National Park Service
U.S. Department of the Interior

State of the Park Report

Stones River National Battlefield

Tennessee

2017

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On the cover: The sun rises over the McFadden Farm where Union cannons crushed the final Confederate attack on January 2, 1863. NPS Photo by VIP Buddy Secor.

Disclaimer. This State of the Park report summarizes the current condition of park resources, visitor experience, and park infrastructure as assessed by a combination of available factual information and the expert opinion and professional judgment of park staff and subject matter experts. The internet version of this report provides the associated workshop summary report and additional details and sources of information about the findings summarized in the report, including references, accounts on the origin and quality of the data, and the methods and analytic approaches used in data collection and assessments of condition. This report provides evaluations of status and trends based on interpretation by NPS scientists and managers of both quantitative and non-quantitative assessments and observations. Future condition ratings may differ from findings in this report as new data and knowledge become available. The park superintendent approved the publication of this report.

Executive Summary

The mission of the National Park Service (NPS) is to preserve unimpaired the natural and cultural resources and values of national parks for the enjoyment, education, and inspiration of this and future generations. NPS Management Policies (2006) state that "The Service will also strive to ensure that park resources and values are passed on to future generations in a condition that is as good as, or better than, the conditions that exist today." As part of the stewardship of national parks for the American people, the NPS has begun to develop State of the Park reports to assess the overall status and trends of each park's resources. The NPS will use this information to improve park priority setting and to synthesize and communicate complex park condition information to the public in a clear and simple way.

The purpose of this State of the Park report is to:

- Provide to visitors and the American public a snapshot of the status and trend in the condition of a park's priority resources and values;
- Summarize and communicate complex scientific, scholarly, and park operations factual information and expert opinion using non-technical language and a visual format;
- Highlight park stewardship activities and accomplishments to maintain or improve the State of the Park;
- Identify key issues and challenges facing the park to help inform park management planning.

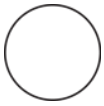
The Purpose of Stones River National Battlefield (STRI) is to preserve and interpret the battlefield of Stones River, to mark the significant sites, and to promote understanding and appreciation of the battle and related events. The park is 570 acres along the Stones River in Rutherford County, Tennessee. STRI memorializes the Battle of Stones River, a key battle of the American Civil War that took place on December 31, 1862 and January 2, 1863. STRI includes the battlefield and monuments areas, the Stones River National Cemetery, and the area at historic Fortress Rosecrans.

Significance statements express why the park unit's resources and values are important enough to warrant national park unit designation. STRI is significant because:

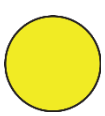
- Stones River was a major battle of the Union western campaign that resulted in the occupation of Murfreesboro and the control of the productive agricultural land and supply network of central Tennessee.
- The battle marked the commencement of the Union army's campaign that resulted in the "March to the Sea," and at the same time marked the end of the Confederate army's attempt to move into Kentucky and the North.
- The battle was psychologically and politically important for the Union and had a profound influence on the North not losing other states, such as Kentucky, to the Confederacy. The battle also influenced President Abraham Lincoln's future and the role of England and France in the war.
- The site is sacred ground, where nearly 83,000 men fought and more than 23,000 became casualties. For the Union army, the rate of casualties was the highest of any battle in the war. For the Confederate army, due to the massing of Union artillery, the casualty rate was second only to the Battle of Gettysburg.
- The two armies were evenly matched and used similar strategies and tactics. Although both armies needed a victory, there was no clear tactical victor. However, the Confederate forces left the Union troops in command of the field, and the Union could claim victory.

The summary table, and the supporting information that follows, provide an overall assessment of the condition of priority resources and values at STRI based on scientific and scholarly studies and expert opinion. The internet version of this report, available at http://www.nps.gov/stateoftheparks/stri/, provides additional detail and sources of information about the resources summarized in this report, including references, accounts on the origin and quality of the data, and the methods and analytical approaches used in the assessments. Reference conditions that represent "healthy" ecosystem parameters, and regulatory standards (such as those related to air or water quality) provide the rationale to describe current resource status. In coming years, rapidly evolving information regarding climate change and associated effects will inform our goals for managing park resources, and may alter how we measure the trend in condition of park resources. Thus, reference conditions, regulatory standards, and/or our judgment about resource status or trend may evolve as the rate of climate change accelerates and we respond to novel conditions. In this context, the status and trends documented here provide a useful point-in-time baseline to inform our understanding of emerging change, as well as a synthesis to share as we build broader climate change response strategies with partners.

The Status and Trend symbols used in the summary table, which follows, and throughout this report are summarized in the following key. The background color represents the current condition status, the direction of the arrow summarizes the trend in condition, and the thickness of the outside line represents the degree of confidence in the assessment. In some cases, the arrow is omitted because data are not sufficient for calculating a trend (e.g., data from a one-time inventory or insufficient sample size).

Condition Status		Trend in Condition		Confidence in Assessment	
	Warrants Significant Concern		Condition is Improving		High
	Warrants Moderate Concern		Condition is Unchanging		Medium
	Resource is in Good Condition		Condition is Deteriorating		Low

State of the Park Summary Table

Priority Resource or Value	Condition Status/Trend	Rationale
Natural Resources		web ▸
Air Quality		Scenic vistas and landscape views at STRI are often obscured by pollution-caused haze. Ozone sometimes reaches levels that can make breathing difficult for sensitive groups and cause injury to ozone-sensitive plants. Vegetation communities in the park, including forest, wetland, and lichen species, may be sensitive to excess sulfur and nitrogen deposition. Airborne toxics, including mercury, can deposit with rain and snow and accumulate in organisms, such as amphibians and birds.
Water Quality		Water quality at STRI commonly meets all state designated use criteria. Exceptions include: elevated bacteria following storm run-off events, and naturally low dissolved oxygen in park springs.
Forest Communities		Much of STRI's acreage at the time of park establishment was covered with old agricultural fields and grazed pastures and naturally open/barren prairie communities. Many of these areas have reverted to young forest. Threats to the health of forested communities include invasive exotic species, which are capable of outcompeting native vegetation. Forest monitoring was initiated in 2011 to monitor this and other threats, as well as overall trends in forest conditions.
Glade and Barren Communities		STRI supports 232 documented plant species including a concentration of rare species, most of which are part of the Nashville Basin Limestone Glade ecological system (Nordman 2004).
Wetland Communities		Although relatively small, several wetlands exist in the park. These wetlands were not substantially disturbed prior to park establishment and are generally considered in good condition.
Wildlife Communities		The park contains a number of wildlife species, including over 150 birds, which are known to utilize the park. However, recent inventories of other wildlife groups (i.e., amphibians, reptiles, and small mammals) failed to find some species, which are considered common within the region.

Priority Resource or Value	Condition Status/Trend	Rationale
Dark Night Sky		Ongoing population growth and development fuel increasing light pollution.
Acoustic Environment		The mean acoustic impact level (L_{50} dBA), a measure of noise contributed to the existing acoustic environment by man-made sources, is 11.9 dBA in STRI, meaning that the condition of acoustic resources warrants significant concern under non-urban criteria, and also approaches the threshold for significant concern under urban criteria. Overall, long-term projected increases in ground-based transportation and aircraft traffic indicate a downward trend in the quality of acoustic resources at this location.
Cultural Resources		web ▸
Archeological Resources		There are 21 sites, 22 subsites, and 5 local archeological resources in the park. The 21 sites are currently in good condition. The overwhelming majority of these sites are related to the Battle of Stones River, Fortress Rosecrans, and the historic homestead. Some prehistoric sites are also present.
Cultural Anthropology		The Ethnographic Overview and Assessment report is a key tool used by the park to understand and manage its resources. This document is in draft form, and requires significant editing and additional research in order to be completed.
Cultural Landscapes		All nine of STRI's cultural landscapes are listed in the Cultural Landscapes Inventory (CLI) with complete, accurate, and reliable information, including condition. Cultural Landscape Reports (CLR) exist for the Battlefield (2007) and the National Cemetery (2015). These documents provide treatment recommendations that are used to preserve and maintain the park's cultural landscapes. The entire park is listed in the National Register of Historic Places, but not all historic contexts and landscape features are enumerated in the nomination.
Historic Structures		19 of the park's historic structures are documented on the List of Classified Structures. Recent boundary expansion included the acquisition of the Pioneer Brigade Earthworks, and complete documentation is needed. The main park entrance gate and 3 historic Mission-66-era residences need to be assessed for National Register eligibility.
History		Although the park's Historic Resource Study is from 2004, it remains a usable baseline history document. The park's Administrative History is in progress, which will include additional documentation for the park's 1977 National Register nomination.
Museum Collections		The park lacks dedicated museum staff to manage the collections. 45.45% of the baseline documents, critical for management, planning, and safety of collections are not current but are in the process of being updated. Park staff has managed to catalog nearly 100% of the park's collections with up-to-date records. A Collection Management Plan is being drafted, and Museum Fire and Security Survey will follow in 2017.
Visitor Experience		web ▸
Number of Visitors		Visitors to the park in 2015 (264,925) increased 23.15% compared to the 10-year average for 2005–2014 (215,128).

Priority Resource or Value	Condition Status/Trend	Rationale
Visitor Satisfaction		The percentage of visitors satisfied in FY15 was 98%, which is slightly lower (0.7%) than the average for the previous ten years.
Interpretive and Education Programs – Talks, Tours, and Special Events		The number and variety of interpretive programs and special events has increased annually while visitor participation has generally shown a downward trend since 2012.
Interpretive Media – Brochures, Exhibits, Signs, and Website		Updated park brochures, handouts and continuing fabrication and installation of new wayside exhibits have created new opportunities for visitors to learn about the park's resources. The park also produces an annual "rack card" featuring the coming year's interpretive programs.
Accessibility		An Accessibility Survey was conducted in 2016. The park has made some immediate improvements and is awaiting the final report to plan more extensive upgrades.
Safety		The park has experienced no major visitor accidents for several years, and reportable employee accidents occur at the rate of 1 to 2 per year with no major injuries or illnesses.
Partnerships		Park staff facilitated the reorganization of the Friends of Stones River National Battlefield and has forged numerous community partnerships.
Park Infrastructure		web ▸
Overall Facility Condition Index		Between 2008 and 2016 the park has improved the condition of each of the five asset categories. The overall Facility Condition Index for the park's 66 assets for FY16 is 0.066, which is Good based on industry and NPS standards and down from 0.108 in FY08.

Summary of Stewardship Activities and Key Accomplishments to Maintain or Improve Priority Resource Condition

The list below provides examples of stewardship activities and accomplishments by park staff and partners to maintain or improve the condition of priority park resources and values for this and future generations:

Natural Resources

- In the last five years, 241 acres have been treated for invasive plant species including Chinese privet and bush honeysuckle. Control efforts for many other exotic species are also occurring.
- In the last five years, 77 acres of cropland or non-native pasture have been converted to native warm season grasses.
- Successful re-introduction and focused management efforts contributed to the delisting of the Tennessee coneflower in 2012 from the endangered species list.
- Successful controlled burns were conducted in 2010, 2011, 2012, 2014, and 2015. Fire is an essential tool for improving forest health.
- In the last five years planted over 10,000 native trees, shrubs, and forbs.
- In cooperation with Missouri Botanical Gardens and U.S. Fish and Wildlife Service, the park continued efforts to conserve Pyne's ground plum, an endangered plant species.

Cultural Resources

- The park received a final draft Ethnographic Overview and Assessment in 2016. The document needs editing and additional research, but is a significant addition to the park's anthropological research.

- A Cultural Landscape Report for Stones River National Cemetery was approved in 2015.
- Park staff has reviewed the final drafts of nine Historic Structure Reports. Reports include the Artillery Monument, General Bragg's Headquarters Monument, General Rosecrans's Headquarters Monument, the Hazen Brigade Monument, Nashville Pike, Nashville & Chattanooga Railroad, Van Cleve Lane, Pioneer Brigade Earthworks, and Old Nashville Highway Entrance Gate.
- An updated Administrative History and National Register nomination are being drafted. Both projects should be complete in 2017.
- A team of NPS specialists spent a week surveying the park's museum collections and have produced a draft Collection Management Report that includes an updated Archival Collections Survey, Scope of Collections Statement, and Collection Storage Plan.

Visitor Experience

- The park has actively pursued ways to allow members of the public to connect to the park's resources through volunteerism including partnering with more than a dozen local agencies and groups to host major volunteer events on Park Day and National Public Lands Day.
- The park coordinated the efforts of numerous partner organizations to present an array of coordinated programs including three African American Heritage programs in 2016.
- Since 2011, the park has installed nearly three dozen wayside exhibits to improve the self-guiding visitor experience. The park also purchased and installed other landscape exhibits for marking artillery and infantry positions.

Park Infrastructure

- Park opened new entrance on major thoroughfare in November 2011. The project included the new entrance, creation of new portions of tour road, resurfacing of existing tour road, incorporating previously unused historic trace as part of new tour road, and resurfacing and expansion of Visitor Center parking area.
- The Maintenance Shop was rehabilitated in 2012, making the facility Americans with Disabilities Act (ADA) compliant, updating office area to include kitchen/break area, and improving heating, ventilation, and air conditioning (HVAC) efficiency.
- The Pioneer Brigade Earthworks trail was created, allowing visitor access to Civil War-era earthworks constructed at the time of the battle of Stones River.

Key Issues and Challenges for Consideration in Management Planning

Murfreesboro, Tennessee and Rutherford County have experienced some of the fastest population growth rates in the state and nation during the past two decades. The U.S. Census Bureau estimates that Murfreesboro population topped 126,000 in July 2015 while the county had an estimated 288,906 residents in 2014. The State of Tennessee projects a county-wide population growth rate of 75% or more for Rutherford County between 2005 and 2025 and City of Murfreesboro projections estimate that the population will reach 228,000 by 2035.

This population growth will drive continued development of residential, transportation, and commercial infrastructure. Such rapid development will lead to shifting drainage patterns, increased air, water, noise and night sky pollution, and impose greater challenges to creating a sense of historical place within the park's landscapes. Park staff will face challenges in dealing with degrading natural resources as environmental conditions worsen.

Preservation of additional battlefield landscapes—particularly those beyond the park's authorized boundary, which includes less than 15% of the 4,000 acre battlefield—will become increasingly difficult as pressure builds to develop areas surrounding the park. The park must increase its efforts to develop and expand partnerships with local government agencies and interest groups to find ways to connect the growing population with the park and to foster a sense of stewardship throughout the community.

The park needs to build the remaining portions of the auto tour road that are outlined in the Tour Road Management plan to proactively address the crowded parking areas, overflow parking for events, and future parking needs and improve signage in and out of the park.

Within the landscapes currently managed by the NPS, continued progress on completing recommend actions in the battlefield Cultural Landscape Plan will be critical to providing visitors with a sense of place. The recommended actions include clearing of historic vistas, screening peripheral development, and burying above ground utility lines. Many of these actions will require close cooperation with local government agencies and community partners.

Park staff must work intelligently using Long Range Interpretive Plan recommendations to expand on recently successful attempts to create partnership-based interpretation that invites community members to become stakeholders in interpretive programs and media. Increased volunteerism will play a critical part in park programming as both a way to multiply the effectiveness of a small paid staff and as a powerful tool to allow the public to form connections to the park and its resources.

Park staff must continue to find ways to engage younger audiences who experience the world through the lens of technology by recruiting new employees, volunteers, and partners who can design effective virtual experiences that can draw youth to the park and enhance their experience on the landscape. The park must strive to keep its curriculum-based education programs fresh and relevant and find ways to build on successful partnerships, like that with McGavock High School, to expand opportunities for building long-term, high quality relationships with students.

Chapter 1. Introduction

The purpose of this State of the Park report for Stones River National Battlefield (STRI) is to assess the overall condition of the park's priority resources and values, to communicate complex park condition information to visitors and the American public in a clear and simple way, and to inform visitors and other stakeholders about stewardship actions being taken by park staff to maintain or improve the condition of priority park resources for future generations. The State of the Park report uses a standardized approach to focus attention on the priority resources and values of the park based on the park's purpose and significance, as described in the park's Foundation Document or General Management Plan. The report:

- Provides to visitors and the American public a snapshot of the status and trend in the condition of a park's priority resources and values.
- Summarizes and communicates complex scientific, scholarly, and park operations factual information and expert opinion using non-technical language and a visual format.
- Highlights park stewardship activities and accomplishments to maintain or improve the state of the park.
- Identifies key issues and challenges facing the park to inform park management planning.

The process of identifying priority park resources by park staff and partners, tracking their condition, organizing and synthesizing data and information, and communicating the results will be closely coordinated with the park planning process, including natural and cultural resource condition assessments and Resource Stewardship Strategy development. The term "priority resources" is used to identify the fundamental and other important resources and values for the park, based on a park's purpose and significance within the National Park System, as documented in the park's foundation document and other planning documents. This report summarizes and communicates the overall condition of priority park resources and values based on the available scientific and scholarly information and expert opinion, irrespective of the ability of the park superintendent or the National Park Service to influence it.

