

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Motorized winter recreation and glucocorticoid stress responses in elk

Type of Project: Research

Funding Agency: National Park Service

Other Partners/Cooperators: Montana State University

Effective Dates: 8/15/2004 - 9/30/2007

Funding Amount: \$10,000

Investigators and Agency Representative:

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Investigator: Scott Creel, Department of Ecology, Montana State University, Bozeman, MT 59717, (406) 994-7033, screel@gemini.oscs.montana.edu

Project Abstract:

The purpose of this agreement is to conduct assays of fecal glucocorticoid concentrations (i.e., nanograms of glucocorticoids per gram of dry feces) in 162 fecal samples collected from radiocollared adult female elk in the Madison headwaters of Yellowstone National Park during winters of 2003-2007. The fecal samples will be provided to the Principal Investigator by Dr. Robert Garrott, Ecology Department, Montana State University, Bozeman. Extraction and radioimmunoassay procedures will be similar to the previously validated double-antibody ¹²⁵I-corticosterone assay described in Creel et al. (2002; Conservation Biology 16:809-814). Assay results will be used by the NPS Key Official, Principal Investigator, and Dr. Robert Garrott to test for associations between motorized winter recreation and glucocorticoid (i.e., stress hormone) levels in Yellowstone elk.

Outcomes with Completion Dates:

Final Products:

- 1) Results of the extraction and radioimmunoassay of 162 fecal samples from adult female elk in the Madison headwaters of Yellowstone National Park during winters 2003-2007 for glucocorticoid concentrations (i.e., nanograms of glucocorticoids per gram of dry feces).
- 2) Description of the extraction and radioimmunoassay procedures used, including estimates of cross reactivity, antibody binding curves (serial dilutions), recovery of cortisol added to fecal extracts, intra-assay coefficient of variation, inter-assay coefficients of variation, and sensitivity.
- 3) Final report on extractions and radioimmunoassays, including copies of digital databases and analyses created during this project. Due by the end of FY 07.

Keywords: Motorized winter recreation, stress response, elk, Yellowstone National Park, Montana State University, glucocorticoids

For Administrative Use Only:

Date Annual Report Received:

Date Final Report Received:

Publications, etc. on file: