

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Establishing a Baseline for Habitat Restoration in Bighorn Canyon NRA:
Analysis of the Impacts of Historic Flash Floods on Natural and Cultural Resources

Discipline: Interdisciplinary
Type of Project: Technical Assistance
Funding Agency: National Park Service
Other Partners/Cooperators: University of Wyoming, Northwest College
Effective Dates: 5/15/2009 - 5/14/2010
Funding Amount: \$9,588

Investigators and Agency Representative:

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Project Abstract: This project would help Bighorn Canyon NRA establish a baseline database to determine the relationships between recent climate change and historic land use patterns that has resulted in massive sediment movement from hill slopes in Bighorn Canyon. A 2006 flash flood made apparent the ability of a single storm to move massive amounts of sediment with destructive results. Is sediment mobilization the result of overgrazing, a decrease in grass cover due to persistent droughts, an increase in the frequency and intensity of flash floods, or a combination of all factors? At Bighorn Canyon NRA, there is direct, observable evidence of historic landscape instability that is evident through destruction of sections of the prehistoric Bad Pass Trail system, but more importantly via burial of historic structures.

Northwest College, Powell, Wyoming, in cooperation with the University of Wyoming will assist the NPS in examining the stratified deposits behind two historic structures at two different historic ranches where intact sediment deposits are now exposed through excavation to restore the partially buried structures. This information can be used to determine the frequency and magnitude of sediment movement within the last 100 years. With this information, the climate and hydrology database can be extended back into time by examining arroyos and associated landforms for evidence of past flash floods, or prolonged periods of heavy rain. The director of the summer field school program and students from Northwest College in Powell, Wyoming - in cooperation with the University of Wyoming - will document and collect data from the field survey, and collect and compile published material related to the new database.

Bighorn Canyon NRA has limited documentation on local environmental records, and merging the results of this study with woodrat midden data (published in 2002), and tree ring based reconstruction of precipitation patterns (published in 2003) would be beneficial in understanding current local climate conditions, and trends for planning long term re-vegetation, and landscape restoration efforts during the course of this project.

Outcomes: The results of the current data collected in summer 2009 will be merged with the existing woodrat midden data (published in 2002), and tree ring based reconstruction of precipitation patterns (published in 2003) and then written up as a report to be submitted to Bighorn Canyon NRA and RM-CESU by May14, 2010.

Keywords: climate, packrat middens, tree rings, historic structures, Bighorn Canyon NRA, University of Wyoming, Northwest College