

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Compare and Contrast Sister Parks' Research Findings and Monitoring Efforts

Discipline: Natural Resources

Type of Project: Technical Assistance

Funding Agency: National Park Service

Other Partners/Cooperators: University of Colorado at Boulder

Effective Dates: 8/1/2011 - 8/31/2012

Funding Amount: \$26,455

Investigators and Agency Representative:

NPS Contact: Judy Visty, Research Administrator, Rocky Mountain National Park, 1000 Highway 36 Estes Park, CO 80517, ph. 970 586-1302, judy_visty@nps.gov.

Investigator: William D. Bowman, Department of Ecology and Evolutionary Biology, Mountain Research Station, INSTAAR, University of Colorado, Boulder, CO 80309, Phone: (303) 492-2557, William.Bowman@colorado.edu

Project Abstract: Rocky Mountain National Park (RMNP), a unit of the U.S. National Park Service (NPS), the Tatra National Park, Slovakia (Sprawa TANAP and Statne Lesy TANAP are further referred to as TANAP), and the Tatra National Park, Republic of Poland (TPN) have had a sister park relationship since 2006. The formal partnership agreement identifies commonalities in biological communities, geologic setting, and visitor issues. All three parks are recognized as International Biosphere Reserves by the United Nations.

To date numerous staff visits and jointly held meetings between the three parks have laid the groundwork for a more substantive collaboration. This summer (2011) research teams from the University of Wroclaw, the Slovakian Academy of Sciences, and Colorado State are undertaking projects investigating riparian community response to climate change and recovery of areas previously grazed.

This project is intended to better define areas of possible future scientific exchange and collaboration. For the purposes of discussion, three general categories of overlap will be considered.

1. Topics that represent space for time substitution. An example of this type of comparison is an examination of how intense nitrogen deposition (estimated 40X background level) in the Tatras has resulted in the loss of soil cations (e.g., calcium and magnesium) and evidence of aluminum toxicity as aluminum now buffers the soils. Since RMNP is currently being exposed to 4x background levels of nitrogen, the Tatras provide insight into possible future soil and water pH changes if nitrogen is not regulated. Ozone, another air pollutant, typically has higher values in some parts of the Tatras relative to RMNP where ozone levels have shown an increase over the last few decades.
2. Topics that relate to similarities in species biology or management. The Tatras are unusual in that they have retained all of their native carnivores including grizzly bears and wolves. In RMNP, the reintroduction of wolves has been considered but rejected as not practical due to the small size of the park. Black bears, still extant in Rocky, show signs of becoming more habituated to human food. The Tatras may provide insight into how large carnivores can be successfully maintained in relatively small protected areas and may serve as a concrete example of how wolves can be managed within agricultural environments. These findings are also likely relevant to other US national parks that have wolves but are encountering societal push back regarding management outside their boundaries. In another species example, very similar marmot species are doing well in RMNP but are endangered within the Tatras. Finally, high elevation spruce trees in the Tatras (*Picea abies*) have been documented to possess cold temperature adaptive traits, but this experiment has likely not yet to be conducted with Engelmann spruce (*Picea engelmannii*), the native RMNP spruce. Understanding these traits may be important to preparing for climate change.
3. Topics that relate similar habitats. The projects being undertaken this summer in riparian areas and at treeline fall into this category. One project examines possible similarity of response to a similar stressor, climate changes. The other contrasts recovery in a habitat grazed by livestock for only a short period of time versus an area grazed for centuries. The amount of time since grazing ended also varies. Likewise, the Global Observation in Alpine Environments (GLORIA) monitoring effort seeks to compare and contrast the response of alpine areas to climate change, particularly warming. Both RMNP and TANAP have GLORIA sites.

The literature review component of this project should test the idea that projects and results from two similar mountain environments are of mutual relevance. The framework for possible future collaborations will evolve from discussion among a group of subject matter experts and park staff. The end goal would be to emerge with recommendations regarding joint projects.

Outcomes with Completion Dates: August 31, 2012

Keywords: sister parks, scientific exchange, Rocky Mountain National Park, USA, Tatra National Park, Slovakia University of Colorado at Boulder

