

Chapter 3 – Affected Environment

3.1 Introduction

This chapter specifically 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; and air quality. Cultural resource topics evaluated include: archeological resources; historic buildings and structures; cultural landscapes; and historic viewsheds. The remaining topics examined in detail include visitor use and experience and 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 that 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 Ozarks.¹

¹ John Milner Associates. *Wilson's Creek National Battlefield Cultural Landscape Report*. Department of the Interior, National Park Service, 2004. P 3-1 – 3-3.

Soils identified within park boundaries 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 allowed to revert to forest. The Gasconade-Roc rock outcrop complex is typically maintained in idle 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 (the land could be cropland, pastureland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods (Missouri NRCS Field Office 2000).

The following prime farmland soils and soils of statewide importance have been determined to be found at Wilson's Creek:

<i>Prime Farmland</i>	<i>Acreage</i>	<i>Erosion Hazard</i>
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		
5C Wilderness cherty silt loam	346 acres	Slight
921 Secesh-Cedargap silt loams	91 acres	Slight

² Wilson's Creek National Battlefield *Environmental Assessment* Wilson's Creek National Battlefield Fire Management Plan. Republic, Missouri: National Park Service, February 2004. p. 3-1 – 3-3.

1 About 908 acres of the park fall into the category of prime farmland or soils of state importance.
2 Most of the acreage that falls in the Peridge silt loam category is currently being farmed as hay
3 fields or other crop exhibits (Sharp cornfield and Sharp stubblefield), as is some acreage that falls
4 in the Secash-Cedargap, Wilderness, and Pembroke categories (Gibson oatfield and Ray cornfield
5 and orchard).³

6 **3.2.3 Water Resources / Floodplains**

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

13 **Wilson's Creek.** Wilson's Creek National Battlefield contains three streams, Wilson's Creek,
14 Terrell Creek, and Skegg's Branch. Wilson's Creek, which originates in Springfield, Missouri, is
15 located in Greene and Christian counties and is the main stream flowing through the park.
16 Wilson's Creek is one of the largest tributaries of the James River. Wilson's Creek has a drainage
17



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



Figure 3-2: View of Wilson's Creek from the County Road bridge. Streambed has shallow banks with more tree density in the floodplain.

³ John Milner Associates. *Wilson's Creek National Battlefield Cultural Landscape Report*. 2004. p.3-4 -3-5.

1 area above the park of 58.3 square miles and average annual flow rates generally are 90.9 cubic
2 feet per second, as measures by a gauge (07052160) near Wilson's Creek Battlefield (USGS 2010).
3 Wilson's Creek is subject to floods. Flooding has periodic, short term effects on adjacent
4 vegetation and results in erosion to the stream banks of the Creek and flooded surfaces. The
5 broad floodplain of Wilson's Creek, a narrow band bordering McElhaney Branch, and a narrow
6 zone along the lower one-third mile of Skegg's Branch are developed in alluvial sediments. A
7 narrow bank that borders either side of the floodplain of Wilson's Creek, as well as some of its
8 tributaries, including the upper reaches of Skegg's Branch, are developed in the Elsey formation.⁴

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

20 **3.2.4 Water Quality.**

21 Wilson's Creek has poor water quality and is classified as a 303(d) stream. Sampling has shown
22 water toxicity from unknown pollutants and bacteria are of an unknown source. Most likely it is
23 from non-point sources such as run-off from parking areas and roads, and from developments
24 that are not hooked to the City of Springfield sewage system. Springfield has adequate sewage
25 treatment. These pollutants probably do not get routed to the treatment system. Studies since
26 1968 have shown that effluent from the wastewater treatment facility and urban runoff during
27 storms release inorganic chemicals and nutrients into Wilson's Creek. Depleted oxygen and
28 pollutants have reduced fish and animal populations.

⁴ John Milner Associates. *Wilson's Creek National Battlefield Cultural Landscape Report*. 2004. p.3-1 – 3-6.

⁵ Ibid. p. 3-1 – 3-6.

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 in the park area. 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

At the time of the Civil War Battle of Wilson's Creek, the savanna was open range grazing for cattle, sheep and horses. This was not a pristine natural area, but one that was already impacted by human activity. Several farmsteads were present. Small fields and pasture dotted the landscape, which also still featured savanna and open mixed forest on many of the upland areas. After the Civil War, agricultural use of the land intensified with additional fields plowed and grazed. In addition, as agriculture expanded in the late 1800s and early 1900s, suppression of fire increased. The result of fire suppression was a gradual succession of old fields to early successional forest, made up of fast-growing pioneer tree species and of woodlands, to thick, second-growth, mature forests, made up of climax species able to grow in dense shade conditions.⁷

Currently, the vegetation of WICR is about half open grassland and shrub land and half woodland and forest, about 90 percent of the latter is deciduous. Communities are predominantly disturbed, and grasslands are mostly dominated or co-dominated by non-native or weedy grasses and early successional vines and shrubs. Likewise, woodlands and forests generally contain early successional trees among the dominants. Small, open glades support unique plant communities, and prairie restoration efforts have helped establish native warm-season grasses in some areas. The *Natural Resource Condition Assessment* (2011), based on evaluation of data collected by the Heartland Network and from other sources, found the park in overall moderate/poor condition, and the vegetation in poor condition overall.

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

⁷ *Ibid.* P 11.

Ten community types and three other covertypes—Developed Land, Water, and Crops—were mapped in the “Vegetation Classification and Mapping of Wilson’s Creek National Battlefield, 2013.” Of the 1,975 acres (799 hectares) that were addressed by the study, most of the area (93 percent) is in semi-natural vegetation as opposed to developed. Of the semi-natural area, about half (911.7 acres, 369 ha or 46 percent) is open, half is woodland or forest (875 acres, 354 ha or 44.3 percent) and only 48 acres (19.4 ha, or 2.5 percent), is shrubland. Upland Deciduous Woodland and Forest covers 595 acres (240.8 ha or 30.1 percent) of the park, whereas Non-native Ruderal Grassland covers 462 acres (187 ha, or 23.3 percent) of the park. Open glades cover only 10.6 acres (4.3 ha) but are considered among the most important natural features of the park. Different attempts to restore native grasses have been made over the past four or more decades, resulting in a great diversity of grassland types in the modern landscape. Only a minority, 48.7 acres (19.7 ha or 5.3 percent) of the herbaceous vegetation, is considered Restored Tallgrass Prairie based on current conditions.⁸

In all communities, interspersed among native plants are non-native, invasive species that continue to compete with native species for land and resources. Exotic species of particular concern within the park include non-native bromes (e.g., soft chess, downy brome, and barren brome), Johnsongrass (*Sorghum halipense*), multiflora rose (*Rosa multiflora*), musk thistle (*Carduus nutans*), and Chinese bushclover (*Sericea lespedeza*). Invasive trees of concern include Osage orange (*Maclura pomifera*), and honey locust (*Gleditsia triacanthos*). Non- native plants currently inhabit dense patches on about 500 acres of parkland.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 have also been identified in grasslands. Glades are defined as openings in woodland that range between 0.20 ha to 607.00 ha in size, are treeless, and occur on bedrock openings that can contain up to 400 vascular plant species. Glades are often associated with savanna and are typically found on south and west aspects of hillsides. Drought

⁸ Diamond, David D., 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. p.22–62.

⁹ Ibid. p.22–62.

1 and fire tolerant plant species inhabit glades. Some glade plants grow only during the winter and
2 spring when water is abundant and temperatures are lower.¹⁰

3 Once nearly treeless, the remnant glade communities at Wilson's Creek National Battlefield are
4 now threatened by a proliferation of Eastern red cedar (*Juniperus virginiana*). Left unmanaged,
5 cedars encroach in glades thereby decreasing space for herbaceous cover and eventually
6 dominate the canopy, decreasing species richness and diversity (Amelon 1991; Jenkins et. al.
7 1997). The cedars shade out native species, cool the substrate below, deplete available water, and
8 alter soil chemistry. This change in light availability and cooling effect changes the mass-heat
9 relationships of the exposed bedrock on which native glade plant and lichen species are
10 dependent. The shaded conditions have allowed for a proliferation of invasive Asian annual
11 grasses such as Japanese chess (*Bromus japonicus*), which in addition to the cedars, will require
12 management to control. Although scarcely resembling their former extent or character, the glades
13 still retain a number of lichens and herbaceous plant species requiring conservation and should
14 be classified as significant natural features to be protected.

