Technical Report No. 109), and *In Search of the Gwin Farm at Wilson's Creek National Battlefield, National Park Service)* (2007 MSU Archeological Field School).

If you are aware of any cultural resource restraint, concern, or issue, please do not hesitate to contact us. We would greatly appreciate your participation to ensure that any concerns or suggestions you or your staff may have are considered and adequately addressed. At this time, we anticipate no significant cultural resource impacts associated with the project, and we look forward to receiving any guidance or comments you may have regarding the process or the project itself. Thank you for helping in this matter, and if you need any additional information or should you have any questions regarding this request, please feel free to contact Gary Sullivan at (417) 732-2662, ext. 286 or in writing at Wilson's Creek National Battlefield, 6424 West Farm Road 182, Republic, Missouri 65738-9514.

Sincerely,

Ted Hillmer
Superintendent

Enclosure

cc: Gary Sullivan, NPS-WICR
Jane Jacobs, Commonwealth Heritage Group

United States Department of the Interior
NATIONAL PARK SERVICE
Wilson's Creek National Battlefield
6424 W. Farm Road 182
Republic, Missouri 65738-9514

COPY

January 31, 2017

Amy Salveter
Field Supervisor
U.S. Fish and Wildlife Service
Columbia Ecological Services Field Office
101 Park DeVille Drive, Suite A
Columbia, Missouri 65203-0057

Re: Environmental Assessment for Implementation of the Wilson's Creek National Battlefield Park Cultural Landscape Report, (2004)(CLR)
Wilson's Creek National Battlefield (Wilson's Creek NB)
Informal Consultation with U.S. Fish and Wildlife for Threatened and Endangered Species

Dear Ms. Salveter:

Wilson's Creek National Battlefield is located five miles southwest of Springfield, Missouri, and three miles east of Republic, Missouri, in the southwest corner of the state. The county line between Greene and Christian counties bisects the 2,029-acre park, which includes 75% of the actual battleground. The battlefield is the site of an important battle for control of the state of Missouri during the first year of the Civil War. The park features a 4.9 mile, one-way auto tour route with interpretive stops at all the major historic points on the battlefield. The visitor center at the beginning of the tour route has interpretive displays, including an animated map depicting the sequence of the battle, a video presentation and museum exhibits. Trails and a picnic area are also available. The park is popular not only as an historic site, but for recreational uses such as hiking, biking, and running by local residents. The legislative history of the park establishes its importance as an historic site, with an abundance of natural and cultural resources. Also, it establishes the need for adequate interpretation to support the purpose established by the enacting legislation of making the site available for the enjoyment and benefit of the public.

A National Park Service (NPS) contractor is preparing an Environmental Assessment (EA) for the purpose of satisfying the compliance requirements for the implementation of the Wilson's Creek National Battlefield Cultural Landscape Report (2004) (CLR). Cultural landscape treatment recommendations and guidelines were prepared to provide Wilson's Creek NB with a vision for the protection of the park's cultural landscape in order to sustain long-term management and interpretation. Although the CLR was not intended to duplicate the work of a Long-Range Interpretive Plan, the connection between management of the park's cultural, natural, and historic resources and interpretation became a focus of the treatment recommendations, particularly as they addressed the objectives of the General Management Plan's preferred management alternative.

The treatment recommendations for Wilson's Creek NB provide resource protection measures for the site as well as specific guidance for individual resources. The concept for cultural landscape treatment at

Wilson's Creek NB is to balance the park's requirement to protect and enhance the battlefield's commemorative and contemplative qualities with the need to establish contemporary features and activities that support the comfort, enjoyment, and safety of the public.

The EA will look at a reasonable range of alternative actions to implement the treatment recommendations in the CLR. Issues that may be addressed as part of this planning process include:

- Rehabilitation and restoration of the natural systems to support preservation of the site's cultural resources and historic integrity and respect the issue of sustainability;
- Enhancement of visual accessibility through the removal of the existing weedy thickets and densely wooded areas and rehabilitation of historic prairie and savanna plant communities;
- Reduction in the number of resident deer to a more natural density;
- Management of prescribed burning;
- Development and or realignment of trails, exhibits and interpretation;
- Management of vegetation; and
- Cultural Resource management.

This letter serves as notification that we have begun the National Environmental Policy Act (NEPA) process and are proposing to have an Environmental Assessment (EA) available for public and regulatory review later this year. In addition, this letter serves as a record that the NPS is initiating informal consultation with your agency pursuant to Section 7 of the Endangered Species Act of 1973, that requires that a federal agency consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service on any action that may affect endangered or threatened species or candidate species or that may result in adverse modification of critical habitat. The compliance process requires we request information concerning federal and state rare, threatened, and endangered species documented or reasonably suspected within 0.5 miles of the project site, which is depicted on the attached USGS Quadrangle map. The project team reviewed the most current list of federally listed species that may occur in Greene and Christian counties which are listed below. Also the team reviewed EA compliance documents for recent projects within the park which included analysis of impacts to threatened and endangered species.

The USFWS Columbia Ecological Services Field Office website identifies the following species as potentially present in Christian and Greene counties:

Species	County	Federal Status
Gray Bat *(Myotis grisescens)*	Christian and Greene	Endangered
Indiana bat *(Myotis sodalis)*	Christian and Greene	Endangered
Northern long-eared bat *(Myotis septentrionalis)*	Christian and Greene	Threatened
Missouri bladderpod *(Physaria filiformis)*	Christian and Greene	Threatened
Running buffalo clover *(Trifolium stolonifereum)*	Christian	Endangered
Virginia sneezeweed *(Helenium virginicum)*	Christian	Threatened
Niangua darter *(Etheostoma nianguae*	Greene	Threatened / Critical Habitat
Ozark cavefish *(Amblyopsis rosae)*	Greene	Threatened
Geocarpon *(Geocarpon minimum)*	Greene	Threatened
Western prairie fringed orchid *(Platanthera praeclara)*	Greene	Threatened

Species that have been identified as present in the park and included in more recent EA compliance documents are the Missouri bladderpod *(Physaria filiformis)* and the gray bat *(Myotis grisescens)*. A large population of Missouri bladderpod resides in the park. The Bloody Hill Glade supports one of the

largest protected populations of the federally endangered plant. Population size has been monitored since 1988 and studies developed for management recommendations to restore habitat since the early 1990s. Gray bats were discovered in an inventory of cave resources initiated by the park staff in 1996. A small population (less than 50 individuals) was hibernating in a cave in the park. Proposed actions in the Fire Management Plan EA (2004) avoided prescribed fire activities in the vicinity of caves where bats hibernate and/or bear young. Also under all alternatives there was the recommendation to return to a more natural fire regime that would benefit habitat for endangered plant species. Future actions included ecosystem-level management practices in the park which would enhance habitat for threatened and endangered species.

Bald eagles are common migrants and fly over the park and occasionally perch on several trees along Wilson's Creek. The eagles typically stay one or two days each year, however, some winters they do not visit the park at all. They are no longer protected under the Federal Endangered Species Act, but remain protected under the Bald and Golden Eagle Protection Act.

We would appreciate your confirmation of the list of species to be addressed in the Environmental Assessment for the cultural landscape treatment alternatives. Also, should you know of or come across any other resource constraint that may be a possible planning issue, please do not hesitate to contact us. We anticipate no significant environmental impacts associated with the project and look forward to receiving any guidance or comments you may have regarding the process of the project. Once prepared, we will provide you with a draft of the Environmental Assessment with preliminary effects determination and proposed mitigation, if any, for your review and concurrence.

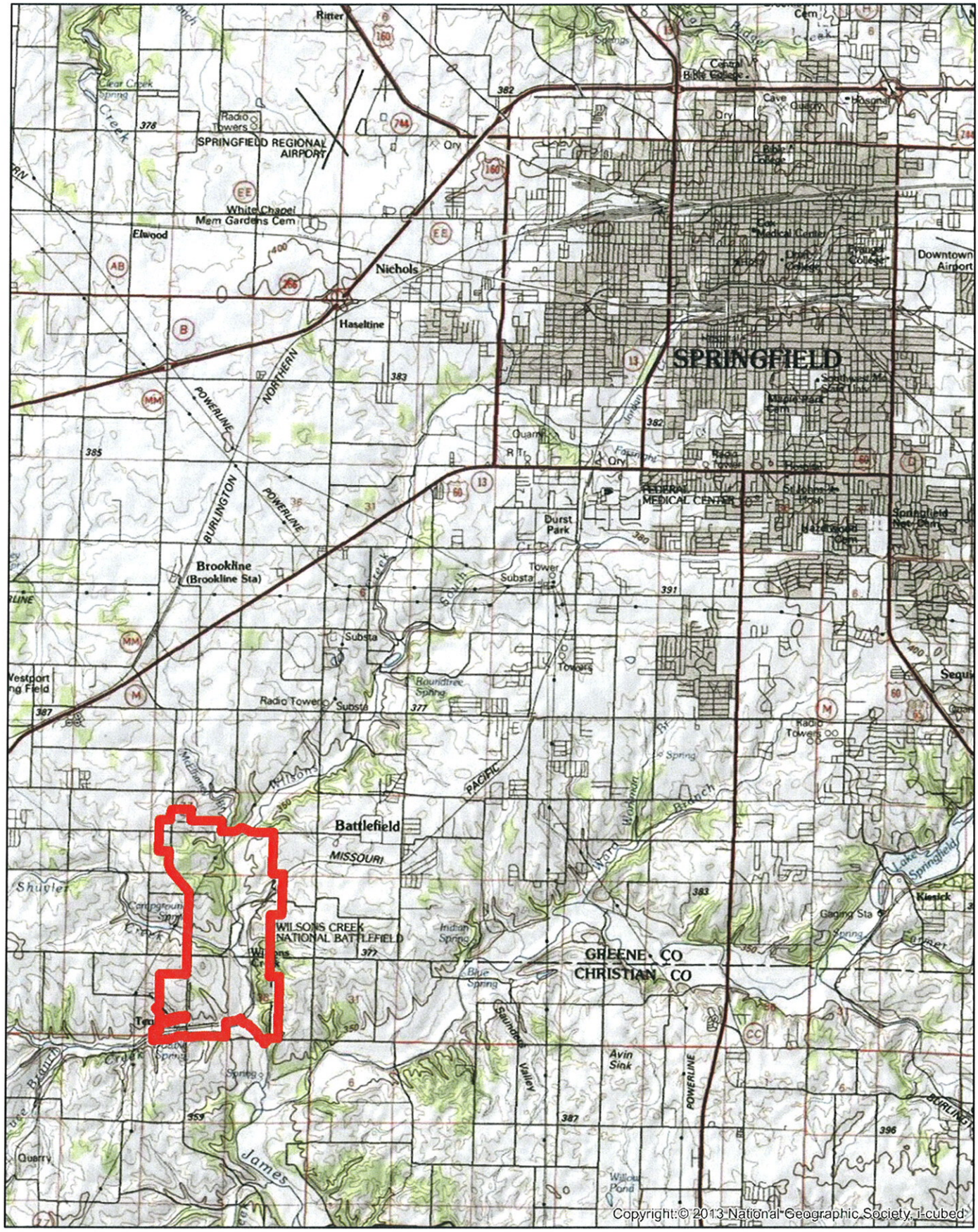
Thank you for helping in this matter, and if you need any additional information or should you have any questions regarding this request, please feel free to contact Gary Sullivan at (417) 732-2662 ext. 286 or in writing at Wilson's Creek National Battlefield, 6424 West Farm Road 182, Republic, MO 65738.

Sincerely,

Ted Hillmer
Superintendent

Enclosure

cc: Gary Sullivan, Supervisory Natural Resource Management Specialist (WICR)
Jane Jacobs, Commonwealth Heritage Group



Wilson's Creek National Battlefield Boundary 2017

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0 2,500 5,000 10,000 Feet

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CHEROKEE NATION®
P.O. Box 948 • Tahlequah, OK 74465-0948 • 918-453-5000 • cherokee.org

Office of the Chief

Bill John Baker
Principal Chief
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S. Joe Crittenden
Deputy Principal Chief
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December 11, 2017

Gary Sullivan
Wilson's Creek National Battlefield
6424 West Farm Road 182
Republic, MO 65738

Re: Wilson's Creek National Battlefield Environmental Assessment (EA)

Mr. Gary Sullivan:

The Cherokee Nation (CN) is in receipt of your correspondence about **Wilson's Creek National Battlefield Environmental Assessment (EA)**, and appreciates the opportunity to provide comment upon this project.

The CN maintains databases and records of cultural, historic, and pre-historic resources in this area. This Office's standard buffer is one mile when reviewing projects. Our Historic Preservation Office reviewed this project, cross referenced the project's legal description against our information, and found instances where this project intersects or adjoins such resources, including the CHEROKEE TRAIL OF TEARS. The Trail of Tears is a significant cultural and historic resource to the CN.

Please allow this letter to serve as the CN's interest in acting as a consulting party to this proposed project. The CN concurs with the Monitoring Guidelines and Mitigation Measures for Cultural Resources provided in the EA, and requests that Tribal Historic Preservation Officers are also included to coordinate the protection and mitigation of cultural resources affected by the action alternative.

The action alternative expands existing trails. Thus, the CN recommends that a cultural resources survey is conducted before any ground disturbing activities. Finally, the CN suggests that Indian Tribes are considered in the development of content for wayside signs to address ancestral homelands, the Trail of Tears, and involvement during the Civil War.

Also, the CN requests that the NPS halt all project activities immediately and re-contact our Offices for further consultation if items of cultural significance are discovered during the course of this project.

Additionally, the CN requests that NPS conduct appropriate inquiries with other pertinent Tribal and Historic Preservation Offices regarding historic and prehistoric resources not included in the CN databases or records.

If you require additional information or have any questions, please contact me at your convenience. Thank you for your time and attention to this matter.

Wado,



Elizabeth Toombs, Special Projects Officer
Cherokee Nation Tribal Historic Preservation Office
elizabeth-toombs@cherokee.org
918.453.5389

---------- Forwarded message ----------
From: **Langum, Connie** <connie_langum@nps.gov>
Date: Thu, Dec 7, 2017 at 8:07 AM
Subject: Fwd: Draft Environmental Assessment - Cultural Landscape Report Implementation
To: Gary Sullivan <gary_p_sullivan@nps.gov>

---------- Forwarded message ----------
From: **Deel, Judith** <judith.deel@dnr.mo.gov>
Date: Thu, Dec 7, 2017 at 6:52 AM
Subject: Draft Environmental Assessment - Cultural Landscape Report Implementation
To: "Connie_Langum@nps.gov" <Connie_Langum@nps.gov>

Connie,

The Missouri SHPO has reviewed the draft Environmental Assessment – Cultural Landscape Report Implementation. Overall, we concur that the implementation should have "no adverse effect" on Wilsons Creek National Battlefield, a property listed in the National Register of Historic Places.

We do encourage you to be sure to take into consideration the effects of the various activities on the prehistoric archaeological sites that have been identified, such as avoiding routing walking trails near or over such sites, and to assess the adequacy of the survey for prehistoric sites.

Thank you,

Judith Deel

Compliance Coordinator

State Historic Preservation Office

P.O. Box 176

Jefferson City, Missouri 65102

judith.deel@dnr.mo.gov

573/751-7862 (phone)

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--

Connie Langum
Historian, Wilson's Creek National Battlefield
(417) 732-2662 ext. 399

--

Gary Sullivan

Supervisory Natural Resource Management Specialist
Wilson's Creek National Battlefield
6424 West Farm Road 182
Republic, MO 65738

Office Phone: 417-732-2662 ext. 286
Fax: 417-732-1167
Cell Phone: 417-207-6659
email: gary_p_sullivan@nps.gov

---------- Forwarded message ----------
From: **McKenzie, Paul** <paul_mckenzie@fws.gov>
Date: Mon, Nov 27, 2017 at 3:08 PM
Subject: FWS comments on the NPS' EA for Wilson Creek National Battlefield
To: gary_p_sullivan@nps.gov
Cc: "Herrington, Karen" <karen_herrington@fws.gov>

Gary Sullivan,
National Park Service
Wilson's Creek National Battlefield
6424 W. Farm Rd. 182
Republic, Missouri 65738-9514

Gary:

This is response to the letter and Environmental Assessment (EA) for the Wilson's Creek National Battlefield's Draft Cultural Landscape Report Implementation, dated October 23, 2017, that we received from Park Superintendent Ted Hilmer, requesting input on the document and a concurrence that actions are not likely to adversely affect any federally listed threatened or endangered species.

The following comments are provided by the U.S. Fish and Wildlife Service under the authority of the National Evironmental Policy Act of 1969 (42 U.S.C. 4321-4347), and the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544).

We have reviewed the information provided on the potential impact of management actions to federally listed species discussed on pages 49-50, 91-94, and those on pages 46-47 regarding vegetation community management. In particular, we have reviewed the potential impact of management on the federally threatened Missouri bladderpod (*Physaria filiformis*).

We are in complete agreement that there is a crtical need to restore habitat for the bladderpod by removing eastern red cedar (*Juniperus virginianum*) and the control of other non-native vegetation, especially brome grasses (*Bromus* spp.), Japanese honeysuckle (*Lonicera japonica*), and other exotics.

We are also in agreement that prescribed fire is proven to be the most effective tool in managing bladderpod but question the need to seed areas following burning with native grasses. Missouri bladderpod can have explosive responses with an abundance of flowering following prescribed fire, especially those conducted in late summer. The seeding of native grasses following burns could compete with bladderpod and reduce the seedbank for successive generations. Additionally, most bladderpod sites are characterized by thin-soiled substrates that are not particularly well suited to enable warm season grasses to become established. Lastly, it is likely that glades that are burned will have a seed bank of native species or have sufficient areas adjacent to these habitats to revegetate areas disturbed by fire. Thus, the planting of native grasses is likely not needed and could compete with bladderpod for space and growth. We are in agreement, that to the maximum extent possible, prescribed fires should be conducted at a minimum of once every five years.

In conclusion, we concur with your determination that actions outlined in your report and vegetation management plan are not likely to adversely affect any federally listed species and concur that these techniques will enhance habitat for the Missouri bladderpod.

If you have any questions regarding my comments, please contact me by email or phone at 573-234-5005.

Best regards,

/ Paul McKenzie / for Karen Herrington, Field Supervisor

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