Southern Plains Network
Inventory & Monitoring Program

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science

# PRAIRIE ZEPHYR

Newsletter of the Southern Plains Network

December 2017

## Changes in the Wind

As 2017 comes to an end, I cannot help but to feel changes in the wind, and thought that it was time to send out this newsletter to reflect on the past and look forward to the future. In the pages that follow, we will highlight some of the activities of both the parks and the Southern Plains Inventory and Monitoring Network (SOPN). The 2017 field season has come to an end, but we will continue into the winter with data management, report preparation and planning for the next field season. Although the work of SOPN continues, some of the faces likely will be changing. We will highlight some of those personnel changes on the following pages.

Some familiar faces will soon be retiring. Karl Zimmermann will soon be leaving Sand Creek Massacre National Historic Site (NHS). Bruce Fields, of the Southern Plains Fire Group, and Robert Maguire, superintendent at Lake Meredith National Recreation Area (NRA), will also be retiring, possibly even before you receive this newsletter. All will be missed.

Some of you may know by now that I too am shifting gears. I will still have a role at SOPN, but am being reassigned to the Washington Support Office (WASO) after the first of the year. My new duties will be focused on fostering a more collaborative environment for resource management within the NPS. As such, I will continue working on ongoing collaborative projects in SOPN parks, but the day-to-day running of the network will change hands, starting with a detail while my replacement is being hired.

As you will read in this newsletter, collaboration is a common theme for SOPN, which has the third-smallest budget of all National Park Service (NPS) inventory and monitoring networks. Over the past decade, we have developed a strong collaboration with the Chihuahuan and Sonoran Desert Networks. As the Southwest Network Collaboration (SWNC), we work together extensively on protocol development and data management, and to some extent on analysis, reporting and field efforts. We also have developed an outstanding partnership with the Southern Plains Fire Group, the Southwest Exotic Plant Management Team, and more recently the Northern Rocky Mountain Exotic Plant Management Team. During the past year, we have also started developing a collaboration with the IMR Cultural Landscape Program to help make the connection between natural and cultural resources.

I want to close by saying that it has truly been an honor to work with you all.

*-Rob Bennetts,* SOPN Program Manager

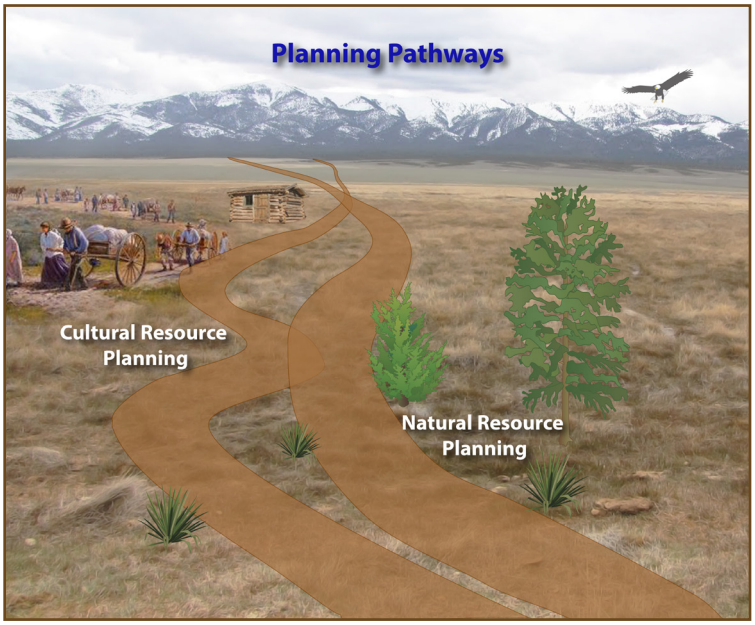
### Inside this issue



# Cultural Landscapes Inventory Program & SOPN

SOPN and the Cultural Landscapes Inventory Program of the Intermountain Region have recently initiated a collaborative effort to integrate the documentation, planning and stewardship of vegetation and cultural landscapes. A pilot effort at Washita Battlefield National Historic Site (NHS), Fort Union National Monument (NM) and Pecos National Historic Park (NHP) will develop approaches that intertwine pathways and processes that have institutionally-evolved separately for managing cultural and natural resources.

It is well-known that natural and cultural resources are highly interrelated. The presence of natural resources such as rivers, game and topography are frequently the reason that cultural resources are located where they are. In turn, cultural sites and human activity have a dramatic influence on natural resources. Thus, the environmental history of an area typically reflects a constant interplay between natural and cultural elements. Despite this inherent connection, natural and cultural resource planning and management are typically compartmentalized as if they were independent entities.




