

Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Develop & Implement Vegetation Restoration Effectiveness Monitoring Program

Discipline: Natural
Type of Project: Technical Assistance
Funding Agency: National Park Service
Other Partners/Cooperators: Colorado State University
Effective Dates: 8/15/2010 - 12/31/2013
Funding Amount: \$34,005

Investigators and Agency Representative:

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Project Abstract: Human caused disturbances and vegetation restoration needs in Rocky Mountain National Park (RMNP) are increasing due to improvements to park infrastructure. Canada thistle (*Cirsium arvense*) and cheatgrass (*Bromus tectorum*) infestations are expanding. Twenty years ago cheatgrass rarely inhabited sites above 8,000 feet, but it currently inhabits sites up to 9,500 feet in RMNP. A comprehensive vegetation restoration effectiveness monitoring program is needed to make informed decisions on treating invasive plants and restoring disturbed park lands. Information from this monitoring program will benefit RMNP, other National Park Service units, regional land managers, and also advance the field of restoration ecology.

RMNP's existing vegetation restoration effectiveness monitoring program does not meet current needs for statistically valid data. Existing monitoring projects and protocols need to be reviewed, updated, and properly implemented. In the past, monitoring project data was collected by a different group of employees each year, which could have affected data collection accuracy. This pilot project will provide the needed expertise and consistency that will begin a partnership to study the effectiveness of park vegetation restoration activities and provide recommendations to strengthen future restoration efforts.

RMNP will collaborate with Colorado State University (CSU) College of Agricultural Sciences researchers during a two year pilot project to develop and implement a monitoring program that will measure the effectiveness of vegetation restoration activities. A doctoral student will be tasked with acquiring funding for subsequent years. Also, in subsequent years, RMNP may have funds available to supplement funds acquired by CSU.

Objectives:

- Review published and gray literature for relevant, tested examples of vegetation restoration effectiveness monitoring protocols.
- Review and update (as appropriate) existing RMNP vegetation restoration effectiveness monitoring protocols.
- Develop a vegetation restoration effectiveness monitoring plan that will continue to be implemented in future years through RMNP project funds.
- Design, implement, and analyze approximately ten vegetation restoration effectiveness studies annually.
- Recommend actions to improve future vegetation restoration efforts.

Outcomes with Completion Dates:

- Produce yearly monitoring report by December 31st, 2010 and December 31st, 2011. Yearly reports must include introduction, methods, photos, location maps, results, and recommendations.
- Produce draft final vegetation restoration effectiveness monitoring protocols and monitoring plan by October 31st, 2012. Produce a final report by December 31st, 2012. The final report must include introduction, methods, photos, location maps, results, recommendations, and recommended RMNP monitoring protocols.
- Peer-reviewed publications as required by doctoral program.

Keywords: Vegetation, human impacts, restoration, monitoring plan, Colorado State University, Rocky Mountain National Park