

## Project Summary

### Rocky Mountains Cooperative Ecosystem Studies Unit

**Project Title:** An Assessment of informal trails and visitor created sites in Rocky Mountain National Park, Colorado

**Type of Project:** Research  
**Discipline:** Social  
**Funding Agency:** National Park Service  
**Other Partners/Cooperators:** Utah State University  
**Effective Dates:** 7/1/2014 - 12/31/2016  
**Funding Amount:** \$25,912

**Investigators and Agency Representative:**

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**Project Abstract:** Rocky Mountain National Park (ROMO) is world renown for unique and challenging wilderness experiences. With the recent increases in popularity of outdoor recreation, and the growing population in Colorado, there remains a continued demand for quality outdoor recreation experiences. Associated with this ever present demand comes the potential for associated resource impacts.

Recent investigations in ROMO suggest that a primary mechanism of resource impact is when visitors depart from the well-developed and maintained trail system and seek out alternate pathways to more isolated locations in the park (D'Antonio et al., 2013). This type of behavior often results in the formation of informal trail networks (sometimes called "social" trails), areas of intense disturbance where visitor-created sites form, and larger "polygons" where less spatially organized, more diffuse impacts form. Our previous study in ROMO, suggested that these three distinct spatial patterns of impact are prevalent in certain locations in the park; particularly where high capacity developed trails "deliver" many visitors to destinations with a relatively low capacity to confine visitors to developed trails and sites. Moreover, ROMO is a popular destination for several visitor activity types that by their nature tend to seek out areas typically not served by existing trails systems, namely, mountaineers/rock climbers, fly fishers, and boulderers. Given the popularity of these activities, it is likely that numerous areas with the aforementioned impact patterns exist, but at present, only a few locations in the park have been investigated thoroughly (D'Antonio et al., 2013; Svajda, 2014)

The idea that off-trail impacts are important is also supported empirically by several lines of recreation ecology research. First, recreation use-impact theory (Hammitt and Cole, 1998; Monz et al., 2013) suggests that initial disturbance by visitors in previously undisturbed areas results in a rapid formation of impact to groundcover vegetation. Once impacts are formed and apparent, these visitor-created trails and sites can attract subsequent use, both increasing the permanence of these impacts and the spatial extent and magnitude. The formation of networks of informal trails has also been shown to be of concern with landscape-level ecological processes, with increases in habitat fragmentation and associated impacts occurring as informal trail networks increase (Leung et al., 2011; Wimpey and Marion 2011). Last, visitors appear to have thresholds of tolerance for the occurrence and proliferation of visitor created trails, beyond which these impacts become unacceptable to their experience in a park setting. This groundbreaking work on visitor perceptions of informal trails was conducted in ROMO and numerous locations where the density of these impacts exceeded acceptable levels were found in the Bear Lake study area (D'Antonio et al., 2013).

The above points demonstrate the importance of understanding and managing informal trails and associated impacts. Management of informal trails is a challenge for several reasons, but it is especially difficult since little is currently known about influential factors that may result in informal trails forming in one location and not in others. It is likely that there are use-related, behavioral, ecological and landscape factors that affect the frequency, density and distribution of informal trails. But little research has been conducted to explore these relationships. This proposed research will examine informal trails and associated impact patters from inventory perspective to understand their location and extent in ROMO, and will also conduct exploratory statistical and spatial analysis to examine factors that may influence their formation on the landscape.

The proposed project will have three overall dimensions:

- 1) Spatial modeling of existing data from previous work conducted by the project PI and graduate student in ROMO to inform the field sampling design
- 2) Field assessment of a representative sample of locations in ROMO as to the location, extent and intensity of informal trail and site formation
- 3) Spatial and statistical analysis of the field assessment data.

**Outcomes with Completion Dates:**

Final Report - June 30, 2016

**Keywords:** visitor use, transportation planning, Moose-Wilson corridor, Grand Teton National Park, Utah State University