

**Rocky Mountains Cooperative Ecosystem Studies Unit  
Project Summary**

**Project Title:** Identifying Structure of the Yellowstone Bison Population

**Task Agreement #:** P18AC00951

**Discipline:** Natural

**Type of Project:** Research

**Funding Agency:** National Park Service

**Other Partners/Cooperators:** University of Wyoming

**Student Participation:** No

**Effective Dates:** 6/1/18 - 12/31/22

**Funding Amount:** \$33,000

**Investigators and Agency Representative:**

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**Project Abstract:**

**Project Goals –** The Yellowstone bison population is thought to exist in at least two separate breeding herds that use northern and central areas of Yellowstone National Park. Recent and dramatic increases in bison using northern areas and decreases in bison using central areas has raised concern that management removals have targeted the central breeding herd. Bison are managed under an Interagency Management Plan that limits population abundance and distribution. Under this plan, limited numbers of bison are allowed to migrate out of the park during winter with the remainder lethally removed when migrating beyond park boundaries. Based on counts during 2017, numbers of bison using central areas of the park may no longer be sufficient for long-term genetic conservation. However, there is some indication that the historic herd structure has broken down over time. If this is the case, with bison conforming to a single, intermixing population, then the current bison population is likely sufficiently large for long-term genetic conservation – although there are substantially fewer bison observed in central areas of the park.

The goals of this project are twofold. First, we aim to determine the number of breeding herds in the Yellowstone bison population and characterize their genetic makeup. Second, we aim to evaluate whether management removals that occur when bison migrate out of the park differentially affect breeding herd units. This project will identify minimum numbers of bison necessary to maintain the current genetic and herd structure of the population. In turn, this project will provide managers with new information to advise culling animals from the population in a manner that promotes long-term conservation.

**Project Objectives –** The end result of the project is to prepare a paper suitable to a peer reviewable journal identifying breeding area spatial associations and genetic characterizations of Yellowstone bison and evaluate potential effects of management removals. The specific steps are to: 1) complete a network analysis of the spatial distribution of radio-collared bison; 2) determine the connectedness of breeding groups between years; 3) describe the genetic composition of breeding groups using mitochondrial markers; and 4) evaluate the risk of management removal to each breeding group.

**Keywords:** Bison, Yellowstone National Park, National Park Service, University of Wyoming, Bison Management, Genetic Conservation.