The Battle of Stones River occurred over a three-day period from December 31, 1862, to January 2, 1863. It was waged over an area of approximately 4,000 acres west of Murfreesboro. In this battle, nearly 83,000 men fought, and more than 23,000 became casualties. There was no clear tactical victor. However, the Confederate forces left the Union troops in command of the field. The battle boosted morale in the North, Lincoln strengthened his position, and the Army of the Cumberland constructed Fortress Rosecrans, a large supply depot, which fueled the army's drive to Chattanooga and Atlanta.

In 1862, Congress passed legislation creating national cemeteries, one of which was established on the battlefield at Stones River. This national cemetery would eventually serve as the nucleus for the military park and help define where land acquisition would initially occur. On March 3, 1927, STRI was established as a national military park under control of the secretary of war. This legislation recognized the significance of sites throughout the original battlefield by providing for the marking of troop movements and important battle events. However, only about 350 acres of the original battlefield in the vicinity of the national cemetery were acquired and protected.

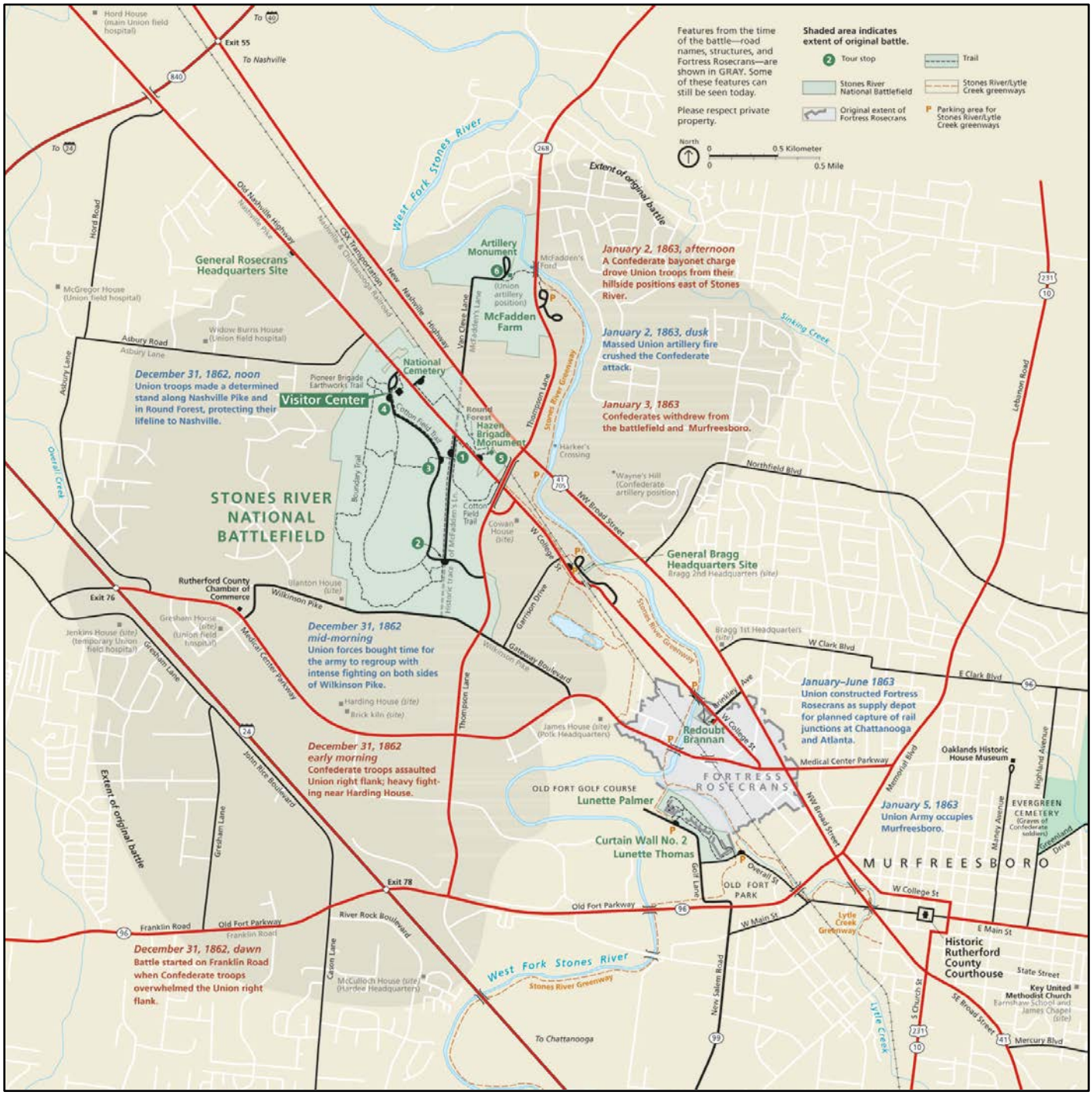
In June 1933, the park was transferred to the National Park Service. On April 22, 1960, the park was expanded and designated as Stones River National Battlefield. STRI includes the battlefield and monuments areas, the Stones River National Cemetery, and the area at historic Fortress Rosecrans.

The purpose of STRI is to preserve and interpret the battlefield of Stones River, to mark the significant sites, and to promote understanding and appreciation of the battle and related events.

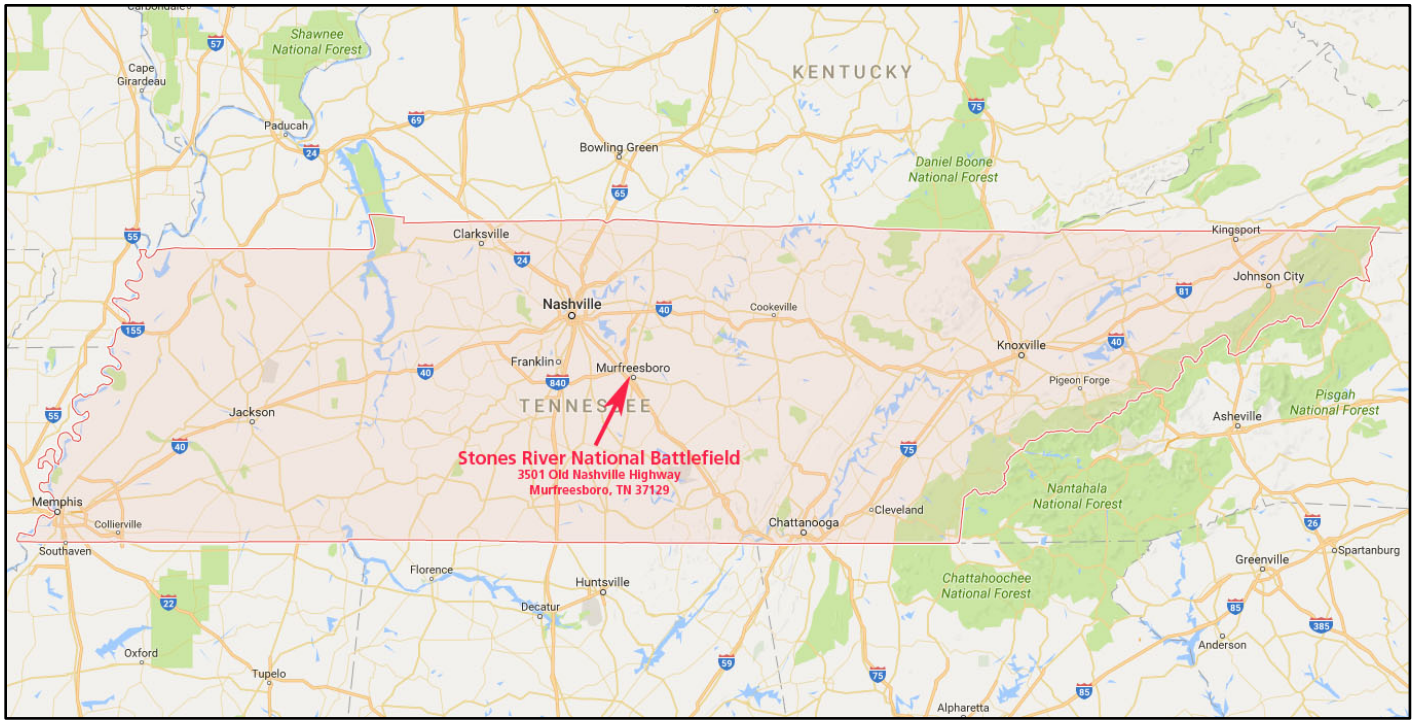
Significance statements express why the park unit's resources and values are important enough to warrant national park unit designation. STRI is significant because:

- Stones River was a major battle of the Union western campaign that resulted in the occupation of Murfreesboro and the control of the productive agricultural land and supply network of central Tennessee.
- The battle marked the commencement of the Union army's campaign that resulted in the "March to the Sea," and at the same time marked the end of the Confederate army's attempt to move into Kentucky and the North.
- The battle was psychologically and politically important for the Union and had a profound influence on the North not losing other states, such as Kentucky, to the Confederacy. The battle also influenced President Abraham Lincoln's future and the role of England and France in the war.
- The site is sacred ground, where nearly 83,000 men fought and more than 23,000 became casualties. For the Union army, the rate of casualties was the highest of any battle in the war. For the Confederate army, due to the massing of Union artillery, the casualty rate was second only to the Battle of Gettysburg.

- The two armies were evenly matched and used similar strategies and tactics. Although both armies needed a victory, there was no clear tactical victor. However, the Confederate forces left the Union troops in command of the field, and the Union could claim victory.



Map of the Park



Location of the Park in Tennessee

Chapter 2. State of the Park

The State of the Park is summarized below for four categories—Natural Resources, Cultural Resources, Visitor Experience, and Park Infrastructure—based on a synthesis of the park's monitoring, evaluation, management, information programs, and expert opinion. Brief resource summaries are provided below for a selection of the priority resources and values of the park. Clicking on the web ▸ symbol found in the tables and resource briefs below will take you to the internet site that contains content associated with specific topics in the report.

The scientific and scholarly reports, publications, datasets, methodologies, and other information that were used as the basis for the assessments of resource condition are referenced and linked throughout the report and through the internet version of this report that is linked to the NPS IRMA data system (Integrated Resource Management Applications). The internet version of each report, and the associated workshop summary report available from the internet site, provide additional detail and sources of information about the findings summarized in the report, including references, accounts on the origin and quality of the data, and the methods and analytical approaches used in data collection and the assessments of condition. Resource condition assessments reported in this State of the Park report involve expert opinion and the professional judgment of park staff and subject matter experts involved in developing the report. This expert opinion and professional judgment derive from the in-depth knowledge and expertise of park and regional staff gained from their being involved in the day-to-day practice of all aspects of park stewardship and from the professional experience of the participating subject matter experts. This expert opinion and professional judgment utilized available factual information for the analyses and conclusions presented in this report. This State of the Park report was developed in a park-convened workshop.

The status and trends documented in Chapter 2 provide a useful point-in-time baseline measured against reference conditions that represent "healthy" ecosystem parameters, or regulatory standards (such as those related to air or water quality). We also note that climate change adaptation requires us to continue to learn from the past, but attempting to manage for conditions based on our understanding of the historical "natural" range of variation will be increasingly futile in many locations. Thus, these reference conditions, and/or our judgment about resource condition or trend may evolve as the rate of climate change accelerates and we respond to novel conditions. Our management must be even more "forward looking," to anticipate plausible but unprecedented conditions, also recognizing there will be surprises. In this context, we will incorporate climate considerations in our decision processes and management planning as we consider adaptation options that may deviate from traditional practices.

2.1. Natural Resources

Air Quality

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Ozone	Human Health: Annual 4th-highest 8-hour concentration		Human health risk from ground-level ozone warrants moderate concern. This condition is based on NPS Air Resource Division benchmarks and the 2008–2012 estimated ozone of 71.0 parts per billion (ppb). Ozone is also a respiratory irritant, causing coughing, sinus inflammation, chest pains, scratchy throat, lung damage, and reduced immune system functions. Children, the elderly, people with existing health problems, and active adults are most vulnerable. No trend information is available because there are not sufficient on-site or nearby ozone monitoring data.

Air Quality (continued)

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Ozone (continued)	Vegetation Health: 3-month maximum 12-hour W126		Vegetation health risk from ground-level ozone warrants moderate concern. This condition is based on NPS Air Resource Division benchmarks and the 2008–2012 estimated W126 metric of 11.0 parts per million-hours (ppm-hrs). A risk assessment concluded that plants at Stones River National Battlefield (NB) are at high risk for ozone damage (Kohut 2004; Kohut 2007). There are at least 18 ozone-sensitive plants in the park (see list of ozone-sensitive plant species). No trend information is available because there are not sufficient on-site or nearby ozone monitoring data.
Ozone Foliar Injury	Number of species with injury		No confirmed injury was found on surveyed plant species in 2010. However, ozone exposure indices in 2010 may have been abnormally low for the region.
Deposition	Sulfur wet deposition		Wet sulfur deposition warrants significant concern. This condition is based on NPS Air Resource Division benchmarks of 3.7 kilograms per hectare per year (kg/ha/yr). Acidification effects can include changes in water and soil chemistry that impact ecosystem health. Some kinds of plants appear to be more sensitive to acidification effects than others. Some lichens are especially sensitive, with documented effects occurring in the deposition range of only a few kilograms of sulfur per hectare per year. Among the vascular plants, sugar maple trees (*Acer saccharum*) are known to be particularly sensitive, and are found in the park (Sullivan et al. 2011a; Sullivan et al. 2011b). No trend information is available because there are not sufficient on-site or nearby wet deposition monitor data.
	Nitrogen wet deposition		Wet nitrogen deposition warrants significant concern. This condition is based on NPS Air Resource Division benchmarks and the 2008–2012 estimated wet nitrogen deposition of 4.3 kilograms per hectare per year (kg/ha/yr). Some vegetation communities in the park, including forest, wetland, and lichen species, may be sensitive to excess nitrogen deposition (Sullivan et al. 2011c; Sullivan et al. 2011d). No trend information is available because there are not sufficient on-site or nearby wet deposition monitor data.

Air Quality (continued)

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Deposition (continued)	Mercury/toxics deposition		Mercury/toxics deposition warrants moderate concern at Stones River NB. A mercury risk assessment based on water chemistry and physical parameters rated the potential for methylmercury production in the park moderate as compared to other NPS units (Krabbenhoft *in Review*). High mercury concentrations in birds, mammals, amphibians, and fish can result in reduced foraging efficiency, survival, and reproductive success. Elevated levels of mercury in humans can affect the brain, kidneys, and reproductive function. No trend information is available because there are not sufficient on-site or nearby mercury wet deposition monitor data.
Visibility	Haze index		Average visibility warrants significant concern. This condition is based on NPS Air Resource Division benchmarks and the 2008–2012 estimated average visibility of 11.8 deciviews (dv) above estimated natural conditions of 7.5 dv. No trend information is available because there are not sufficient on-site or nearby visibility monitoring data.

Water Quality

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Water Chemistry	pH		0% of pH measurements fell below the Tennessee (TN) lower standard for Fish and Wildlife of 6.0 SU (Meiman 2010).
	Dissolved oxygen		20% of measurements fell below the TN standard for Fish and Wildlife of 4.0 mg/l for Subecoregion 71i. Nearly all low readings are from a natural condition of park springs (Meiman 2010).
	Water temperature		0% of temperature measurements were above the TN standard for Fish and Wildlife of 30.5 °C (Meiman 2010).
	Specific conductivity		There is no TN standard for specific conductivity. STRI waters reflect the geology of limestone watersheds (Meiman 2010).

Water Quality (continued)

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Water Chemistry (continued)	Nitrate		0% exceeded the Environmental Protection Agency (EPA) recommendation for freshwater life (90 mg/l) or the EPA drinking water standard of (45 mg/l) (Meiman 2010).
	Escherichia coli		9% exceeded the TN recreational standard *E. coli* standard. High bacteria are always associated with runoff events (Meiman 2010).

Forest Communities

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Snag Abundance	Density of snags		Dead standing trees (i.e., snags) are important habitat for many wildlife species such as bats and birds. Ideally in mature forests, about 10% or more of all standing trees should be snags and 10% of all medium to large trees should be snags (Miller et al. 2012). Cumberland Piedmont Network monitoring efforts found a moderate number of snags (8% of all standing trees) and larger snags (8% of medium to large trees). While these numbers fall slightly below the desired cut-offs for late-successional forests, it is anticipated these numbers will improve as these forests continue to mature.
Forest Composition	Relative proportion of tree species composition by forest strata		A majority of the park's forest can be considered successional in nature meaning it is young forest growing into the expected mature forest type for the area. Much of STRI's acreage at the time of park establishment was covered with old fields/grazed pastures and naturally open barren/prairie communities. These areas were replaced by red-cedar dominated forests, which in turn are being replaced primarily by ash, elm, and hackberry (CUPN 2013a). In other words, natural succession is occurring.

