

Acadia Style—Using Historic Precedents to Rehabilitate Hiking Trails

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This paper contains 3,695 words including italicized sections plus figure captions (200 words) and endnotes (341 words). All text in italics (1,000 words) may be included in the paper submitted to APT Bulletin, depending on desired length. The paper was written by the project manager and one of the coauthors of the reports, which will soon be published through the Government Printing Office.

Introduction

The hiking trails at Acadia National Park in Maine are not typical “backcountry” trails, but are highly-crafted walking paths, with steps, stone paving, walls, and ironwork. A majority of the existing 120 miles of marked, maintained trails predate the park’s establishment in 1916 and were constructed by local village improvement associations during the late 19th and early 20th centuries.¹ The walking paths were laid out across Mount Desert Island, radiating from coastal villages and summer estates to the island’s mountains and lakes (Figure 1). A close look along, beside, and even underneath the trails reveals the abundant stone and ironwork done by experienced craftsmen in the rustic style, which was commonly used on summer estates (Figure 2). Later work and additions by the Civilian Conservation Corps (CCC) in the 1930s added an additional layer of complexity to the style of stone and ironwork present on Acadia’s trail system.

Over the ensuing decades, many trails and their historic stonework deteriorated. The park knew that the trail system was old and special, but its history had only been partially documented. Recent planning by the staff at the Olmsted Center for Landscape Preservation and Acadia National Park has resulted in a two-volume Cultural Landscape Report to address the need for rehabilitation of the trail system.² The report applies a methodology developed by the National Park Service for the recognition and protect of cultural landscapes as described in, *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques*.³ The Cultural Landscape Report for

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Acadia's trails include a historical overview of the system's development, existing conditions documentation, analysis of significance, evaluation of historic features, and treatment and maintenance guidelines.

This paper will describe the overall planning process, with an emphasis on the treatment of historic stonework by relearning and preserving the traditional craftsmanship evident on Acadia's trails. Project team members from the Olmsted Center and Acadia National Park rediscovered historic stonework techniques at Acadia through field investigations. These historical techniques are now combined with modern methods to address current park operational needs and the methodology described herein has been successfully implemented in the field. Research and planning work by the team aided in building a constituency for trail care, justified the physical work needed, provided guidance to seasonal trail crews during implementation, and helped preserve the historic "Acadia Style" of trail construction. This effort ultimately culminated in a thirteen million-dollar endowment for trail system rehabilitation through the efforts of the Friends of Acadia and Acadia Trails Forever Campaign.⁴

Planning Process: Research

Our ability to understand how trails were originally laid out within natural and cultural contexts, and how they were constructed, was critical for guiding rehabilitation and management decisions. Initially, trail crew members were unsure how certain stone features were historically constructed and many early rehabilitation efforts were hit or miss in preserving historic character. The potential for loss of historical features was exacerbated by the heavy use of the trails, a limited number of trails crew, a short work season, and an emphasis on cost savings by using new techniques and materials. These challenges were coupled with the reality that trails extend into remote areas that are difficult to access and work is typically done with simple tools and extensive hand labor. To focus and prioritize rehabilitation work, we hoped that research in the format of a Cultural Landscape Report would uncover detailed information about the traditional craftsmanship used at Acadia and help guide future work.

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With assistance from park staff, local repositories, and trail enthusiasts, the Olmsted Center gathered historical information from both primary and secondary sources, including: maps, trail guides, hiking club annual reports, journals, maintenance logs, paintings, photographs, newspaper articles, and oral histories. Despite the exhaustive research, there was very little information on early construction methods and limited information concerning CCC construction, but many exceptional photographs. As a result, information on traditional craftsmanship was gleaned in the field by Acadia's trails crew. Through careful examination of extant historic stonework, including disassembly and reconstruction of various features, crew members were able to identify and document historic construction techniques as will be described in greater detail.

Information sought included: (Italics sections could be included or deleted from paper, depending on desired length)

- *Designers and builders of the trail, design intent, width, grade, origin, route or alignment, destination, views, natural features, cultural sites*
- *Adherence to local, regional, or national design standards*
- *Materials used and sources, local or imported*
- *Tools and equipment used for construction and maintenance, crew size, and professional skills of builders*
- *Types and extent of built features such as drainage systems, steps, retaining walls, ladders, railings, tread materials, and bridges*
- *Location and frequency of repairs for trail sections or rationale for trail closures and reroutes*
- *Successes and failures of maintenance solutions, particularly in high use areas*
- *Changes in origin, destination, tread materials, width, or use*

