



Waterman Fund Grant Report 2016 Cadillac Mountain South Ridge Trail Rehabilitation Acadia National Park



Sledging Rock for the Trail Tread

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Grant Dates

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EXECUTIVE SUMMARY

We created about 100 feet of rock-lined causeway in two distinct locations on the Cadillac Mountain South Ridge Trail, clearly defining the trail and eliminating the standing water and mud that was there and the hiker encroachment along the trail edges. Before rehabilitation, 87% of hikers stayed on the trail; afterwards this increased to 99%. Observations showed that visitors strayed from the trail largely due to hiker congestion and water, and that the rehabilitation project prevented these behaviors from continuing. We contacted 165 visitors with a subalpine Leave No Trace message. The cost of the project was \$7,264 total. The National Park Service and Friends of Acadia match was \$4,064, or 56%. The Waterman Fund grant will cover the remaining \$3,200.

INTRODUCTION

This project was nearly identical to the one completed on Sargent Mountain in 2014 with a grant from the Waterman Fund. The purpose was to stabilize soil, protect plants, and provide a better trail experience for hikers, only this time in the subalpine (dwarf shrubland) zone of the Cadillac Mountain South Ridge Trail. This work was needed to: 1. prevent widening and braiding of the trail by hikers due to the standing water and mud that followed significant rainfall events (and ice in winter); 2. Protect two subalpine species of plants that are of growing concern and are potentially at risk from trampling by hikers; and 3. provide a stable, more narrow, and more inviting trail tread to better concentrate the estimated 5,000 hikers in July and August on a durable surface.

Additional purposes were to evaluate the effectiveness of the completed work by observing hiker traffic and behavior before and after the project, and to educate hikers with Leave No Trace messages about the fragility of the subalpine environment and the need to stay on the trail.

This project again brought together the Acadia National Park Trail Crew and Friends of Acadia's Ridgerunner, Recreation Technician, and Youth Conservation Corps (YCC) programs.

METHODS

Trail Rehabilitation

On July 19, 2016, the Trails Foreman, two Trail Crew workers, two Trail Crew Youth Conservation Corps (YCC) leaders and eight YCC workers, plus three Friends of Acadia (FOA) Ridgerunners, the FOA Recreation Technician, and their Natural Resource Specialist supervisor converged on the Cadillac Mountain South Ridge Trail (Figure 1, next page) at the two work sites described in the proposal. A temporary sign was posted at the south end of the work site with the names and logos of the Waterman Fund, Friends of Acadia and the National Park Service as partners in the project (Figure 2). On July 20, the size of the crew was about the same but the composition changed slightly. On the final day, July 21 five Friends of Acadia staff worked about 3/4 of a day to finish up.



Figure 2: Temporary Sign

Professional trail crew staff focused on setting solid retaining walls of large rocks to hold a rubble-filled causeway, assisted by Ridgerunners (Figure 3). Some vegetation and soil was removed during work and relocated to the previously impacted sides of the causeway. YCC crews and Ridgerunners moved big rocks for the retaining walls (Figure 4), removed smaller rocks from the nearby West Face Trail junction cairn (Figure 5), and crushed rocks to create material for the trail tread (Figure 6). Removing rocks from the large intersection cairn reduced the impacts of gathering or quarrying rocks from the surrounding environment.

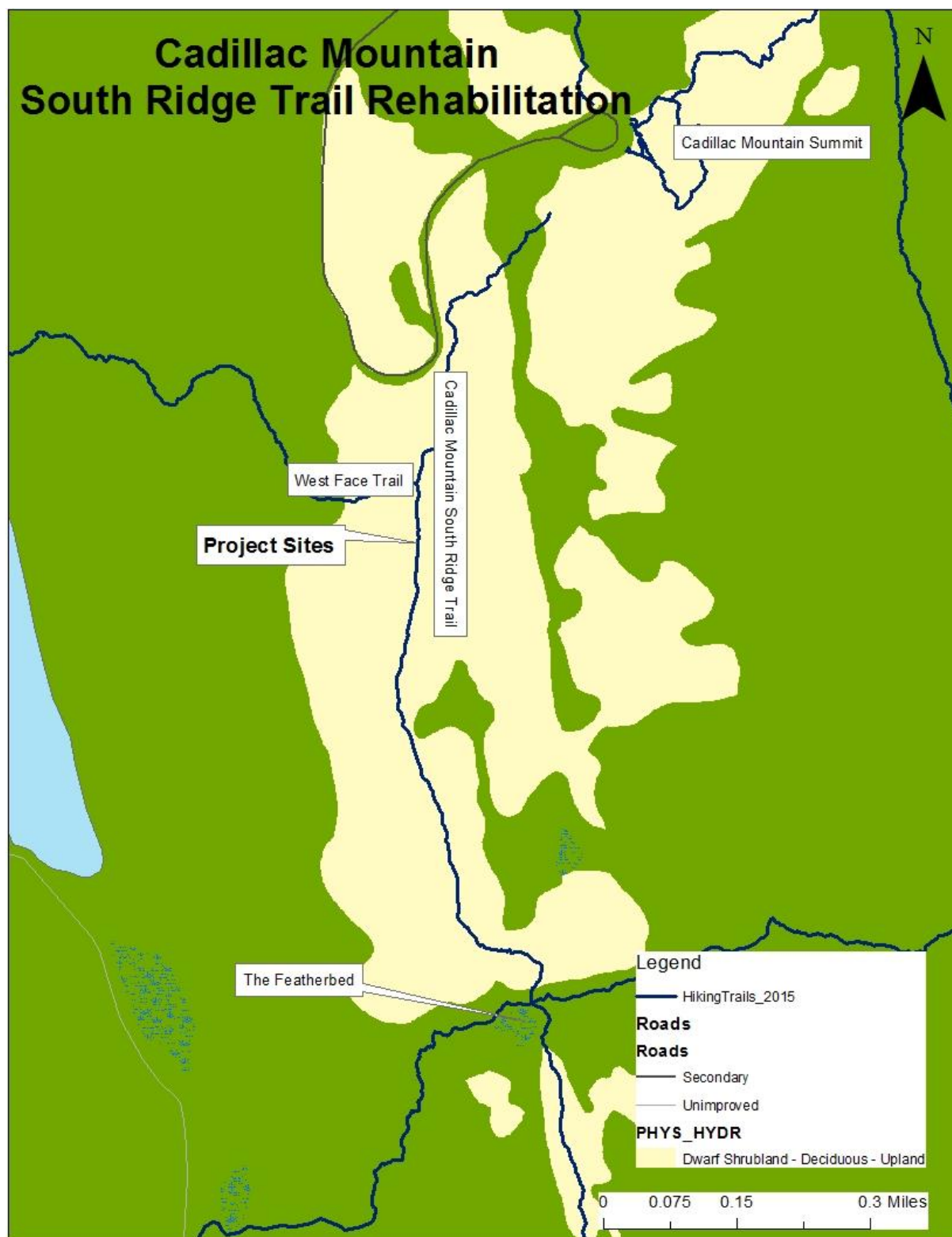


Figure 1: Cadillac South Ridge Trail Rehabilitation, Site Location



Figure 1: Setting Retaining Wall



Figure 4: Moving Rocks



Figure 5: Removing Junction Cairn Rocks



Figure 6: Rock Crushers

Observation

Before the work began, we counted hikers and observed their behaviors (unobtrusively and in civilian clothes) on July 11, 12, 15, and 18 for a total of nine hours at the southernmost of two work sites. We recorded the Date, Time, Weather, and Trail Condition each day. We also recorded hiker direction of travel, whether hikers used the east side, west side, or center of the wide trail (all considered to be on the trail); were off trail; the reason they appeared to be off trail; and group size.

After the work was completed, we counted hikers and observed their behaviors at the same site on July 24 and 31, and August 8 and 11 for 8.5 hours and recorded the same data. For the post-rehabilitation observations, we removed several temporary signs shown in report images and replaced them when we finished observing. This allowed the trail work to stand on its own to help keep hikers on trails. These signs will probably be removed in a few years when the vegetation grows back more fully.

One of our pre-rehabilitation observation times followed a rain event the previous day and a few others had at least a damp trail tread. One post-rehabilitation observation followed a modest rain event the previous day, but conditions were much drier overall.

Education

The Natural Resource Specialist was the primary Leave No Trace educator on-site for the project.

RESULTS

Trail Rehabilitation

We created about 100 feet of rock-lined causeway in two distinct locations that clearly defined the trail, eliminating the standing water and mud that was there (Figures 7, 8, 9, and 10). We also rebuilt two cairns to better direct hiker traffic to one of the trail sections. Deer hair sedge (*Trichophorum cespitosum*) and mountain sandwort (*Minuartia groenlandica*), two species of growing concern in the park, are now better protected in the vicinity of the project.

