

## Affected Environment

### Introduction

This section describes the resources or conditions potentially impacted by the treatment alternatives. It is organized by impact topics that were derived from potential issues identified during internal park and external public scoping. More detailed information on park resources may be found in the GMP/EIS and the Draft Pea Ridge National Military Park Vegetation Management Plan and Environmental Assessment.<sup>3.108</sup>

### Natural Systems and Features

The natural systems of Pea Ridge NMP include streams, mountains and cliffs, and the local plant and animal communities. Pea Ridge National Military Park is situated in rolling hills at the foothills of the Ozark Mountains and dissected by several streams and drainages. Elkhorn Mountain is the highest point within the park (1,610 feet) with the remainder elevated on a high plateau. The park consists of forests interspersed with fields.

The natural systems influenced the settlement and development of the area, and influenced the Battle of Pea Ridge by creating natural barriers and obstructions around which the armies had to negotiate.

### Climate

The climate is primarily continental, but has a maritime influence from the Gulf of Mexico. The summers are warm, accompanied by high humidity. The winters are mild, but freezing temperatures occur in mid-winter. Precipitation averages nearly forty-five inches per year. Winters average eight to nine inches

of snow per year. Spring is the wet season and May is the wettest month.<sup>3.109</sup>

### Geology

Pea Ridge NMP is on the Springfield Plateau, part of the Ozark Highlands. The rock in the area is sandstone and limestone laid down in inland seas that existed in the area over two million years ago.<sup>3.110</sup> Tectonic activity uplifted the sedimentary layers creating the Ozark Highlands. This uplift and its subsequent erosion and weathering have produced the present topography.<sup>3.111</sup>

### Soils

The soils within the Park vary with the terrain. In general, Tonti soils are found on ridges, terraces, and stream terraces; Nixa soils occur on ridge tops; and Noark and Clarksville soils are located on steep hill slopes. Secesh and Elseh soils occur on floodplains.<sup>3.112</sup>

### Hydrology

Intermittent streams dissect the terrain. These include Winton Spring Run, Pratt Creek, Little Sugar Creek, Williams Hollow, and Lee Creek. Winton Spring feeds Winton Spring Run, a drainage through the south end of the Park. Little Sugar Creek is the only perennial stream, which runs adjacent to the Federal Trenches. The 100-year flood level of Little Sugar Creek extends into this area.<sup>3.113</sup> All of these bodies of water originate within the park boundaries with the exception of Little Sugar Creek.

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3.108 NPS 2006. NPS 2013. Draft Pea Ridge National Military Park Vegetation Management Plan and Environmental Assessment. In preparation.

3.109 Pea Ridge NMP, Resources Management Plan, 4.

3.110 Pea Ridge NMP, Resources Management Plan, 5.

3.111 Pea Ridge NMP, Resources Management Plan, 6.

3.112 Soil Conservation Service, 1977.

3.113 FEMA. Pea Ridge NMP, Resources Management Plan, 6.

## Fauna

Species are typical of northwest Arkansas. Species surveys have found ninety-two bird, forty-six mammal, eighty-six fish, twenty-seven amphibian, and fifty reptile species. Common park wildlife includes white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), several small mammals—gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), and eastern chipmunk (*Tamias striatus*)—as well as numerous migratory songbirds. Scarlet tanagers (*Piranga olivacea*), summer tanagers (*Piranga rubra*), rosebreasted grosbeaks (*Pheucticus ludovicianus*), ovenbirds (*Seiurus aurocapillus*), and various woodland warblers (*Phylloscopus* spp.) are among the bird species that visit the park in the spring and summer to nest and breed. The endangered gray bat (*Myotis grisescens*) is the only federally listed animal species that has been observed within the boundaries of Pea Ridge, though there are no resident populations within the park.<sup>3.114</sup>

The most visible fauna within the park are the numerous white-tail deer. These animals may pose a threat to resources by over browsing in certain vegetation communities and changing species composition.

