

## Project Summary

### Rocky Mountains Cooperative Ecosystem Studies Unit

**Project Title:** Establishing permanent transects for monitoring seed dispersal by Clark's nutcrackers in relation to whitebark pine health in Yellowstone, Grand Teton, and Glacier National Parks

Discipline: Natural

**Type of Project:** Research

**Funding Agency:** National Park Service

**Other Partners/Cooperators:** University of Colorado at Denver

**Effective Dates:** 6/1/2008 - 12/31/2010

**Funding Amount:** \$5,000

**Investigators and Agency Representative:**

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**Project Abstract:** Recent studies have demonstrated declines in seed dispersal services by Clark's nutcrackers (*Nucifraga columbiana*) in whitebark pine (*Pinus albicaulis*) ecosystems with high levels of blister rust damage and tree mortality (from multiple factors). Glacier and Yellowstone/Grand Teton National Parks represent two extremes on the whitebark pine blister rust infection continuum in the northern Rockies. Recent assessments in Glacier National Park and the Greater Yellowstone Area (GYA) indicate mean blister rust infection levels to be 67% and 26%, respectively. Glacier National Park, the contiguous Waterton Lakes National Park in Canada, and the Blackfeet Reservation have the highest mean blister rust and mortality levels known rangewide for whitebark pine (with mortality from all factors ca 50%). However, regions within the GYA are currently sustaining heavy whitebark pine losses to mountain pine beetles (*Dendroctonus ponderosae*). UC-Denver researchers will establish two to three permanent 2 km x 30 m belt transects through stands of mature whitebark pine in different areas in Yellowstone National Park; two transects will be installed in Grand Teton National Park in different drainages; and, three similar permanent 2 km transects will be installed in Glacier National Park prior to July 25, 2008. These transects will be monumented, with geospatial coordinates, and surveyed according to a protocol developed by Tomback in consultation with park partners and research cooperators. In 2008 (and 2009), each belt transect will be surveyed for nutcrackers twice in mid-July, before seed dispersal, and again twice in late August/early September after seed dispersal has begun. Data collected will include the time of day the transect survey was started and ended; time of day, nutcracker sightings (with or without expanded throat pouch), nutcracker activities, nutcracker vocalizations without sightings, and squirrel sightings will all be recorded for 10 minutes at point count stops every 250 m (9 count stops). This project will be used to develop effective and efficient long-term monitoring protocols to assess the potential temporal trends in Clark's nutcracker activity associated with changes in whitebark pine health and seed production. The primary goal is to produce monitoring protocols that provide sufficient information to detect nutcracker population trends, but yet can be completed in a timely and efficient manner.

**Outcomes with Completion Dates:** Transects and subplots established, surveyed, and resurveyed. Protocol for long-term monitoring finalized in the course of fieldwork. Test of previous observations of live basal area per hectare of whitebark pine and number of cones per hectare predicting seed dispersal by nutcrackers. Annual report due by June 1, 2009; Final report due by June 1, 2010.

**Keywords:** University of Colorado Denver, Yellowstone NP, Grand Teton NP, Glacier NP, Whitebark pine, Clark's nutcracker,