15 Both alternatives encompass the glade plant communities within Wilson's Creek National
16 Battlefield and surrounding plant communities. These areas contain relatively high-quality glade
17 remnants where Missouri bladderpod (*Lesquerella filiformis*) exists or has the potential to exist.
18 These glades include: Bloody Hill (6.45 ah); Manley (12.1 ha); North Bloody Hill (7.4 ha); Terrell
19 Creek (1.1 ha); Walnut (2.5 ha); Wire Road (10.2 ha); and York (0.2 ha).¹¹

20 **3.2.6 Wildlife**

21 Fauna associated with the park is typical of old fields and disturbed woodlands and forests in the
22 eastern Ozark Highlands. "A report currently being published has recorded 115 bird species on
23 the Battlefield, 97 are considered breeding species."¹² The most common and widely distributed
24 species was the Indigo bunting (*Passerina cyanea*). The Northern cardinal (*Cardinalis cardinalis*)
25 and blue-gray gnatcatcher (*Polioptila caerulea*) occurred frequently as well. Partners in Flight, a
26 coalition of agencies and individuals whose mission is to conserve North America's declining bird
27 populations, classify ten species found at the park as species of continental importance. Two

¹⁰ *Vegetation Management Implementation Plan*. Republic, Missouri: National Park Service, April 2014. p.11–14.

¹¹ *Vegetation Management Implementation Plan*. Republic, Missouri: National Park Service, April 2014. p.11 – 14.

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

grassland obligate species were recorded—the dickcissel (*Spiza americana*) and the Eastern meadowlark (*Sturnella magna*) (NPS 2010 NR Condition Assessment). Other species include: the red-tailed hawk (*Buteo jamaicensis*); great blue heron (*Ardea Herodias*); and the killdeer plover (*Charadrius vociferous*). In addition, the common crow, vulture, and various ducks and geese have been observed.

An inventory of the presence/absence of mammals at Wilson’s Creek National Battlefield was conducted in June 2004. An initial expected species list suggested thirty-seven terrestrial species as present or probably present at the park. A cross section of the mammals present in the park include: white-tailed deer, cottontail rabbits, squirrels, coyote, red and grey fox, raccoons, bobcats, skunks, opossums, woodchucks, muskrats, beavers, field mice, moles, voles, and gophers. A complete and ongoing species list of amphibians, reptiles, birds, fish, mammals, plants and more can be found on the website of NPS Heartland I&M Network.

(<http://science.nature.nps.gov/im/units/htln/parks/wicr.cfm>)

3.2.7 White-tailed Deer

Since European settlement, white-tailed deer (*Odocoileus virginianus*) 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 rarely available for hunting. Therefore, deer experience high rates of population growth as long as food is available in these small blocks of patchy habitat. 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 (NPS Heartland I&M Monitoring website).

Due to increased development, altered ecosystems, and concerns over visitor safety at Wilson’s Creek National Battlefield, Heartland Inventory and Monitoring (I&M Network) has continually monitored deer population at Wilson’s Creek National Battlefield since 2005. Using an index of deer density, they are able to identify annual changes in the deer population. 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. 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 12-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.

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 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). The Missouri bladderpod (*Lesquerella filiformis*) exists adjacent to the project area and is listed as threatened by both the federal and state governments. In addition, the USFWS included Virginia sneezeweed (*Helenium virginicum*) in the list of federally-threatened species.