## Flora

Pea Ridge NMP is rich in natural resources and contains diverse ecosystems and habitats that support a variety of species, including several rare plants: field pussytoes (*Antennaria neglecta*), lobed spleenwort (*Asplenium pinnatifidum*), and Ozark chinquapin (*Castanea pumila ozarkensis*), and the federally listed endangered gray bat.<sup>3.115</sup> Invasive non-native species include *Sericea lespedeza* and Japanese honeysuckle, which

are a threat to native habitats due to their ability to colonize and overrun ecosystems.

## Cultural Resources

Cultural landscapes, archeological sites, and historic structures and objects associated with the park are described in detail in Chapter 2 and previous sections of Chapter 3 of this report.

## Vegetation

The general historic and ecological contexts of the park, including vegetation types, were described in the previous sections of this report. This section provides information on existing vegetation communities in the park. The existing vegetation communities described in this section have been taken from the draft Vegetation Management Plan<sup>3.116</sup> and are summarized for brevity where appropriate. When different from the vegetation community, the cultural landscape vegetation type is provided in parentheses.

**Mowed Grasses.** Fescue and other pasture grasses were planted since the 1862 battle and have been maintained by the park by mowing.<sup>3.117</sup> Areas with mowed grasses include portions of the 1862 historical crop fields, pasturelands, wood lot, and peach orchard.

**Typical Upland Deciduous Woodland and Forest** (Arkansas Highlands Forest and Open Woodlands). The most prevalent vegetation association within the park is woodlands and forests dominated by black oak (*Quercus velutina*), other oaks (*Quercus* spp.), and mockernut hickory (*Carya alba*). These occur

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3.116 NPS 2013. Draft Pea Ridge National Military Park Vegetation Management Plan and Environmental Assessment. In preparation.

3.117 Diamond, D., L. Elliott, M. DeBacker, K. James, and D. Pursell. 2013. Vegetation Classification and Mapping of Pea Ridge National Military Park – Project Report. NPS/PERI/NRR-2013/649. National Park Service, Fort Collins, CO. April.

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3.114 Civil War National Parks: The Battles for Missouri. State of the Parks. National Parks Conservation Association, June 2009, 50.

3.115 NPS, State of the Parks, 2009, 33.

mostly on the northern and eastern ends of the park with scattered stands throughout the park.<sup>3.118</sup> Hardwood forests are composed of either even-age growth or two age classes. The density of the trees ranges from open woodland to closed canopy forests. Native shrubs such as coralberry (*Symphoricarpos orbiculatus*) and flowering dogwood (*Cornus florida*) and small trees dominate the understory, with an often sparse herbaceous layer.<sup>3.119</sup>

**Dry Deciduous Woodland and Forest** (Arkansas Highlands Forest). Dry woodlands and forests dominated by post oak (*Quercus marilandica*), other oaks, and black hickory (*Carya texana*) cover the top and slopes of Elkhorn Mountain, except where previously disturbed. On the ridgetop and other elevated portions, this association consists of open woodlands with a grassy understory of Virginia wildrye (*Elymus virginiana*). The tree canopy is more closed on the mountain slopes with fewer herbaceous species in the understory.<sup>3.120</sup> Hardwood forests are composed of even-age growth or two age classes.

**Bottomland Deciduous Woodland and Forest** (Arkansas Highlands Forest and Open Woodlands). Bottomland Deciduous Woodlands and Forest occurs along Lee Creek and other small creeks within the project area. Relatively early successional species such as black walnut (*Juglans nigra*) dominate these woods with an understory of coralberry and the nonnative multiflora rose (*Rosa multiflora*). Wetlands may also occur within these woods around streams.<sup>3.121</sup>

**Eastern Red Cedar Woodland and Forest.** Eastern red cedar is a common pioneer species that invades old crop fields and other open areas. This native conifer is shade intolerant as a seedling and tends to die out when densely shaded by overstory species.<sup>3.122</sup> Natural regeneration occurs in poor hardwood or pine sites or open pastures.<sup>3.123</sup> Pastures or open grasslands that are not burned provide an optimal growth medium for eastern red cedar because they are highly susceptible to burning.<sup>3.124</sup> Periodic mowing also prevents the establishment of eastern red cedar. Eastern red cedar forms dense stands with little diversity and little herbaceous overgrowth; although other deciduous trees such as American elm (*Ulmus americana*) and common hackberry (*Celtis occidentalis*) also grow in these woods and may eventually replace the eastern red cedar.<sup>3.125</sup>

