Olmsted Center for Landscape Preservation

Acadia Trails Treatment Plan

Cultural Landscape Report for the Historic Hiking Trail System of Acadia National Park


Historic Hiking Trail System, 2003
Western Part of Mount Desert Island
Produced by
National Park Service
Olmsted Center for Landscape Preservation
Legend
Existing marked, maintained trails
Historic trails no longer marked
Roads and carriage roads
Acadia National Park lands
Approximate scale (miles):
0
1
2
SOMESVILLE
PRETTY MARSH
Pine Hill
Oak Hill
Bernard Mtn
Mansell Mtn
Beech Mtn
Acadia Mtn
St. Sauveur Mtn
Flying Mtn
Norumbega Mtn
Park Mtn
Schoolhouse Ledge
Hwy Route 198
Hwy Route 102
SOUTHWEST HARBOR
BASS HARBOR
Seawall

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Funding provided by

National Park Service Cultural Resources Preservation Program
National Park Service Fee Demonstration Program
Friends of Acadia

Olmsted Center for Landscape Preservation
National Park Service, Boston, Massachusetts, 2006

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ISBN 0-9779833-1-5

Library of Congress Cataloging-in-Publication Data

Acadia trails treatment plan: cultural landscape report for the historic hiking trail system of Acadia National Park, Maine / prepared by Christian S. Barter ... [et al.]; illustrated by Sarah E. Baldyga; project manager, Jim Vekasi ; contributors, Brooke Childrey ... [et al.].
p.cm.

Includes bibliographical references and index

1. Acadia National Park (Me.) 2. Trails—Conservation and restoration—Maine—Acadia National Park. 3. Landscape assessment—Maine—Acadia National Park. 4. Landscape protection—Maine—Acadia National Park. I. Title: Cultural landscape report for the historic trail system of Acadia National Park, Maine. II. Barter, Christian, 1969-
III. Vekasi, Jim. IV. Olmsted Center for Landscape Preservation. (U.S.)

F27.M9A24.2006
974.1'45—dc22

2006040031

Cover Photo: Acadia Trails crew installing rustic arched bridge on the Jordan Pond Path, 2003. Photograph by Peter Travers.

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FOREWORD

A century ago, visitors to Mount Desert Island scaled granite peaks to enjoy breathtaking ocean views, and strolled leisurely through verdant stands of spruce and fir. These experiences were made possible by intrepid trail builders who used wood, iron, earth and stone to create a system that was unequalled in its scope and workmanship. Acadia National Park owes its very existence to the people who had the inspiration and foresight to protect this magnificent network of walking paths and the surrounding land for all to enjoy. When the park was formed in 1916, the first superintendent, George Bucknam Dorr, spoke eloquently of the need to protect the land:

> By taking the opportunity given to us by the richly varied topography of the island, by its situation on the border between land and sea, by the magnificent beginning made, and the government's cooperation, we can do something now whose influence will be widely felt.

With the completion of this Cultural Landscape Report, we continue to honor the legacy of trail stewardship that began with Dorr and others so long ago. This project was truly a collaborative effort, and it is with deep gratitude that I recognize our partners, the Olmsted Center for Landscape Preservation and Friends of Acadia.

I would also like to thank our very professional trails crew at Acadia, now recognized nationally for its expertise in utilizing rehabilitation techniques, and commend Chris Barter, Margie Coffin Brown, Tracy Stakely, and Gary Stellpflug and numerous contributors for their dedication to this project. Many local organizations and individuals generously contributed historic photographs and maps, allowing this cultural landscape report to serve as the most in-depth record of the history of the island's trail system.

In addition to recognizing the contributions of the past, this comprehensive document also looks to the future. The report has both documented existing conditions, and also provided a treatment plan for sensitive rehabilitation, an effort that is already underway. It will serve as a blueprint for maintaining the magnificent trails at Acadia for many years to come. The Acadia Trails Forever program makes this rehabilitation possible, and provides for the continued care of the trails in perpetuity. Future generations will surely benefit from these extraordinary efforts.

