



Working Together for Vegetation Management

A Collaborative Stewardship Strategy in Three Southern Plains Parks

Small Parks, Big Challenges

Bent's Old Fort National Historic Site (NHS), Sand Creek Massacre NHS, and Washita Battlefield NHS, three small parks on the southern Great Plains of eastern Colorado and western Oklahoma, were set aside because of their historic and cultural significance.

Natural resources, especially native vegetation in these parks, are a part of their cultural stories because the landscape provides the context for the historic events that the parks commemorate. All three parks have complex natural resources issues related to maintaining, and in some cases restoring, healthy communities of native vegetation. Invasive non-native plants have crowded out native grasses, natural fire regimes have been altered, and disturbances from previous agricultural use and grazing have impaired native soils.

Since vegetation contributes to each park's fundamental resources and values, effectively managing it at these sites is an integral part of meeting the National Park Service mission.

Staff at these sites receive assistance from the NPS Washington Office and Intermountain Region support programs—help that is especially welcomed by these small units with limited staff and budgets. The Southern Plains Inventory and Monitoring Network (SOPN) provides important information about the condition of key natural resources by conducting long-term monitoring. The Southwest and Northern Rocky Mountain Invasive Plant Management Teams (IPMTs) help parks maintain natural biodiversity by treating infestations of invasive non-native plants. And the Southern Plains Fire Group conducts prescribed burns and monitors the response of vegetation communities to fire.



Cottonwood trees growing near Big Sandy Creek in Sand Creek NHS are essential components of the riparian ecosystem and they provide forage and habitat for wildlife. They are also important elements of the site's cultural landscape.

Cross-purposes

However, in the mid-2000s, the parks and the support programs were not coordinating well with each other. Field staff from the monitoring network sometimes arrived in a park to sample established plots, only to find that the area had just been mowed or had been treated with herbicide by the invasives team. The invasives team was responsible for treating non-native plant infestations, but weren't able to easily use SOPN's monitoring data that contained information on the location of invasive plants. And the monitoring network and the fire group collected nearly the same data, but ran completely separate monitoring programs.

Park staff also had to wade through sometimes-conflicting advice from the different support programs about which management actions would be most effective to address specific resource issues. Vegetation management efforts were further complicated by staff

"We keep being told work smarter, not harder. Or that we can't do more with less, so we have to do less. I think the collaboration allows us to actually do a little bit more with less because we're working more efficiently."

Cynthia Wiley



Bent's Old Fort &
Sand Creek Massacre NHS

The Parks



Bent's Old Fort National Historic Site

commemorates the historic role that this trading post played in the "opening of the West." It features a reconstruction of the 1830s–1840s adobe post located on the Santa Fe Trail where traders, trappers, travelers, and the Cheyenne, Arapaho and other tribes peacefully came together for trade.

The historic site contains 799 acres along the Arkansas River in southeastern Colorado. The native flora and fauna of the river bottoms and grasslands surrounding Bent's Old Fort is part of its cultural heritage, providing visitors an opportunity to step back in time. Therefore, vegetation is managed for both its ecological and cultural significance. Park riparian communities have been restored by the removal of invasive non-native tamarisk, and disturbed grasslands have been partially restored to natural conditions.



Sand Creek Massacre National Historic Site

commemorates the November 29, 1864 massacre of about 230 Cheyenne and Arapaho Indians, mostly women, children, elderly, and infirmed, by members of the 1st and 3rd regiments, Colorado (U.S.) Volunteer Cavalry, under the command of Col. John Chivington.

The park's mission is to preserve the site's cultural landscape as closely as practical to that of the time of the massacre. As a result, vegetation is managed for both its natural and cultural significance.

Vegetation in the 3,025-acre park is a mosaic of sand sagebrush shrubland and shortgrass prairie bisected by a corridor of riparian vegetation along the creek channel, which is dry except when flooding. Sand Creek Massacre NHS was established in 2007, and most of its acreage was previously used for agriculture and livestock grazing.



Washita Battlefield National Historic Site

protects and interprets the site of the Southern Cheyenne village of Peace Chief Black Kettle. The village was attacked by the U.S. Cavalry under Lt. Col. George A. Custer on November 27, 1868, leading to the deaths of approximately 60 individuals, including American Indian men, women, and children, as well as U.S. soldiers.

The 315-acre site is located along a section of the Washita River in western Oklahoma. Vegetation management aims to preserve the historic landscape as much as possible to its 1868 appearance. While the area retains a rural character, the riparian corridor and floodplain hydrology have been significantly altered, an abandoned railroad grade cuts across the site, and its grasslands have been plowed and invaded by non-native grasses.

The Programs



Mixed-grass and shortgrass prairies are the dominant ecosystems in southern Great Plains, a vast semi-arid region of southeastern Colorado, central Kansas, northeastern New Mexico, most of Oklahoma, and a large swath of west Texas.

The **Southern Plains Network (SOPN)** encompasses 11 national park units that have close interrelationship between natural and cultural resources within this immense grassland landscape. SOPN is one of 32 NPS inventory and monitoring networks nationwide that conduct vital signs monitoring in order to assess the condition of park ecosystems, collecting data on the plants, animals, and other natural resources that can indicate a park's overall biological health. The information the network collects helps park staffs make sound, science-based stewardship and management decisions that help preserve park resources.



Invasive non-native plants cause changes in ecosystem structure, alteration of nutrient cycles, soil chemistry, and normal successional trajectories in a system, and pose significant challenge to the management of the natural resources in national parks.

Invasive Plant Management Teams (IPMTs) support to approximately 290 park units by providing professional assistance to prevent introductions of new invasive species, reduce existing infestations, and restore native plant communities and ecosystem functions. The Biological Resources Division supports 15 invasive teams coast to coast. Until 2012, Bent's Old Fort, Sand Creek Massacre, and Washita Battlefield NHS were all served by the Southwest IPMT, when Bent's Old Fort and Sand Creek Massacre were transferred to the Northern Rocky Mountain IPMT.



Fire is an essential ecological driving force in the southern Great Plains. Fire frequency and seasonality impacts the diversity of native species, nutrient cycling, and productivity. The fire effects program is part of the **Wildland Fire Program**, and aims to understand the role of fire in ecological systems. The **Southern Plains Fire Group** manages wildland fire and prescribed burns for seven park sites, including Bent's Old Fort, Sand Creek Massacre, and Washita Battlefield NHS.

The Southern Plains Network and the Southern Plains Fire Group (along with the Bandelier Fire Group, the Big Thicket Fire Group, and the Midwest Region) collaborate on monitoring of grassland vegetation in the Southern Plains. This partnership increases effectiveness and efficiency, cuts costs, reduces administrative overlap, and increases information-sharing.

turnover and the subsequent loss of institutional knowledge.

As a result, vegetation management strategies in the three parks were conducted in an ad hoc manner, and treatments were sometimes redundant, inefficient, and not as effective as they could have been.

