

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Clark's Nutcracker Summer Use of Whitebark Pine Communities

Discipline: Natural

Type of Project: Research

Funding Agency: National Park Service

Other Partners/Cooperators: University of Colorado at Denver

Effective Dates: May 29, 2009 - May 30, 2012

Funding Amount: \$30,000

Investigators and Agency Representative:

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Project Abstract: The widespread and precipitous decline of whitebark pine (*Pinus albicaulis*) in the Crown of the Continent Ecosystem, primarily from infection by *Cronartium ribicola* (the invasive pathogen that causes white pine blister rust) but also from previous mountain pine beetle (*Dendroctonus ponderosae*) outbreaks, has been previously documented through methodical field sampling. Both blister rust and mountain pine beetles kill trees, but blister rust often first destroys tree canopies over many years, reducing cone production. Thus, living trees are rendered non-reproductive.

Clark's Nutcrackers (*Nucifraga columbiana*) are the primary dispersers of whitebark pine seeds. Recent studies indicate that nutcrackers do not reliably disperse seeds in highly damaged whitebark pine communities, including those in Glacier National Park. Reduction in nutcracker seed dispersal visits to whitebark pine results in reduced regeneration for the pine. Much information is lacking, however, on the implications of whitebark pine decline. Will the Crown of the Continent Ecosystem retain its population of Clark's Nutcrackers? Do nutcrackers use other forest habitat types in this geographical region, and how does use vary with time of year? How do numbers of nutcrackers vary from year to year in the region? Is there a relationship between cone production by whitebark pine and numbers of nutcrackers? Do nutcrackers use the healthiest whitebark pine communities in the ecosystem?

The objectives of this study are "(1) to determine the occurrence and distribution of Clark's Nutcrackers in whitebark pine forests and alternative habitats in the Crown of the Continent Ecosystem, (2) to investigate the behavior of nutcrackers in the healthiest whitebark pine stands, and (3) to create a rigorous, tractable monitoring protocol for Clark's Nutcrackers that can be used wherever nutcrackers are found."

Outcomes with Completion Dates: Annual Report due March 31, 2010; Final Report and all other products due December 31, 2011

Keywords: University of Colorado Denver, Glacier NP, Whitebark pine, Clark's nutcracker,