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- *Maps or other documents to locate features difficult to find in the field, such as closed trails, drainage systems above the trail, closed culverts, iron work, or retaining walls that may be obscured or in poor condition*

Sidebar: A Brief History of the Trail System

Research revealed four historic trail networks overlaid on Mount Desert Island.⁵ The first network, predating the 1600s, was the Native American carry paths used to portage canoes inland to hunting and fishing areas. Typically, these straight, narrow routes connected lakes and streams, and were not marked by Native Americans to discourage use by others. These unconstructed routes became overgrown or were widened during later periods. European settlers developed the second trail system when they cut cart paths and logging trails across the island. Most of these routes are now roads. Island tourism led to the third trail system in the late 1800s and early 1900s. Summer visitors spent one or two months in large hotels or “cottages.” Beginning in 1890, these preservation-minded tourists formed “Village Improvement Societies” in four of the villages to enhance the livability and aesthetic qualities of the island. Each society had a path committee to map, mark, and maintain walking paths from the villages to the mountain. They loved to build paths and constructed over 250 miles (400 km) of trails, including commemorative trails for deceased family members, which were endowed with construction and maintenance funds. Path committee members also promoted the idea of a National Park to protect the island’s scenic areas from private development. Ironically, community involvement in path marking and maintenance diminished with the arrival of the federal government when the park was established in 1916. The fourth trail system evolved during the Great Depression of the 1930s, prior to World War II. Hundreds of young men, employed through the Civilian Conservation Corps (CCC), built roads, picnic areas, and trails with in the federally designated park area. The park did not maintain the many village trails that led outside of the

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parkland, resulting in the abandonment of over 100 miles of trails. Today these abandoned trails serve as outdoor museums or archives of early trail construction.

Existing Conditions

Documentation of the existing conditions of the trail system required both a holistic view of the trails as a circulation system within a varied landscape, connecting scenic and cultural destinations, and a detailed examination of constructed features. We mapped the trail system using Global Positioning System and Geographical Information System (GPS and GIS) technology in order to produce digital maps and a spatially linked database. Pairs of contemporary and historic photographs taken from the same vantage point showed very little change in some sections of highly crafted trails but did show changes in the surrounding views. Other comparisons portrayed the extent of the erosion and change in trail width. For highly crafted features such as drainage systems, bridge crossings, ironwork and walls, the trails crew produced sketches, measured sections, and plans for subsequent phases of analysis and treatment.

(italicized section could be added or left out of paper)

Types of trail features documented included:

- *Guidance: fences, safety rails, signs, blazes, cairns, plaques*
- *Drainage: culverts, side drains, water bars, water dips*
- *Retaining Structures: coping stones, walls, checks, iron pins*
- *Crossings: bridges, causeways, stepping stones, bogwalks*
- *Steps, Rungs, and Ladders: set-behind, slab-laid, cribbing, foot and hand rungs, ladders*
- *Tread: gravel, soil, ledge, stone pavement, concrete, bituminous*
- *Associated Structures: benches, shelters, towers, restrooms, parking lots, assembly areas*

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- *Associated Cultural Features: archeological or historic sites*
- *Associated Natural Features: water features, views, vegetation, wildlife, geological formations*

An important resource for describing constructed features and their condition was the trail crew's pre-existing feature inventory and work log. Beginning in the 1980s, the trails were inventoried using a measuring wheel, and each feature was recorded according to the trail, the trail section, and the distance, so that each feature had a unique number associated with it. In the 1990s this information was entered into a searchable database. While this inventory was far from providing the trails crew with all the specific information needed—such as exact measurements and styles of construction—it listed nearly all of the thousands of individual features in the system, with some rudimentary information about each feature. This inventory aided in the documentation need for the Cultural Landscape Report of features in remote areas and the comparison of constructed features in different parts of the system.

A key to effective documentation and communication between research and field staff was the use of correct terminology. Trail work techniques and vocabulary travel largely by way of the oral tradition, influenced by earlier generations of crews and by crew members bringing experience from other regions. As part of the project, we developed a glossary of terms. These terms were then used throughout the specifications in the treatment and maintenance guidelines. Having a lexicon that is recognizable to other experts in the field will also make the document more useable to a larger audience.

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Analysis

Of the three circulation systems within the park, the motor roads and carriage roads were determined eligible for the National Register of Historic Places, but the hiking trails had not yet been evaluated. We determined that the trail system was eligible for the National Register and prepared a nomination as part of a multiple property nomination for the “Historic Resources of Acadia National Park.”⁶ Many trails that are closed and no longer maintained, retain their historic integrity and will be included in the listing and are part of a larger system of rustic design elements in the landscape.⁷

<i>Evaluation of Integrity for Trails</i>		
<i>Aspect of Integrity</i>	<i>Retains Integrity</i>	<i>Does Not Retain Integrity</i>
<i>Location</i>	<i>Continued use of historic route, or an abandoned route that is still present</i>	<i>Substantial reroutes and obliterated historic route</i>
<i>Design</i>	<i>Evidence of design style or design standards from period of significance</i>	<i>Redesign, realignment, or obliteration of design from period of significance</i>
<i>Setting</i>	<i>Setting (open, wooded, undeveloped, etc.) or views from period of significance</i>	<i>Loss of trail corridor setting, important sites, destinations, or views due to subsequent development</i>
<i>Materials</i>	<i>Tread, crossings, and drainage features that date to period of significance or are replaced with same materials</i>	<i>Loss or replacement of materials from period of significance</i>
<i>Workmanship</i>	<i>Features, such as walls and steps, that</i>	<i>Loss of constructed features from period</i>

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	<i>date to period of significance</i>	<i>of significance</i>
<i>Feeling</i>	<i>Presence of a trail corridor or setting, views, and materials from period of significance</i>	<i>Dramatic change in use, setting, views, or destinations</i>
<i>Association</i>	<i>Physical evidence of associated sites, uses or cultural traditions</i>	<i>Loss of physical evidence of associated sites, uses, or cultural traditions</i>

After determining the areas of significance, we identified the key physical characteristics and features that contribute to the construction of the trail system.⁸ With a lack of records from the original builders, and only an assortment of historic photographs and notes in the annual reports of the village improvement societies, we needed to determine the location, age, methods used, and significance for constructed features. This evaluation required field investigations by the trails crew who had a working knowledge of the structure, function, and basic building techniques of trail features.

Over the course of two falls and winters, the crew went on a fact-finding mission that led to a certain amount of detective work and theorizing. Because much of the trail system had been left for over sixty years—since World War II—with almost no maintenance and much of the original work on the trails in various states of dilapidation. Especially vulnerable features, such as gravel paving or wooden structures, were all but completely gone. We sought intact structures to analyze, and found partial clues in the field, such as pieces of structures, to figure out what was there. The search for original, intact structures was helped by the existence of about 100 miles abandoned trail miles. For example, on the unused Gurnee Path, we found the remains of posts and railings, capstone culverts, and areas of intact gravel paving that never would have survived the high use of the open trail system.

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Using information from the research phase of the study, we could date work on these abandoned trails. Once we began to find intact, “unfixed” structures on abandoned trails, the remnants of structures on open trails began to make sense. For instance, a number of open stone culverts are extant on maintained trails; however, after analyzing the abandoned trails, we found that certain builders used almost exclusively covered stone culverts and we realized that many existing open culverts had simply had the top stones removed as a quick fix. We found extensive original iron work, including an iron and stone bridge as well as various uses of iron pins for securing stone steps and coping (Figure 3). On abandoned trails we also found many extant Bates style cairns, built according to the written specifications of Waldron Bates in 1906 (Figure 4). It was very exciting period of discovery and learning.

In analyzing dilapidated structures, the trail crew’s knowledge of how trail structures are put together proved to be critical. We studied the placement of obscured edging stones to determine historic width. We studied stones for marks to determine whether they had been cut, shaped, or moved with a derrick (Figure 5). We were often able to discern the existence and qualities of staircase construction from looking at its remnants. We also scoured the woods along trail corridors looking for old pits in order to determine if a trail had been surfaced with local gravel.

We assumed that structures of an era were built more or less the same, a universal approach termed “the Acadia style.” However, in the field the crew discovered distinguishing characteristics for different builders and village improvement society districts. Time tends to reduce differences, and two semi-dilapidated structures tend to look about the same. However, as we began to piece together the physical evidence in the field in different locations, building styles began to emerge, some of which are quite striking. For instance, steps built in the Bar Harbor district in the 1910s were nearly always cut stones of uniform size, while those built at the same time in Seal Harbor district were natural stones. Another striking example occurs between the Seal Harbor district where

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nearly all the premier trails were once about four feet wide and surfaced with gravel, while in Northeast Harbor there was little use of gravel surfacing.

Treatment

After documenting the trail system's historical development, determining its significance, and evaluating its integrity, we chose a treatment approach for long-term management and maintenance in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*.⁹ We divided the treatment guidelines into three levels of information: (1) overall treatment philosophy and principles, (2) guidelines for types of features common to many trails, and (3) specific guidelines for individual trails or trail segments. Since many features are rustic and assembled with local wood and stone, we phrased guidelines as parameters, e.g., bridge railings consist of logs between 4 and 6 inches in diameter or stone steps are between 16 and 24 inches wide. Pairing historic and contemporary photographs and diagrams, we illustrated compatible yet distinguishable differences in construction style and explained underlying construction techniques. In some cases, we added concealed features for durability, such as perforated pipe, iron pins, or underground stone check bars. In addition, we recommended the use of mechanized trail equipment where possible to facilitate the movement of materials, much of which is imported to minimize soil disturbance, particularly in wetland zones.

While the topics addressed are similar to those in generic trail maintenance manuals, the techniques are specific to the park's historic trails, including bridge styles, stone and step construction methods, ironwork, and signs.¹⁰ For instance, a bridge on the Great Meadow Loop Trail was built similar to a CCC bridge built in the vicinity in the 1930s and no longer extant (Figures 6 & 7). Working together, the Olmsted Center defined the guidelines format, contributed historical narrative, and compiled the document, while the park's trails crew prepared the

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specifications and diagrams in the winter months. This collaborative approach produced excellent and practical guidelines and ultimately improved the ability of crew leaders to direct seasonal workers and volunteers.

The thorniest treatment issues arose when historic construction practices were not sustainable, either because of flawed work or because of changes in conditions or use since trail construction. Many trails at Acadia today see more use in one week than in an entire season eighty years ago. The character of many of the structures was closely related to structures, alignments, or trail widths that are no longer durable. For instance, the stone walls on many early trails were simply not as durable as they need to be today. Early walls were often simply stacked rocks laid up without a solid foundation, constructed core, with many unbroken joints, or with rocks laid in a weak orientation. Many of these walls depended on vegetation along the top course to retain tread material, and with today's high use, this vegetation was often trampled. We needed specifications for rebuilding these walls that would blend with extant work while using the best building practices we now understand.

All retaining walls are currently built with sturdy foundations, use of "header rocks" laid lengthwise into the wall, a built core behind the wall, broken (or overlapping) joints and inslope of face rocks. Diagrams specify how to construct two types of walls: (1) a highly crafted retaining wall and (2) a "rubble retaining wall" that looks like a rough, loosely built wall, but is much more durable. Gaps in the face of the wall are accommodated for by use of larger, insloped rocks with broken joints and a well-packed core. A third set of diagrams specifies how to build a concealed wall to retain root-exposed and eroded areas and reestablish a comfortable, safe walking tread. Walls that retain tread material are now constructed with high contact along the top course to prevent the escape of fines, rather than relying on vegetation. The guidelines also specify two different styles of staircases (Figures 8 & 9). The drawings for these graphics were all done in the shop by the trails crew, and then enhanced and clarified by a professional graphics designer, a summer seasonal trail worker retained for winter work. Trail work often attracts people with many other talents.

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As the trails crew gained field experience, their knowledge of historic stonework was supplemented through examination of other examples of regional stonework dating to similar time periods as the Acadia work, completion of stonework rehabilitation projects at other parks, and participation in professional conferences. As a result, we developed a working methodology for stonework rehabilitation in the “Acadia Style” that has allowed us to accurately and consistently rehabilitate many miles of trail at Acadia. The project also sparked interpretive programs with park visitors and training programs with some of the country’s leading trail experts, including hands-on sessions Steven Tufnel of the Dry Stone Masonry Group and masons of the Historic Preservation Training Center in Maryland.

In conclusion there is much work to be done to preserve historic trails and associated sites. This work can be streamlined by using a well-defined methodology, such as a Cultural Landscape Report. Documenting the history of the trail system is an important first step to garnering community and financial support, but field investigation is critical for developing effective guidelines. Raising enough funds to establish an endowment for trail maintenance ensures long-term viability. The knowledge and insights of field staff should be used to its greatest possible advantage. The success of the Acadia trails plan is due to the combined knowledge of how document a historic landscape and a practical field-based approach to rehabilitation guidelines.

Sidebar: Community Involvement and Acadia Trails Forever Campaign

Of the three million visitors that come to the park each year, most use the marked trails within park boundaries. However, many of the abandoned trails are still evident and used by local residents. In the mid-1990s, the park’s non-profit support group, Friends of Acadia, initiated a fundraising campaign entitled “Acadia Trails Forever,” which highlighted reopening abandoned trails. The first initiative was to work with community members to

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reopen the village connectors into the mountains. The largest initiative was to establish an endowment, for the rehabilitation of the island's trails system. Although the campaign initially focused on opening abandoned trails, concerns about the poor condition of existing trails and maintenance needs, shifted the emphasis to rehabilitation of the island's most popular trails. A tremendously successful campaign, now a 13 million dollar endowment makes Acadia trails the first endowed NPS trail system. A lead gift of five million dollars was matched with many smaller donations from ten dollars on up. The federal government also contributed funds through its Fee Demonstration Program, where park admission fees are spent on park improvements rather than placed in a central fund. Additional contributions were received to rehabilitate trails to meet accessibility codes. People that live around or visit the park love and actively use the trail system appreciate the history of the trail system and were eager to contribute to its long-term care.

Figure 1. Acadia National Park is predominantly located on Mount Desert Island along the Maine coast (Acadia National Park).

Figure 2. Circa 1922 photograph of stonework on the memorial Emery Path (Acadia NP).

Figure 3. Original Bates style cairns date to the early 1900s. The gap between two central stone indicates the direction of the trail and sightline to the next cairn (Olmsted Center).

Figure 4. Arch stone placed by derrick over steps through crevice on recently opened Homans Path (Olmsted Center).

Figure 5. Uniform, cut stones on the Homans Path in the Bar Harbor district, bottom step is held with iron pin. (Olmsted Center).

Figure 6. Details for a typical Waldron Bates-style staircase built by the Bar Harbor Village Improvement Associations in the early 1900s (Specification by Acadia Trails Crew).

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Figure 7. Detail of typical staircase built on Village Improvement Association memorial paths in the 1910s and 20s and by the Civilian Conservation Corps in the 1930s (Specification by Acadia Trails Crew).

Figure 8. Bridge constructed in the Great Meadow in 2000 in CCC style (Olmsted Center).

Figure 9. Specifications for CCC-style bridge developed by studying historic photographs and bridge remnants from the 1930s (Specification by Acadia Trails Crew).

¹ (www.nps.gov/acad/)

² (www.nps.gov/frla/oclp.htm) Established in 1992, the Olmsted Center strengthens the capacity of parks to manage cultural landscapes as part of our national heritage and works in partnership with national parks, universities, government agencies, and private non-profit organizations. The Olmsted Center offers expertise in horticulture, landscape architecture, and history. Based at the Frederick Law Olmsted National Historic Site, the Olmsted Center perpetuates the tradition of Olmsted's lifelong commitment to people, parks, and public spaces.

³ Robert Page, Cathy Gilbert, and Susan Dolan. *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques*. Washington, DC: US Department of the Interior, National Park Service, Cultural Resource Stewardship and Partnerships, Park Historic Structures and Cultural Landscapes Program: 1998. Order #0245-005-01187-1, US Gov. Printing Office, Wash., DC, 20402-9325

⁴ (www.friendsofacadia.org) See also W. Kent Olson, "Acadia Trails Forever" a \$13 Million Public Private Campaign to Rehabilitate Acadia's 130-mile Historic Trail System" in *Preserving Historic Trails, Conference Proceedings*. Acadia National Park, October 17-19, 2000. Brookline, MA: Olmsted Center for Landscape Preservation.

⁵ Margaret Coffin Brown. "Historic Hiking Trail System of Mount Desert Island, Cultural Landscape Report, Volume 1: History, Existing Conditions, and Analysis" NPS, Olmsted Center for Landscape Preservation, Draft, June 2003.

⁶ Lauren Meier and Lee Terzis, "Historic Resources of Acadia National Park Multiple Property Listing." Brookline, MA: National Park Service, Olmsted Center for Landscape Preservation. Draft June 2001.

⁷ Linda Flint McClelland, *Building the National Parks: Historic Landscape Design and Construction*. Baltimore: The Johns Hopkins University Press. 1998.

⁸ Landscape characteristics defined in *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques*, include: natural systems and features, spatial organization, land use, cultural traditions, cluster arrangement, circulation, topography, vegetation, buildings and structures, views and vistas, constructed water features, small-scale features, and archeological sites.

⁹ Charles Birnbaum, ed. with Christine Capella Peters. *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. Washington, DC: US Department of the Interior, NPS, Cultural Resource Stewardship and Partnerships, Heritage Preservation Services, Historic Landscape Initiative. 1996.

¹⁰ For trail planning, construction, and maintenance manuals, see <http://forestry.lib.umn.edu/bib/trls.phtml> and www.sctrails.net.