Working Together

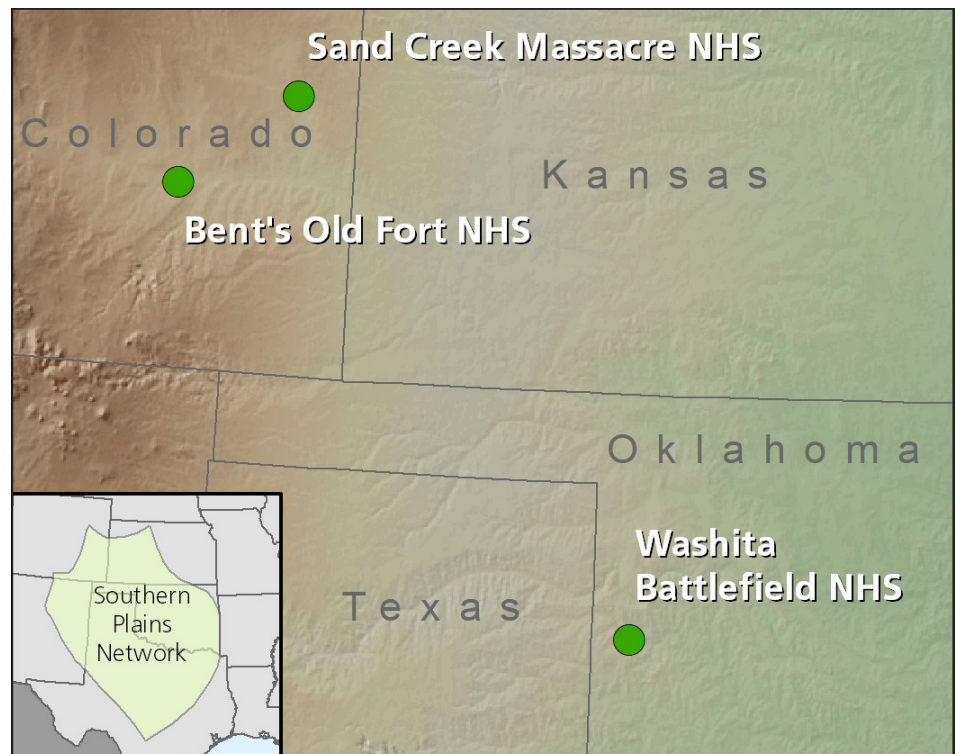
By 2007, a growing awareness of the limitations of the status quo led to an exploration of how staff could work together to improve management of native vegetation. Instead of continuing to work independently, employees of the monitoring network, the fire group, invasives teams, Bent's Old Fort, Sand Creek Massacre, and Washita Battlefield began to collaborate.

They developed combined monitoring protocols, found new ways to share data and information, and formulated a new approach to vegetation management planning that was comprehensive, strategic, and adaptive—and that yielded better stewardship of park resources. The collaboration has given resource managers in these small parks new tools to help them address complex issues, while leveraging limited budgets and taking advantage of the interdisciplinary skills of the collaborative team. It has also created a mechanism to build institutional histories to maintain a long-term continuity in vegetation management.

First Steps

The first collaborative effort in the Southern Plains was the development of a combined grassland and fire effects monitoring protocol. Fire is an important natural disturbance in prairie ecosystems. It removes accumulated debris from aboveground growth, recycles nutrients, and controls invasions of woody plants. Prescribed fire helps provide these ecological benefits as well as reduce wildfire risk. In addition to conducting prescribed fires and managing wildfire, the Southern Plains Fire Group monitors grassland communities to understand the response of vegetation communities to fire.

Since grassland is the most prevalent ecosystem type in Southern Plains parks, it is one of the key vital signs monitored by SOPN. Network monitoring focuses on the long-term ecological



The Southern Great Plains span parts of New Mexico, Texas, Oklahoma, Kansas, and Colorado.

health of grasslands and includes the effect of fire on vegetation.

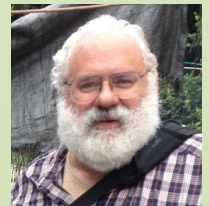
Given the overlap of these separate monitoring programs, collaborating on

a joint grassland monitoring program allowed the monitoring network and the fire group to work more efficiently. They were able to collect more comprehensive datasets, reduce costs and

Leadership

While everyone involved in vegetation management in the three parks recognized the overlap in program responsibilities and the resulting inefficiencies, the collaboration required a champion to initiate and shepherd it through the initial phases.

Rob Bennetts became the Southern Plains Network Program Manager in 2007, and soon thereafter sought opportunities to work with other support programs and park staff to more efficiently steward park resources. Rob explained, *"Being the champion requires additional time and effort. And I don't think people had the time to put in. I was lucky enough to have supervisors that were supportive of me taking the time to spearhead the collaborative efforts."*



Although Rob took on a leadership role in the collaboration until he retired in March 2018, he was careful to make sure that all partners were equally involved in the process. *"A collaborative group has to evolve on its own,"* he said. *"In other words, it has to be dynamic in terms of who's the champion, who's doing what, who's on board with what, and how it's changing. And I think it's really important in any processes that you have to plan for that. And we actually did some planning for that where we started really shifting around the kind of roles and responsibilities so that different people would have ownership and take it from there. And that's the scary part of the process because as soon as you sort of relinquish your champion role, it's up to somebody else to pick it up in whatever manifestation they have of it."*



Collaborative partners communicated by email, phone, and in-person meetings. Travel restrictions sometimes limited opportunities to meet in person, but participants agreed that meeting face-to-face was most productive.