The state of Missouri considers five additional plants at the park to be imperiled or critically imperiled, including green thread (*Thelesperma filifolium* var. *filifolium*), buffalograss (*Buchloe dactyloides*), blue gramma grass (*Bouteloua gracilis*), royal catchfly (*Silene regia*), and false gaura (*Stenosiphon linifolius*) (Missouri Department of Conservation 2000). Except for royal catchfly and false gaura, these plants are found on or adjacent to limestone glades. Royal catchfly inhabits transition zones in savanna habitat between open fields and woodlands. False gaura occurs along the tour-road loop near the southern bridge over Wilson's Creek and may have been brought into the park as part of a wildflower seed mix.¹³

The USFWS also lists the federal and state endangered gray bat (*Myotis grisescens*), observed in McElhaney Branch cave near Wilson's Creek east of the Visitor Center. Gray bats have a limited geographic range in the southeastern United States where they generally inhabit pits and caves in limestone karst regions characterized by sinks, ridges, and caverns (USFWS 2017). The gray bat

¹³ 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. April 2014. p. 29–34.

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*); the Northern long-eared bat (*Myotis septentrionalis*); the Ozark cavefish *Amblyopsis rosae*; and the grotto salamander (*Typhlotriton spelaeus*), a species of concern to the state, documented in McElhaney Branch cave.

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

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 such low abundance years are often of concern to resource managers, winter annuals such as Missouri bladderpod are well adapted to the harsh conditions and shallow unproductive soils of glades.

Point estimates for the Missouri bladderpod population in Manley Woods Glade (MWG) 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 2007.¹⁴

Bald eagle. Bald eagles are common migrants and winter residents throughout the state 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 occasionally perch on several 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.¹⁵

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. April 2014. p.29–34.

¹⁵ Mangi Environmental Group. *Environmental Assessment, Wilson's Creek National Battlefield Fire Management Plan*. National Park Service. December 2004. p.3-7–3-9.

3.2.9 Air Quality

Air quality is an important environmental issue facing most national parks. Data collected through the NPS air quality programs show 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 park system through visibility reduction, biological and human health effects, and degradation of historic structures and artifacts.¹⁶

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

Wilson's Creek National Battlefield contains a substantial number of known archeological resources that significantly contribute to the integrity of the cultural landscape. For the purposes

¹⁶ Annis, Gust M., 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. p.39–40.

of the EA, archeological resources will be broadly defined to include not only all subsurface artifacts and features but also above ground features such as architectural ruins, milldams and races, cemeteries, and road systems, that are integral to interpreting both specific sites and the larger park landscape.

Generally, all known historic archeological sites within Wilson's Creek National Battlefield fall into three broad categories: house or home sites; formal cemeteries or informal burial sites; and industrial sites such as mill complexes, quarries, and corporate towns. All of these archeological sites retain integrity in the areas of location, setting and association. Each of the properties, whether house site, cemetery, or mill ruin, was located within the larger battlefield landscape, and continues to maintain significant relationships with other adjacent features such as views, road systems and fence lines.

The number of known archeological sites and the 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 to re-establish a feeling for the 1861 period of significance. A majority of known archeological resources serves to place the park visitor where events related to the period of significance 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.¹⁷

3.3.2 Historic Buildings, Structures, 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 with associations to the commemorative period landscape of Bloody Hill. Little or nothing is known about buildings or structures that may have existed within the Wilson's Creek landscape prior to early settlement of the region by individuals of European descent.

During the early European-American settlement period of the 1830s and 1840s, several homesteads were established within the park landscape, only one of which—the Ray house—survives. The majority of these were residences and associated outbuildings that related to

¹⁷ John Milner Associates. *Wilson's Creek National Battlefield Cultural Landscape Report*. 2004. p.3-71–3-72.

1 agricultural use of the land. The homesteads that are thought to have included buildings by the
2 Civil War period include: the Ray, C.B. Manley, Sharp, Edwards, Gwinn, Gibson, Short, T.B.
3 Manley, and Edgar family properties. Industrial uses were also represented during this period in
4 the Gibson property which included a millrace, mill, and wool carding factory by the Civil War.
5 Little is known about the character of the Gibson house, mill or wool carding factory, the C.B.
6 Manley or T.B. Manley houses, the Short house, or the Sharp house and outbuildings, none of
7 which survive.

8 The Ray house, constructed in 1852, has been continuously occupied since the 1850s. It has been
9 altered since the Civil War by subsequent residents to accommodate evolving needs. The Ray
10 springhouse structure is also considered to survive from the Civil War period. A third structure
11 thought to survive from the Civil War period, although not in its current location, is the wooden
12 Edwards cabin.