Forest Communities (continued)

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Exotic Species	Presence and spread of exotic species		Species that have been introduced or moved by human activities to a location where they do not naturally occur are termed exotic. A subset of these is considered invasive because they have the ability to outcompete and replace native species. Nordman (2004) believed invasives "are probably the biggest single threat to the overall ecological health of the park." Recent monitoring by the Cumberland Piedmont Network (CUPN 2013b) detected invasive species within every plot on STRI with the most common (Chinese privet, Amur honeysuckle and Japanese honeysuckle) considered severe or significant threats by the Tennessee Exotic Pest Plant council. The prevalence of these species in the landscape surrounding the park makes control efforts on the park more difficult.
Species Diversity	Species diversity		STRI contains a number of distinct vegetation associations comprising a high diversity of species, typical of natural communities within the region (Nordman 2004). Recent monitoring confirms it is one of the more diverse parks within the Cumberland Piedmont Network (CUPN 2013b).

Glade and Barren Communities

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Species Diversity	Species richness		Cofer et al. (2008) identified 232 plants within 40 identified glades within the park. These numbers are comparable (perhaps higher) when compared to published studies of glades in northern Alabama and middle Tennessee. STRI supports a concentration of rare plant species, most of which are part of the Nashville Basin Limestone Glade ecological system (Nordman 2004).
Exotic Species	Proportion of exotics		Shea et al. (2008) found that 18.8% of glade flora on average was exotic. These numbers were comparable to glade flora within the southeast. Much work has been done to control exotics within the glades and barrens during the 2000s. These efforts were negatively impacted by the 2009 tornado (disturbance).

Wetland Communities

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Wetland Function	Number and condition of wetlands		Roberts and Morgan (2006) documented 15 wetlands totaling an estimated 1.70 acres at STRI. Their primary functions are to support breeding populations of amphibians and to reduce flooding along the river. None of the wetlands had the capability to store enough water to reduce downstream flooding. Because the hydrology and soils of most wetlands at STRI have not been altered substantially, they are examples of wetlands in generally good condition.

Wildlife Communities

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Amphibians and Reptiles	Species composition and diversity		Miller et al. (2005) were only able to document 49% of species of amphibians and reptiles known to occur in Rutherford County. While specialized habitats for many of these species may not occur within the confines of the park, the fact that many relatively common species within the region went undetected is a concern. This group of vertebrates are notoriously difficult to document and the relative short duration of the study (and potentially weather conditions during survey efforts) may have contributed to the low success, which is why confidence in assessment is currently ranked low.
Fish	Species composition and diversity		Mullen (2006) conducted an inventory in two ponds within park boundaries and adjoining portions of Lytle Creek and the West Fork of the Stones River. A total of 46 species were documented. Based on species richness estimates, Mullen (2006) determined the survey was successful in documenting approximately 90% of the species in the area. Although pollution intolerant species were detected during this effort, they were few in number and earned this measure a “moderate concern” rating. The EPA 2010 Water Body Report lists the West Fork of the Stones River and Lytle Creek as impaired for fish due to excessive sedimentation and siltation (Momm et al. 2016).
Birds	Species composition and diversity		Stedman and Stedman (2006) list 152 species as occurring on the park. The fact that the park is completely surrounded by urban development likely inhibits the presence of those species requiring large blocks of habitat, but Stedman and Stedman (2006) concluded overall species richness was “moderately good” with species utilizing grassland and shrub-scrub habitats being well represented.

Wildlife Communities (continued)

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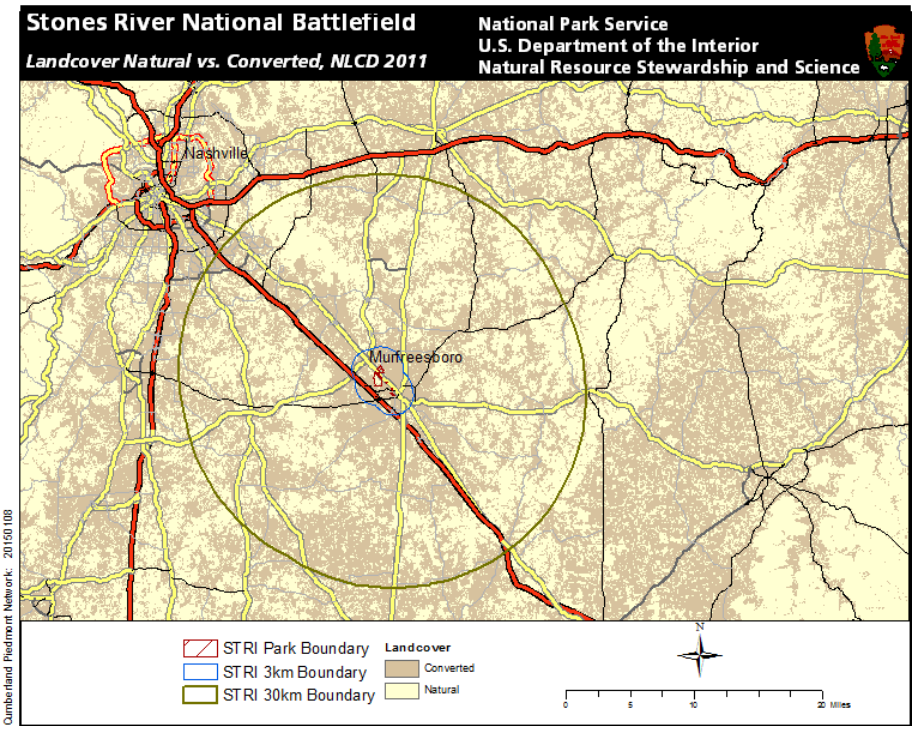
Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Mammals	Species composition and diversity		Kennedy and LaMountain (2007) documented 25 species they considered "to have a relatively high potential for occurring at STRI." It should be noted, park staff has confirmed the addition of three additional species of mammals (flying squirrel, armadillo, and bobcat). However, the authors speculated that, like with amphibians and reptiles (Miller et al. 2005), the reason that many species known to occur in the region were not found at the park during their investigation was due to land use prior to park establishment and the lack of adequate corridors for species to repopulate. Kennedy and LaMountain (2007) noted this is particularly shown by the few species of bats, shrews, and rodents found at STRI.

Resource Brief: Landscape Context of Stones River National Battlefield

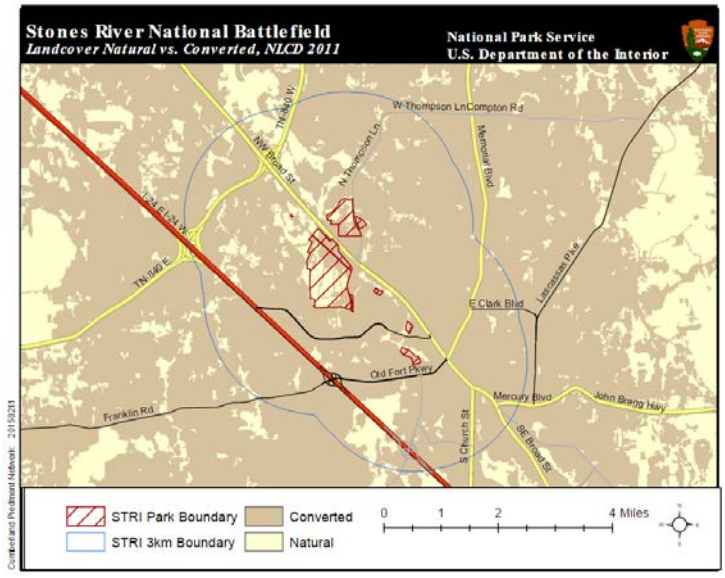
Changes in natural land cover provide a general indication of overall landscape condition and offer insight into potential threats and opportunities for conservation (Monahan et al. 2012). Areas with over 60% of natural land cover intact are considered in "good" condition, while those with less than 30% are considered "of concern" (With & Crist 1995, McIntyre & Hobbs 1999, Wade et al. 2003). Based on the National Land Cover Dataset (2011), the 30 km area surrounding STRI contains 53% natural cover and is therefore considered "fragmented." However, the 3 km area around STRI contains only 12% natural cover and so is "relictual." This is mainly a result of development and expansion of Murfreesboro, the fastest growing city in Tennessee and the 10th fastest in the nation (Maciag 2014), and growing metropolitan Nashville.

Some of the potential threats from nearby development include:

- Air quality issues, such as an increase in ozone sources from greater Nashville traffic and industry. These sources emit ozone precursors, which can raise ozone to unhealthy levels causing respiratory symptoms in visitors and foliar injury to sensitive plants. There are neighboring ozone monitors to help assess this situation, and the Cumberland Piedmont Network is also monitoring ozone levels within the park every seven years.
- Water quality issues: Stones River National Battlefield lies in the West Fork Stones River watershed, which is one of the two main watersheds that drain out of the city of Murfreesboro, and two waterways pass through the park: Lytle Creek and the West Fork of the Stones River. Pollution from urban sources may impact the water quality and the aquatic communities of the park, and water quality monitoring is conducted every month for two years with a five-year off-period to detect potential changes.
- Invasive plant issues: Exotic plant species may represent the largest single threat to the overall ecological health of the park. An initial vegetation inventory in 2004 showed that roughly 28% of the species in the park were non-native and that 44 of them were considered invasive, and an additional three exotic species have been documented during 2011 and 2012 vegetation monitoring (CUPN 2013b).



Natural and converted landcover in the year 2011 occurring within 30 km of Stones River National Battlefield.



Natural and converted landcover in the year 2011 occurring within 3 km of Stones River National Battlefield.

Dark Night Sky

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Anthropogenic Light	Anthropogenic Light Ratio (ALR) — Average Anthropogenic Sky Glow: Average Natural Sky Luminance		The modeled Anthropogenic Light Ratio (ALR), a measure of light pollution calculated as the ratio of median Anthropogenic Sky Glow to average Natural Sky Luminance, was 12.1, which is considered a poor condition. Trend is negative based on rapid population growth (30%) of the Nashville-Davidson-Murfreesboro-Franklin Metropolitan statistical area from 2008 to 2013 (U.S. Census Bureau 2013). No lighting ordinances or light pollution mitigation efforts are currently in place in these urban centers.

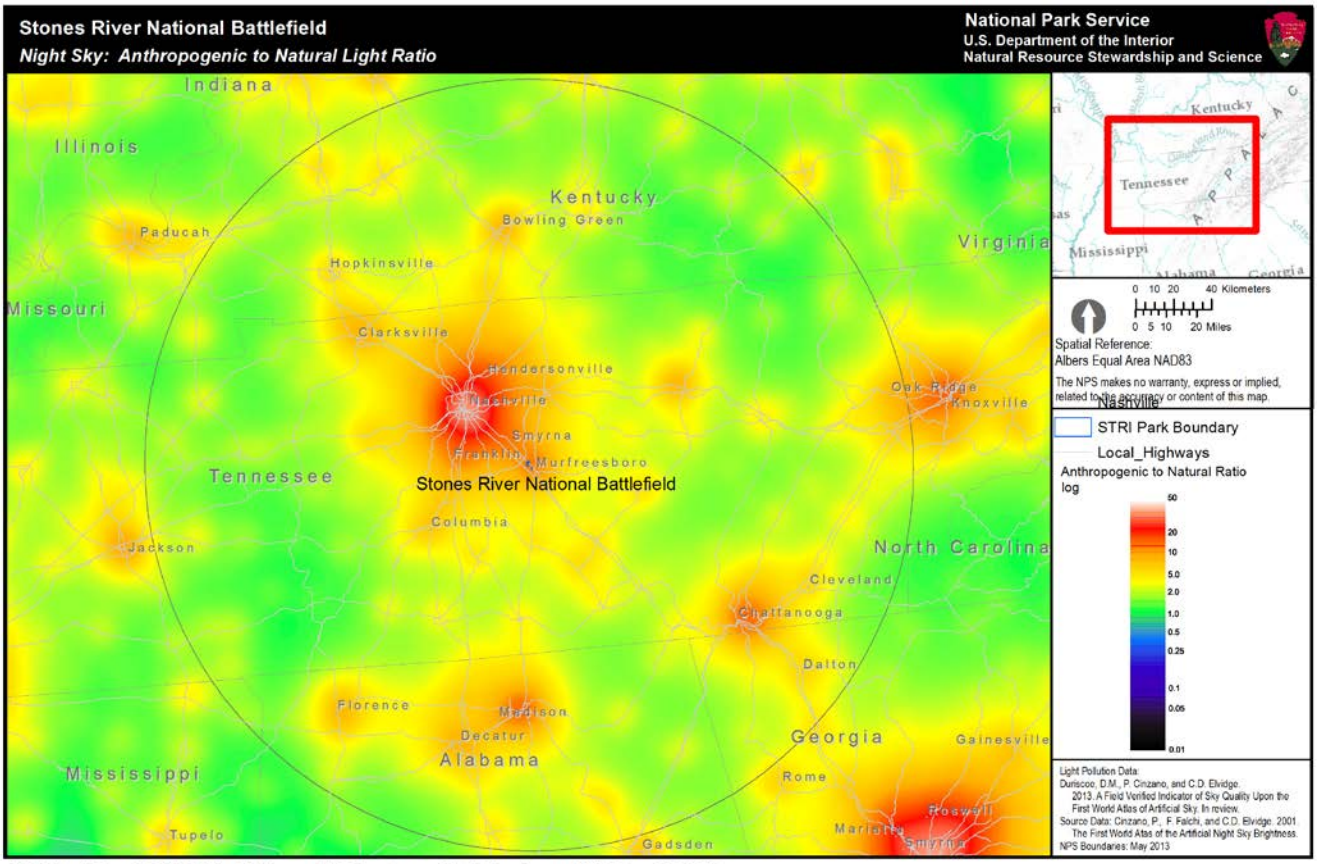
Resource Brief: Night Sky Resources at Stones River National Battlefield

The night sky has been a source of wonder, inspiration, and knowledge for thousands of years. Unfettered night skies with naturally-occurring cycles of light and dark are integral to ecosystem function as evidenced by the fact that nearly half the species on earth are nocturnal. The quality of the nighttime environment is relevant to nearly every unit of the NPS system as the nighttime photic environment and its perception of it by humans (the lightscape) are both a natural and a cultural resource and are critical aspects of scenery, visitor enjoyment, and wilderness character.

Condition
Night sky quality at Stones River National Battlefield is in poor condition. One way the Natural Sounds & Night Sky Division (NSNSD) scientists measure the quality of the photic environment is by measuring the median sky brightness levels across a park and comparing that value to average natural night sky luminance. This measure, called the Anthropogenic Light Ratio (ALR), can be directly measured with ground based measurements, or when these data are unavailable are modeled. The GIS model, calibrated to ground based measurements in parks, is derived from the 2001 World Atlas of Night Sky Brightness, which depicts zenith sky brightness (the brightness directly above the observer). A neighborhood analysis is then applied to the world atlas to determine the anthropogenic sky brightness over the entire sky. Anthropogenic light up to 200 kilometers from parks may degrade a park's night sky quality, and is considered in the neighborhood analysis. This impact is illustrated in the corresponding ALR map with a 200 km ring around the park center.

The ALR thresholds are applied spatially to the park. For both urban and non-urban parks, the designated condition (green, amber, red) corresponds to the ALR level that exists in *at least half of* (median condition) the park's landscape. Thus it is probable that a visitor will be able to experience the specified night sky quality. It is also probable that the majority of wildlife and habitats found within the park will exist under the specified night sky quality. For parks with lands managed as wilderness, the designated condition is based on the ALR level that exists in more than 90% of the wilderness area.

Impact Criteria
Two impact criteria were established to address the issue of urban and non-urban park night sky resources. Parks within urban areas, as designated by the U.S. Census Bureau, are considered less sensitive to the impact of anthropogenic light and are assessed using higher thresholds of impact. Parks outside of designated urban areas are considered more sensitive to the impact of anthropogenic light and are assessed using lower thresholds of impact. Stones River National Battlefield is categorized as 90% as non-urban and 10% urban according the U.S. Census Bureau. Non-urban parks are considered more sensitive to anthropogenic light while urban areas are less sensitive. Learn more in the document Recommended Indicators of Night Sky Quality, and the NPS Natural Sounds & Night Skies Division website.



NPS Natural Sounds & Night Skies Division and NPS Inventory and Monitoring Program MAS Group 20150105

Regional view of anthropogenic light near Stones River National Battlefield. The circle around the park represents the distance at which anthropogenic light influences the night sky quality of the park.

Acoustic Environment

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Acoustic Impact Level	Mean acoustic impact level (L50 dBA) – a measure of the noise contributed to the acoustic environment by man-made sources.		The mean acoustic impact level (L_{50} dBA) in STRI, calculated as the difference between nationwide models of existing and natural ambient, is 11.9 dBA. This indicates that the condition of acoustic resources warrants significant concern under non-urban criteria and approaches the threshold for significant concern under urban park criteria. Acoustic conditions in national parks are largely driven by transportation activity, and overall, nationwide increases in ground-based (Federal Highway Administration 2013) and aircraft traffic in recent decades (Federal Aviation Administration 2010) indicate a downward trend in acoustic conditions.