"I think the best circumstances were the ones where we were all together in person. The benefit of being physically present when working with others has such a positive impact on the outcome of any project. You are able to share and engage so much more and that presence really makes a difference. The personal touch of working with others face-to-face encourages a more invested and motivated effort."

Jeanine Foley



Southwest IPMT Crew Leader



administrative overhead, and increase information sharing while pooling limited funds to achieve statistically-desirable sample sizes. By 2011, they were collaboratively using a new monitoring protocol in all eleven Southern Plains parks that sampled permanent transects each year, and fire plots before and after burns.

Implementation Strategies

Opportunities for the programs to work more collaboratively with park staff on vegetation management grew out of Washita Battlefield's effort to develop a vegetation management environmental assessment, as well as discussions that park staff at Bent's Old Fort had with the Southern Plains Network Program Manager Rob Bennetts about the pros and cons of vegetation management treatment options and the overall ecological health of the landscape.

By 2014, Washita Battlefield had spent more than 10 years trying to develop an integrated vegetation management plan and environmental assessment, but had gotten bogged down by the cumbersome National Environmental Policy Act (NEPA) process and the limited staffing resources and subject-matter expertise in a park with only eight full-time employees.

The collaborative process gained new momentum in late 2014, when park and program staff met to further define informal collaborative efforts that had been ongoing. Then-Superintendent Tucker Blythe and Park Ranger Dick Zahm met with Rob Bennetts and Tomye Folts-Zettner from the Southern Plains Network, Richard Gatewood and Bruce Fields from the Southern Plains Fire Group, and Jeanine Foley from the Southwest Invasive Plan Management Team to outline restoration and exotic plant management priorities.

The team developed desired conditions for native vegetation, and identified spatial management units based on ecological characteristics and previous land use. A guiding principle of their partnership was that Washita Battlefield staff was responsible for park stewardship decisions, and that the monitoring network, fire group, and invasive teams supported the park by providing expertise, assisting with treatments, and producing data.

One of the most important elements that came out of the collaboration

Collaboration Takes Time

One of the important lessons of the Southern Plains vegetation management collaboration is that establishing good working teams is a time-intensive process, and that there will be a time lag before a collaboration yields results. But when it does, a collaborative team likely will be able to address complex management issues in park settings more efficiently and effectively.

One reason that establishing effective collaborative groups takes time is because all teams go through stages of group development before they can reach peak potential. Almost any group can expect to go through "forming, storming, norming, and performing" phases. Team members need to build trust and respect with one another, as well as develop faith in the collaborative process. But once a collaborative group finds its footing and develops a shared vision, the resulting synergy can be channeled to increase park stewardship.

was an annual project schedule for vegetation management. This work plan consisted of seasonal cycles of planning, implementation, and assessment involving all members of the collaboration. This approach allowed for adaptive management and strategic decision-making as opposed to ad hoc management actions.

A similar collaborative process for Bent's Old Fort and Sand Creek Massacre NHS, parks that share a superintendent and some staff, began in 2015. Both parks had experienced challenges in ensuring that management treatments such as prescribed fire met ecological goals and were in alignment with the parks' cultural landscapes. They had also received conflicting advice on specific issues like the use of grazing as a vegetation management tool. The collaborative process helped park staff identify management priorities. By getting subject-matter experts and ecologists from the fire program, monitoring network, and invasives team together, park staff were able to follow consensus recommendations

Annual Project Schedule for Vegetation Management

Months	Activity	Primary Responsible Party			
		Park	SOPN	Fire Group	IPMT
Feb–Mar	Plan treatments & develop annual work plan	X	X	X	X
Mar–Apr	Approve work plan	X			
Apr	Pre-season planning	X	X	X	X
May–Jul	Management treatments; Collect treatment data & monitoring data	X	X	X	X
Aug–Sep	Data Entry; Quality assurance/quality control; GIS	X	X	X	X
Oct–Nov	Deliver treatment maps & data	X	X	X	X
Nov–Jan	Prepare annual report with input from all partners		X		

SOPN = Southern Plains Inventory & Monitoring Network. Fire Group = Southern Plains Fire Group.
IPMT = Invasives Plant Management Team

All collaboration partners are involved throughout the annual work cycle. Park staff have the final approval of all work plans. This process also allows for the use of adaptive management principles.

from the entire group. The synergy resulting from the programs working together and in concert with park resource specialists was invaluable, and it ultimately led to greater protection and more effective management of park resources.