The collaborative effort will envelop different scopes. At a broader planning scale, such as for a General Management Plan, integration may include the development of mutually-compatible desired conditions that take into account the similarities and differences among historical and ecological perspectives. In many cases, the character-defining features of a cultural landscape are quite compatible with the desired ecological state of a site. Planning would then focus on expressing desired conditions that incorporate the attributes important to both natural and cultural

General Custer observed the fighting at the Battle of Washita from this knoll, a natural feature that also has important cultural significance.

resources. In other cases, natural and cultural desired states may be in conflict. In these situations, it is important to understand the interplay of cultural and natural resources and use the priorities of the park based on enabling legislation and other prerogatives to inform desired conditions.

For lower-levels, such as for a vegetation management plan or cultural landscape inventory or report, the desired conditions may be further refined into measurable attributes of the landscape. These attributes may then be used in condition assessments or state of the park reports. By using integrated desired conditions, monitoring or assessments can readily applied in both natural and cultural arenas. Evaluation of management and stewardship effectiveness, priorities, etc. becomes an interdisciplinary process rather than independent and potentially incompatible initiatives.

Several parks in the SOPN have an existing collaboration for vegetation management (see next page). SOPN, the Southern Plains Fire Group and the Southwest Exotic Plant Management Team already use an adaptive approach to evaluate and refine management based on the effectiveness of treatments in achieving desired outcomes. With this new collaboration, the Cultural Landscapes Inventory Program becomes a logical member of this team because desired outcomes are applicable to both ecological condition and the cultural landscape.

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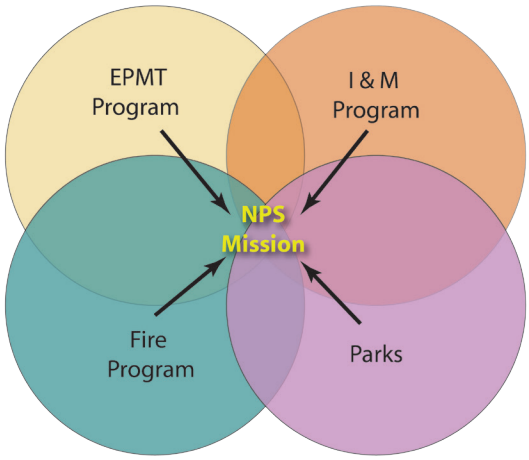
## SOPN Natural Resource Management Collaborative Framework

The Inventory and Monitoring Division, the Biological Resource Division's Exotic Plant Management Teams and the Fire and Aviation Division have established a collaboration with SOPN parks to better assess and manage natural resources. Although each program may have its own programmatic objectives, considerable overlap exists in their goals and efforts. Traditionally these groups have worked independently, but these programs are working collaboratively to provide more comprehensive and consistent aid in natural resource management activities.

Working collaboratively provides increased effectiveness and efficiency. For example, the Southern Plains Fire Group and the SOPN consolidated vegetation monitoring, and cut costs, reduced administrative overlap and increased information-sharing. Additionally, the collaborative approach improves the quality of information provided to parks and leads to consensus.




Each partner within the collaborative framework has specific roles and responsibilities. Parks have an explicit responsibility for management of park lands and have the final authority for making park-level decisions, even though all partners may provide input. The collaborative process uses reference conditions to evaluate the effectiveness of resource management progress and assesses resources in a variety of relevant contexts to help parks better understand resource conditions, especially those relative to the park's fundamental resource values.

# Southwest Network Collaboration

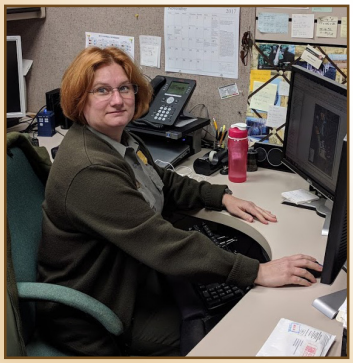
The Southwest Network Collaboration (SWNC) is a joint effort between the SOPN, the Chihuahuan Desert Network (CHDN) and the Sonoran Desert Network (SODN). The networks share several monitoring protocols and utilize common databases, streamlining data collection and reporting tasks. The goal of the SWNC is to improve effectiveness and efficiency across the three networks.

One of the key components of the SWNC is collaboration among data management team members. Data managers for the three networks, Heidi Sosinski (SOPN), Mark Isley (CHDN) and Kristen Bonebrake (SODN), meet weekly to discuss current projects and to facilitate cooperation. This collaboration enables the SWNC to complete projects that a single network may not be able to complete independently.

One such example is the recent upgrade to the springs monitoring database. The springs protocol is complex as it requires collection of several different categories of data, such as core water quality parameters and spatial data. The SWNC data management team worked together to design and deploy a new database that allows multiple users to access and enter data housed on network servers. This project took multiple people with a variety of skill sets to accomplish. Heidi significantly contributed to this project by updating the front end data entry application for the database, now in use throughout the SWNC.

