Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Predicting Disease Spread in Greater Yellowstone Elk Using DNA Markers
Discipline: Natural Resources
Type of Project: Research
Funding Agency: National Park Service
Other Partners/Cooperators: University of Montana; USDA-Forest Service
Effective Dates: 4/1/2007-6/30/2009
Funding Amount: $16,500
Investigators and Agency Representative:

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Project Abstract: A critical need for developing feasible strategies to minimize the adverse conservation, economic, and social effects of these diseases is information on disease transmission pathways through the Greater Yellowstone Area. This project will address this need by identifying elk DNA markers in non-invasively collected fecal and tissue samples that can be used to assign individuals to their population of origin and estimate sex-specific rates of gene flow and movement among elk populations. This information can then be used by natural resource managers throughout the Greater Yellowstone Area to track the origin and spread of diseases, and predict the risks and geographic routes of transmission.

The specific objectives of this project are to: 1) identify 15 microsatellites that are highly polymorphic in elk; 2) identify maternally-inherited mitochondrial DNA markers (mtDNA) useful for assessing female elk movements and population connectivity; 3) optimize the analysis of microsatellite and mtDNA markers from fecal samples; and 4) estimate sex-specific rates of gene flow and movement among elk populations in the Greater Yellowstone Area.

Outcomes with Completion Dates:

1. Final report by May 2008 that identifies useful microsatellite and mtDNA loci and includes estimates of genetic differentiation, migrants per generation, tests for selection signatures, and assignment tests among populations.
2. Digital copies of all laboratory output, genotyping, databases, and analyses created during this project by June 2008.
3. *(Added with modification)* Final report by August 2008 that gives prevalence of macro- and micro-parasites of elk at the northern range area of Yellowstone National Park, the Madison Valley area of Yellowstone National Park, and Grand Teton National Park area in Wyoming; identifies polymorphic nuclear and mtDNA loci for macro- and micro-parasites; and estimates genetic differentiation and transmission rates within and between host species and populations from the three sampling locations.

Keywords: Yellowstone NP, northern range, elk, DNA markers, wildlife disease, University of Montana

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Date Annual Report Received:
Date Final Report Received:
Publications, etc. on file: