Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Evaluate Hydrological Function & Riparian Health of Johnson Creek to Develop Management Options

Discipline: Interdisciplinary
Type of Project: Research
Funding Agency: National Park Service
Other Partners/Cooperators: University of Montana
Effective Dates: August 1, 2011 – August 1, 2015
Funding Amount: $40,000

Investigators and Agency Representative:
NPS Contact: Jason Smith, National Park Service, Grant-Kohrs Ranch NHS, 266 Warren Lane, Deer Lodge, MT 59722, 406-846-2070 ext 232, Jason_F_Smith@nps.gov

Investigator: Glenn Shaw, Geological Engineering, Main 316B, Montana Tech, 1300 West Park Street, Butte, MT 59701, 406-496-4809, gshaw@mtech.edu

Project Abstract: Cultural resources at the ranch are being negatively impacted by natural resource management actions taken 14 years ago. This project is needed to understand the hydrological function/impacts of Johnson Creek as it passes through the ranch and to develop management options that will effectively balance protection of the Johnson Creek riparian area and the cultural landscape and historic features within.

The North Fork Johnson Creek and Johnson Creek enters the Grant-Kohrs Ranch from the east and runs west through the park for about ¼ mile before merging. The North Fork flows quietly through a pasture located between Kohrs' grandson, Conrad Warren's 1934 home/Administrative Headquarters and the Visitor Center. It is a prime location for offering visitors a view of the site's historic cattle breeds. It merges with the mainstem of Johnson Creek within a complex of corrals, fences and about a dozen historic structures (barns, sheds, chutes) - purposely located there as it provided a year around water source for livestock. From 1972 when the site was acquired by the NPS and 1995, park staff continued to use these areas as they had been historically – grazing and pastures for livestock. Around 1975 the NPS installed an underground "French drainage system" that mimic a Kohrs Era drainage method to insure ground water levels were lowered to protect historic structures. The Johnson Creek channel was annually "scoured" by hand to remove vegetation, silt, and any beaver activity from the slow-moving waterway to encourage flow.

By 1995, the Grant-Kohrs Ranch began to recognize the importance of balancing the needs of natural resources with that of cultural resources. The Natural Resource Specialist saw a negative impact to the Johnson Creek riparian area from livestock (trampling of banks and lack of vegetation). In response, a fence was constructed along the creek to exclude livestock. Limited livestock grazing through fencing and grazing management has allowed riparian vegetation to recover and increase the water holding capacity along Johnson Creek, and enlarge the riparian area associated with Johnson Creek. Now, 14 years later, cultural resources are being negatively impacted by extremely shallow ground water levels. Water is percolating up, freezing, and is a safety hazard. Some historic structures are sitting in water. The enlarged riparian area/increased water holding capacity associated with Johnson Creek may be a contributing factor of surface water appearing in the lower yard.

This study is needed to 1) understand the hydrology behind the current scenario, to determine if the enlarged Johnson Creek riparian area, or other influences (non-functioning drain system, increased upstream hydrologic influences) are contributing to surface water appearance, 2) develop and propose management/resource protection alternatives, and 3.) study these options to find the most balanced management approach for Johnson Creek and cultural resources.

This project will: 1) Evaluate the hydrologic function & groundwater table of Johnson Creek as it passes through the Home Ranch Complex (a contributing element to the National Historic Landmark) 2) Evaluate the riparian health of the entire ½ mile reach as it passes through GRKO, and 3) Develop alternatives & recommend treatment that balances riparian function with historic resources

Outcomes with Completion Dates:
Draft final report due by August 1, 2014

Keywords: Johnson Creek, hydrology, riparian health, management actions, Grant-Kohrs Ranch National Historic Site, University of Montana - Montana Tech