13 The McElhaney farm complex is the only surviving example of the development that
14 characterized the period between 1905 and 1928. The primary features of the complex were built
15 in 1911 and has been little altered since its construction. Structures built during this period that
16 survive include the Wire (County Road) bridge over Wilson's Creek (1910).

17 The remaining buildings and structures currently located within Wilson's Creek National
18 Battlefield are associated with mid-to late-twentieth-century park development.

19 The Lyon marker established in 1928 survives from the commemorative period. It replaced a
20 rock cairn dating from the 1860s that was slowly lost to visitors who removed the stones.¹⁸



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



Figure 3-4: Edwards cabin survives from the Civil War period but not in its original location.

¹⁸ John Milner Associates. *Wilson's Creek National Battlefield Cultural Landscape Report*. 2004. p.3-39–3-43.

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 in 1966 based on passage of the National Historic Preservation Act. National Register documentation was prepared for the park in 1976, and the nomination accepted by the Missouri State Historic Preservation Office and the Washington office of the National Register.

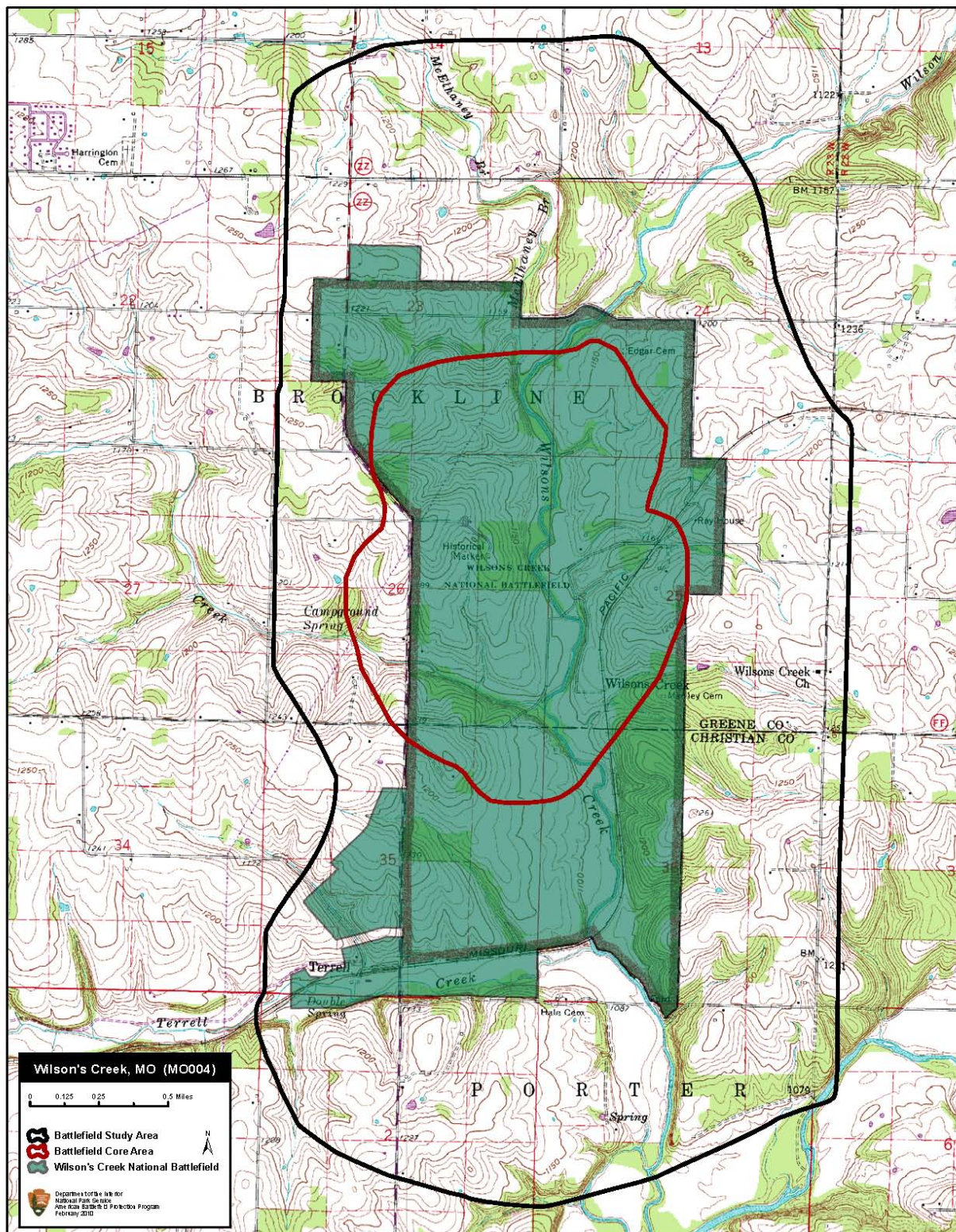
Since preparation of the 1976 nomination, as well as the CLR (2004), new scholarship has suggested that the extent of the battlefield was greater than indicated in the nomination. Specifically, the *Update to the Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields* (2011) identified both a larger study area, as well as an expanded area that was identified as eligible for listing in the National Register of Historic Places. The 1976 nomination focused on the Wilson's Creek National Battlefield property, which at the time extended over 1,749 acres. The area indicated as eligible for listing in 2011 extends over more than 5,109 acres, as indicated in Figure 3-5. A large part of the eligible battlefield occurs on privately held property. Wilson's Creek National Battlefield, including lands acquired since 2004, is encompassed within the study area and National Register-eligible boundary.