**Ruderal Grassland and Shrubland.** In previously disturbed croplands that have not been mowed or burned frequently, grasslands with a mixture of shrubs and small trees have developed. Common small woody species include Pennsylvania blackberry (*Rubus pensilvanicus*) and coralberry, and common herbaceous species include tall fescue (*Schenodonius phoenix*) and a variety of other grasses and forbs. Most of the areas that are currently Ruderal Grassland and Shrubland were oak and hickory woodlands in 1862.<sup>3.126</sup>

3.118 Diamond, D., L. Elliott, M. DeBacker, K. James, and D. Pursell. 2013. Vegetation Classification and Mapping of Pea Ridge National Military Park – Project Report. NPS/PERI/NRR-2013/649. National Park Service, Fort Collins, CO. April.  
3.119 Ibid.  
3.120 Ibid.  
3.121 Ibid.

3.122 Anderson, Michelle D. 2003. Juniperus virginiana. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available at: <http://www.fs.fed.us/database/feis/>. Last updated: May 31, 2013.  
3.123 Ibid.  
3.124 Lawson, E. 2013. Juniperus virginiana L. Eastern Redcedar. Available at: [http://www.na.fs.fed.us/pubs/silvics\\_manual/Volume\\_1/juniperus/virginiana.htm](http://www.na.fs.fed.us/pubs/silvics_manual/Volume_1/juniperus/virginiana.htm).  
3.125 Diamond et al. 2013.  
3.126 Bearss, The Battle of Pea Ridge. 1862.

**Restored Prairie.** At the time of the 1862 battle, an area called the Round Prairie existed in an extinct Pleistocene lake bed at the western end of the park. Over time, the prairie degraded and in 1975, efforts were taken to restore the prairie by planting native tallgrass species including big bluestem (*Andropogon gerardi*) and little bluestem (*Schizachyrium scoparium*).<sup>3.127</sup> Currently, big bluestem and little bluestem are the dominant species in the grasslands along with other typical tallgrass species, although nonnative grasses such as Kentucky bluegrass (*Poa pratensis*) are also present.

**Orchards.** In 2009, park staff reestablished the two orchards present in 1862, with the help of local civic organizations. The orchard near Elkhorn Tavern was planted with approximately 38 apple trees. The other orchard, which is adjacent to Ford Road, near Ford Cemetery on the historic Ford Farm, was planted with approximately 200 peach trees (approximately one-third of the historic orchard). The remainder of the area of the historic orchards contains fescue grasses.

**Marsh.** A cattail (*Typha latifolia*) marsh occurs in a small ponded area in the southwestern part of the park. This marsh was originally created as a pond in the 1940s. This wetland is dominated by herbaceous species with a few scattered trees including silver maple (*Acer saccharinum*) and common persimmon (*Diospyros virginiana*).

**Silver Maple Forest.** A forest dominated by young silver maples is present in a poorly drained area on the northwestern boundary of the park. These trees grow on disturbed moist soils along with other trees such as American elm. Based on the species described in Vegetation Classification and Mapping

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3.127 Dale, Edward Jr. 1976. Reestablishment of Native Prairie at Pea Ridge National Military Park, Benton County, Arkansas – Final report for 1976 to Southwest Region National Park Service.

of Pea Ridge National Military Park, this vegetation association may contain wetland species.<sup>3.128</sup>

**Glade.** Glades are open areas in forests that are underlain by limestone, sandstone, or other bedrock that contain an uncommon assemblage of native wildflowers, potentially including rare plants.<sup>3.129</sup> A survey conducted in 2012, by Dr. Steven Stephenson of the University of Arkansas, Department of Biological Sciences in Fayetteville identified three glade-like areas within the park. These areas are associated with old eastern red cedar trees and contain prickly pear cactus (*Opuntia humifusa*) and other forbs typically found in glades. No rare plants were found during the survey.<sup>3.130</sup>

**Historic Trees.** Trees more than 150 years old that were alive at the time of the battle have been designated as historic trees. Twelve post oaks (*Quercus stellata*) and three white oaks (*Quercus alba*) have been found that were alive at the time of the battle, ranging in age from about two years to 262 years old at the time of the battle in 1862. These trees are located along the ridge and southern slope of Elkhorn Mountain and around Leetown Hamlet.