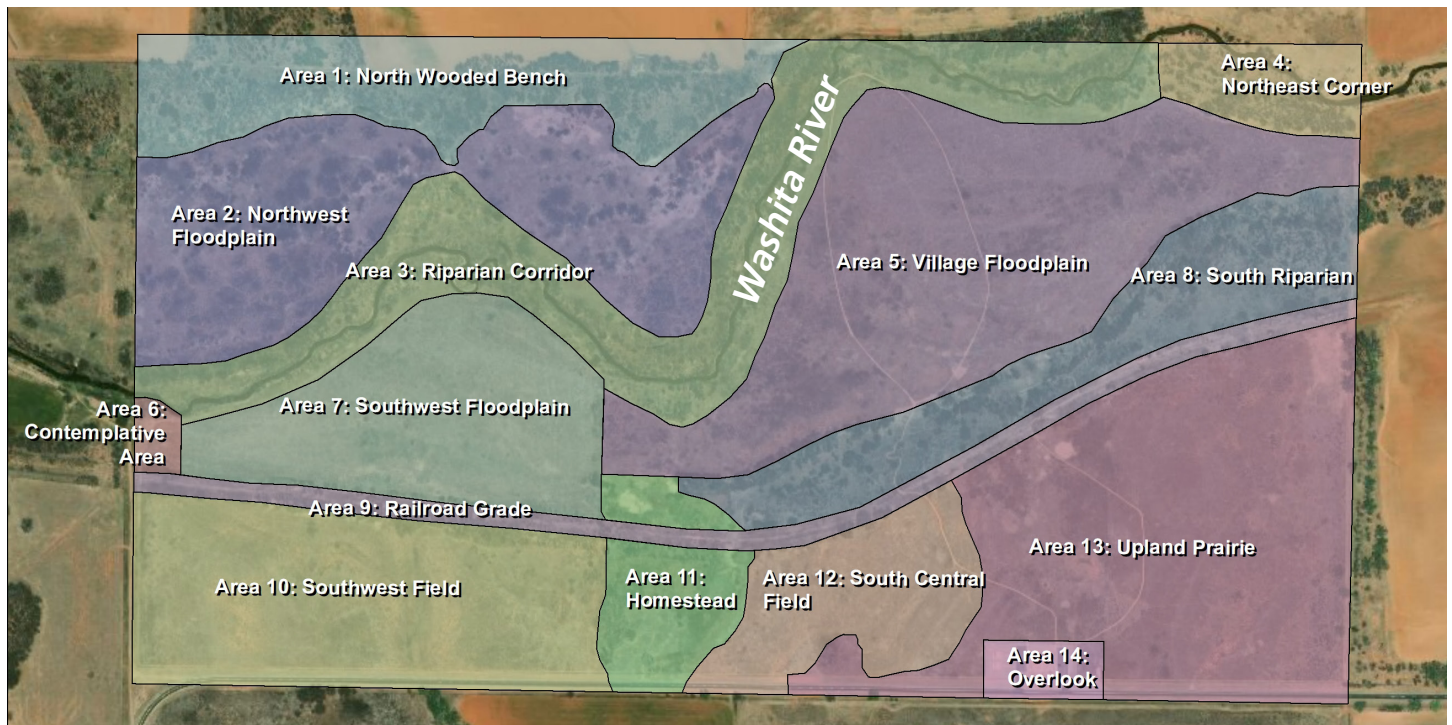
Vegetation Management Plans

The development of management areas and annual work plans were originally envisioned as implementation strategies that would operate under existing or soon-to-be-completed NEPA documents, such as a General Management Plan (GMP) or an existing vegetation management plan. However, the GMPs

“We put a huge emphasis on making sure that we supported what the park wanted to do. We had a standing agreement that the park always had veto power. If we had disagreements about something, the park had the final say.”

