Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Economic Analysis of Brucellosis Management in the Greater Yellowstone Ecosystem

Discipline: Natural
Type of Project: Research
Funding Agency: National Park Service
Other Partners/Cooperators: Montana State University
Effective Dates: 7/15/2013 – 12/31/2014
Funding Amount: $38,259

Investigators and Agency Representative:
NPS Contact: Rick Wallen, Yellowstone National Park, Yellowstone Center for Resources, PO Box 168, Mammoth Hot Springs, WY 82190; 307-344-2207; rick_wallen@nps.gov

Investigator: Randal Rucker, Montana State University, Department of Agricultural Economics and Economics, Bozeman, MT 59717-2920; 406 994-5644; rrucker@montana.edu

Project Abstract:
The purpose of this project is to develop a detailed study plan that will serve as the foundation for a comprehensive economic analysis of brucellosis management activities. The study plan will describe the analysis of three specific management objectives: 1) brucellosis eradication; 2) brucellosis suppression; and 3) risk management (separation of bison and cattle) without active brucellosis suppression. A detailed review of potential brucellosis suppression and risk management tools (e.g., vaccination, contraception, test and slaughter, etc.) will be provided to the Principal Investigators by the NPS Technical Advisor, with descriptions of the potential uses and limitations of each tool. A subset of the most effective tools will serve as the management activities used to meet the specific management objectives. For each objective, the Principal Investigators will develop and describe an analysis and modeling framework that assesses the approximate cost of reaching the objective. The NPS Technical Advisor will provide an overview of the current state of a comprehensive brucellosis model, which relates reductions in brucellosis infection with specific management objectives and tools. For each of the management objectives, the study plan will describe how a cost comparison could be made between brucellosis outbreak(s) in local cattle herds and proactive brucellosis suppression activities. The NPS Technical Expert will also provide the Principal Investigators with technical information on the current state of knowledge related to transmission mechanisms and probabilities of transmission for brucellosis among different types of wildlife (especially elk and bison). The study plan will integrate the scientific research on brucellosis with an economic analysis of each of the management objectives. The analysis will be used to estimate and compare the financial investment in the following management objectives:

1. **Brucellosis Eradication**: Based on the effectiveness of specific management activities, estimate the cost of brucellosis eradication from Yellowstone bison. If eradication is unlikely using the specified management activities, the Principal Investigators will work with the NPS Technical Advisor to estimate the cost (overall and annual) of reaching and sustaining the reduced level of infection (e.g., 90% reduction in prevalence). The analysis should address the extent that brucellosis in elk would need to be reduced from its current state to effectively eradicate or reduce brucellosis prevalence in bison.

2. **Reducing the prevalence of infection**: Estimate the annual financial investment for a brucellosis suppression program that reduces the prevalence of the disease in Yellowstone bison by one-half from current levels of approximately 60% prevalence in the population, including cost estimates for each specific brucellosis suppression activity or tool.

3. **Managing the risk of brucellosis transmission without disease suppression activities**: Estimate the annual cost of reducing the risk of brucellosis transmission from bison to cattle by maintaining separation between them, but without implementing actions to suppress the prevalence of brucellosis in bison.

Outcomes with Completion Dates:
Draft Final Report: March 7, 2014
Presentation of Study plan to Interagency Partners: May 2014
Final Report: September 30, 2014

Keywords: bison, brucellosis, brucellosis, Yellowstone National Park, Montana State University