**Invasive and Exotic Species.** Invasive nonnative species dominate portions of nearly all open fields, prairie areas, and road corridors in the park. A vascular inventory in 2009, identified eighty-three nonnative vascular plants within the park.<sup>3.131</sup> The

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3.128 Diamond et al. 2013.

3.129 Dale. 1983.

3.130 Hinterthuer, W. 2003. Inventory of Vascular Plants of Pea Ridge National Military Park. Prepared for Heartland Network. Stephenson, Steven. 2012. Inventory Glades and Develop a Management Plan at Pea Ridge National Military Park – Progress Report. University of Arkansas, Department of Biological Sciences. Fayetteville, AR.

3.131 Williams, M.H. 2009. An evaluation of biological inventory data collected at Pea Ridge National Military Park: Vertebrate and vascular plant inventories. Natural Resource Technical Report NPS/HTLN/NRTR—2009/261. National Park Service, Fort Collins, CO.

park has identified twenty-two nonnative plant species that are of most concern, including Japanese honeysuckle (*Lonicera japonica*), fescue grasses (*Festuca* spp.), spotted knapweed (*Centaurea maculosa*), *Sericea lespedeza*, and Canada bluegrass (*Poa compressa*). These species have the ability to colonize, overrun, and disrupt ecosystems. Currently, the park treats approximately 500 to 1,000 acres with prescribed burns annually, and another 200 acres of invasive plants are mechanically removed.

**Rare Species.** An inventory of vascular plants in the park in 2003, identified four species that are tracked by the Arkansas Natural Heritage Commission because they are uncommon or have conservation concerns.<sup>3.132</sup> These species were the Ozark chinquapin (*Castanea pumila* var *ozarkensis*), lobed spleenwort (*Asplenium pinnatifidum*), field pussytoes (*Antennaria neglecta*), and black maple (*Acer nigrum*). The Ozark chinquapin trees were found in the park below the east overlook and the lobed spleenwort was found on the sandstone bluffs in the park below the east overlook. The 2003 inventory report did not document if the field pussytoes or black maple were found in the park.

An inventory of vascular plants conducted in 2009 identified forty-one plant species as species of conservation status.<sup>3.133</sup> No federally listed species are present or are likely to be present in the park; however, three state threatened species (forked aster (*Eurybia furcatus*); ovate-leaved catchfly (*Silene ovate*); and royal catchfly (*Silene regia*)) and two state endangered species (caric sedge (*Carex opaca*) and small headed pipewort (*Eriocaulon koernickianum*)) were noted as likely present in the park during the 2009 survey.<sup>3.134</sup> The forked aster is a woodland plant associated with low, wet

areas; the ovate-leaved catchfly occurs in dry to mesic forests; and the royal catchfly occurs in open woods, glades, meadows, and prairies.<sup>3.135</sup> The caric sedge is found in low areas in prairies, roadside ditches, and poorly drained areas and the small headed pipewort is found in moist to wet sands and sandy silts of seep sites.<sup>3.136</sup>

## Wildlife

The dense forests, open fields, and prairies within the park provide year-round habitat for a variety of wildlife. This habitat is becoming more important as development continues to increase and encroach around the park.<sup>3.137</sup> Common species in the park include white-tailed deer (*Odocoileus virginianus*); coyote (*Canis latrans*); red fox (*Vulpes vulpes*); opossum (*Didelphis marsupialis*); woodchuck (*Marmota monax*); eastern cottontail rabbit (*Sylvilagus floridana*); several species of squirrels, mice, and voles; and numerous migratory songbirds.<sup>3.138</sup>

An inventory of vertebrate species was completed at the park in 2009.<sup>3.139</sup> The inventory found 143 vertebrate species present in the park, including sixty-seven birds, nineteen fish, eighteen mammals,

3.132 Hinterthuer 2003.

3.133 Williams 2009.

3.134 Ibid.

3.135 Center for Plant Conservation (CPC). 2010a. Aster furcatus plant profile. Available at: [http://www.centerforplantconservation.org/Collection/CPC\\_ViewProfile.asp?CPCNum=338](http://www.centerforplantconservation.org/Collection/CPC_ViewProfile.asp?CPCNum=338). Last updated: September 28, 2010.

Center for Plant Conservation (CPC). 2010b. Silene regia plant profile. Available at: [http://www.centerforplantconservation.org/Collection/CPC\\_ViewProfile.asp?CPCNum=4005](http://www.centerforplantconservation.org/Collection/CPC_ViewProfile.asp?CPCNum=4005). Last updated: March 4, 2010.

3.136 NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, VA. Available at: <http://www.natureserve.org/explorer>. Last accessed: April 2, 2013.

3.137 National Parks Conservation Association (NPCA). 2009. State of the Parks – Civil War National Parks: The Battles for Missouri. June.

3.138 National Parks Conservation Association (NPCA). 2009. State of the Parks – Civil War National Parks: The Battles for Missouri. June. Johnsey, P. and M. Malinen. 1970. Final Report on Population Densities of Small Mammals in Relation to the Specific Habitat in Pea Ridge National Military Park, Benton County, Arkansas.

3.139 Williams 2009.

eighteen amphibians, and twenty-one reptiles. Of these, eight birds, one fish, three mammals, five amphibians, and two reptiles were listed by the Arkansas Natural Heritage Commission as species of conservation status. No federal- or state-listed vertebrate species were listed in the park. The federally endangered gray bat (*Myotis grisescens*) has been observed in the park; however, no resident populations are present in the park.<sup>3.140</sup> Other bat species have been observed in the park, including the red bat (*Lasiurus borealis*), eastern pipistrelle (*Pipistrellus subflavus*), and northern long-eared bat (*Myotis septentrionalis*), with five potential bat habitats documented within the park.<sup>3.141</sup>

A continuing concern of visitors and park staff has been the increase in white-tailed deer populations within the park.<sup>3.142</sup> The park is likely to have a higher density of deer due to the overall decline in deer habitat in northwest Arkansas from urban sprawl, agriculture, and forest clearing, and because the park provides a haven from predators and hunting.<sup>3.143</sup> White-tailed deer populations have been monitored in the park since 2005.<sup>3.144</sup> The deer populations have both declined and increased within the seven years of monitoring, with 2012, having a population value ten percent below the average value within those years. The decline in population levels in previous years was

due to a hemorrhagic outbreak (an acute, infectious, often fatal viral disease of some wild ruminants) and future outbreaks are possible.<sup>3.145</sup>

In 2009, the park's fish monitoring program documented four species of fish in Pratt Creek.<sup>3.146</sup> The monitoring report indicated the species diversity was moderate and species richness was low, with three of the species intolerant to human disturbance and two that are benthic species that need clean gravel/cobble substrate. The fish species observed include southern redbelly dace (*Phoxinus erythrogaster*), orangethroat darter (*Etheostoma spectabile*), banded sculpin (*Cottus carolinae*), and redspot chub (*Nocomis asper*). One federally threatened fish species, the Ozark cavefish (*Amblyopis rosae*), and one federally endangered crustacean species, the cave crawfish (*Cambarus aculabrum*), have been documented by the USFWS as potentially occurring in the park; however, based on the inventory conducted in 2011, it is unlikely these species are present.<sup>3.147</sup>

In 2000, the amphibian and reptile monitoring documented six species of salamander, one species of newt, eleven species of toads and frogs, two species of turtles, one species of lizard, three species of skinks, and fifteen species of snakes in the park.<sup>3.148</sup> The grotto salamander (*Typhlotriton spelaeus*), a state species of concern, has also

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3.140 NPCA 2009.

3.141 Sley, M., C. Bitting, and J.D. Wilhide. 2004. A Bat Inventory of Buffalo National River, Pea Ridge National Military Park, and Wilson's Creek National Battlefield. February.

3.142 Grabner, K., M. Struckhoff, and D. Buhl. 2005. Evaluating the Impacts of White-Tailed Deer (*Odocoileus virginianus*) on Vegetation within Pea Ridge National Military Park. U.S. Geological Survey, Northern Prairie Wildlife Research Center. April.

3.143 Cribbs, J. Tyler and David G. Peitz. 2008. White-tailed Deer Monitoring at Pea Ridge National Military Park, Arkansas: 2008 Status Report. Natural Resource Technical Report NPS/HTLN/NRTR—2008/104. National Park Service, Fort Collins, CO

3.144 Peitz, D.G. 2005. White-tailed Deer Monitoring at Pea Ridge National Military Park, Arkansas: 2005-2006 Status Report. Natural Resource Technical Report NPS/MWR/HTLN/NRTR—2006/XXX. National Park Service, Omaha, NE.

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3.145 Michigan Department of Natural Resources (MIDNR). 2013. Epizootic Hemorrhagic Disease (EHD) in White-Tailed Deer. Available at: [http://www.michigan.gov/dnr/0,1607,7-153-10370\\_12150-26647--,00.html](http://www.michigan.gov/dnr/0,1607,7-153-10370_12150-26647--,00.html). Last accessed: March 22, 2013.

3.146 Dodd, H.R., J.A. Hinsey, and S.K. Mueller. 2011. Fish community monitoring at Pea Ridge National Military Park: 2009 report. Natural Resource Data Series NPS/HTLN/NRDS—2011/217. National Park Service, Fort Collins, CO.

3.147 NPS 2006. Dodd et al. 2011.

3.148 Briggler, Jeff and Melissa Pilgrim. 2001. Final Report: Amphibian and Reptile Survey for Pea Ridge National Military Park. March 9.

been observed in the park in Winton, Pratt, and Lee creeks.<sup>3.149</sup>

The grasslands and forests within the park provide ample habitat for a variety of bird species. Increasingly fragmented landscapes have decreased overall bird habitat within the region surrounding the park due to urban and industrial development.<sup>3.150</sup> According to park staff, more than 100 bird species have been identified in the park, with thirty species identified as regional species of concern. A breeding bird survey conducted in the park in 2008, recorded sixty-three species of breeding birds.<sup>3.151</sup> From the survey, sixteen species found in the park are classified by Partners in Flight as species of continental importance. The species richness for birds in grassland habitat in the park is similar to those reported elsewhere, while the species richness in the woodland habitat was lower than values reported elsewhere. Bird species that commonly nest and breed in the park include scarlet tanagers (*Piranga olivacea*), summer tanagers (*Piranga rubra*), rose-breasted grosbeaks (*Pheucticus ludovicianus*), ovenbirds (*Seiurus aurocapillus*), and various woodland warblers (*Phylloscopus* sp.).<sup>3.152</sup> Wild turkey (*Meleagris gallopavo*) and northern bobwhite quail (*Colinus virginianus*) are also often found in the fields of the park.

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3.149 Bowles, David 2013. Aquatic Program Leader, National Park Service through Missouri State University, Department of Biology, email communication to Gregory Eads, National Park Service regarding salamanders that occur in Winton, Pratt, and Lee Creeks. March 29.

3.150 Peitz, D.G. 2009. Bird monitoring at Pea Ridge National Military Park, Arkansas 2008 Status Report. Natural Resource Technical Report NPS/HTLN/NRTR—2009/194. National Park Service, Fort Collins, CO.

3.151 Peitz, D.G. 2009. Bird monitoring at Pea Ridge National Military Park, Arkansas 2008 Status Report. Natural Resource Technical Report NPS/HTLN/NRTR—2009/194. National Park Service, Fort Collins, CO.

3.152 NPCA 2009.

## Visual Resources

About ninety percent of the Civil War battlefield where fighting took place is protected within the park.<sup>3.153</sup> Protecting such a large portion of an original battlefield is uncommon among Civil War parks in the national park system, and this protection is essential to the unique visual character of the park. Much of the land that is now protected within the park underwent extensive changes from the time of the battle until the park was established in 1956. Much of the land that now constitutes the park was historically used for agriculture, raising livestock, and homestead sites. These land uses, along with practices of fire suppression and logging, both before and after the battle, have combined to alter the landscape and influence the character of the park relative to its historic appearance.<sup>3.154</sup>

Visual resources on the battlefield are important to the visitor's understanding of the battle events. Visual resources include replica artillery, fencing, and historic structures; and historic fields, roads, and trails. For more information on the visual resources within the cultural and historic context of the park, see Chapter 2 of this report.