## SOPN Data Manager Heidi Sosinski

Heidi Sosinski has served as the SOPN data manager for almost 14 years, and is based out of Lyndon B. Johnson National Historical Park (NHP). Her role with SOPN is to manage anything involving data collected in support of the network's monitoring protocols. She designs and maintains protocol databases, creates maps, manages spatial data and publishes reports created from our monitoring efforts.



# SOPN Publishes Prairie Restoration Report

In July 2017, SOPN published *Prairie Restoration on the Southern Plains: Lessons Learned from a Multi-Phase Project in Nine Parks*. The report provided an overview and insights gained from prairie restoration projects that took place between 2008 and 2015 in eight SOPN parks and in San Antonio Missions National Historical Park (NHP) in the Gulf Coast Network.

Since restoration of complex shortgrass and mixed-grass prairie ecosystems cannot be completed in a short period of time, such as that covered by the projects, the report is a progress report for a larger restoration process. It overviews the planning, evaluation, implementation, management, monitoring and information-sharing methods and processes used in the restoration efforts. The report also notes successes, failures, highlights and lessons learned from restoration efforts in each park, and is designed to be an educational resource for others planning or implementing restoration in shortgrass and mixed-grass ecosystems. Case studies, or vignettes, illustrate important points. Some of the techniques used were specific to restoration projects in grasslands, but other concepts are more widely applicable to other ecosystems.

The multipark project sought to restore the biological function of park grasslands and restore cultural landscapes, both vital to the fundamental resources and values of the parks. Participating parks included Bent's Old Fort National Historic Site (NHS), Chickasaw National Recreation Area (NRA), Fort Larned National Historic Site (NHS), Lake Meredith NRA, Lyndon B. Johnson NHP, Pecos NHP, San Antonio Missions NHP, Sand Creek Massacre NHS and Washita Battlefield NHS.

Major goals of the project included not only restored prairie sites in park areas, but also the creation of opportunities for parks to gain experience in and to build capacity for conducting such restoration projects in the future. The parks worked collaboratively with one another, with SOPN, other NPS programs and outside experts, including from the Lady Bird Johnson Wildflower Center. Parks also shared equipment, expertise and lessons learned with each other during the project. This interpark sharing was especially beneficial to the participating parks given the small size of their resource management staffs.

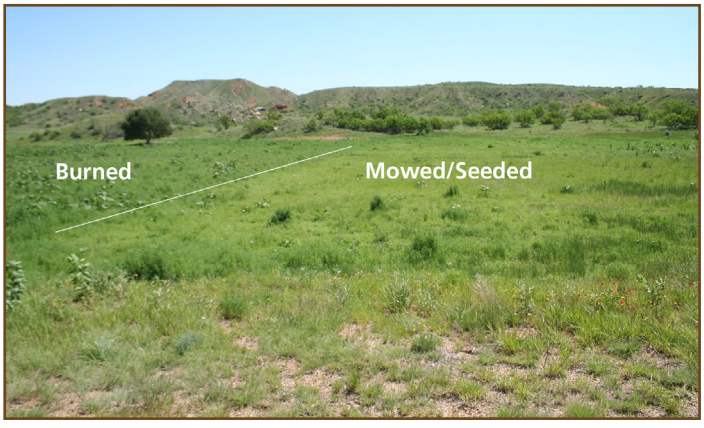
The report covers all stages of the restoration process from conceptual planning through implementation, maintenance and management and subsequent monitoring, and also discusses the value that interpretive components add to restoration projects.

Download the full report at https://irma.nps.gov/DataStore/Reference/Profile/2242874

Pannebaker F., T. Folts-Zettner, A. Mathis and R. Bennetts. 2017. Prairie restoration on the southern plains: Lessons learned from a multiphase project in nine parks. Natural Resource Report. NPS/NRSS/NRR—2017/1485. National Park Service. Fort Collins, Colorado.

Lake Meredith NRA experimented with different control techniques for exotic plants in a restoration site. Burning was tested on one section, and mowing followed by drill seeding was used in another section. The mowed/seeded section responded best. Mowing followed by drill seeding is now the standard treatment for control of exotic plants in the recreation area.


The restoration site, showing the burn treatment area to the left and the mowed area to the right.




The area that was mowed and then seeded (right) has better grass and fewer weeds than the burned area (left).

# Exotic Plants Monitoring

## Summer 2017 Monitoring Results

SOPN has been monitoring for invasive plants in all 11 network parks since the summer of 2009. Exotic plant monitoring mostly takes place along roads, trails and park boundaries, which are vectors for the invasion of exotic plants. Each individual transect is monitored every three years. In addition to vector monitoring, rapid assessments are periodically conducted to help parks identify exotic species in areas of concern.

