

RM-CESU - Project Progress Report, FY 05

Project Title: Inventory of Plants at Sand Creek Massacre NHS

Park: SAND

Funding Source: Rocky Mountains CESU Research Funding (\$10,000); Southern Plains Inventory and Monitoring Network (\$19,610). Alexa Roberts, Superintendent at Sand Creek Massacre NHS and Dusty Perkins, Southern Plains Network Coordinator have each devoted approximately 0.5 pay periods to the project, to date. This amount will likely double before the project is complete.

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University Partner, PI: Colorado State University, Dr. Roy Roath

Student Participants: Two from Colorado State University

Project Description:

Sand Creek Massacre National Historic Site (SAND) in Colorado was established in the fall of 2000 with an authorized area of 12,583 acres, of which 2,400 acres are currently under National Park Service (NPS) management. This park is located within the short-grass prairie ecosystem, but has a unique vegetation community due to sandy soils and the intermittent creek that traverses the park. The soil and creek provide areas with the potential for mixed-grass and tall grass prairie with proper management.

Sand Creek Massacre NHS was authorized with little information on natural resources and currently has no staff or funding devoted specifically to natural resources. This park's enabling legislation states, "The Secretary shall manage the site to protect and preserve the site including the cultural landscape of the site in a manner that preserves, as closely as practicable, the cultural landscape of the site as it appeared at the time of the Sand Creek Massacre." This cultural landscape was most likely high quality prairie habitat. In order to maintain and effectively manage high quality prairie, the plant species and vegetation communities must be known.

This park is part of the Southern Plains Inventory and Monitoring Network (SOPN), but it was a late addition to the network and was not part of the Inventory and Monitoring Program's original 270 target parks. Therefore no funding has been allocated to SOPN for SAND inventories, and it is not known if SOPN will ever receive inventory funding for this park. Despite this lack of natural resource information SAND must develop general and resource management plans and a vital signs monitoring program. The objectives of this study were to document the vascular plant species and vegetation communities present at SAND. Specifically, the objectives were to:

- 1) Document 90% of the vascular plant species present at Sand Creek;
- 2) Provide a preliminary map of the different vegetation communities present at Sand Creek;
- 3) Provide voucher specimens of all non-rare plant species detected; and
- 4) Enter species records into appropriate NPS databases.

During 2005, SAND was surveyed by a crew for 20 days accounting for 63 human days of effort. First, the area was surveyed with a site-wide reconnaissance. Additional surveys took place by strata based on soils and seral condition of the vegetation. The vegetation transects were stratified across each of the soil/seral position strata so that each strata was sampled with 3-5 transects depending on the variability of the vegetation in that strata. A total of 110 transects were completed with 2200 quadrats placed. Each transect quadrat was a nested frequency plot

with plant frequency by species was read in each nested plot. Ground cover was taken for each quadrat.

Project Results:

A total of 120 plants with five samples of each plant were collected and identified, and are currently being verified and mounted. These collections will be made available to SAND, Bent's Old Fort NHS, to a regional Park Service Archive, and a resident collection on long-term loan to Colorado State University. The field data is currently being summarized and should be available by early January. All information gathered during this project will be put into standard NPS databases such as NPSpecies, the Natural Resource Bibliography (NatureBib), and the Dataset Catalog this fall and winter.

The base map of vegetation types and attributes should also be ready in January. This winter, an additional trip to Eads to work with Natural Resources Conservation Service is necessary in order to develop the base map and assign plant community attributes to each strata. The result will be a base map of the current vegetation by seral position and the potential vegetation for each stratum. The project leader has also met with Regional National Park Service representatives in Eads to discuss management approaches to be employed by SAND to achieve their desired outcomes.

The information gathered in this project is essential to the development of the park's first general and resource management plans, and to building a vital signs monitoring program. The plant information will serve as the foundation for developing grassland management plans. There are 7 rare, threatened or endangered species (Colorado bursage, black-tailed prairie dogs, lesser prairie chicken, burrowing owl, mountain plover, ferruginous hawks, and swift fox) that either do, or may occur at SAND. Several of these species are sensitive to grazing practices. Many species have evolved with grazing by native herbivores. Since Europeans came to the area this site has been grazed by cattle, but grazing ceased in 2000 when NPS took ownership. Much of the short-grass prairie ecosystem has been damaged by overgrazing, however, a lack of grazing can also negatively impact this ecosystem. For example, prairie chicken display grounds, or leks, are established in open areas of low-growing vegetation that can be created in heavily grazed areas. Swift foxes prefer open, sparsely vegetated short- and mixed-grass prairie, where visibility and mobility are unimpeded, and intensive grazing can be beneficial for mountain plovers. The lack of grazing since NPS has acquired the land could be changing the vegetation community and potentially negatively affecting some of these rare species. Due to the rarity of high-quality prairie and the decline of several prairie species, it is essential that prairie in NPS ownership be maintained in optimal condition to serve as habitat for rare species and as an example of how to manage this ecosystem.

Publications, Other Reports Expected:

Data entry will continue this fall and winter. The first annual report of activities is due January 15, 2006. The original agreement included a possible second shortened field season that would target specific species that could have been missed during the 2005 field season. This winter SOPN, SAND, and Colorado State will discuss if this additional field work is necessary. The final report is not due until January 31, 2007, however if no additional field work is necessary it is anticipated that the final report will be completed before this date.