Sheridan Steele
Superintendent
Acadia National Park

ACKNOWLEDGMENTS

This project was funded by the National Park Service Cultural Resources Preservation Program (CRPP), the National Park Service Fee Demonstration Program (Fee Demo), and Friends of Acadia. The guidelines presented here were developed through the combined efforts of staff at Acadia National Park on Mount Desert Island, Maine, and the Olmsted Center for Landscape Preservation in Brookline, Massachusetts. Project direction was provided by Jim Vekasi, Chief of Maintenance at Acadia. Primary authors for the document include Christian S. Barter and Gary J. Stellpflug, from Acadia's trails program, and Margaret Coffin Brown and J. Tracy Stakely, historical landscape architects with the Olmsted Center. Sarah E. Baldyga, also with the Acadia trails program, illustrated the document.

Many individuals assisted in the preparation of this report by providing narrative text, specifications, sketches, and photographs. Thanks to the following contributing park service staff, interns, and interested individuals: Brooke Childrey, Peter Colman, Judith Hazen Connery, Carl Demrow, David Goodrich, Laura Hayes, Charles Jacobi, Keith W. Johnston, David Kari, Lester Kenway, Courtney LaRuffa, Lauren G. Meier, David Salisbury, James Schissel, Lee Terzis, Lauren Laham, and Heidi Werner. Thanks to Jim Vekasi, Charles Jacobi, H. Eliot Foulds, and Chris Stevens for reviewing initial drafts and making substantive comments for the document's improvement. Special thanks to Paul F. Haertel, former Superintendent of Acadia National Park, and W. Kent Olson, President of the Friends of Acadia, for their continued support of trail preservation efforts at Acadia and the work of the Olmsted Center.

Historical information used in this document and in other phases of planning for Acadia's trail system was obtained from numerous sources. Thanks to the following contributing repositories, agencies, and individuals for their assistance: Bar Harbor Historical Society—Ed Garrett and Deb Dyer; Bar Harbor Village Improvement Association—Les Brewer and Phil Cunningham; Friends of Acadia—W. Kent Olson and Marla Major O'Byrne; Harpers Ferry Library; Historic American Engineering Record; Jesup Memorial Library in Bar Harbor—Nancy Howland; Maine Historic Preservation Commission—Earle Shettleworth, Jr. and Kirk Mohney; Maine State Archives—Roy Wells and Ed Wheaton; National Archives—Helen Engle; National Park Service Northeast Museum Services Center—John Maounis and Liz Banks; Northeast Harbor Library—Robert Pyle; Northeast Harbor Village Improvement Society—Dan Falt; Seal Harbor Library and Village Improvement Society—Deborah Burch; *Trails of History*—authors Tom St. Germain and Jay Saunders. The document was edited and indexed by Jane Crosen. Page layout and production was provided by Brian P. Graphic Arts.

INTRODUCTION

In accordance with National Park Service (NPS) policy, the Cultural Landscape Report (CLR) serves as the primary supporting document to guide the treatment of a cultural landscape and is required before a major intervention. This report represents the second volume of the CLR for the Historic Hiking Trail System of Mount Desert Island. It articulates a strategy for the long-term treatment and maintenance of the trails within the boundaries of Acadia National Park (NP). While the first volume of the CLR focused on the history and significance of the overall trail system on the island, this volume focuses more specifically on the 103 marked, maintained trails within the park, which extend over 118 miles (see Appendix B).

This volume is the culmination of several years of research, analysis, field inventory, and documentation necessary to synthesize voluminous information about the island's extensive trail system. The fundraising initiative "Acadia Trails Forever," a partnership between the NPS and Friends of Acadia, has raised $13 million of private and federal funds to implement treatment and maintenance work through an endowment for the trail system. This document will help guide the efficient and appropriate use of these funds to protect park resources and ensure the highest-quality hiking experience in Acadia NP.

