

**Project Title:** Grassland bird and mammal response to bison reintroduction in northern Colorado

## **Project Background**

The plains bison (*Bison bison*), along with natural fire, was instrumental in helping shape North America's Great Plains. The grassland prairies that form the Great Plains are critical sources of carbon storage, but have been degraded over time due to in part to the loss of native grazers, such as the plains bison. The local extinction of keystone species groups, also known as defaunation, can have important consequences for species diversity and ecosystem processes. Large grazers, including bison, directly and indirectly affect grassland ecosystems by altering plant community composition, changing soil nutrient cycling, causing shifts in dominant bird species, and impacting small mammal abundance. A recent bison reintroduction (November 1, 2015) to northern Colorado (Soapstone Prairie Natural Area and Red Mountain Open Space) could help restore grassland function and quality for birds and other animals. My work examines how bison reintroduction affects grassland fauna and flora, and tests for potential differences in bird and mammal use in bison grazed and cattle grazed sites.

## **Goals and Objectives**

**Goal 1:** This research seeks to advance the science of refaunation as it relates to reintroducing bison to a shortgrass prairie ecosystem. Refaunation refers to restoring animals that provide important ecosystem functions to their native habitats.

**Objective 1:** Determine how the reintroduction of plains bison alters grassland bird and mammal habitat use and vegetation composition and structure

**Goal 2:** A second goal involves examining the potential for nonnative species (e.g. cattle) to serve as ecosystem engineers and restore ecosystem services in lieu of native species (e.g. bison) in shortgrass prairie systems.

**Objective 2:** Assess differences in grassland bird and mammal habitat use and vegetation composition and structure between bison-grazed, cattle-grazed, and reference sites

## **2017 Research Accomplishments**

From May-June 2017 we successfully surveyed grassland birds at 60 point count stations evenly distributed between bison, cattle, and reference sites at Soapstone Prairie Natural Area and Red Mountain Open Space in northern Colorado. We visited each point count station 5 times during the season for a total of 300 visits. We also set up 20 remotely-triggered wildlife cameras at each site (60 cameras total) from May-October 2017. We conducted 120 vegetation transects (one for each point count station and wildlife camera) from June-July 2017. We have concluded the 2017 season of data collection for grassland birds, mammals, and plants.

Although we are still analyzing data, the most common bird species observed across all sites and years included Western Meadowlarks (*Sturnella neglecta*), Vesper Sparrows (*Pooecetes*

*gramineus*), Brewer's Sparrows (*Spizella breweri*), Grasshopper Sparrows (*Ammodramus savannarum*), and Horned Larks (*Eremophila alpestris*). Less common birds included Baird's Sparrows (*Ammodramus bairdii*), Lark Sparrows (*Chondestes grammacus*), Lark Buntings (*Calamospiza melanocorys*) and Common Night Hawks (*Chordeiles minor*). The mammals most often captured on cameras, across sites and years, included pronghorn (*Antilocapra Americana*), bison (*Bison bison*), cows (*Bos taurus*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), and black-tailed jackrabbits (*Lepus californicus*). Dominant grass species included blue gramma (*Bouteloua gracilis*), buffalo grass (*Bouteloua dactyloides*), Columbia needlegrass (*Achnatherum nelsonii*), and western wheatgrass (*Pascopyrum smithii*), while the main forbs were two-grooved milkvetch (*Astragalus bisulcatus*), silky sophora (*Sophora nutalliana*), and American vetch (*Vicia americana*). Dominant shrubs included prairie sagewort (*Artemisia frigida*) and broom snakeweed (*Gutierrezia sarothrae*).

The LWF funds were essential for transportation to and from my field site (Fort Collins — Soapstone Prairie Natural Area and Red Mountain Open Space). These funds enabled me to complete my third and final year of data collection that is critical for rigorously comparing bird and mammal habitat use, and vegetation composition and structure between bison-grazed, cattle-grazed, and reference sites. I spent funds on the following transportation materials: gas, mileage, and the monthly fee for renting a field truck from my department.