Rob Bennetts,
SOPN Program Manager

did not have the necessary level of detail and the parks did not have other completed compliance documents. As a way to move past this issue, the collaborative team decided to pilot a vegetation management plan for Bent’s Old Fort NHS that encompassed the management areas and annual work planning elements of the implementation strategy, but followed NEPA



Spatial management units, such as the ones shown here for Washita Battlefield NHS, are a key part of the vegetation management plans. The three parks developed management units based on other park planning documents such as General Management Plans as well as ecological characteristics of different areas. Washita’s spatial units reflect the Washita River corridor and floodplain, upland environments, and previous land use such as former agricultural fields and the abandoned railroad grade.

“The collaboration provides park managers with the expertise needed to help make consistent, defensible, science-based vegetation management decisions. Ultimately, the annual adaptive management approach can help managers allocate labor and budgets to implement management actions within the context of overall park needs and goals.”

Alexa Roberts, Superintendent



Bent's Old Fort &
Sand Creek Massacre NHS

pathways. The collaboration was also expanded to include a representative from the region's Environmental Quality Division.

Bent's Old Fort's plan met the categorical exclusion level of analysis and documentation. Similar NEPA plans were then developed for Sand Creek Massacre and Washita Battlefield NHS, but grazing issues required that Washita's plan be an Environmental Assessment.

Continuing Collaboration

The collaborative process, along with the annual cycle of planning, applying and then evaluating treatments continues to be used by the three parks, although the NEPA documents have not been finalized. Bent's Old Fort is waiting for a grazing study, and Sand Creek Massacre NHS needs to complete its cultural landscape inventory. The Washita Battlefield NHS document has been temporarily on hold while park management vacancies are filled. Nonetheless, the collaboration has enabled the parks to fundamentally improve the way they manage vegetation and maintain biodiversity.

One advantage of the annual work plan is the institutional history it creates, one that new park managers can use to learn about previous management treatments and vegetation management goals. This new process has already proved to be beneficial, as there have been a number of recent retirements and turnover in key members of the collaborative team.

The annual planning meeting in late winter remains the most important meeting of the year for the collaboration. Participants plan treatments for the upcoming seasons, coordinate field schedules, brainstorm possible solutions to resource challenges, and have the opportunity to observe conditions in the field at each park.

Likewise, the year-end report is valuable for all contributors. It provides a concise snapshot of both the management treatments undertaken and monitoring

Spin-offs

The Southern Plains vegetation management strategies are leading to other collaborative efforts. Some parks such as Pecos National Historic Park are applying lessons learned and insights gained from Bent's Old Fort, Sand Creek Massacre, and Washita Battlefield NHS, and are using a template derived from these plans to develop their own.

The concept of collaboration among natural resource managers is being enlarged to include both natural and cultural resources. For example, Guadalupe Mountains National Park is developing a cultural landscape management plan that incorporates the cultural landscape, along with vegetation, soils, and other ecological systems.

Sharing collaboration outcomes and lessons learned may benefit others who are looking for ways to build on the strength of interdisciplinary teams to solve challenges in park settings. Collaborative groups may want to strategize how to document their process so that it can inform others interested in developing similar approaches.

data, and includes information on the condition of grasslands and invasive non-native plants, and provides insights relevant to the condition of historic



Sand sage and yucca in Washita Battlefield NHS.

Lessons Learned

- » Make sure that all partners have the opportunity to fully participate in the collaboration. Both mutual respect and accountability are critical.
- » Effective communication is essential when collaborating. Meet in person (versus email or telecommunication) whenever you can. Face-to-face meetings build trust, foster interpersonal relationships, facilitate brain-storming, and on-site meetings provide opportunities to look at conditions on the ground.
- » At the outset, develop some parameters of what you hope to accomplish by collaborating. Be mindful that the process of collaboration may lead to unanticipated opportunities and outcomes.
- » Collaboration requires significant effort and can present new challenges, especially at the outset. But in the long run, collaboration can yield results such as more efficient, more effective, and more strategic stewardship of park resources, and can be a critical tool in meeting the NPS mission.
- » Collaboration requires a shift in thinking and planning away from a programmatic focus and towards an interdisciplinary approach that requires coordination and cooperation with a variety of programs and specialties.