The 2017 exotic plant monitoring crew consisted of Jonathin Horsley and Kaitlin O'Brien. During the summer season, a total of 60 species were found during vector monitoring and a total distance of nearly 31 km (19.3 mi) was surveyed. The three species most frequently found in the network were kochia (*Kochia scoparia*) (in 29.2% of blocks monitored), King Ranch bluestem (*Bothriochloa ishmaemum*) (28.5% of total blocks) and prickly Russian thistle (*Salsola tragus*) (23.7%). One new species was found during monitoring. Weeping lovegrass (*Eragrostis curvula*), a warm-season bunchgrass that grows rapidly and can outcompete native plants, was present at Fort Union NM.

Rapid assessments for the presence of exotic plants took place at Lyndon B. Johnson NHP and Bent's Old Fort NHS. This monitoring scheme uses a grid pattern and documents species occurrence and density. The crew found 17 exotic plant species at Lyndon B. Johnson NHP and 18 species at Bent's Old Fort NHS. At Lyndon B. Johnson NHP, Bermuda grass (*Cynodon dactylon*) was present at 74% of grid points, rescue grass (*Bromus catharticus*) was present at 52% of points, and King Ranch bluestem was present at 45%. At Bent's Old Fort NHS, kochia was the exotic species most commonly seen and was present at 51% of the points, with field bindweed (*Convolvulus arvensis*) being found at 29% of points, and prickly Russian thistle at 11%.

Trails and road, such as this interpretive trail at Washita Battlefield NHS, can be a vector for the spread of exotic plant species.

| Park | Distance Surveyed | # of Species | Most Common Exotic Species Detected - 2017 Monitoring |
|---|---|---|---|
| Bent's Old Fort NHS | 3750 m | 23 | Kochia (*Kochia scoparia*), field bindweed (*Convolvulus arvensis*), garden asparagus (*Asparagus officinalis*) |
| Capulin Volcano NM | 1850 m | 9 | Common mullein (*Verbascum thapsus*), Japanese brome (*Bromus japonicus*), western salsify (*Tragopogon dubius*) |
| Chickasaw NRA | 3200 m | 18 | Johnsongrass (*Sorghum halepense*), sericea lespedeza (*Lespedeza cuneata*), Japanese brome (*Bromus japonicus*) |
| Fort Larned NHS | 5450 m | 23 | Smooth brome (*Bromus inermis*), field bindweed (*Convolvulus arvensis*), cheatgrass (*Bromus tectorum*) |
| Fort Union NM | 1700 m | 12 | Prickly Russian thistle (*Salsola tragus*), field bindweed (*Convolvulus arvensis*), kochia (*Kochia scoparia*) |
| Lake Meredith NRA/ Alibates Flint Quarries NM | 4800 m | 14 | King Ranch bluestem (*Bothriochloa ischaemum*), prickly Russian thistle (*Salsola tragus*), kochia (*Kochia scoparia*) |
| Lyndon B. Johnson NHP | 800 m | 13 | King Ranch bluestem (*Bothriochloa ischaemum*), Johnsongrass (*Sorghum halepense*), straggler daisy (*Calyptocarpus vialis*) |
| Pecos NHP | 2200 m | 21 | Cheatgrass (*Bromus tectorum*), kochia (*Kochia scoparia*), prickly Russian thistle (*Salsola tragus*) |
| Sand Creek Massacre NHS | 3800 m | 8 | Common lambsquarters (*Chenopodium album*), prickly Russian thistle (*Salsola tragus*), kochia (*Kochia scoparia*) |
| Washita Battlefield NHS | 3400 m | 19 | Cheatgrass (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), Johnsongrass (*Sorghum halepense*) |

# Successful 2017 Grasslands Field Season

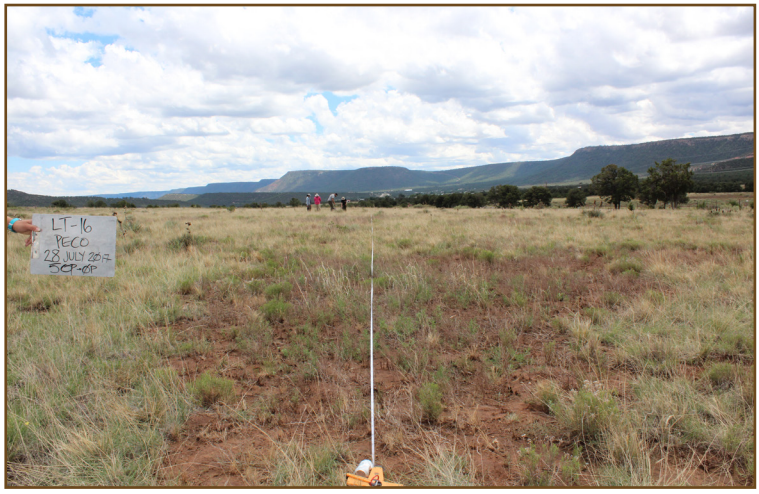
SOPN has teamed with the Southern Plains Fire Group to carry out collaborative monitoring of permanent grassland transects in SOPN parks. Last summer, the grasslands monitoring crew monitored transects in nine parks. Because of scheduling constraints, the crew was unable to monitor transects in Fort Larned NHS. Jonathin Horsley and Kaitlin O'Brien completed the monitoring in Lyndon B. Johnson NHP.

The 2017 grasslands crew consisted of crew lead Jeremiah Bonilla, Jacqueline Acosta, Ashley Dang, Juan "Kiko" Morlock and Emily Martinez. The crew had a fun and productive summer, enjoying mostly pleasant weather. Plenty of rain during the season led to green conditions in most transects with great plant diversity. The crew even encountered standing water in Sand Creek NHS.

Each 50-meter grasslands transect is comprised of ten randomly assigned 1-meter radius plots. During a transect visit, the field crew measures species composition and cover in each plot, shrub density within 10 meters of the transect center-point and point-line intercept cover along the transect. Status and trends in species composition and community structure are examined in relation to environmental variables (i.e., long-term management actions, climate and atmospheric deposition).

Jacqueline Acosta and Ashley Dang "botanizing" while dealing with mosquitoes in Bent's Old Fort NHS.

SOPN parks are dominated by mid- and shortgrass prairies that have been impacted by grazing, fire suppression and row crop agriculture. Individual restoration efforts have been employed in the past in most of these parks with mixed results, but monitoring of these efforts has been minimal. The grassland vegetation protocol was developed to inform park managers of the status and trends of the overall health of their grasslands. Collaboration with the Southern Plains Fire Group fire effects monitoring program addresses broader issues of vegetation health and achieves economic efficiencies for both programs.




Fire frequency and seasonality plays a large role in the ecology of the Great Plains. SOPN parks generally average between 40 and 50 days with thunderstorms per year and fire ignited by summer storms historically occurred May through September. Most SOPN parks have fire management plans and have implemented prescribed burns over the past decade, although two parks, Fort Union NM and Lyndon B. Johnson NHP, control fuel load mechanically.

Long-term ecological monitoring is integral to the proper management and protection of NPS lands. Park resource managers require an effective plant community monitoring protocol to assess their management strategies in maintaining and/or restoring prairie plant community composition, structure and diversity. The SOPN grasslands monitoring strategy attempts to balance the immediate needs of managers for current information and the need for insight into the changes occurring in vegetation communities over time.

Jacqueline Acosta served as acting field crew lead for much of the summer.

# Update on Stream Monitoring

Perennial streams are among the most critical and impacted natural resources of the American Southwest. The presence and extent of surface water has traditionally provided a focus for human habitation in the region, resulting in prehistoric and historic development coincident with reliable and abundant rivers, streams, wetlands and springs.

Perennial and intermittent rivers and streams ("streams") and ephemeral streams ("washes") are important resources in nearly all SOPN parks. Portions of seven major river systems (or their tributaries) are found in network parks. Streams are complex, dynamic systems that comprise interacting, interdependent biological and physical components. To support a comprehensive understanding of stream condition, we employ a holistic approach that integrates key geomorphological, hydrological, and biological processes and indicators.

Scoping for the integrated stream monitoring program was piloted in SOPN parks in Water Years 2010-2012 (WY10-12). Monitoring water quality on a quarterly basis and macroinvertebrates annually has been undertaken since WY12 on the Pecos River at Pecos NHP and the Arkansas River at Bents Old Fort NHS. During this period, data was collected to assess the methodology and hone monitoring logistics.

Stonefly larvae at Pecos NHP

In WY18, the stream monitoring program is transitioning to a distributed operational model with park staff conducting field sampling. Kris Whitbeck (Pecos NHP) and Cassy Hill (Capulin Volcano National Monument (NM)) received intensive USGS water quality training in November 2017.

SOPN stream monitoring staff will be working with Kris and Cassy to implement water quality monitoring at the Pecos River and the Arkansas River in WY18. WY18 results will then be used to implement monitoring programs using this distributed operational model for other SOPN parks.

Please contact Evan Gwilliam, SODN ecologist at (520) 403-3055 or evan_gwilliam@nps.gov for further information.

# Landbird Monitoring in SOPN Parks

As was discussed at the SOPN annual meeting last December at Lake Meredith NRA, landbird monitoring in SOPN parks is undergoing an assessment and likely will be revised. The approach to monitoring landbirds in SOPN parks was developed as part of the Southwest Network Collaboration.

SWNC ecologists have been conducting exploratory analyses on data collected since 2009. The focus of these analyses has been on estimating species abundance, occupancy (presence or absence of a given species) and community dynamics (species richness and associated parameters) in order to determine the reliability of estimating status and trend of bird species with reasonable statistical rigor.

The exploratory analyses have indicated that the data collected under the monitoring protocol have not been achieving the anticipated rigor for estimates of both species abundance and occupancy. The small size of most of SOPN parks, and therefore small sample sizes for all but the most common species, are the primary causes for the lack of statistical rigor. SWNC networks are now in the process of a more extensive analysis of all the bird monitoring data and preparing a synthesis report to help determine the best path forward. At this point, the SWNC is not optimistic that the current cost of sampling (approximately $45,000/year) is warranted by the low reliability of the species abundance and occupancy estimates.

However, rather than eliminating bird monitoring, the networks are exploring the possibility of a lower-cost option that emphasizes bird communities (the most promising element of the exploratory analyses). This would provide a periodic assessment of the species composition in parks, but without a rigorous statistical assessment of trends in individual species. Such a periodic assessment would serve as a broad early warning tool, and more rigorous assessment of individual species could follow as warranted. As always, SOPN staff welcome any input to this effort. The network's intention is to provide the best information to parks, within existing budget and logistical challenges.

House wren

Photo by Robert Shantz

# Research Brief

## Impact of Exotic Plants on Native Bees


In May 2017, Kaitlin O'Brien completed her two-year study on the impact of nonnative plant species on native bee populations in the southern Great Plains, as a partial fulfillment for her Master of Science degree in Integrative Biology from Oklahoma State University.

Bumblebee foraging on white prairie clover (*Dalea* spp.) at Lake Meredith NRA.

Public lands, like those in SOPN parks, provide crucial habitats that are valuable in the fight to save struggling pollinator populations. The worldwide decline of native insect pollinators is of growing concern, as is the decrease in populations of many native flowering forbs. Pollination services provided by native bees contribute substantially to human food production and native plant diversity across numerous regions, making native bees vital parts of ecosystems.

The decline of native bees can be attributed to multiple factors, including habitat loss, habitat fragmentation and degradation, intensification of agricultural practices, pesticide applications, and increased presence of invasive species. Understanding how invasive plants affect native bees is important for the management of pollinator habitat.

In the southern Great Plains, grasslands are prime habitat for native bees, providing diverse floral and nesting resources to pollinators. Grasslands are some of the most endangered ecosystems in the world, with up to 99.9% of native tallgrass prairies lost. Grassland ecosystems are also prone to invasion by introduced plant species, especially in areas with disturbance, high traffic or degraded landscapes. Pollination services are critical for maintaining native grassland plant diversity, which in turn provides habitat for pollinators. Nonnative and/or invasive plant species can alter grassland plant communities, thus the impetus to explore the potential effects of invasive plants on native bee populations and communities.

Kaitlin's study was conducted in coordination with SOPN and had two major objectives: to help document the native bee populations in network parks and to monitor the impacts of nonnative plants on grassland ecosystems. Four parks with native grasslands, Lake Meredith NRA, Washita Battlefield NHS, Sand Creek Massacre NHS and Bent's Old Fort NHS, were included in the study.

The project focused on the impact of two common nonnative invasive plants present in SOPN parks: Kochia (*Kochia scoparia*) and prickly Russian thistle (*Salsola tragus*). Both species are among the most problematic exotics in network parks and have the potential to alter native plant communities and impact pollinator populations. Stands of these two exotic plants are present in many disturbed or degraded sites in network parks.

Ten research plots were used in each park, and each plot was visited three times during the summer of 2016. The plots were located to capture the range of invasion level for kochia and

Kochia can form large swaths that choke out native plant species, affecting habitat quality for native bees.

# Research Brief

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prickly Russian thistle. Plots ranged from 0% invasive cover for kochia and Russian thistle up to 75% nonnative cover. Native and nonnative plant species and cover classes were recorded for each plot. For analysis, vegetation in the plots was categorized into functional groups (forb-blooming, forb-not blooming, grass and woody), and classified as invasive or native, since there were other invasive plant species present in addition to kochia and prickly Russian thistle. Data were also recorded on the percentage of bare ground availability because of its importance to solitary ground-nesting bees. A total of 124 plant species (36 grass species, 73 forbs species, 12 species of shrub and 3 trees species), representing 28 families, were recorded in sampling plots.

Pan traps were used to assess the native bee community because they are considered to be the most objective method for bee sampling. Pan traps are plastic bowls painted white, blue or yellow, and filled with soapy water. The pan colors represented different colors of flowers, with the selected colors being previously-identified as the most effective for collecting a diverse bee community. Nine pan traps were set each plot visit.

A pan trap

More than 6,900 bee specimens were collected, including individuals from 35 different genera and at least 63 different species. Lake Meredith NRA had the highest number of genera, species and specimens collected. Five families were represented in the study; the most abundant being Halictidae (sweat bees) and Apidae (bumblebees, carpenter bees, cuckoo bees, etc.). Bee specimens included social and solitary bees, and even some parasitic bees that steal nests or lay eggs in a host. Bees with varying nesting habits, including soil nesting, cavity nesting and a few hive nesting, were identified.