Observation

We observed 510 hikers before rehabilitation and 401 after rehabilitation in relatively equal numbers hiking north or south. Groups of six or more were observed eight times before rehabilitation and six times after rehabilitation. Before rehabilitation, 87% of hikers stayed on the trail; afterwards this increased to 99% (Table 1). Of the 13% of hikers who went off trail before rehabilitation, 24 went off trail because of congestion (hikers passing one another on this section of trail in the same or the opposite direction), 16 due to water, and 11 for no apparent reason. After rehabilitation, only 2 hikers went off trail, and they did so for no apparent reason. This suggests that most of encroachment we saw along the trail edge (Figures 7 and 9) was the result of rain and puddling in the tread, and that when it was dry enough, most hikers stayed on the trail. It also suggests that any further trail widening due to congestion has been prevented. It is worth noting that 13% noncompliance from hikers is very good, but it represents thousands of hikers per season on a busy trail, and under wet or icy conditions a small number of them can quickly erode the edge of the trail or create a trail braid, and vegetative recovery is slow.



Figure 7: Cadillac South Ridge Trail, South Site October 2015



Figure 8: Cadillac South Ridge Trail, South Site July 2016



Figure 9: Cadillac South Ridge Trail, North Site October 2015



Figure 10: Cadillac South Ridge Trail, North Site July 2016

Table 1: Percent of Hikers Hiking On and Off Off Trail, Before and After Trail Rehabilitation.		
Treatment	On Trail	Off Trail
Before (n=501)	87%	13%
After (n=410)	99.5%	0.5%

Education

We made 165 Leave No Trace contacts with one or more of the following messages as described in our proposal:

- Summits and ridgelines have thin soil and plants both fragile and rare.
- The summit environment is severe—wind, snow, ice, rain and aridity make it a tough place to grow.
- Trail work helps reduce hiker impacts but...every footprint makes a difference too.
- Always look up for the cairns and blazes that mark the trails.
- Please stay on the trail, and if you must step off trail, stay on durable granite ledge.

Anecdotally, we listened to several hikers complain about the tread we crushed, describing it as too hard to walk on because of its large size. Despite this, they stayed on it, perhaps simply because it was obvious. We note that most hikers today, including those we observed, wear low cut trail running shoes or sneakers with little ankle support. Hiking boots are not that common anymore.

DISCUSSION

The lessons learned in 2014 still applied here: use of an existing intersection cairn for materials reduces the impacts of gathering materials from the natural environment; a rock causeway has a large visual impact but can work well at keeping hikers on trail; trail projects in remote areas (even at Acadia) cost much; measuring the success of trail rehabilitation is not always a simple matter; and educating hikers during construction is a challenge unless one person is dedicated to it, as there is always the opportunity become distracted and pitch in and help move rocks. Regarding this last one, we need to focus on this more strongly in any future project, and more visually, using our existing Leave No Trace poster props or showing to hikers pre-rehabilitation photos of the trail to help them understand their own impacts and the importance of staying on the trail in fragile habitats.

SUMMARY

The project met its objectives to stabilize soil, protect plants, and provide a better trail experience for hikers by creating 100 feet of rock lined causeway in the subalpine zone of Sargent Mountain. Observations of hiker behavior before and after the project suggest that most hikers stay on the new trail. We also educated 165 hikers about the subalpine environment and the importance of staying on the trail. We were pleased to partner with the Waterman Fund a second time.

PROJECT ACCOUNTING

Proposed Budget

13 Trail Crew <i>Days</i> (130 hours) @ \$450/day*	\$5,850
12 YCC <i>Days</i> (96 hours) @ \$80/day	\$ 960
7 Ridgerunner Trail Work <i>Days</i> (56 hours) @ \$101/day	\$ 707
15 Ridgerunner <i>Hours</i> of Education @ \$13/hour	\$ 195
9 Rec Tech <i>Hours</i> of Observation @ \$15/hour	\$ 135

Total Project Cost	\$7,847
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Waterman Fund Request	\$3,400 (43%)
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Acadia NP/Friends of Acadia Match	\$4,487 (57%)
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* Trail Crew Days includes all overhead costs of training, equipping, transporting, program administration etc., including overhead costs for the YCC program. A Trail Crew Day is the equivalent of 10 hours.

Actual Costs

8 Trail Crew <i>Days</i> (80 hours) @ \$450/day	\$3,600
16 YCC <i>Days</i> (128 hours) @ \$80/day	\$1,280
14.7 Ridgerunner Trail Work <i>Days</i> (118 hours) @ \$104/day	\$1,529
17.5 Recreation Technician <i>Hours</i> of Observation @ \$15/hour	\$ 263
16 Natural Resource Spec. <i>Hours</i> (trail work and education @ \$37/hour	\$ 592

Total Cost	\$7,264
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Waterman Fund Grant	\$3,200 (44%)
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Acadia NP/Friends of Acadia match	\$4,064 (56%)
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We had fewer professional Trail Crew days and more YCC and Ridgerunner days of work than planned.

We request that the \$3,200 reimbursement check be made to and sent to Friends of Acadia, PO Box 45, Bar Harbor, Maine 04609.