

## **Project Summary**

### **Rocky Mountains Cooperative Ecosystem Studies Unit**

**Project Title:** Field studies of the masking effects of anthropogenic noise on predator/prey interactions

Discipline: Natural Resources  
Type of Project: Research  
Funding Agency: National Park Service  
Other Partners/Cooperators: Colorado State University  
Effective Dates: July 1, 2008 - January 31, 2010  
Funding Amount: \$91,170

**Investigators and Agency Representative:**

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**Project Abstract:** This project will address the effects of man-made noise on animal communication systems by studying songbirds. It focuses on the black-capped chickadee (*Poecile atricapilla*) and the red-breasted nuthatch (*Sitta canadensis*). Animal acoustic signals are constrained by the range over which they are above the threshold of the receiver and the background sound level. We propose to directly measure the costs of acoustic masking created by anthropogenic noise via three-dimensionally reconstructing the animal's position and acoustic environment using a synchronized microphone and digital video camera array. This technology will allow the first quantitative assessment of auditory masking in the field. Several classes of predation-related sounds (conspecific and heterospecific alarm calls, predator calls and predator movement sounds) will be played back to the birds under varying background sound levels and the birds' behavior (vocal and otherwise) will be assessed to determine the extent of signal active space under the constraints of anthropogenic noise. This work will take place along the riparian corridors of the Snake and Gros Ventre rivers in Grand Teton National Park from July - October 2008.

**Outcomes with Completion Dates:** At the end of the first year of this project, CSU will prepare publication-quality scientific graphics, present findings at an international scientific meeting, deliver an annual report on the 3D reconstruction work and contribute to the acoustics component of Kevin Crooks' annual report on the pathway project.

**Keywords:** birds, noise pollution, predator avoidance, recreational pathway, Grand Teton NP, Colorado State University