

Project Completion Report

Rocky Mountains Cooperative Ecosystem Studies Unit (RM-CESU)

Project Title: Climate Change and National Parks Wilderness Review

Project Code: UMT-281; P12AC10837

Type of Project: Education, Research

Funding Agency: National Park Service

Partner University: University of Montana

NPS Agreement Technical Representative:

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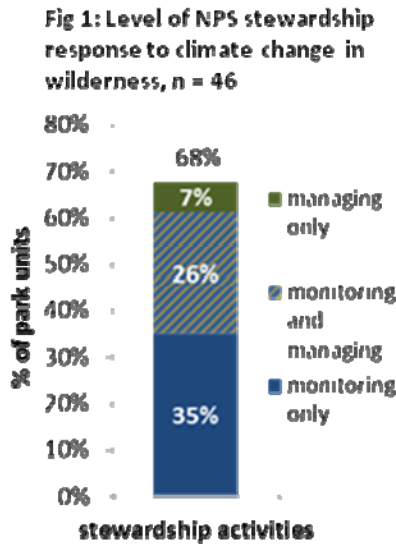
Project Summary:

The student intern at University of Montana completed a 13 week internship with the NPS Wilderness Program. Tasks accomplished and results include:

1. A survey of NPS wilderness parks (49) was conducted to assess the effects of climate change and activities that the park is considering to take in response to climate change (monitoring, mitigation, and adaptation strategies). Survey questions targeted specific climate change related management actions; assisted migration, invasive species removal, endangered species management, tree restoration, and fire management, for instance. The survey received a 93.9% response rate.
2. The results of the survey, as well as the analysis of the potential effects of climate change and park activities on wilderness character, were summarized as a fact sheet for National Park Service and national Wilderness audience distribution, in a poster presentation for the George Wright Society conference, a PowerPoint for presentation for the National Interagency Fire Center, and a published as part of a Master's Thesis from the University of Montana. The Master's thesis, titled *Responses to Climate Change in National Park Service Wilderness: What*

is Happening in the Field?, included detailed examples and analysis of the range and effects and activities that parks are considering, and recommended actions for the future.

Results summary:



Stewardship responses

Is the hands-off approach the default approach?

More than two thirds of the park units participating in this study reported conducting stewardship projects in wilderness to specifically respond to climate change and its effects. See Fig. 1. Invasive species and fire were among the topics most commonly monitored and managed in this context.

Several respondents commented that more stewardship activities were happening in their park unit wilderness than had been reported in the survey. These additional activities went unreported because the activities *happened to be related to climate change* and had not been *designed specifically to address it*. Other park units mentioned that they were just beginning to address the issue.

Fig 2: Characteristics of management actions designed to address climate change in wilderness

What is a 4(c) use?

Section 4(c) of the 1964 Wilderness Act prohibits commercial enterprises, roads, motor vehicles, motorized equipment, mechanical transport, structures, and installations in designated wilderness, except as necessary to administer the area for the purpose of the Wilderness Act.

60%

What is a Minimum Requirement Analysis (MRA)?

NPS policy requires that park units conduct an MRA prior to undertaking stewardship activities in designated wilderness. This process is intended to help wilderness coordinators and others identify how such actions affect wilderness character.

76%

* Rates are for management actions that are 1) reported in the survey, 2) designed to address climate change and its effects, 3) ongoing, and 4) carried out in designated wilderness administered by the National Park Service. Among the 45 survey participants who responded to this survey question, 65 management actions were reported, thus n = 65.

Wilderness Character

The 1964 Wilderness Act requires that wilderness be managed for wilderness character. Wilderness character is comprised of five qualities including untrammeled, undeveloped, natural, solitude or primitive and unconfined recreation, and other features of value qualities. Respondents reported that climate change-driven stewardship activities improved and degraded qualities of wilderness character as is shown in Fig. 3. Improvements to wilderness character overwhelmingly benefited the natural quality. Degradations were spread more evenly across the qualities.

Fig 3: Respondents reporting that qualities of wilderness character had been improved or degraded by climate change-driven stewardship activities, n = 45

Quality of wilderness character	Improved	Degraded
Untrammeled- unhindered and free from the actions of modern human control or manipulation	1	11
Undeveloped- retaining its primeval character and influence... essentially without permanent improvement or modern human occupation	0	7
Natural- its ecological systems are substantially free from the effects of modern civilization	12	4
Solitude or primitive & unconfined recreation- provides opportunities for solitude or primitive and unconfined recreation	0	9
Other features of value- unique to an individual wilderness based on features that are in that wilderness	1	0

Definitions quoted from Landres, P., W.H. Tapes, and S. Sturman 2011. Using wilderness character to improve wilderness stewardship. *Park Science*, 20(3), 44-49.

Recommendations

Because wilderness stewardship activities were reported to degrade several qualities of wilderness character, this study calls attention to the need to comprehensively assess, on a case by case basis, whether or not individual stewardship actions are appropriate in a wilderness setting. These findings complicate the assumption that wilderness stewardship activities improve the natural quality of wilderness character while degrading the untrammeled quality. Respondents reported that the natural quality can be both improved and harmed and that several other qualities can be impacted as well.

To encourage thoughtful assessments of wilderness stewardship activities, improve MRA completion rates and thus compliance with NPS policy, the NPS ought to archive MRAs into a centralized database. Existing databases, which already track activities happening in the parks, also need to contain fields that indicate whether or not activities are happening in or affecting designated wilderness. They also ought to track whether or not MRAs have been completed for such activities. These actions would improve transparency and accountability while reducing unnecessary degradations of wilderness character. In an era where climate change challenges our assumptions about appropriate responses, these measures will serve as a guide to ensure that wilderness will be enjoyed by future generations.

Exotic species was the most commonly monitored managed topic in NPS wilderness due to climate change. Almost half of the park units managed exotics in wilderness through manual or mechanical means. A third reported using pesticides in wilderness. These activities were less likely than average to have approved (C) uses for the task. MRA completion rates were about average.



Fire and fuel held much attention among the survey respondents. More than half listed fire among their highest concerns for climate change in wilderness. Fire was also one of the most monitored and managed topics in this regard. Climate change drove fire suppression activities in more than a quarter of the participating park units. Others prescribed fire and created fire breaks — actions they also attributed to climate change. These activities almost always approved (C) uses, yet MRA completion rates varied. MRAs for fire suppression activities were completed about about half the time — a relatively low rate when compared with the average (see Fig. 2). However prescribing fire and creating fire breaks had 100% completion rates.

Number of students participating in this project: 1 graduate student; Master of Science in Environmental Studies degree conferred

Lessons Learned from this project:

The national Wilderness Stewardship Office should have worked closer with the RM-CESU staff during initiation and closure of the project. The lack of connection created frustration at times for the RM-CESU staff and made the burden of the technical implementation of the Task Agreement more difficult than it should have been for the RM-CESU staff. It would have been helpful if someone at The University of Montana could have served as PI who was truly involved with the student and willing to do the minimal paperwork required.

The main lesson learned on the project work is to make the final product scope of work slightly more flexible to allow better inclusion of alternative, equally desirable products as part of the desired results, if a particular desired result ends up not being possible, or the desired results changes slightly over the course of the project (as long as both parties agree that it is an acceptable product of equivalent value).

Other RM-CESU agencies or research partners who participated in this project: None