Resource Brief: Acoustic Environment at Stones River National Battlefield

All physical sound resources (i.e., wildlife, waterfalls, wind, rain, and cultural or historical sounds), regardless of their audibility, are referred to as the *acoustic environment* of a park. The quality of the acoustic environment affects park resources and values including wilderness quality, wildlife, and cultural resources and landscapes. Every unit in the national park system has a unique acoustic environment, and every unit should understand what its desired acoustic environment would be.

Condition

The condition of acoustic resources at STRI warrants significant concern under non-urban criteria, and approaches the threshold for significant concern in urban areas as well. To characterize the acoustic environment (a complex and multifaceted resource) in all parks, the National Park Service has developed a national geospatial model of noise pollution (Mennitt et al. 2014). This model predicts the increase in median sound level that can be attributed to human activities on an average summer day. The model is based on measured sound levels from hundreds of national park sites and about one hundred explanatory variables such as location, climate, landcover, hydrology, wind speed, and proximity to noise sources such as roads, railroads, and airports. The resulting model predicts sound levels anywhere in the contiguous U. S., and also estimates how much lower these sound levels would be in the absence of human activities. It is this predicted difference between the existing and natural sound level (acoustic impact level) that is used to evaluate the condition of the acoustic environment. Because acoustical conditions within a park may vary widely along a gradient, mean acoustic impact level is used because it is a close approximation of expected impact levels at any given point in a park.

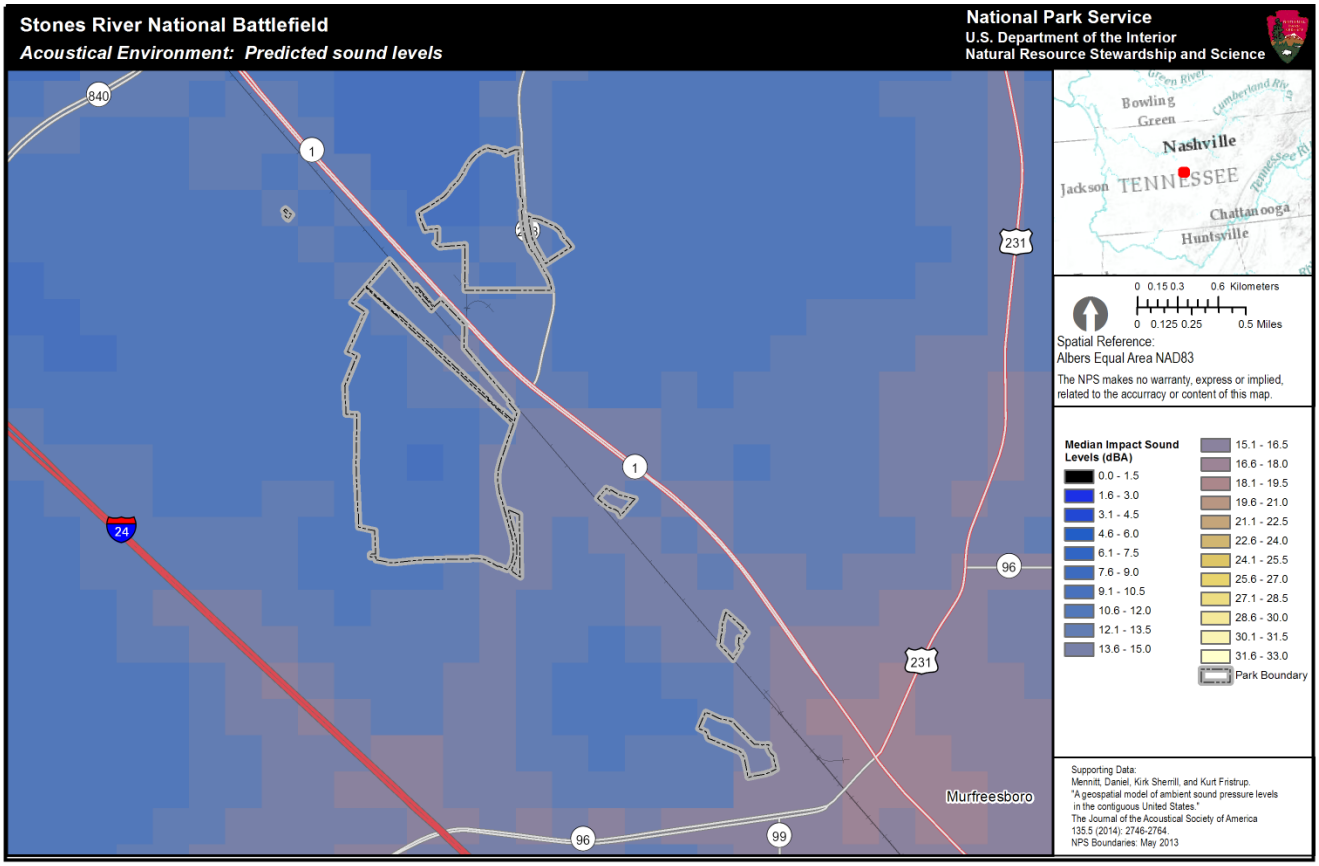
Criteria for Condition Status/Trend

For State of the Park Reports, NPS has established acoustic standards (green, amber, red) and two sets of impact criteria for urban parks and non-urban parks. A park's status (urban or non-urban) is based on data from the U.S. Census Bureau (U.S. Census 2010). Parks outside designated urban areas typically possess lower sound levels, and exhibit less divergence between existing sound levels and predicted natural sound levels. These quiet areas are highly susceptible to subtle noise intrusions. Park units inside designated urban areas typically experience more interference from noise sources in the built environment.

For *non-urban* parks, an acoustic impact of less than or equal to 1.5 dBA is considered a good condition, an acoustic impact greater than 1.5 dBA and less than or equal to 3 dBA warrants moderate concern, and an acoustic impact greater than 3 warrants significant concern. For parks in *urban* areas, an acoustic impact of less than or equal to 6 dBA is considered a good condition, an acoustic impact greater than 6 dBA and less than or equal to 12 dBA warrants moderate concern, and an acoustic impact greater than 12 warrants significant concern. Because significant portions of Stones River National Battlefield intersect with urban areas (10%) and non-urban areas (90%), both thresholds were considered in this document.

More Information

To learn more about acoustic resources, condition criteria, and the model used in State of the Park Reports, refer to Recommended indicators and thresholds of acoustic resources quality for NPS State of the Park Reports, the NPS Natural Sounds and Night Skies Division website, and the figure below.



NPS Natural Sounds & Night Skies Division and NPS Inventory and Monitoring Program MAS Group 20150102

Park-specific acoustic impact (mean L_{50} dBA) map, as generated by ver. 3.1 of the geospatial model. The color scale indicates how much man-made noise raises the existing sound pressure levels in a given location (measured in A-weighted decibels, or dBA), with 270 meter resolution. Black or dark blue colors indicate low impacts while yellow or white colors indicate greater impacts. Note that due to the national scale of the model inputs, this graphic may not reflect recent localized changes (such as new access roads or development).

Resource Brief: Climate change effects at Stones River National Battlefield

Climate change is ongoing and past greenhouse gas emissions, long residence times of these gases in the atmosphere, and our current emissions trajectory suggest that future climate change will be substantial (Wigley 2005, Peters et al. 2012). Even if greenhouse gas emissions are dramatically reduced in the future, Stones River National Battlefield will continue to experience impacts from ongoing changes. Although the precise magnitude of these changes cannot be predicted, many trends are already detectable and can be incorporated into planning efforts.

Warming temperatures mean not only increases in average temperature but also increases in extreme daily high temperatures (Kunkel et al. 2013). A shift of only a few degrees from mid 80s (°F) to low 90s can move visitors from a "Caution" to "Extreme Caution" zone according to the National Oceanic and Atmospheric Administration's Heat Index. More frequent hot spells may especially be of concern to elderly visitors and other sensitive groups. Heat waves are also linked to unhealthy ozone levels, and this is particularly important for Stones River National Battlefield where ozone is already a moderate concern. Higher levels of ozone could cause foliar damage to the vegetation at the Site.

The forests in and around Stones River National Battlefield are likely to change due to a warming climate in conjunction with other stressors such as tree pests (Fisichelli et al. 2014). Habitat suitability for various tree species in the region may increase, decrease, or remain unchanged under future conditions. The table below provides tree habitat suitability projections for select species at Stones River. Projections are for the year 2100 under two climate scenarios ("least change" and "major change") that bracket a range of plausible future conditions based on greenhouse gas emissions and global climate model projections. Habitat suitability projections for 65 tree species at Stones River and for trees at 120 other eastern U.S. parks are available at: http://science.nature.nps.gov/climatechange/.

Potential changes in habitat suitability (2100 compared with 1990) for select tree species in Stones River National Battlefield. Habitat change class designations are based on two future climate scenarios (the "least change" scenario represents strong cuts in greenhouse gas emissions and modest climatic changes and the "major change" scenario represents continued increasing greenhouse gas emissions and rapid warming). Change class designations are based on the ratio of future (2100) to baseline (1990) habitat suitability (output from the U.S. Forest Service Climate Change Tree Atlas).

Scientific Name	Common Name	Least Change Scenario	Major Change Scenario
Acer rubrum	red maple	No change	Small increase
Acer saccharum	sugar maple	Large decrease	Extirpated
Carya ovata	shagbark hickory	Large decrease	Large decrease
Carya tomentosa	mockernut hickory	No change	No change
Celtis laevigata	sugarberry	No change	Small increase
Celtis occidentalis	hackberry	Small decrease	Small decrease
Fraxinus americana	white ash	Large decrease	Large decrease
Juniperus virginiana	eastern redcedar	Small decrease	Large decrease
Liquidambar styraciflua	sweetgum	Small increase	Large increase
Quercus alba	white oak	No change	Small decrease
Quercus muehlenbergii	chinkapin oak	Large decrease	Small decrease
Quercus stellata	post oak	Large increase	Large increase
Ulmus alata	winged elm	Small increase	Small increase
Ulmus americana	American elm	No change	Small increase

Heat can be a key driver of forest impacts and insect pest outbreaks on urban trees (Meineke et. al 2013). Longer growing seasons will increase the risk of insect outbreaks and expand ranges of some species such as scale insects and cankerworm (Ingram 2013, Frank 2014). Near-term (2013–2027) disease and pest risks for the Site include oak decline and emerald ash borer (Krist et al. 2014).

Stones River National Battlefield is home to a cedar glade ecosystem, found in the central basin of Tennessee. The ecosystem is anchored by the eastern redcedar (*Juniperus virginiana*), a species predicted to lose habitat in the future (table above). The cedar glades are home to the endangered Pyne's ground plum (*Astragalus bibullatus*).

Warming temperatures are predicted to increase evapotranspiration, drying forest vegetation and increasing wildfire risk. Increased evapotranspiration may also reduce streamflow (Ingram 2013).

Climate change may increase risk from invasive plant species. Longer growing seasons and shorter cold snaps may allow invaders to expand into new ranges (Ingram 2013). Undesirable species that could impact the site and are likely to benefit from climate change include kudzu (*Pueraria lobata*), privet (*Ligustrum sinense*; *L. vulgare*), and cogongrass (*Imperata cylindrical*) (Bradley et al. 2010).

A changing climate will also affect aquatic systems in and around Stones River (TWRA 2009). For example, high-intensity rain events are likely to continue becoming more common, causing increased turbidity, erosion, and flushing of contaminants in streams and rivers (Treasure et al. 2008, Jacobs et al. 2001). Increasing water temperatures also have multiple potential effects, including decreases in dissolved oxygen, expansion of nonnative invasive fish currently located further south, and increased outbreaks of native and introduced diseases (TWRA 2009).

Effective climate change adaptation requires collaboration among land managers across large landscapes. The Gulf Coast Plains and Ozarks Landscape Conservation Cooperative (http://gcpolcc.org/) is one of a network of Cooperatives planning for a sustainable landscape in the face of climate change. The Cooperative is a good place to find partners to work together to adapt natural and cultural resources to climate change.

Resource Brief: Recent Climate Change Exposure of Stones River National Battlefield

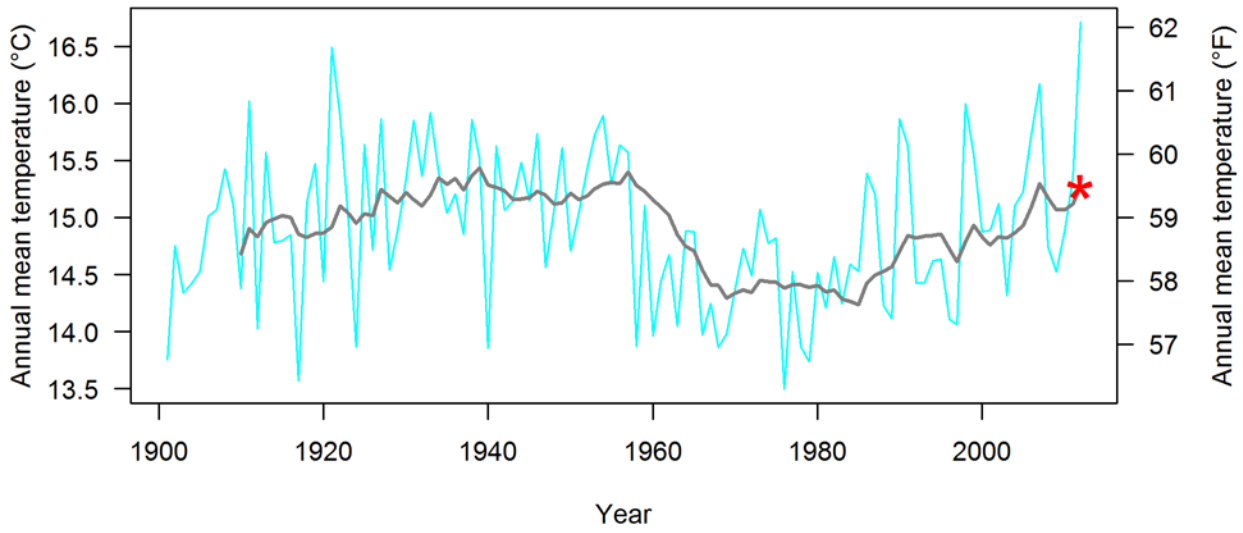
To understand Stones River National Battlefield recent "climate change exposure" —that is, the magnitude and direction of ongoing changes in climate, we investigated how recent climate compares to historical conditions (see Monahan & Fisichelli 2014 for updates to the basic climate inventories for 289 national park units). We evaluated climate change exposure by asking which of 25 biologically relevant climate variables recently (past 10–30 years) experienced "extreme" average values relative to the 1901–2012 historical range of variability. We define "extreme" conditions (e.g., extreme warm, extreme wet) as exceeding 95% of the historical range of conditions.

Methods

To evaluate recent climate values within the context of historical conditions at Stones River National Battlefield, we used the following methods (also illustrated in the figure below). Analyses included areas within 30 km (18.6 mi) of the park's boundary:

- For each temperature and precipitation variable, we analyzed data within three progressive time intervals, or "moving windows," of 10, 20, and 30 years to calculate a series of averages over the entire period of analysis (1901–2012). For example, in progressive 10-year intervals, we calculated averages of temperature and precipitation for 103 blocks of time (1901–1910, 1902–1911 . . . 2003–2012), and repeated this approach for the 20 and 30-year "windows." This type of analysis helps to smooth year-to-year fluctuations in order to identify longer-term trends that characterize the park's historical range of variability (HRV). The three windows encompass both near- and long-term management and planning horizons, as well as important climatic periods and cycles.
- We compared the average temperature and precipitation values for each of the most recent 10, 20, and 30-year intervals (2003–2012; 1993–2012; and 1983–2012) to those of all corresponding intervals across the entire period of 1901–2012. These results (expressed as percentiles) describe "recent" conditions relative to historical conditions. For example, a 90th percentile for annual average temperature over the most recent 10-year interval (2003–2012) means that the annual average temperature during this time exceeded 90% of annual average temperatures for all 10-year periods from 1901 to 2012.
- We then averaged the percentiles of the most recent 10, 20, and 30-year time periods and computed the maximum difference in recent percentile. For each park and climate variable, this resulted in both an overall measure of recent climate change exposure with respect to HRV (dots in second figure below), and an estimate of sensitivity to moving-window size (length of bars in second figure below).

See Monahan & Fisichelli (2014) for a detailed explanation of methods, and the figure below for an example analysis applied to annual mean temperature at the park.