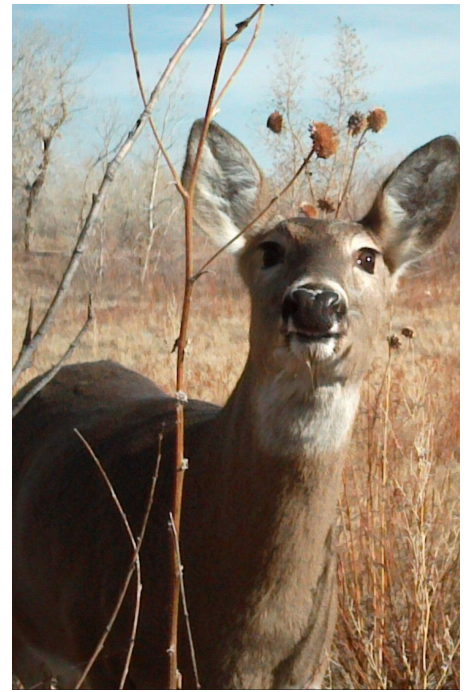
landscapes. It contains information on the condition of park vegetation relative to defined reference conditions as well as periodic trend analyses.

Resource managers are also using the annual work plans in ways not originally envisioned by the collaborative team. For example, the plans have become part of their process for employee evaluations and for documenting the overall performance of the resource management division.

Participants expect this collaboration will mature and evolve with more experience working in concert with one another to preserve natural resources.

The Southern Plains collaboration has been successful so far, and team members have found that the combined capacity of the partners working together is greater than the sum of each partner when working individually. By holistically working to manage park resources, these partners have discovered the power of collaboration in providing exceptional stewardship of park resources that will have far-reaching benefits.

To learn more about the Southern Plains vegetation management collaboration, read an [oral history](#) on the collaboration available from the [NPS Data Store](#).



“People should take the time to collaborate. It may take significant effort on your part, but it creates a narrative where we all fit, for each of our roles in resource management. It benefits the resource in the end. Just come to the table willing to listen. And assume that you might learn something from somebody else, and know that people may know things that you don’t.”

Richard Gatewood



Fire ecologist



Purple prairie clover



Alexa Roberts at Sand Creek Massacre NHS



Vegetation at all three parks has important cultural significances to Plains tribes such as the Cheyenne and Arapaho. Both Sand Creek Massacre and Washita Battlefield are considered sacred ground by affiliated tribes, as reflected by these "period trees" at Sand Creek that may have been saplings at the time of the massacre.

"As long as there remains a common vision and everybody's working toward the same goal, which is the health of park vegetation, it shouldn't matter who the participants are. The collaboration should become institutionalized and stay in place. The way that's going to happen is with tangible successes so that people can see how this program is successful. I certainly hope that the collaboration continues to thrive."

Alexa Roberts, Superintendent
Bent's Old Fort &
Sand Creek Massacre NHS

The National Park Service Collaboration Network

The National Park Service Collaboration Network is a group of dedicated employees who recognize the value of collaboration. We believe that we best serve our parks, and the American people, when we embrace our collective power—the diversity of skills, people, experiences, and expertise that comprise our NPS community. We believe that the mission of preserving our resources, unimpaired, for this and future generations is what unites us across disciplines and administrative boundaries.

To this end, our work is to pave the way for a successful cultural shift—a shift to a more collaborative environment within our organization.

To learn more, visit the [Collaborative Leadership](#) pages on the NPS Common Learning Portal, contact [Terri Hogan](#), Invasive Plant Program Manager, Biological Resources Division, terri_hogan@nps.gov, or any of the members of the Southern Plains collaboration team.

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The Arkansas River in Bent's Old Fort NHS