

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Environmental History of Invasive Exotic Species to Inform Responsible Restoration Practices in Rocky Mountain National Park

Discipline: Interdisciplinary
Type of Project: Research
Funding Agency: National Park Service
Other Partners/Cooperators: Colorado State University
Effective Dates: 7/1/2013 - 6/30/2016
Funding Amount: \$150,004

Investigators and Agency Representative:

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Project Abstract: Human introduction of exotic plant species in the region that is now Rocky Mountain National Park began in the 1850s settlement period with the planting of grasses as livestock forage. After the establishment of the park in 1915, development of public infrastructure introduced additional species carried in on gravel, machinery, and contaminated seed mixes. Species introduction from visitor traffic and use of recreational livestock further exacerbated the problem of invasive exotics within park boundaries. In addition to human-introduced species, natural modes of introduction, including wildlife movement and activities, wind, and water continue to alter the species composition of Rocky's plant communities.

According to Rocky Mountain National Park's 2003 Invasive Exotic Management Plan and Environmental Assessment, there are thirty-five identified species of invasive, exotic herbaceous plants and grasses of current concern to park managers. These invasive species, occurring on an estimated 427 acres within park boundaries, displace natural vegetation and consequently affect the long-term health of native plant and animal communities. Since 1960, Rocky Mountain National Park has employed various methods of control and eradication to varying degrees of success.

Informed management decisions related to the treatment of invasive exotic plants requires a broader understanding of their history. A detailed report providing information about the history of species introduction into the region prior and subsequent to the establishment of the park in 1915 would provide greater context for considering management alternatives. This project will result in a detailed environmental history of invasive exotic species introduction in the park, with particular emphasis on the most problematic species, including Canada thistle, leafy spurge, diffuse knapweed, spotted knapweed, field bindweed, leafy spurge, musk thistle, and yellow toadflax. This history will support prioritization of species for removal, prevention of reintroduction, and communication with adjacent landholders, other stakeholders, and visitors regarding invasive species management in the park.

In addition to the environmental history, this project will include a park-based educational component that provides an opportunity to prepare students for successful outcomes as future resource managers and citizen stakeholders. The field courses known as "Parks as Portals to Learning," (PPL) will demonstrate the essential value of environment history and the role it plays to provide better informed stewardship decisions. PPL will place students in park settings to address exotics and restoration activities with an interdisciplinary team of environmental historians, ecologists, natural resource managers, teachers, college students, and high school students. Students will have the opportunity to improve content competencies (e.g., environmental history, ecology, economics, etc.) while also building their context competencies (e.g., communication skills, critical thinking, teamwork, conflict resolution capabilities, and synthesis skills) through the portal of place-based problems related to environmental degradation. The emphasis will be on building understanding of how federal resource managers make management decisions in time-sensitive, real-world settings. Study sites may include high priority and highly visited areas such as Moraine Park, and the Bear Lake corridor. Students will utilize park resources and data including the park's library and archives and one-on-one consultations with park staff. Each student will define and address a relevant management issue and prepare and present recommendations on options to address the problem at hand.

Students will work as paid interns during the summer performing restoration within the park. The restoration will be focused on areas that were prescribed burned as part of the hazardous tree program at the park. Over the past 5 years over 9000 slash piles have been built throughout the park from trees that were cut down to reduce hazards. Slash piles are burned during the winter and require post-fire restoration of the area. Over 7000 piles still need to be burned and will require rehabilitation of the area. Student crews will be trained and advised by park staff on appropriate restoration techniques. Work plans will be developed annually with park staff and CSU staff to determine priority areas, work periods, and overall target goals.

Additional opportunities will be developed for citizen science projects for other students. These projects will be focused on some part of the restoration, invasive exotic species, or environmental history related to the overall project. These will be volunteer short term experiences for students and the public to gain experience and provide the park with important assistance on resource management issues.

Outcomes with Completion Dates:

Final Report - February 1, 2016

Keywords: Environmental History, invasive species, restoration, Rocky Mountain National Park, Colorado State University