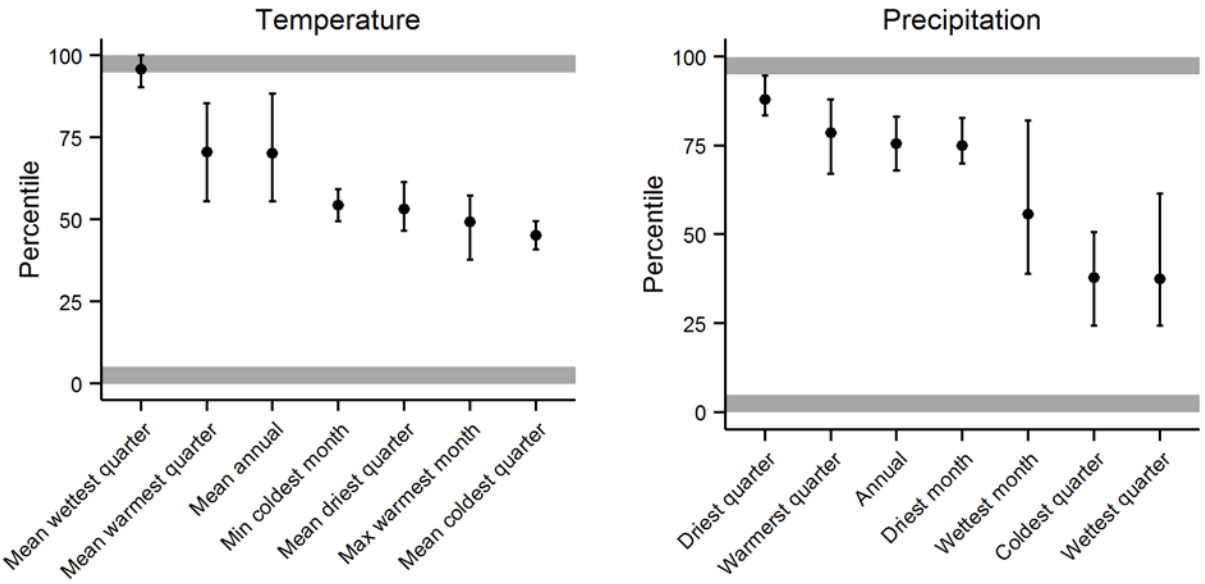


Time series used to characterize the historical range of variability and most recent percentile for annual mean temperature at Stones River National Battlefield (including areas within 30-km [18.6-mi] of the park's boundary). The blue line shows temperature for each year, the gray line shows temperature averaged over progressive 10-year intervals (10-year moving windows), and the red asterisk shows the average temperature of the most recent 10-year moving window (2003–2012). The most recent percentile is calculated as the percentage of values on the gray line that fall below the red asterisk (see results of most recent percentiles for all temperature and precipitation variables in the figure below).

Results

Recent percentiles for 14 temperature and precipitation variables at Stones River National Battlefield appear in the figure below. Results for "extreme" variables at the park were as follows:

- One temperature variable was "extreme warm" (mean temperature of the wettest quarter).
- No temperature variables were "extreme cold."
- No precipitation variables were "extreme dry."
- No precipitation variables were "extreme wet."



Recent temperature and precipitation percentiles at Stones River National Battlefield (including areas within 30-km [18.6-mi] of the park's boundary). Black dots indicate average recent percentiles across the 10, 20, and 30-year intervals (moving windows). Variables are considered "extreme" if the mean percentiles are <5th percentile or >95th percentile (i.e., the gray zones, where recent climate is pushing the limits of all observed climates since the year 1901). Black bars indicate the range of recent percentiles across 10, 20, and 30-year moving windows (larger bars indicate higher sensitivity to moving window size).

Key points for interpreting these results in the context of park resources include:

- Recent climatic conditions are already shifting beyond the historical range of variability.
- Ongoing and future climate change will likely affect all aspects of park management, including natural and cultural resource protection as well as park operations and visitor experience.

Climate Change Adaptation

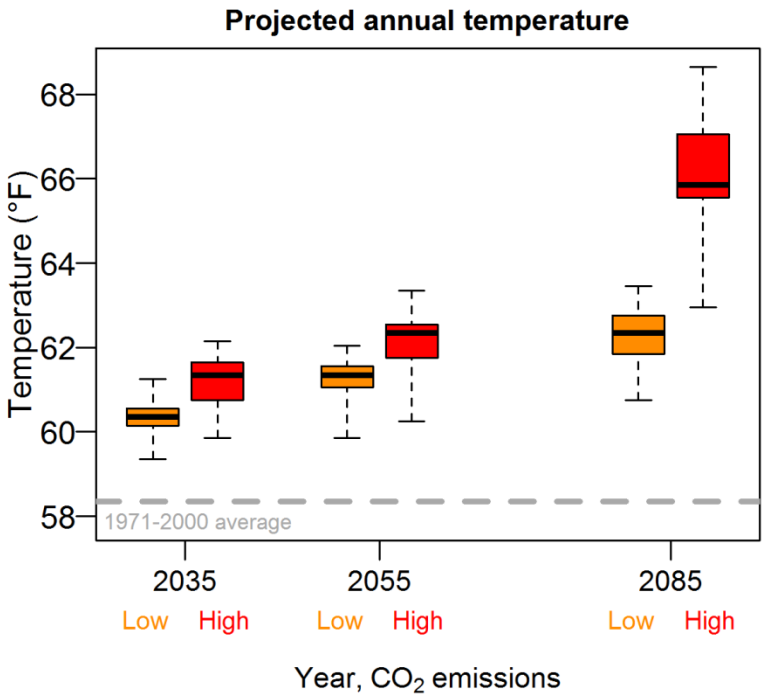
These findings and projections of future conditions can inform climate change adaptation at Stones River National Battlefield by helping park managers, planners, and interpreters to understand how recent and plausible future climates compare to past conditions. For example, these findings may be used to:

- Characterize park exposure to recent climate change in a vulnerability assessment.
- Develop plausible and divergent futures for use in a climate-change scenario planning workshop.
- Synthesize desired future conditions (i.e., reference conditions) for use in a Resource Stewardship Strategy or other management plan.
- Create interpretive materials for communicating with park visitors and local communities.

For more information see Monahan and Fisichelli 2014.

Resource Brief: Future Climate Projections for Stones River National Battlefield

Climate change impacts all aspects of park management from natural and cultural resource protection to park operations and visitor experience. Effective planning and management must be grounded in our comprehension of past dynamics as well as the realization that future conditions may shift beyond the historical range of variability. For example, average annual temperature (30 year mean) in the region including Stones River National Battlefield is projected to be warmer than the 1971–2000 average under all future climate projections (see figure below). Climate change will manifest itself not only as shifts in mean conditions but also as changes in climate variability (e.g., more intense storms, flooding, and drought). Within Stones River National Battlefield, these changes in combination with other factors such as nonnative species may alter the future status, trend, and condition of many natural resources and accelerate weathering, deterioration, and loss of cultural resources.



Historical and projected mean annual temperature for Stones River National Battlefield. Historical data (1971–2000 average) are from Monahan and Fisichelli (2014). Projected climate change (30-year means) for the region including the park are for three future time periods centered on 2035 (2021–2050), 2055 (2041–2070), and 2085 (2070–2099) (Kunkel et al. 2013). Two greenhouse gas emissions scenarios are presented, the low (B1) and high (A2) scenarios (IPCC 2007). Projected climate boxplots indicate the variability in future projections among 15 CMIP3 climate models. Values for the area including the park are based on the mean model output for that location and the range of climate model projections for the region: the bold horizontal black line represents the mean among all models, the upper and lower bounds of the boxes indicate the 25th and 75th percentile model output values and the whiskers show the minimum and maximum values.

2.2. Cultural Resources

Archeological Resources

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research is conducted to understand the relationship of the park's archeological resources to the historic contexts for the park.		Sufficient research has been conducted related to the battlefield and Civil War themes. Additional archeological information and knowledge could be obtained through added investigation of Fortress Rosecrans, the park's associated homesteads, and local prehistoric sites.
	Percentage of archeology baseline documents with current and complete information.		The park currently has none of the NPS-required baseline documents. An archeological Overview and Assessment and a Historic Structures Report would be beneficial.
	Scope of archeological resources in the park is understood and a determination has been made whether or not they are a fundamental or other important resource.		Archeological resources are a fundamental resource for the park and the scope is generally understood.
	The distribution and types of archeology sites is understood.		The type and distribution of the sites within the park are poorly understood as most of the archeological testing has been focused in areas of construction and development (visitor center, roads) and not comprehensive. There have been limited metal-detecting surveys over larger areas of the park.
	The mechanisms affecting site stability and taphonomic influences are understood.		Taphonomic influences are physical processes that influence how items on the landscape are preserved through time. Park historic and prehistoric earthworks are threatened by invasive exotic plants, groundhog infestation, and erosion. While resources are currently in good condition, care is needed in guarding their future.
	Percentage of sites with known date ranges associated with a research theme.		All identified sites have known date ranges associated with a research theme.

Archeological Resources (continued)

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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Inventory	Percentage of park intensively surveyed.		5.9 percent of the park has been systematically surveyed. Sufficient archeological investigations have taken place at Redoubt Brannan and portions of the battlefield near the Visitor Center. Other archeological investigations have taken place on Fortress Rosecrans but additional work is warranted. The park would benefit from an NPS Archeological Overview and Assessment.
	Percentage of survey data included in the Geographic Information System (GIS) meeting current cultural resource standards.		100 percent of the data is entered into GIS and meets current standards.
	Percentage of archeological resources with complete, accurate, and reliable data in the Archeological Sites Management Information System (ASMIS).		100% of the 26 known sites are documented in ASMIS.
Documentation	Percentage of known sites with adequate National Register documentation.		5 of the 26 sites (19%) have adequate National Register documentation.
	Percentage of archeological materials cleaned, conserved, studied, cataloged, and properly stored.		Currently 100% of the park's artifacts are cataloged and stored at the NPS Southeast Archeological Center (SEAC) facility in a secure, climate-controlled environment. There are 6,485 artifacts in the archeological collection. About 20% of these objects still require conservation treatment.
	Park base maps are prepared showing the location and distribution of archeological resources, the nature and extent of archeological identification activities, and the types and degree of threats and damages.		All archeological sites and surveys are on base maps. Additional information such as pending study areas, and types and degrees of potential threats and damages are understood, but have not been mapped.

Archeological Resources (continued)

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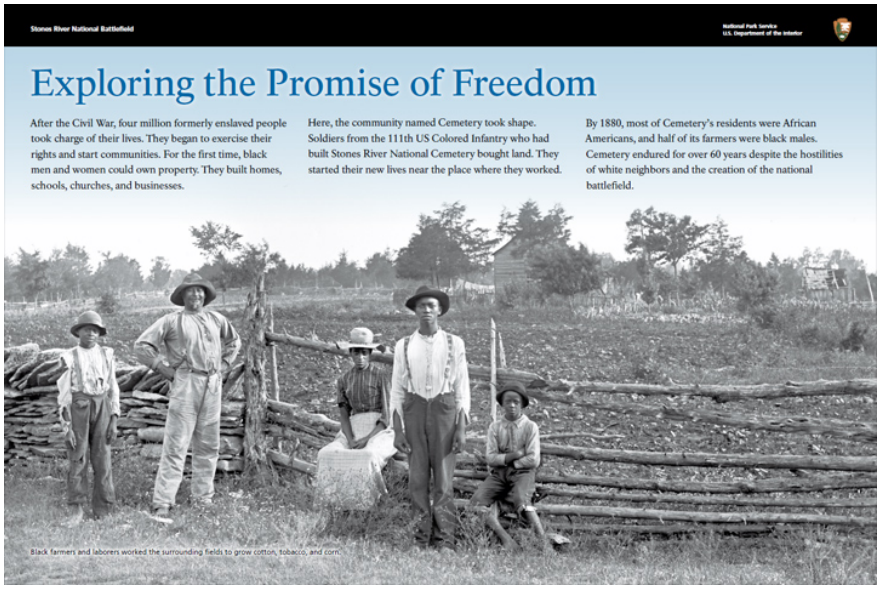
Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Documentation (continued)	Percentage of archeological reports and publications entered in the Integrated Resource Management Applications (IRMA) database with appropriate restrictions for access to sensitive information.		Two of twenty-seven archeological reports currently appear in IRMA.
	Research results are disseminated to park managers, planners, interpreters, and other NPS specialists and incorporated into appropriate park planning documents.		All NPS Southeast Archeological Center reports have been transmitted to the park.
Certified Condition	Percentage of archeological resources certified as complete, accurate, and reliable in the Archeological Sites Management Information System (ASMIS) in good condition.		100% of the 26 known sites have complete data sets in ASMIS and are rated in good condition.

Cultural Anthropology

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research is conducted to understand the relationship of the park's ethnographic resources to the historic context(s) for the park.		The park received a final draft of an Ethnographic Overview and Assessment in 2016. While this draft has helped document cultural connections to the park's landscapes, considerable editing and additional research will be required to make the document useful as a management tool. The park continues to cooperate with the Public History Program at Middle Tennessee State University to explore ethnographic and anthropological resources connected to the park.
Inventory	Appropriate studies and consultations document resources and uses, traditionally associated people, and other affected groups, and cultural affiliations.		The new Ethnographic Overview and Assessment study for the park identifies local traditionally associated people and groups and provides information on anthropological resources and traditional uses. The final draft still requires considerable editing and additional research to reach completion. Additionally, the Center for the Study of History and Memory at Indiana University, Bloomington has a collection of ten interviews with the Stones River Battlefield Community conducted by Miranda Fraley in 1999. These interviews are important for reconstructing the history of the Stones River National Battlefield and the surrounding Murfreesboro area.
Documentation	Research results are disseminated to park managers, planners, interpreters, and other NPS specialists and incorporated into appropriate park planning documents.		Research results are actively disseminated among the park staff, with copies of the results on file in park libraries. In addition, reports are disseminated to the public via the park and other NPS websites. Research results guide management decisions regarding land acquisition, site preservation, resource management, and administration; and are effectively incorporated by the park's interpretive staff to develop site bulletins, wayside exhibits, and interpretive programs.

Resource Brief: Discovering the Cemetery Community



Ten years ago, visitors to the battlefield might never have known about the compelling story that played out on the landscape between the end of the Civil War and the establishment of the park. Thanks to the efforts of students in the Public History Program at Middle Tennessee State University, the story of the Cemetery Community has emerged as an important part of the historical context of the Battle of Stones River.

Professors and students searched through government records, newspapers, and archival collections for details about the community of freedmen that grew up around Stones River National Cemetery. They recorded oral histories with living members of the community, many of whom still live just beyond the park's boundaries on land that had been part of Cemetery.

Students then turned that research into interpretive programs, exhibits, and a smart phone tour that is available to the public. Their research will also serve as a critical part of the park's ongoing Ethnographic Overview and Assessment documenting the relationships of people and cultures to the battlefield.

Cultural Landscapes

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research exists to understand the relationship of the park's cultural landscapes to the historic context(s) for the park.		Stones River National Battlefield tells the story of a major Civil War battle. The national park covers only a portion of the area of battle. Research does exist to provide an understanding of the relationship between the park's cultural landscapes and historic contexts. Nine historic landscapes are defined for the park including: the Stones River National Battlefield Landscape, General Bragg's Headquarters Site, General Rosecrans's Headquarters Site, Hazen Brigade Monument, McFadden Farm Unit, Nashville Pike Unit, Curtain Wall No. 2 and Lunettes, Redoubt Brannan, and the Stones River National Cemetery (Stones River Cultural Landscape Inventory 1994, Stones River Cultural Landscape Report 2007, Stones River National Cemetery Cultural Landscape Report 2015, Stones River Historic Resource Study 2004).
	Cultural landscapes are identified and evaluated using appropriate historical contexts.		Cultural Landscapes Inventories (CLIs) are complete for all nine of STRIs cultural landscapes. These CLIs identify and evaluate all appropriate historical contexts. The park superintendent and Tennessee State Historic Preservation Office have approved the CLIs, although the additional documentation of historic contexts has not officially been approved or added to the National Register nomination.

Cultural Landscapes (continued)

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge (continued)	Scope of cultural landscapes in the park is understood and a determination has been made whether or not they are a fundamental or other important resource.		The CLIs identified contributing features in each of the park's cultural landscapes, and gave these properties an assessment of "must be preserved and maintained." The Foundation Document (NPS 2014) went on to identify the park's fundamental resources, including the battlefield landscape, the national cemetery, the commemorative landscape and monuments, and Fortress Rosecrans.
	Adequate research exists to document and preserve the cultural landscape's physical attributes, biotic systems and uses when those uses contribute to historical significance.		The park's CLIs document how the landscape's physical attributes contribute to the significance of this historic property. The Battlefield Cultural Landscape Report (CLR) (2007) and Cemetery CLR (2015) expand on this documentation and provide treatment recommendations for how to preserve and maintain these historic properties.
Inventory	Percentage of landscapes eligible for the National Register in the Cultural Landscapes Inventory (CLI) with certified complete, accurate, and reliable data.		100% – Nine cultural landscapes are documented in the Cultural Landscapes Inventory (1994) • Stones River Cultural Landscapes Inventory 1994 • Redoubt Brannan Cultural Landscapes Inventory 1998 • Stones River National Cemetery Cultural Landscapes Inventory 1998 • McFadden Farm Unit Cultural Landscapes Inventory 1998 • Nashville Pike Unit Cultural Landscapes Inventory 2007 • Curtain Wall No. 2 and Lunettes Cultural Landscapes Inventory 1998 • General Bragg's Headquarters Site Cultural Landscapes Inventory 1998 • General Rosecrans's Headquarters Site Cultural Landscapes Inventory 1998 • Hazen Brigade Monument Cultural Landscapes Inventory 1998
	Percentage of Cultural Landscapes Inventory (CLI) data included in the Geographic Information System (GIS) meeting current cultural resource standards.		Through combined efforts of the NPS Southeast Regional Office, the National Center for Preservation Technology and Training, and other NPS GIS specialists, the park's CLI data is now in GIS. A complete geodatabase of the park's cultural landscape boundaries and contributing landscape features is expected in 2017.

