

## **Project Summary**

### **Rocky Mountains Cooperative Ecosystem Studies Unit**

**Project Title:** Draft Best Management Practices and Further Development of BEHAVE Program with Cattle (Cows Eating Weeds)

**Discipline:** Natural  
**Type of Project:** Technical assistance and Research  
**Funding Agency:** National Park Service  
**Other Partners/Cooperators:** Montana State University  
**Effective Dates:** July 1, 2009 - September 30, 2013  
**Funding Amount:** \$100,000 [FY10: \$31,000; FY09: \$69,000]

**Investigators and Agency Representative:**

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**Project Abstract:** Currently, we are working on two projects at Grant Kohrs Ranch (GRKO): "1) research and draft agricultural Best Management Practices (BMPs) specific to this Grant Kohrs Ranch Historic Site; and 2) the continuation and expansion of the cattle livestock Behave Program (Cows Eating Weeds)." The proposed project is intended to expand on the two continuing projects, as follows.

Invasive species (weeds) have been part of the landscape at GRKO for several decades. The ideal outcome will be that by training cattle to graze these weeds, weeds will become a minor component on the landscape. In our proposed project, we will assess how cattle use the landscape containing weeds, and whether cattle distribution across the landscape is positively or negatively influenced by populations of weeds.

The perimeter of weed populations will be mapped with GPS. The observer will tag the location with the following information: weed species, dominant non-weed species, and density of weed species (low, medium, high). This information will be incorporated into GIS.

Second, we will develop spatial attribute layers, using GIS, to develop predictive models of cattle use of these weed species. As GIS layers, we will include: 1) weed patches by density class (high, moderate, low), 2) dominant, non-weed species, 3) water sources, 4) roads, 5) fences, 6) elevation, 7) slope, 8) aspect and 9) in Year 2, the location of an incentive (supplement). Items 3-5 are in the Grant-Kohrs Ranch GIS database. An elevation gradient will be obtained from a United States Geological Survey (USGS) 10-m digital elevation model (DEM). Percent slope and aspect will be generated from the V-Lake 10-m DEM using ArcGIS Spatial Analyst.

Third, cattle locations will be tracked 24/7 with GPS collars. In separate trials, we will randomly select two cows from each of the treatment groups (Trial 1, trained, untrained-new cattle; Trial 2, trained, untrained-herd mates). From May-August, cows will be tracked with Lotek GPS 3300 collars (Lotek Wireless, Newmarket, Ontario, Canada) at 10-min intervals, equivalent to 144 positions per day. With remote access technology, cattle locations will be displayed on a monitor in real time for research and educational purposes. In addition to GPS tracking, an observer will locate and record the positions of all cows two times each week to determine if the positions of collared cows represent the positions of other cows in the group.

Finally, in the spring of 2012, cattle that have not shown a predilection for consuming weeds will be trained as described by Voth (2009).

**Outcomes with Completion Dates:** December 31, 2012

**Keywords:** Montana State University, Grant-Kohrs Ranch NHS, Best Management Practices, Weeds, Cattle