Civil War Sites Advisory Commission Report Update

Wilson's Creek was identified in the original *Civil War Sites Advisory Commission Report on the Nation's Civil War Battlefields* completed in 1993 study as a priority III battlefield requiring additional protection. An update to the report prepared in 2011 suggests that Wilson's Creek, which is one of seven Missouri battlefields already listed in the National Register of Historic Places, should be considered for a National Register nomination boundary expansion to recognize the 3,300 acres of historic land that fall outside of the National Park Service unit and are not within the current documentation.¹⁹ The study area was indicated as 5,109.74 acres, the core area at 1,021.26 acres, and the potential National Register boundary as the same 5,109.74 acres associated with the study area. Of these, 1,749.91 are indicted as already listed.²⁰ The study

¹⁹ 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), p.15.

²⁰ National Park Service, *Update Report*, p.21.



Map 3-1: ABPP map for 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).

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, that was the ideal position to allow the battery to have 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 that have been sited to take advantage of expansive views across the battlefield toward important landscape features. None of the views currently afforded within the park sufficiently approximates the views available during the Civil War and commemorative periods.²³

²¹ National Park Service, Update Report, p. 24–25.

²² National Park Service, Update Report, p.24–25.

²³ John Milner Associates. *Wilson's Creek National Battlefield Cultural Landscape Report*. 2004. p.3–68.

3.4 Visitor Use and Experience

Affected Environment: The actions described in the alternatives are within Wilson's Creek National Battlefield, which is located five miles southwest of Springfield, Missouri, and three miles east of Republic, Missouri, in the southwest corner of the state. The county line between Greene and Christian Counties bisects the park, which includes 75 percent of the actual battleground. Wilson's Creek National Battlefield provides visitors with an array of opportunities and experiences that enhances their understanding of the significance of the site and its role in the Civil war west of the Mississippi River. At the visitor center, battle-related exhibits, a 30-minute video, and a fiber-optics map provide historical context and give visitors a sense of the physical dimensions of the battle. A 12,000 volume Civil War library is available to the public and exhibits are under development to display the Nation's premier collection of Trans-Mississippi Civil war artifacts in the visitor center. The park also maintains partnerships with local municipal and county governments, the Springfield/Greene County library, and other Civil War related sites, such as Pea Ridge, Fort Scott, and Newtonia.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 and approximately half of the visitors are repeats. 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 loop;
- Viewing exhibits at the visitor center;
- Viewing the battle map;

²⁴ 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. April 2014. p.42–46.