Cultural Landscapes (continued)

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Documentation	Percentage of cultural landscapes with adequate National Register documentation.		The entire park was administratively listed on the National Register in 1966 with the passage of the National Historic Preservation Act. Updates have been made or proposed in 1974, 1978, and 2003. In 1974, a nomination was prepared to include the recently acquired portions of Fortress Rosecrans. The state office accepted documentation for the Stones River park historic district in 1978. The existing boundaries of the National Register district encompass the federally-owned park property (as of the last documentation date). In 2003, a draft of additional documentation was submitted to the park for review. The draft has additional historic contexts, including the early commemoration of the battlefield and the African-American ethnic heritage, but does not include the War Department era commemoration. SHPO concurrence for the documentation has not been filed. An ongoing update of the park's Administrative History will facilitate an update to the park's National Register nomination information. The update is currently in draft and is expected to be approved in 2017
	Percentage of cultural landscape reports and publications entered in the Integrated Resource Management Applications (IRMA) database.		100% – All of the park's completed Cultural Landscape Reports and Inventories are in the IRMA database.
	Research results are disseminated to park managers, planners, interpreters, and other NPS specialists and incorporated into appropriate park planning documents.		Cultural landscape inventories and reports are circulated to all park staff and are made available to the public via the park's website.
Certified Condition	Percentage of cultural landscapes certified as complete, accurate, and reliable in the Cultural Landscapes Inventory (CLI) in good condition.		100% of the park's nine cultural landscapes have complete, accurate, and reliable data in the CLI. 55.5% (5 of 9) of the landscapes are in good condition. The remaining four landscapes are in fair but stable condition.

Resource Brief: Nature or History?

Prescribed fire kills invasive plants and provides nutrients for the native species that thrive after a burn. NPS Photo.

When visitors discover that Stones River National Battlefield has a team of employees and volunteers devoted to managing the park's plants and animals they sometimes seem puzzled. Why would a Civil War battlefield have Biological Science Technicians? Because *cultural* landscape management is *natural* resource management at our park.

What is a battlefield? The terrain where the Battle of Stones River raged more than 152 years ago included open fields, cedar forests filled with limestone outcroppings, wetlands, cedar glades and the river. Soldier accounts of the battle routinely describe these natural features and the plants and animals they encountered during the fighting, and period maps show how these natural features fit together upon the larger battlefield. These historic sources serve as the guide for park staff today as they work to present visitors with landscapes that resemble those of 1862.

Our resource management team fights a daily battle to turn back the tide of landscape changes that have affected the battlefield during the last 152 years. Instead of muskets and cannons, they use weapons like loppers, bush hogs, herbicides, and prescribed fire to combat the tide of invasive exotic plants that threaten to choke out the species that populated the 1862 landscape. As the exotics recede, our staff plants seeds and live native plants, slowly bringing back the viewsheds that soldiers saw during the battle. As the native plants take hold, the number and diversity of animal populations has grown in step with the increasing health of the park's habitats.

The battle to reclaim the battlefield from invasive species may never end, but the successes we have achieved by applying sound natural science to the cultural landscape has created a battlefield experience that can satisfy the history buff and the nature lover in one place.

Natural features like these limestone outcroppings at the Slaughter Pens played a key role in the battle. Restoring 1862 landscape features helps visitors better understand the layers of history on the battlefield. NPS Photo.

Historic Structures

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research is conducted to understand the relationship of the park's historic structures to the historic context(s) for the park.		A Historic Resource Study (2004) and a 1977 National Register nomination document the research and understanding of the relationship of the park's historic structures to the historic contexts of the park. An updated National Register nomination is expected to be complete in 2017.
	Historic Structures are identified and evaluated using historical contexts.		A total of 19 structures, or groups of structures, are documented on the park's List of Classified Structures. 7 of 19 structures have completed Historic Structure Reports. There are two additional LCS-eligible structures documented with Historic Structure Reports. • Pioneer Brigade Earthworks • Old Nashville Highway Entrance Gate Six historic structures at Stones River National Cemetery are documented in the National Cemetery Cultural Landscape Report (2015). The remaining structures are documented in the Battlefield Cultural landscape Report (2007) and the park's Historic Resource Study (2004).
Inventory	Percentage of historic structures eligible for the National Register in the List of Classified Structures (LCS) with accurate, complete, and reliable data.		100% of the 19 historic structures on the LCS have accurate, complete, and reliable National Register data. An ongoing revision of the park's National Register nomination will document a number of structures that may be eligible for the LCS including: • Pioneer Brigade Earthworks • Old Nashville Highway Entrance Gate • Three Mission 66 Residences
Documentation	Percentage of historic structures with adequate National Register documentation.		100% of historic structures in the LCS have adequate National Register documentation. Additional National Register documentation will be part of an ongoing project to produce an updated Administrative History and National Register nomination in 2017.
	Research results are disseminated to park managers, planners, interpreters, and other NPS specialists and incorporated into appropriate park planning documents.		All reports are distributed and accessible to park staff. The public may access reports through the park's website.

Historic Structures (continued)

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Certified Condition	Percentage of historic structures certified as complete, accurate, and reliable in the List of Classified Structures (LCS) in good condition.		74% (14 of 19) are listed as being in Good Condition in the LCS.

History

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research is conducted to understand the national significance and historical contexts for the park.		A Historic Resource Study (2004) and a 1977 National Register nomination document the park's historic context and significance. An Administrative History being drafted will improve understanding and document the NPS history at the park. Additional information about the park and its significance is included in the General Management Plan (1999) and the Foundation Document (2014).
	Percentage of history baseline documents with current and complete information.		75% – The park's Historic Resource Study remains a viable baseline document. A funded and in-process Administrative History, which will include additional National Register documentation, will add to the base of knowledge of the park.
	Research at the appropriate level of investigation (exhaustive, thorough, or limited) precedes planning decisions involving cultural resources.		CLI and CLR for park and cemetery are complete. The park utilizes the NPS's Planning, Environment and Public Comment tools and processes to guide and document planning decisions involving cultural resources for major projects. The park has begun using that process to guide planning and compliance for routine tasks as well.
Inventory	Cultural resources are inventoried and evaluated in consultation with State Historic Preservation Officers (SHPOs).		The park maintains an on-going relationship with the Tennessee State Historic Preservation Officers.

History (continued)

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Inventory (continued)	Research data are accessioned as part of the park's museum collection.		Research data is accessioned as part of the park's museum collection. The park also maintains library copies of most research and is actively digitizing holdings to provide greater access to staff and the public.
Documentation	Percentage of historic properties with adequate Determinations of Eligibility (DOE) documentation.		Current National Register documentation covers 95% of known historic properties. Updated nomination information is needed to reflect recent research. New documentation for the National Register is ongoing. An Administrative History that is expected to be complete in 2017 will include additional National Register documentation and will add to the base of knowledge of the park.

Museum Collections

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Scope of museum collection in the park is understood and a determination has been made whether or not they are a fundamental or other important resource.		The park's museum collections are a fundamental resource for the park. The Scope of Collection Statement (SOCS) was reviewed and revised 9/27/2012. The museum collections are a fundamental resource for the park (STRI Foundation Document).
	Percentage of museum collection baseline documents with current and complete information.		45.45% of the park's baseline documents are up to date. A draft Collection Management Plan that includes and updated Archival Survey, Scope of Collection Statement, and Collection Storage Plan should be finalized by 2017. The park has contracted for a Fire & Security Survey in 2017. The park needs an updated Collection Condition Survey (last done in 1993). The Housekeeping and Integrated Pest Management Plans will require updates within five years.
	Archival and manuscript collections are surveyed and described in the Interior Collections Management System (ICMS) and finding aids are produced.		A draft archival survey was completed in 2016 as part of a Collection Management Plan. The park's archival collections are cataloged using the Archives Module of ICMS. The recent archival survey has provided strategies for reorganization of the collections and generation of finding aids.

Museum Collections (continued)

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Inventory	Percentage of existing collection that is accessioned and cataloged.		99.98% of the collection has been accessioned (formally added to collections) (Collection Management Report 2015). However, there is concern that "Due to the dispersed nature of the collection, some items may be lost or misplaced" (Foundation Document 2014). The park currently has a backlog of less than 4,000 objects including archives. All objects/archival collections are accessioned.
	Scope of Collection is consistently implemented; items or objects are researched to determine their appropriateness for inclusion in the museum/archive collection.		The Scope of Collection is always used to determine whether or not an item is added to the park's collections.
	Accession and deaccession files are complete with all appropriate signatures.		All files are complete.
Documentation	Percentage of cataloged records with completed descriptive fields (beyond required fields).		100% of cataloged records include information beyond what is required.
	Percentage of museum collection reported in CMR and checklist report in good condition.		58.7% of museum objects and collections rated in good or better condition. No objects assessed during the past five years of inventories have shown deterioration sufficient to justify a lowering of a condition rating.

2.3. Visitor Experience

Visitor Numbers and Visitor Satisfaction

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Number of Visitors	Number of visitors per year		The park's new entrance gate opened in November 2011 and resulted in an increase of more than 70,000 visits as compared to previous years. Visit numbers have remained steady at around 260,000 since 2012.
Visitor Satisfaction	Percent of visitors who were satisfied with their visit		Based on the standard visitor satisfaction survey conducted each year, the percentage of visitors satisfied in FY15 was 98.0%, which is slightly lower than the average for the previous five years (99.2%) and ten years (98.7%). Source: 2015 Visitor Survey Card Data Report.

Interpretive and Education Programs – Talks, Tours, and Special Events

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Education Programs	Number and quality of programs, and number of participants		The park reported 10,794 students served by education programs in its FY 2015 Servicewide Interpretive Report (SIR). In some cases students attended more than one program during their visit. This is 2,166 less than reported in FY 2014, continuing a downward trend since 2012. Administrative and budgetary limitations on school field trips have driven down onsite programs, and the park's current staffing level limits our ability to increase outreach services at a rate that would offset field trip decreases.
Ranger Programs	Number and quality of programs and attendance		The park reported 4,246 visitors attending ranger programs in FY 2015 as compared to 4,780 in FY 2014 and 4,557 in FY 2013. The park reported visitor participation of 6,100 to more than 11,000 in FY 2005–2012.
Junior Ranger Programs	Number of programs and attendance		The park introduced a revised Junior Ranger booklet in FY 2012 as well as a Family Activity booklet used to award Civil War to Civil Rights trading cards. The park reported 1,742 Junior Ranger contacts on its FY 2015 SIR. This is the first time since 2012 that numbers of Junior Rangers has decreased.

Interpretive and Education Programs – Talks, Tours, and Special Events (continued)

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Special Events	Variety and longevity of events, community involvement		The park reported 7,118 visitor contacts at special events including several NPS Centennial events in FY 2015. This number is significantly higher than the 1,930 special event contacts in FY 2014 but more in line with the 6,744 contacts reported in FY 2013, which included most of the park's main events commemorating the 150th anniversary of the Battle of Stones River. The park and several local partners worked together to present a number of programs in October 2014 as part of its first annual Heritage Month and is exploring additional special events to reach underserved audiences.

Resource Brief: Good Luck Leads to a Great Education Partnership

Sometimes a chance meeting yields rich rewards. That certainly proved true in 2010 when Barclay Randall, the Broadcasting teacher in the Country Music Television Academy of Digital Design and Communication at McGavock High School approached one of our rangers at a teacher workshop. What followed has been an ever growing partnership between Stones River National Battlefield, the National Park Service, and students in one of the largest and most diverse schools in Tennessee.

McGavcock High School students collect water quality samples in Mammoth Cave. NPS Photo.

Over five years, more than 1,000 students have benefited from an array of field trips, outreach programs, and project-based learning opportunities. In October 2012, the park adopted the Class of 2016 in response the NPS Centennial Class Act Initiative. This four year set of programs sponsored by the NPS and the Tennessee Wildlife Federation's Great Outdoors University features an annual field trip to the battlefield, Mammoth Cave National Park, Big South Fork National Recreation Area and Great Smoky Mountains National Park. By the time they graduate in 2016 these students will be well on their way to becoming lifelong visitors to national parks.

Interpretive Media – Brochures, Exhibits, Signs, and Website

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Wayside Signs	Condition and currency of signs		The park had a Wayside Plan prepared in 2006 and has installed 34 exhibits through 2014. The park plans to continue adding exhibits as funds are available and has submitted a PMIS request to fund an updated plan.
Park Directional Signs (off-site)	Usefulness, quantity, and placement		Rutherford county has installed an array of directional signs, and the park has also updated its road and tour route signs in the past ten years. The park is working to get directional signs on I-40, I-65, and TN-840.
Exhibits	Exhibits		The exhibits are more than ten years old. They continue to do an excellent job of creating a contextual framework for visitors, but some elements have begun to show signs of deterioration. Replacement of outdated Audio/Visual (AV) equipment that will fit existing exhibits may prove difficult.
Print Media	Accuracy and availability of primary park publications		The park folder is updated with every printing. A schedule of events rack card is updated annually.
Audio-visual Media	Orientation Films		The park's films generally function well and continue to provide a short, but thorough synopsis of the battle and its significance. The film and projection equipment were upgraded to digital media in 2016. The new film includes on screen captions.
	Other AV material		Most AV equipment has been replaced or upgraded during the last ten years, but some key equipment such as the interactive cemetery burial search, the Hell's Half Acre diorama, and Fortress Rosecrans map rely on outdated or custom-built equipment that cannot easily be replaced without significant changes to the exhibit.
Websites	Currency and scope of website; number of website visitors		The number of website unique page visits has hovered between 220,000 and 300,000 for the past five years.
	Social media: Facebook updates and "likes," overall activity		The park debuted on Facebook (FB), Twitter, and Flickr in July 2012. The park currently has more than 10,000 FB likes and more than 4,600 Twitter followers. The park started an Instagram site in December 2014 and has more than 2000 followers.

Accessibility

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Mobility	ADA compliance		The visitor center and exhibits comply with the Americans with Disabilities Act (ADA). The park had an Accessibility Assessment conducted in 2016. The park has prepared a request for funding for a trail plan that will address mobility issues on some park trails.
Visual Accommodation	ADA compliance		The visitor center and exhibits are ADA compliant.
Auditory Accommodation	ADA compliance		The visitor center and exhibits are ADA compliant.
Public Transportation	Access to park via public transportation		No public transportation routes include the park. Some routes stop nearby, and the park will work with local governments to enhance public transportation access.
Multi-lingual Resources	Audio and print materials in multiple languages Bi-lingual staff		The park has translations of an older version of its park folder in several Asian languages. A Spanish language website serves Spanish speakers. The park has no multi-lingual resources for current interpretive media.

Safety

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Visitor Safety	Recordable incidents		The safety of visitors is a park priority. The park works to quickly identify and mitigate potential hazards, and the number of accidents is very low.
Staff Safety and Training	Number of staff trained		Operational Leadership Training has been completed by park staff, and cardiopulmonary resuscitation (CPR), First Aid, and automated external defibrillator (AED) training are offered to staff on a space-available basis. Job Hazard Analysis is conducted before jobs throughout the park. Regular safety messages are given and distributed to staff members.

Partnerships

web

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Volunteers	Number and hours contributed		The park's Volunteers-In-Parks program has steadily grown from 967 volunteers contributing 12,078 hours in FY 2004 to 1,876 volunteers and 15,081 hours in FY 2015.
Partnerships	Number of official and unofficial partnerships		The park has formal partnerships with Middle Tennessee State University, McGavock High School, the Tennessee State Natural Area Program, and Friends of Stones River National Battlefield. The park has numerous informal partnerships with local governments, schools, and groups. During 2014, the park worked with more than a dozen groups through an inaugural Heritage Month in October 2014 and two volunteer events (Park Day & National Public Lands Day) during the past two years. Since 2013, the Friends of Stones River National Battlefield have reorganized, elected a new board, launched a new website and Facebook page, and increased their membership.

Resource Brief: Community Involvement Kicks into High Gear

In 2014 Stones River National Battlefield expanded community engagement. Park staff coordinated the efforts of nearly two dozen partners during two special events that promise to create a sustainable and growing connection between the park and its neighbors.

As it has in the past, Stones River National Battlefield participated in National Public Lands Day by coordinating a volunteer project on the last Saturday of September. In 2014 several local agencies and groups contributed employees, volunteers, equipment and other logistical support allowing more than ninety volunteers to remove trash and invasive exotic plants from Old Fort Park, Fortress Rosecrans, and the Lytle Creek Greenway. The park and its partners, including some new additions, kicked off the NPS Centennial with an April event hosting more than 200 volunteers.