The most popular activity for visitors is to travel the seven-mile Tour Road through the park. Guided by the park brochure, visitors can follow the Tour Road and pull over at ten interpretive stops identifying important battle sites. There are several interpretive exhibits, and historic roads, trails, fields, and structures are available for viewing as well.

Over the past eleven years, in an effort to restore the historic landscape that soldiers witnessed during the Civil War battle, the park removed 11,000 feet of power lines

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3.153 NPS 2006.

3.154 Ibid.

that were interfering with battlefield views, planted more than 2,000 trees in areas that were forested in 1862, rebuilt seventeen miles of historic fence lines that help to demarcate battle lines, emplaced artillery, and restored five miles of historic roads and road traces. In addition, the park is working to control eastern red cedar trees, which are encroaching on the park's open fields. Wildlife and vegetation also contribute to the visual experience in the park.

Most of the park is protected from outside visual and auditory intrusions. However, there are some modern intrusions in the battlefield landscape, such as the visitor center and administrative area, residential development and associated infrastructure around the perimeter of the park such as cell towers, and Arkansas Highway 72 and U.S. Highway 62, which bisect the western and southern portions of the park, respectively. In general, visitors have several opportunities to visualize the 1862 landscape, despite the absence of the farm structures that existed at the time of the battle. The landscape is generally representative of the historic conditions, although fire prevention and suppression have resulted in an increase in tree density in some areas of the park. This includes denser areas of forest around the battlefields, trenches, and fields; the invasive eastern red cedar species occurring throughout the park; fields that were previously open agricultural fields and crops, currently dominated by introduced grasses; and asphalt around the trenches (placed there circa 1970, in an effort to preserve them). The change in vegetation characteristics has altered views and interpretation of the battlefields and routes, making it somewhat difficult for visitors to visualize how the landscape affected the battle.

## Visitor Experience

The park provides visitors with opportunities that enhance their understanding of the Battle of Pea Ridge and its pivotal role in the Civil War west of the Mississippi River.<sup>3.155</sup>

The battlefield within this national park is unique due to the lack of monuments, as the park provides more of a "living landscape." Park visitors have the opportunity to view different areas of the battlefield and the cultural resources associated with the park including historic structures, earthworks, and historic ruins. In addition, the natural resources of the park provide recreational opportunities to visitors, with many visitors coming solely for recreation such as running, hiking, biking, and horseback riding.

The primary visitor experience at the park is centered on interpreting the Civil War battle and the events surrounding the conflicts.<sup>3.156</sup> Interpretation of the events includes interpretive signs and exhibits throughout the park placed at the routes and sites of the battles, Elkhorn Tavern, and Federal earthworks.<sup>3.157</sup> The automobile tour of the park (the Tour Road) is one of the primary interpretive programs of the park (see the Visual Resources section). One tour stop provides an overview of the countryside to the south and another provides an overview of the battle scene near Elkhorn Tavern. A trail follows Telegraph Road in Cross Timber Hollow. Trails follow many of the historic roads within the park. About ten to twenty percent of visitors venture beyond the tour stops. The Tour Road was designed to accommodate a one-way, single lane of automobile, bus, or recreational vehicular traffic. Today, the Tour Road accommodates motorized touring, bicycling, and jogging.

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3.155 NPS 2006.

3.156 Ibid.

3.157 NPCA 2009.

The visitor center serves as the primary facility for preparing visitors to understand and appreciate the park.<sup>3.158</sup> The visitor center provides park visitors with an orientation to the park, an opportunity to view a video about the battle, talk with an interpretive ranger, view exhibits about the battle, and purchase Civil War-related literature.<sup>3.159</sup> A museum in the visitor center contains several exhibits and displays more than ninety objects.<sup>3.160</sup> A library of historic documents and books related to the battle is in the visitor center/administrative complex. The library is open to researchers by appointment.<sup>3.161</sup> Interpretive signs are also present along the Trail of Tears, which goes through the park. In 2007, the park provided 328 interpretive programs; however, the park has had to reduce the number of interpretive programs due to a lack of funding.<sup>3.162</sup> In fiscal year 2010, 18,945 visitors attended interpretive programs and demonstrations.<sup>3.163</sup>

The park has nine miles of horse trails and seven miles of hiking trails.<sup>3.164</sup> Some trails are aligned with historic roads or traces. Many visitors bike through the park along the Tour Road. Equestrian staging is in a gravel lot off the two-lane Tour Road. The designated equestrian trail passes through the western part of the battlefield, then proceeds around the north side of Elkhorn Mountain to Elkhorn Tavern, and then along Telegraph Road back to the staging area.