- 1 • Viewing the film; and
- 2 • Shopping in the museum bookstore.

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

9 **Visitor Experience and Interpretation.** Many visitors to Wilson's Creek National battlefield
10 begin their visit at the visitor center located at the park entrance just inside the northwest corner
11 of the park. At the visitor center, visitors can receive an orientation to the park, talk with a Park
12 Ranger, buy materials at the cooperating association sales area, and view exhibits about the battle.
13 A 30-minute video presents the battle's historical background. In addition, a 6-minute program
14 conducted on fiber-optically-lighted map illustrates the course of the battle. The visitor center is
15 accessible by wheelchair from the parking area.



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



Figure 3-6: The picnic area for visitors is located south of the visitor center.

16
17 An excellent Civil War research library located in the visitor center is open to visitors and
18 researchers on an advanced reservation basis.

19 Living history programs depicting Civil War soldier life are presented on weekends during the
20 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 loop, 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 seven-mile trail system is available for horseback riding and hiking from the tour road.



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

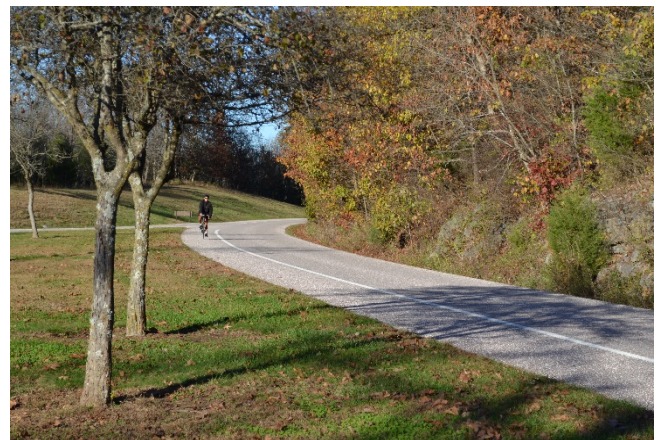


Figure 3-8: Cyclists use designated lanes along the tour road within the park.

Although highways and roads surround all sides of the park, traffic noise in most places is typically unobtrusive. However, traffic noise at Bloody Hill, adjacent to County Road ZZ is audible. The 4.9-mile paved tour-road loop, with eight interpretive stops at significant battle points, provides a self-guided automobile tour of the battlefield. The tour road 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 specific lane designated for bicycle use that is also used by pedestrians.

In addition to the tour road, there are five walking trails (varying in length from one-quarter to three-quarters of a mile) that are accessible to visitors from the tour road and provide access to additional sites related to the battle. For example, one trail leads to the Ray house, which is a historic house on the northeastern corner of the park that was built before the battle. The Ray

house served as a temporary field hospital for Confederate soldiers following the battle and the body of Gen. Nathaniel Lyon was taken here after he was killed in battle. The bed on which the general's body was placed remains on exhibit in one of the 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 off the tour-road loop are both primitive and not designed for wheelchair use, or were constructed in past years and do not meet current universal accessibility compliance guidelines. (i.e. the Ray house and Bloody Hill)

3.5 Human Health and Safety

Numerous conditions at the park require continual attention by management personnel to ensure the safety of visitors. Park personnel are vigilant about visitor safety issues such as the potential for severe summer weather—heat and humidity, hailstorms, and tornadoes, 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



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 health and safety of visitors.

- 1 personnel also monitors and maintains the park's signage that clarifies to visitors where there is
- 2 separation of equestrian use and pedestrian use.
- 3 Vegetation management strategies in the park, such as the use of prescribed fire, can be extremely
- 4 hazardous and life-threatening to humans. Park personnel and a variety of other agencies
- 5 associated with fire management plans work to ensure the safety of the public during such
- 6 management action. Current federal fire management policies emphasize that firefighter and
- 7 public safety is the first priority.
- 8 The large deer population within and surrounding the park is a concern to park personnel due to
- 9 the safety hazard for visitors driving on Farm Road 182 and on Highway ZZ as well as on the
- 10 internal tour road of the park. Heartland I&M Network continues to monitor density of the deer
- 11 population within the park.