Partners and volunteers remove invasive exotic plants from the banks of Old Fort Park Creek.

2014 National Public Lands Day Partners

- City of Murfreesboro Parks & Recreation Department
- Discovery Center
- Friends of Stones River National Battlefield
- Friends of the Greenway
- Middle Tennessee State University Stormwater Program
- Murfreesboro Stormwater Program
- Outdoor Murfreesboro
- Rotary Club of Murfreesboro
- Stones River Watershed Association
- Walmart

Battlefield visitors enjoy a Tennessee Valley Winds concert.

During October 2014, Stones River National Battlefield and thirteen partners presented an array of programs at sites throughout Murfreesboro and Rutherford County during the inaugural *Sharing Our Past Month*. Programs included: special tours of local cemeteries, an outdoor concert, scholar presentations, an archival preservation workshop for community members, living history programs, festivals, and a teacher workshop. Planning is underway for our 2015 slate of events with new partners coming on board.

2014 Sharing Our Past Month Partners

Bradley Academy Museum, Eastern National, Friends of Stones River National Battlefield, Heritage Center of Murfreesboro and Rutherford County, Historic Cannonsburgh Village, Middle Tennessee State University History Department, Middle Tennessee State University Public History Program, Oaklands Historic House Museum, Rutherford County Archives, Rutherford County Convention and Visitors Bureau, Sam Davis Home, Teaching with Primary Sources at Middle Tennessee State University, Tennessee Civil War National Heritage Area, and the Tennessee Valley Winds.

2.4. Park Infrastructure

Overall Facility Condition Index

web

The National Park Service uses a facility condition index (FCI) to indicate the condition of its facilities and infrastructure. FCI is the cost of repairing an asset, such as a building, road, trail, or water system, divided by the cost of replacing it. The lower the FCI number, the better the condition of the asset. The condition of the buildings and other infrastructure assets at each park is determined by regular facility inspections, or "condition assessments," including daily informal inspections and formal yearly inspections. Deficiencies identified from these assessments are documented in the NPS Facility Management Software System and the cost for each repair determined. Repairs that cannot be completed within the year count against the condition of a structure. The total cost of these deferred repairs divided by the total cost to replace the structure results in the FCI, with values between 0 and 1 (the lower the decimal number, the better the condition). The FCI is assigned a condition category of Good, Fair, Poor, or Serious based on industry and NPS standards. Deferred maintenance projects that require additional funding are identified based on FCI. Planned preventive maintenance on critical components occurs during the year, using a park's base budget. For additional information about how park managers use information about the condition of facilities and infrastructure to make decisions about the efficient use of funding for maintenance and restoration activities at the park, Click Here.

Asset Category	Number of Assets 2008 / 2016	FCI 2008 / 2016	Condition Status/Trend	Rationale
Buildings	8 / 8	0.131 / 0.093		Buildings condition is shown trending upwards due to rehabilitation of Maintenance Shop in 2012. The park is planning improvements to buildings Quarters 5 & 6. The Resource Management Office is expected to undergo alterations pending the results of a park-wide Accessibility Survey.
Trails	5 / 5	0.036 / 0.011		All trails are routinely maintained and are in good condition. Various types of trail surfaces are present in the park, including: asphalt, crushed rock, wood chips, gravel, poly-pave, and unimproved surfaces. The park is developing a more formal trail plan that will assess trail surfaces and guide creation of new trails.
Water Systems	1 / 1	0.453 / 0.481		Water systems at STRI are in fair condition. Facility Management Software System (FMSS) data is incomplete, and some work orders and funding are not represented in the data. The Stones River National Cemetery water system was replaced in 2013.
Paved Roads, Parking Areas, Bridges, Tunnels	22 / 22	0.779 / 0.337		Overall, the condition of paved roads in the park has improved since data in FMSS was last updated. Multiple roads and parking areas have been repaved in recent years. There is outstanding needed maintenance on off-site roads and some parking areas.

Overall Facility Condition Index

web

Asset Category	Number of Assets 2008 / 2016	FCI 2008 / 2016	Condition Status/Trend	Rationale
All Others	20 / 48	0.066 / 0.021		Deferred maintenance costs have been reduced by 80% in last 8 years. Cemetery headstones were raised and straightened in 2009–2011. Pioneer Brigade Earthworks have been rehabilitated and informational signage developed. At Fortress Rosecrans, the Rosecrans Headquarters site and Redoubt Brannan Cultural Landscape currently have poor FCI, and are in need of maintenance and improvements.

Resource Brief: Green Parks Plan

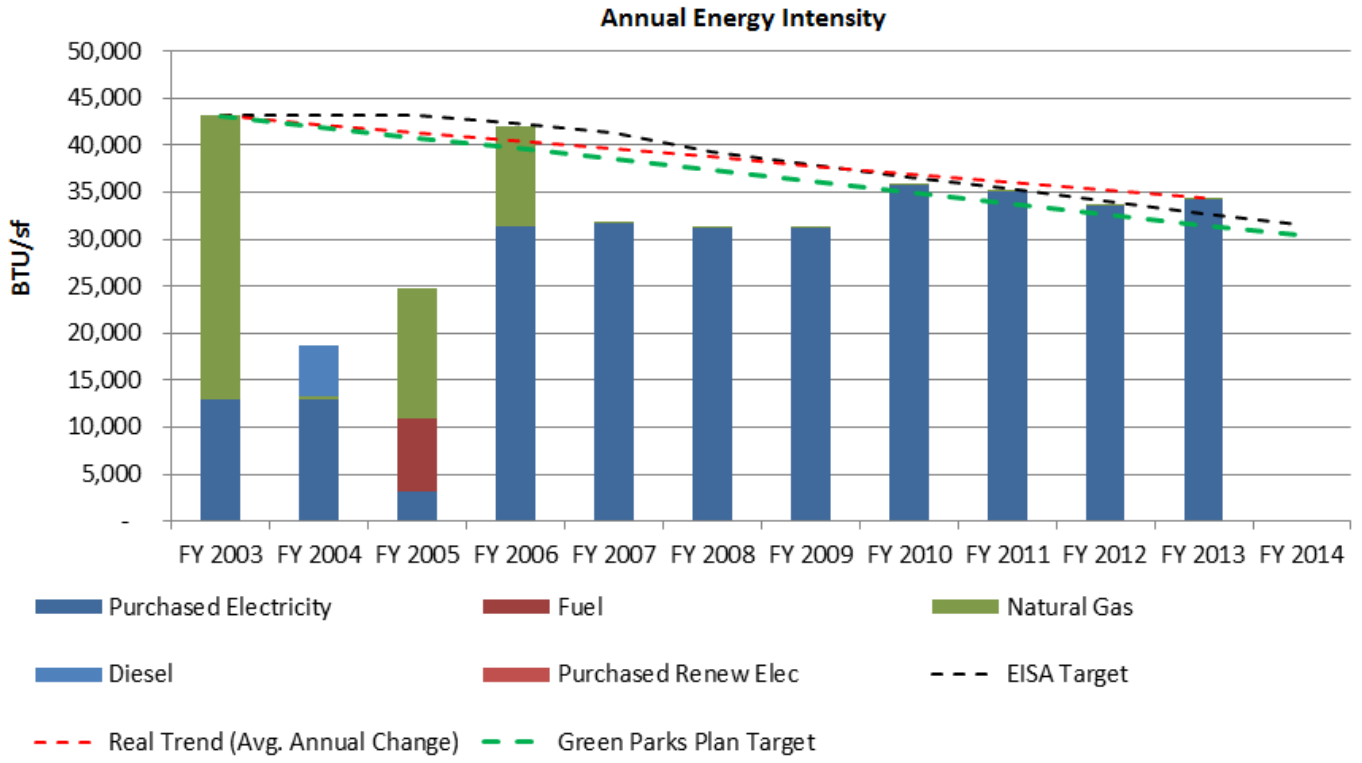
The NPS manages the largest number of constructed assets of any civilian agency in the Federal Government. It operates more than 67,000 structures that account for more than 50 million square feet of constructed space such as visitor centers and historic structures. The Green Parks Plan (GPP) defines a collective vision and a long-term strategic plan for sustainable management of NPS operations. A critical component of the implementation of the GPP will be informing and engaging parks' staff, visitors, and community partners about climate change and sustainability to broaden opportunities to foster change.

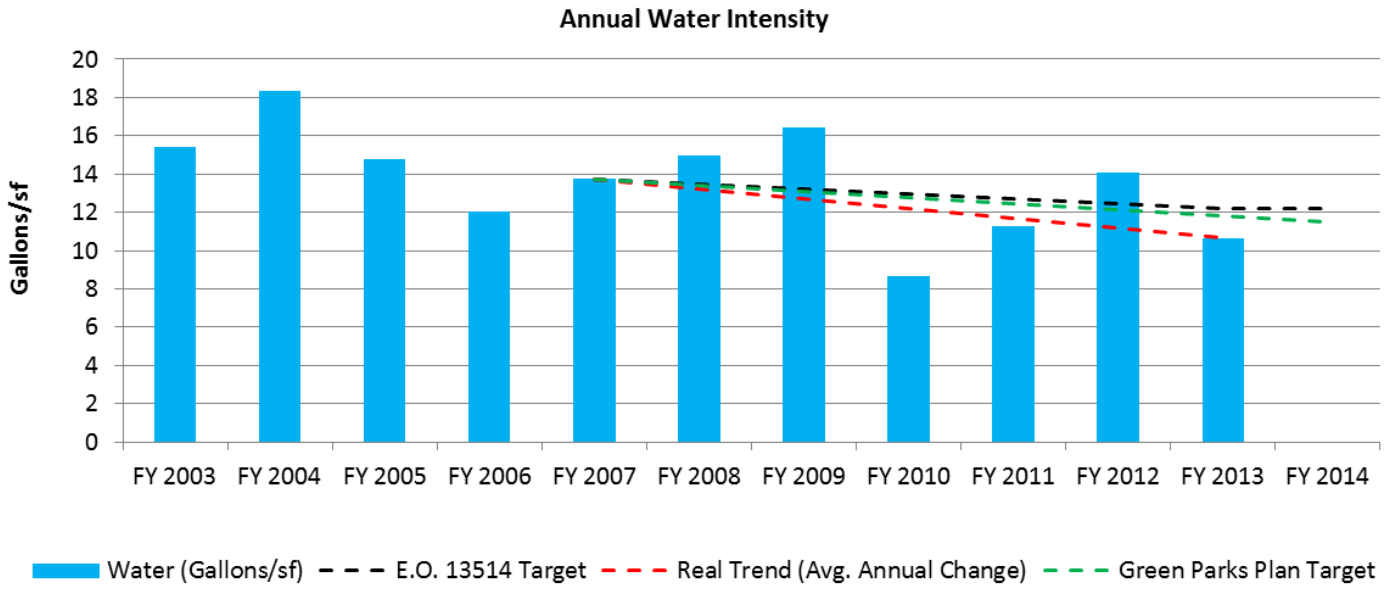
The Vision defined in the GPP plan is, "The NPS will preserve park resources unimpaired for the enjoyment of current and future generations by reducing its environmental impact through sustainable operations, design decisions, and management at every level of the organization." The plan is based on nine strategic goals that focus on the impact of facilities on the environment and human welfare. Two of those goals are closely aligned with Park Infrastructure as defined in this State of the Park report. Those are:

- Be Energy Smart: The NPS will improve facility energy performance and increase reliance on renewable energy; and
- Be Water Wise: The NPS will improve facility water use efficiency.

For Energy, one of the performance objectives is to reduce Servicewide building energy intensity by 35 percent by 2016 from the 2003 baseline, where energy intensity is energy consumption per square foot of building space. For Water, one of the performance objectives is to reduce potable water use intensity by 30 percent by 2020 from the 2007 baseline.

Historical data for energy and water consumption reported by STRI and available in the Energy Data Reporting Tool (EDRT) is shown below.





Highlights for STRI include:

- Park has reduced annual energy consumption since FY 2003.
- Plan in place for park to replace all florescent light bulbs in Visitor Center with LEDs.
- Park has eliminated the use of natural gas for heating Maintenance Shop, transitioning to electric heat.
- While fluctuating from year to year, the park's annual water consumption has declined since FY 2007.
- Park draws water from the Stones River to reduce dependence on metered water source to irrigate tree and shrub plantings.
- Well water used as irrigation source within national cemetery.

Resource Brief: Thompson Lane Entrance and Tour Road Construction

In November 2011 the park opened a new entrance to the battlefield and rerouted the tour road. Due to the development of new transportation routes to accommodate the expanding neighboring community, Old Nashville Highway became a secondary road making the park entrance difficult for visitors to locate. To bring the park to the public, Stones River National Battlefield developed and constructed a new entrance located on Thompson Lane making the park easier to access and establishing a park presence on one of the busiest thoroughfares in the city. This effort has increased the park's accessibility and visibility to visitors and the local community, as visitation numbers have increased nearly 37% since the opening of the Thompson Lane entrance.

Entrance gate at Stones River National Battlefield. NPS Photo.

The project included the construction of a winged-wall entrance, reversing the flow of traffic on a section of the previous tour road, the creation of new parking areas, and a redesign of the Visitor Center parking area, implemented the year prior to the entrance opening. In the process, a previously unused historic road—Van Cleve Lane —was reopened as part of the new tour road, allowing visitors to travel the same route used during the battle.

The park also utilized a portion of the previous tour road, which is now closed to vehicles. By incorporating the asphalt surface into the park trail system, the park increased the mileage of accessible trails and gave pedestrians and cyclists an area to exercise and enjoy the park undisturbed by vehicular traffic.

Chapter 3. Summary of Key Stewardship Activities and Accomplishments

Activities and Accomplishments

The list below provides examples of stewardship activities and accomplishments by park staff and partners to maintain or improve the condition of priority park resources and values for this and future generations:

Natural Resources

- In the last five years, 241 acres have been treated for invasive plant species including Chinese privet and bush honeysuckle. Control efforts for many other exotic species are also occurring.
- In the last five years, 77 acres of cropland or non-native pasture have been converted to native warm season grasses.
- Successful re-introduction and focused management efforts contributed to the delisting of the Tennessee coneflower in 2012 from the endangered species list.
- Successful controlled burns were conducted in 2010, 2011, 2012, 2014, and 2015. Fire is an essential tool for improving forest health.
- In the last five years, STRI planted over 10,000 native trees, shrubs, and forbs.
- In cooperation with Missouri Botanical Gardens and U.S. Fish and Wildlife Service, the park continued efforts to conserve Pyne's ground plum, an endangered plant species.
- A Natural Resource Condition Assessment was drafted in 2013 with help from Middle Tennessee State University.
- In cooperation with Middle Tennessee State University, STRI continues research of park's rare cedar glades.
- Natural resources "vital signs" monitoring started, tracking forest community health, water quality, ozone impacts, and other natural resources. This monitoring is in cooperation with scientists from the NPS Cumberland Piedmont Network that serves a number of parks in the region.
- Several volunteer partnership efforts are ongoing with Boy Scouts of America and other groups, aimed at conserving natural resources.
- Vertebrate and vascular plant inventories were completed.

Cultural Resources

Ethnographic Resources

- The park reviewed a draft Ethnographic Overview and Assessment in 2016. The document needs editing and additional research, but is a vast improvement to the park's anthropological research.

Cultural Landscapes

- A Cultural Landscape Report for Stones River National Cemetery was approved in 2015.

Historic Structures

- Since 2004, teams from the Historic Preservation Training Center have performed a number of repairs on park historic structures including; the National Cemetery Wall, Hazen Brigade Monument, Headquarters Monuments, Artillery Monument, and Old Nashville Highway Gate pillars and wall.
- Park staff has reviewed the final drafts of nine Historic Structure Reports. Reports include the Artillery Monument, General Bragg's Headquarters Monument, General Rosecrans's Headquarters Monument, the Hazen Brigade Monument, Nashville Pike, Nashville & Chattanooga Railroad, Van Cleve Lane, Pioneer Brigade Earthworks, and Old Nashville Highway Entrance Gate.

History

- Park employees and interns have completed ten Masters theses and PhD dissertations documenting park resources and history during the past ten years.
- The park has contracted for an updated Administrative History and National Register nomination. Both projects should be complete in 2017.

Museum Collections

- A team of NPS specialists spent a week surveying the park's museum collections and have produced a draft Collection Management Report that includes an updated Archival Collections Survey, Scope of Collections Statement, and Collection Storage Plan.
- The Museum Fire and Security Survey plan is in draft in 2016.