A sample of the diversity of native bees found during the study, including large bumblebees and smaller sweat bees and digger bees.

| Park | # of Genera | # of Species | # of Specimens |
|---|---|---|---|
| Bent's Old Fort NHS | 25 | 45 | 1456 |
| Lake Meredith NRA | 35 | 63 | 2219 |
| Sand Creek Massacre NHS | 21 | 40 | 1632 |
| Washita Battlefield NHS | 19 | 34 | 1645 |

Regression models were used to evaluate how the bee community (richness and abundance) responded to invasive plant species cover and bare ground cover. The analysis considered kochia and prickly Russian thistle together, since these two species commonly occur with one another and were expected to have similar impacts on the native bee community.

The study's findings suggest that grasslands with no or low levels of invasive species support higher bee species richness, but the presence of exotic plants did not affect bee abundance. Plots containing higher levels of bare ground showed a significant correlation with bee richness. Possible factors contributing to these observations could be the lack of floral resources for kochia and prickly Russian thistle, which require limited insect pollination, along with the reduced abundance and diversity of native forbs. Bare ground is especially important for solitary, ground-nesting bees and is a factor that can be influenced by invasive plant cover.

This study suggests that invasive plant species control is important for improving grasslands to support diverse native bee communities. Parks can improve habitat for native bees by maintaining native plant diversity in grasslands and controlling invasive plant species.

*Article courtesy of Kaitlin O'Brien. Photos courtesy of Kaitlin O'Brien and Richard Zahm, Washita Battlefield NHS.*

# The Sands of Time are Shifting at Sand Creek Massacre NHS

Sand Creek Massacre NHS is one of the newer units of the National Park System, having been formally authorized in November 2000 and opened to the public in 2007. Some of the site's staff, notably Superintendent Alexa Roberts and Chief of Operations Karl Zimmermann, have been with it since the earliest stages of planning and were instrumental in its establishment. But times are changing with Karl planning to retire in the fall of 2018.

A complex land acquisition process necessary for a new NPS unit took place between the site's authorization and establishment. During that time, Karl worked in the Division of Natural Resources at Bent's Old Fort NHS, where he led a successful project to eradicate invasive tamarisk (*Tamarix* spp.) from the park. Additionally, Karl devoted every spare moment to Sand Creek Massacre NHS because he saw the development of a new NPS unit as a challenge with new issues that needed to be solved.

The future site of the Sand Creek Massacre NHS was literally a clean slate for natural resource management. The new park site provided an opportunity to transform approximately 2,500 acres of ranchland that had been grazed and cultivated for decades into one of the best preserved and managed segments of mixed-grass prairie in the southern Plains and the National Park System.

When Sand Creek NHS was formally established in 2007, Karl became the site's Operations Manager. In less than 10 years, Karl oversaw the initiation or completion of nearly every major baseline natural resource study, inventory or plan. He has used research, innovation and creativity to tackle issues and solve problems, many of which are applicable to the NPS systemwide. Today, Sand Creek's grasslands are in excellent condition and hopefully can be maintained with an adaptive management approach. SOPN cites Karl's work as an exemplary of effective natural resource management, especially his work using mowing to keep shrub encroachment in check.

Karl Zimmerman

Since Karl has always been on hand as a devoted steward of both Bent's Old Fort and Sand Creek Massacre NHS, it will be great loss to the NPS when Karl retires. Luckily, Zach Cartmell, the newly-appointed biologist for Sand Creek Massacre NHS, Bent's Old Fort NHS and Capulin Volcano NM, is spending time learning the park and gleaning what he can before Karl retires. Zach has the added advantage of having worked in the High Plains parks in his previous position in resource management at Capulin Volcano NM.

Now, if we can just distract Alexa from looking too hard at retirement flyers, she can continue to lead stewardship efforts at the site, while new staff like Zach build their own institutional knowledge.

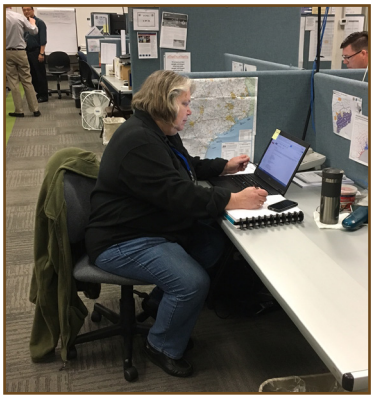
*-Rob Bennetts and Fran Pannebaker*


Mowing has been successfully used to reduce the cover of sand sagebrush (*Artemisia filifolia*) at Sand Creek Massacre NHS, and is a preferred treatment method there because of the site's very sandy soils. Cover of sand sagebrush likely increased with continual grazing prior to establishment of the historic site, and the site contains an overabundance of early successional forbs and annual plants relative to historical climax plant communities. Mowing also allows existing native grasses and forbs to grow and multiply, and precludes the use of herbicides which would kill native forbs and thereby decrease resources available to native pollinators, an important component of shortgrass prairie ecosystem.

# Staff Updates

## SOPN Biologist Tomye Folts-Zettner on Detail for Hurricane Harvey Recovery

Tomye Folts-Zettner is currently on detail to the Department of Interior as the natural resource subject matter expert for the Recovery Support Function in Texas as part of the response to Hurricane Harvey, which caused widespread damage to natural resources in coastal areas of Texas. She works out of the Joint Field Office is Austin as part of a multi-department and multi-agency federal program working in conjunction with FEMA. The primary objectives of the Recovery Support Function is to improve preparedness, resiliency and sustainability for future storm events.



Tomye is working for the Natural and Cultural Resource Functions Recovery Group, largely focusing on coastal resiliency. In collaboration with the Texas General Land Office, other state agencies, NGOs and volunteer organizations, the Recovery Support Function is identifying ways to stabilize shorelines, bays, estuaries and wetlands in preparation of future storms.

Natural resources along the Texas Gulf Coast experienced significant impacts during Hurricane Harvey. The storm heavily damaged colonial waterbird rookery sites, where waterbirds such as terns, gulls, herons, egrets and roseate spoonbills gather in large numbers to raise their young. Some rookery sites were literally blown away. Harvey also impacted threatened and endangered species along with Texas species of concern, with some species of reptiles and native fish potentially being extirpated.

Tomye will be serving as acting deputy field coordinator for natural and cultural resource recovery during the holidays. Her detail with the Recovery Support Function is scheduled to last until sometime in early January.

## Farewell to Bruce Fields

One of the changes looming in the very near future is the retirement of Bruce Fields from the Southern Plains Fire Group. Bruce came to the southern Plains in 2010, and has been a friend and ally of the network and its parks ever since.

A common theme throughout this newsletter is collaboration. When Bruce arrived in the southern Plains, the network had been trying to establish a collaborative effort with both the Fire Program and the Invasive Plants Program. There is now an ongoing collaborative effort, for which Bruce can take considerable credit. He has always put an emphasis on making sure that the resource management goals of the parks comes first. This attitude has made it possible for us to work together more effectively and efficiently than either program could do on their own. As a result, the fire effects monitoring of the Southern Plains Fire Group and SOPN vegetation monitoring are conducted via a single crew using the same protocol. Network staff very much appreciate all that Bruce has contributed and wish him well on the next phase of his journey.

## SOPN Writer/Editor Allyson Mathis

Allyson Mathis, a research associate with the Northern Rockies Conservation Cooperative, joined SOPN as a writer/editor in 2016. Allyson also works as a writer/editor for the Chihuahuan Desert Network. With more than 20 years' experience in science communication on natural resource topics, Allyson brings a varied background to SOPN. She enjoys visiting the parks and working with network staff. To date, she helped write the *Prairie Restoration on the Southern Plains* report and is working on a number of resource briefs for SOPN parks. Allyson is based in Moab, Utah.

## SOPN Parks

Alibates Flint Quarries National Monument
Bent's Old Fort National Historic Site
Capulin Volcano National Monument
Chickasaw National Recreation Area
Fort Larned National Historic Site
Fort Union National Monument
Lake Meredith National Recreation Area
Lyndon B. Johnson National Historical Park
Pecos National Historical Park
Sand Creek Massacre National Historic Site
Washita Battlefield National Historic Site

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# Invading the Plains: Prickly Lettuce

Prickly lettuce (*Lactuca serriola*) is an exotic plant that is an emerging threat to SOPN parks. It is invading many areas in the southern plains and presents a high risk for further encroachment in SOPN parks.

Prickly lettuce is an annual or biennial plant that can produce up to 200,000 seeds per plant. Seedlings typically emerge in the fall and develop into a rosette that overwinters until a flower stalk emerges. These stalks can grow nearly 1.8 m (6 ft) tall and the lower part of stalks is usually covered by small spines. It is native to Europe, Asia and north Africa.

This drought-tolerant species usually colonizes disturbed areas such as roadsides and can be a horticultural weed in no-tillage fields. It is considered to be an invasive species in the western states. It quickly forms dense stands that have been observed from southeastern Colorado to the Texas panhandle. Seeds can be dispersed by wind and may also be spread by water.

Photo by Jim Kennedy / Creative Commons

Prickly lettuce can be controlled by pulling, but the plant has a deep tap root. Mowing is not considered an effective treatment since plants will regrow the flower stalk. It can also be controlled with herbicide.