In addition to the annual anniversary of the battle event (March 7 and 8), other special events are held each year (when funding allows) such as the Hispanic Heritage Festival, Elkhorn Tavern 1860 Christmas, and the June

Festival.<sup>3.165</sup> Living history demonstrations are conducted throughout the year, primarily at Elkhorn Tavern. The cannon programs are popular with visitors, with demonstrations occurring throughout the year.

Visitation in fiscal year 2012, was 131,907, the highest amount of visitors in the last five years.<sup>3.166</sup> Visitation has fluctuated between 61,000 and 131,000 since 1976.<sup>3.167</sup> Visitation is highest from May through August, with another peak in October. School groups visit the park primarily in April and May. Approximately forty to fifty military groups come to the park per year.<sup>3.168</sup> Based on staff observations, the average stay in the park is one to three hours.

### Park Operations

The park grounds and visitor center are open seven days a week. The visitor center is closed Thanksgiving Day, Christmas Day, New Year's Day, and all other federal holidays.

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3.158 NPCA 2009.

3.159 NPS 2006.

3.160 NPCA 2009.

3.161 NPS 2006.

3.162 NPCA 2009.

3.163 Ibid.

3.164 National Park Service (NPS). 2011. Pea Ridge National Military Park - Long-Range Interpretive Plan. December.

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3.165 National Park Service (NPS). 2011. Pea Ridge National Military Park - Long-Range Interpretive Plan. December.

3.166 National Park Service (NPS). 2012b. National Park Service Visitor Use Statistics - Annual Park Visitation (All Years) Report for Pea Ridge National Military Park. Available at: [https://irma.nps.gov/Stats/SSRSReports/Park Specific Reports/Annual Park Visitation \(All Years\)?Park=PERI](https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Visitation%20(All%20Years)?Park=PERI).

3.167 National Park Service (NPS). 2012b. National Park Service Visitor Use Statistics - Annual Park Visitation (All Years) Report for Pea Ridge National Military Park. Available at: [https://irma.nps.gov/Stats/SSRSReports/Park Specific Reports/Annual Park Visitation \(All Years\)?Park=PERI](https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Visitation%20(All%20Years)?Park=PERI).

3.168 NPCA 2009.

Park staff currently consists of the following full-time positions (fifteen total):

- Superintendent and one law enforcement ranger;
- Administrative Officer and two administrative assistants in the division of administration;
- Facility Manager, two maintenance employees, and custodian in the division of facilities management;
- Chief of Resource Management, a biologist, and a laborer in the division of resource management;
- Chief of Interpretation and two park guides in the division of visitor services and resource protection;
- Volunteers in Parks - across all divisions to help augment park staff.

Current management and vegetation maintenance in the park includes thinning open woodlands, planting trees, implementing the Exotic Pest Management wing existing grassland areas, conducting prescribed burns, and reestablishing orchards at Elkhorn Tavern.

The Long-Range Interpretive Plan identified additional park staffing needs in order to conduct important activities within the park including interpretation programs, visitor services, and a survey of the park's boundaries.<sup>3.169</sup>

The visitor center provides orientation and key visitor services, including museum exhibits, as well as office space for some staff and the primary maintenance area.<sup>3.170</sup> Park entrance fees are collected at the visitor center. Park staff has converted two former residences for use as office space. An additional maintenance area is used for equipment and materials storage. A new maintenance facility is planned for the park; however, a location for the facility has yet to be determined. The Federal Trenches are not contiguous with the rest of the park but are open to the public.

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3.169 NPS 2011.

3.170 NPS 2006.