Visitor Experience

- The park has actively pursued ways to allow members of the public to connect to the park's resources through volunteerism including partnering with more than a dozen local agencies and groups to host major volunteer events on Park Day and National Public Lands Day.
- The park coordinated the efforts of numerous partner organizations to present an array of coordinated programs including three African American Heritage programs in 2016.
- Since 2011, the park has installed nearly three dozen wayside exhibits to improve the self-guiding visitor experience. The park also purchased and installed other landscape exhibits for marking artillery and infantry positions.
- The park worked with local and state agencies to establish an effective system of directional signage that has helped visitors to access park sites from the interstate and other locations throughout Murfreesboro and Rutherford County.
- The park has rehabilitated landscapes by replacing fences and managing native and exotic species using guidance provided by the 2007 Cultural Landscape Report.
- The park began offering a cell phone tour option to visitors in 2009, and is currently working on adding content that can be accessed by smart phone users.
- The park coordinated the efforts of ten partner organizations to present an array of programs throughout the month of October 2014 during the first annual Sharing Our Past Month. Planning is underway for an expanded effort in 2016.

Park Infrastructure

- Park opened new entrance on major thoroughfare in November 2011. The project included the new entrance, creation of new portions of tour road, resurfacing of existing tour road, incorporating previously unused historic trace as part of new tour road, and resurfacing and expansion of Visitor Center parking area.
- The Maintenance Shop was rehabilitated in 2012, making the facility ADA compliant, updating office area to include kitchen/break area, and improving HVAC efficiency.
- The Pioneer Brigade Earthworks trail was created, allowing visitor access to of Civil War-era earthworks constructed at the time of the battle of Stones River.
- Stones River National Cemetery contains over 7,000 headstones dating from the Civil War through the Vietnam War, which were raised, straightened, and aligned as part of contracted work during 2009–11. Care of these headstones is ongoing.

Chapter 4. Key Issues and Challenges for Consideration in Management Planning

Meeting the Challenges and Opportunities of Urban Growth

Murfreesboro, Tennessee and Rutherford County have experienced some of the fastest population growth rates in the state and nation during the past two decades. The U.S. Census Bureau estimates that Murfreesboro population topped 126,000 in July 2015 while the county had an estimated 288,906 residents in 2014. The State of Tennessee projects a county-wide population growth rate of 75% or more for Rutherford County between 2005 and 2025 and City of Murfreesboro projections estimate that the population will reach 228,000 by 2035.

This population growth will drive continued development of residential, transportation and commercial infrastructure. Such rapid development will lead to shifting drainage patterns, increased air, water, noise and night sky pollution, and impose greater challenges to creating a sense of historical place within the park's landscapes. Park staff will face challenges in dealing with degrading natural resources as environmental conditions worsen. Management of invasive exotic plants will become increasingly difficult as pollution and climate change negatively impact the health of native species.

Higher traffic volume of roads surrounding and passing through the park will increase air and noise pollution and present greater hazards to visitors experiencing the park by car, bike, or on foot. Demands for recreational use of the park will increase due to shrinking green space in the region. Protecting people and resources within the park will become increasingly difficult at current staffing levels.

Preservation of additional battlefield landscapes, particularly those, beyond the park's authorized boundary, which includes less than 15% of the 4,000 acre battlefield, will become increasingly difficult as pressure builds to develop areas surrounding the park. The park must increase its efforts and expand partnerships with organizations like the Civil War Trust to secure additional landscapes through purchase or easement.

Increased population and development also offers the park opportunities for greater community engagement. The park has worked proactively with local government agencies and neighbors to explore expanded opportunities to provide local access points to the park. The park needs a Trail Management Plan to expand recreational opportunities and park staff must continue to develop and expand partnerships with local government agencies and interest groups to find ways to connect the growing population with the park and foster a sense of stewardship throughout the community.

Connectivity to the Community

As Rutherford County's population continues to grow and development increases surrounding the park, the park will see heightened demand for the use of the national battlefield as "green space" for activities such as jogging, biking, picnicking, dog-walking, and auto-touring. The park needs a study related to recreational use in the park to help park managers to obtain a better sense of local recreation trends and preferences in light of the increasing population and need for recreational green space.

The park needs to build the remaining portions of the auto tour road that are outlined in the Tour Road Management plan to proactively address the crowded parking areas, overflow parking for events, and future parking needs. Additional parking is needed at the visitor center to accommodate many of these uses, and a shade structure such as a pavilion with picnic tables would be useful for picnickers and educational programs. Appropriate revisions also need to be made to the auto tour route and accompanying signs in order to better serve visitors seeking to participate in this activity.

Current wayfinding tools, including brochures and signage, can be confusing to park visitors, particularly in noncontiguous parcels of the park like the McFadden Farm. In addition, there are small sections of the auto tour route where bicyclists may conflict with motorists if appropriate bike trails are not put in place, such as in between the Michigan Marker and Tour Stop 2. Some tour stops are difficult to pull out of, such as the parking lot for the Hazen Brigade Monument, where motorists must back into Van Cleve Lane to exit the tour stop. The park has completed a tour road plan, as well as a sign plan. The signs are currently in good condition and only minor improvements are needed on the road. Funding has been secured for the trail portion of the sign plan, but additional funding is needed to fully implement the tour road plan.

The Stones River Greenway, a key piece of the Murfreesboro Greenway System, is close to several parcels of the park. To better accommodate increased recreation demand in the city, increased visibility of the park, and to help coordinate green space protection efforts, the park hopes to increase connectivity between the greenway system and the park's trail system. New waysides and

directional signs could be added along the Stones River Greenway to direct pedestrians to various park sites like the Artillery Monument and Fortress Rosecrans. Planning needs related to this parkwide issue include a development concept plan for the visitor center area related to expanded parking and a shade structure and trail management plan to help address connectivity between park trails, local neighborhoods, and the greenway.

Protection of the Entire Battlefield Landscape

The current boundaries of the park encompass a small portion of the original landscape over which the Battle of Stones River took place. Many historic properties not owned by the park and outside the current authorized boundary are threatened by urban expansion, and their preservation or alteration will significantly affect our understanding and interpretation of the historic events that took place during the battle. Structures that date to the time of the battle, including houses, earthworks, roads, and railroads, have significant value in helping visitors understand and connect to the historic events that occurred on the landscape. The destruction of these resources reduces the historic fabric of the overall battlefield and impacts key fundamental resources within the park.

Incompatible development, such as high-density commercial or residential construction, could indirectly undermine the park's integrity by compromising vistas that are key to the interpretation of the battle's noteworthy events. Opportunities exist to work with private landowners; state, county, and city officials; and preservation groups such as the Civil War Trust and Tennessee Civil War Preservation Association to conserve these parcels or transfer ownership to the National Park Service. Any future land acquisitions would present operational and stewardship challenges given the limitations of current staffing levels and existing funding. Planning needs to help address this parkwide issue include a boundary adjustment study that references the park's general management plan. The park has an outstanding relationship with the Civil War Trust, who has been our key partner in land acquisition. Maintaining this relationship and the relationship with the Southeast Region Lands Office is key to acquiring the properties needed to protect the park.

Within the landscapes currently managed by the NPS, continued progress on completing recommend actions in the battlefield Cultural Landscape Plan will be critical to providing visitors with a sense of place. The recommended actions include clearing of historic vistas, screening peripheral development, and burying above ground utility lines. Many of these actions will require close cooperation with local government agencies and community partners.

Expanding Interpretive Programming

While completing a Long Range Interpretive Plan (LRIP), park staff, partners, and stake holders identified the following challenges to expanding opportunities for a wide range of visitors to forge connections with the park's resources.

- Greater competition for the peoples' time will continue to affect audience decisions about making a physical (or virtual) trip to a park. Staff will need to continue its efforts to work with and through community and other partner organizations to demonstrate value added to their lives for the public to spend their valuable free time at a park.
- Current audiences have different expectations and needs and they expect different types of media and technology to understand and connect with park resources. Park staff will need to maintain external awareness and adapt to societal, technological, and programmatic changes.
- The park must continue to reassess its approaches and operations for operational and fiscal sustainability. This means taking a hard look and making difficult decisions such as ending some traditional services, hours, practices, and programs. It means finding creative ways to support desired services and programming by leveraging non-traditional sources for funding and staffing. Staff must be intentional and data-driven in making decisions about programs and media.

Park staff must work intelligently using the LRIP recommendations to expand on recently successful attempts to create partnership based interpretation that invites community members to become stakeholders in interpretive programs and media. Increased volunteerism will play a critical part in park programming as both a way to multiply the effectiveness of a small paid staff and as a powerful tool to allow the public to form connections to the park and its resources.

Park staff must continue to find ways to engage younger audiences who experience the world through the lens of technology by recruiting new employees, volunteers, and partners who can design effective virtual experiences that can draw youth to the park and enhance their experience on the landscape. The park must strive to keep its curriculum-based education programs fresh and relevant and find ways to build on successful partnerships, like that with McGavock High School, to expand opportunities for building long-term, high-quality relationships with students.

The park needs to use media and/or programs to feature natural and recreational resource experiences. The park's work to remove invasive exotic plants and restore native plant ecosystems has created an opportunity for visitors to experience a growing number of animal species within the park. Increasing development will continue to drive demand for recreational opportunities. The park must find creative ways to connect with natural resources and develop an array of recreational options that are consistent with its preservation mission.

Expanding Partnerships

The park maintains productive partnership programs with its surrounding community including Rutherford County and the City of Murfreesboro, Eastern National, the Friends of Stones River National Battlefield, Rutherford County tourism offices, several local museums, the State of Tennessee, Rutherford County Schools and schools throughout the greater Nashville Metropolitan area, Tennessee Civil War National Heritage Areas, Middle Tennessee State University, Tennessee Civil War Preservation Association, Tennessee War's Commission, and the Civil War Trust. The park actively participates in and provides technical assistance and support for planning and designing of interpretive exhibits, brochures, social media, symposiums, special events, and historic preservation of sites and commemorative features. The importance of partners and partnerships at Stones River National Military Park continues to grow and is important to the park's success. A robust relationship with these constituent groups will lead to more active support for the park's mission, help raise awareness of the park's needs, and lead to more devoted engagement in numerous stewardship efforts with the park. Additional growth in partners is possible by reaching out to local businesses and private organizations with an interest in the park and in the Civil War.

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See Also:

Collection of Natural Resource-Related References

Collection of Cultural Resource-Related References

Collection of Visitor Experience-Related References

Glossary

See the State of the Parks home page for a link to a complete glossary of terms used in State of the Park reports. Definitions of key terms used in this report are as follows:

Americans with Disabilities Act (ADA)	Law enacted by the federal government that includes provisions to remove barriers that limit a disabled person's ability to engage in normal daily activity in the physical, public environment.
Archeological Sites Management Information System (ASMIS)	The National Park Service's standardized database for the basic registration and management of park prehistoric and historical archeological resources. ASMIS site records contain data on condition, threats and disturbances, site location, date of site discovery and documentation, description, proposed treatments, and management actions for known park archeological sites. It serves as a tool to support improved archeological resources preservation, protection, planning, and decision-making by parks, centers, regional offices, and the national program offices.
Baseline Documentation	Baseline documentation records the physical condition of a structure, object, or landscape at a specific point in time. A baseline provides a starting point against which future changes can be measured.
Cultural Landscapes Inventory (CLI)	A Cultural Landscapes Inventory describes historically significant landscapes within a park. The inventory identifies and documents each landscape's location, size, physical development, condition, characteristics, and features, as well as other information useful to park management.
Cultural Landscape Report (CLR)	A Cultural Landscape Report is the principal treatment document for cultural landscapes and the primary tool for long-term management of those landscapes. It guides management and treatment decisions about a landscape's physical attributes, biotic systems, and use when that use contributes to historical significance.
Cumberland/Piedmont Network (CUPN)	One of 32 I&M networks established as part of the NPS Inventory and Monitoring Program. The Cumberland/Piedmont Network] provides scientific data and expertise for natural resources in 14 parks located in Kentucky, Tennessee, North Carolina, South Carolina, Alabama, and Georgia.
Curation	National parks are the stewards of numerous types of objects, field notes, publications, maps, artifacts, photographs, and more. The assemblage of these materials comprises a museum collection. Curation is the process of managing, preserving, and safeguarding a collection according to professional museum and archival practices.
Facility Condition Index (FCI)	FCI is the cost of repairing an asset (e.g., a building, road, bridge, or trail) divided by the cost of replacing it. The lower the FCI number, the better the condition of the resource.
Foundation Document	A park Foundation Document summarizes a park's purpose, significance, resources and values, primary interpretive themes, and special mandates. The document identifies a park's unique characteristics and what is most important about a park. The Foundation Document is fundamental to guiding park management and is an important component of a park's General Management Plan.
Fundamental and Other Important Resources and Values	Fundamental resources and values are the particular systems, processes, experiences, scenery, sounds, and other features that are key to achieving the park's purposes and maintaining its significance. Other important resources and values are those attributes that are determined to be particularly important to park management and planning, although they are not central to the park's purpose and significance. These priority resources are identified in the Park Foundation Document and/or General Management Plan. The short-cut name that will be used for this will be Priority Resources.

General Management Plan (GMP)	A General Management Plan is a strategic planning document that outlines the future management of a National Park Service site for the next 15 to 20 years. The plan will set the basic philosophy and broad guidance for management decisions that affect the park's resources and the visitor's experience.
Green Parks Plan (GPP)	The Green Parks Plan defines a collective vision and a long-term strategic plan for sustainable management of NPS operations. A critical component of the implementation of the GPP will be informing and engaging park staff, visitors, and community partners about climate change and sustainability to broaden opportunities to foster change.
Historic Integrity	Historic Integrity is the assemblage of physical values of a site, building, structure, or object and is a key element in assessing historical value and significance. The assessment of integrity is required to determine the eligibility of a property for listing in the National Register.
Historic Resource Study (HRS)	The historic resource study is the primary document used to identify and manage the historic resources in a park. It is the basis for understanding their significance and interrelationships, a point of departure for development of interpretive plans, and the framework within which additional research should be initiated.
Historic Structures Report (HSR)	The historic structure report is the primary guide to treatment and use of a historic structure and may also be used in managing a prehistoric structure.
Indicator of Condition	A selected subset of components or elements of a Priority Resource that are particularly "information rich" and that represent or "indicate" the overall condition of the Priority Resource. There may be one or several Indicators of Condition for a particular Priority Resource.
Integrated Resource Management Applications (IRMA)	The NPS-wide repository for documents, publications, and data sets that are related to NPS natural and cultural resources.
Interpretation	Interpretation is the explanation of the major features and significance of a park to visitors. Interpretation can include field trips, presentations, exhibits, and publications, as well as informal conversations with park visitors. A key feature of successful interpretation is allowing a person to form his or her own personal connection with the meaning and significance inherent in a resource.
Invasive Species	Invasive species are non-indigenous (or non-native) plants or animals that can spread widely and cause harm to an area, habitat, or bioregion. Invasive species can dominate a region or habitat, out-compete native or beneficial species, and threaten biological diversity.
List of Classified Structures (LCS)	LCS is an inventory system that records and tracks the condition of the approximately 27,000 historic structures listed in the National Register of Historic Places that are the responsibility of NPS.
Museum Collection	NPS is the steward of the largest network of museums in the United States. NPS museum collections document American, tribal, and ethnic histories; park cultural and natural resources; park histories; and other aspects of human experience. Collections are managed by professionally-trained NPS staff, who ensure long-term maintenance of collections in specialized facilities.
Natural Resource Condition Assessment (NRCA)	A synthesis of existing scientific data and knowledge, from multiple sources, that helps answer the question: what are current conditions of important park natural resources? NRCAs provide a mix of new insights and useful scientific data about current park resource conditions and factors influencing those conditions. NRCAs have practical value to park managers and help them conduct formal planning and develop strategies on how to best protect or restore park resources.

Priority Resource or Value	This term refers to the Fundamental and Other Important Resources and Values of a park. These can include natural, cultural, and historic resources as well as opportunities for learning, discovery, and enjoyment. Priority Resources or Values include features that have been identified in park Foundation Documents, as well as other park assets or values that have been developed or recognized over the course of park operations. Priority Resources or Values warrant primary consideration during park planning and management because they are critical to a park's purpose and significance.
Project Management Information System (PMIS)	A servicewide intranet application within the National Park Service to manage information about requests for project funding. It enables parks and NPS offices to submit project proposals to be reviewed, approved, and prioritized at park units, regional directorates, and the Washington Office.
Resource Management	The term "resources" in NPS encompasses the many natural, cultural, historical, or sociological features and assets associated with parks. Resource management includes the knowledge, understanding, and long-term stewardship and preservation of these resources.
Specific Measure of Condition	One or more specific measurements used to quantify or qualitatively evaluate the condition of an Indicator at a particular place and time. There may be one or more Specific Measures of Condition for each Indicator of Condition.
Volunteers In Parks Program (VIP)	The Volunteers In Parks Program was authorized by Public Law 91–357 enacted 1970. The primary purpose of the VIP program is to provide a vehicle through which the National Park Service can accept and utilize voluntary help and services from the public. The major objective of the program is to utilize this voluntary help in such a way that is mutually beneficial to the National Park Service and the volunteer. Volunteers are accepted from the public without regard to race, creed, religion, age, sex, sexual orientation, national origin, or disability.
Wilderness	A designation applied to certain federal lands set aside for preservation and protection in their natural condition, in accordance with the Wilderness Act of 1964.