This introduction first summarizes projects completed to date that serve as the foundation for the treatment guidelines, including the research and analysis conducted for the first volume of the CLR, the trails crew inventory, field documentation, the nomination for the National Register of Historic Places, and the closely associated *Hiking Trails Management Plan*. Additionally, the overall treatment philosophy and approach to be applied to the trail system is presented here.

Acadia's trail system has a unique history, with layers of significance from several historic periods and contributing groups. Some trails have features that are well preserved to a particular era with little or no alteration, while other trails include an assortment of features dating to different periods and builders. Examples of work from local village improvement associations and societies (VIA/VIS), the Civilian Conservation Corps (CCC), and the NPS may all exist on the same trail.

This complicated development pattern calls for thoughtful consideration of the appropriate treatment approach. Through the development of the CLR, the goal for treatment of the trail system is to maintain the character and integrity of the system as a whole while preserving the unique qualities of each individual trail. It is extremely important that the implementation of treatment guidelines not create a homogeneous trail system with little differentiation between trails. Additionally, the guidelines should not establish an unrealistic treatment approach that calls for the rehabilitation of every individual trail feature and would be impossible for the park staff to implement and maintain. Instead, there should be a balanced approach that addresses the system's integrity, individual trail character, and acceptable levels of rehabilitation and maintenance that can be sustained by the park. This is no easy task, given the layers of history of the trail system, the number of character-defining features present on each trail, and the costs of individual trail rehabilitation and continued maintenance.

Early discussions in the development of this report examined various treatment options for the trail system. One suggested approach was to group the trails into two categories—highly crafted memorial trails, and "Acadia Style" trails. The highly crafted trails would include approximately fifteen of the most highly constructed trails on the island, like the Beachcroft Path (#13) or Emery Path (#15). These trails would essentially be restored to their original constructed appearance and then maintained through a high level of effort. All other trails in the system would be maintained to a slightly lower standard. Trail features would be identified that fit within a predetermined "Acadia Style," based on building techniques and materials used during the park's historic periods. These features would be available for use on any trail, regardless of its individual history. It was soon understood that adherence to this approach would be detrimental to the character and integrity of the trail system. The individual character of each trail would be sacrificed for the convenience of a more uniform rehabilitation and maintenance plan.

After much discussion, consultation, and active participation among Acadia park staff, the Olmsted Center for Landscape Preservation (OCLP), the Maine State Historic Preservation Commission, and other interested parties, a more sound methodology was developed and is presented in this volume of the CLR. A general treatment approach has been chosen that focuses on rehabilitation of Acadia's trails in a way that preserves individual trail character as well as the character of the overall system of trails while addressing the park's maintenance concerns.

To facilitate this approach, trail features common to the whole system are identified and the unique character of each individual trail is addressed. Section 1 of this document presents specific feature types such as bridges, iron rungs, and steps. Each feature is identified and described with construction specifications where applicable. Similar to the "Acadia Style" approach described above, the features have been identified as having historic precedent at the park for the VIA/VIS or CCC periods. However, unlike the previous approach, every feature type is not deemed appropriate for use on every trail. In Section 2, individual trails are examined to determine their original character, their layers of development, and which of the identified trail features from Section 1 are or are not appropriate contributors to the trail's individual character. Treatment guidelines are provided addressing appropriate feature types to use during rehabilitation of that particular trail. Although every individual feature on a trail is not addressed, guidelines are established for each trail based on its unique character and development, allowing rehabilitation to proceed in an informed manner.

Trails that have an extensive individual history and numerous built features, like the highly crafted memorial trails, will be covered in a high level of detail and will be held to more exacting rehabilitation standards to ensure their character and integrity are not diminished. These trails typically have more thorough historic documentation, providing a sound foundation for guiding their treatment. However, all trails in the system, whether highly crafted or not, will still maintain their individual character since only features that are appropriate to the trail's historic precedents will be recommended for use. This approach will maintain diversity in Acadia's trails while still allowing room for the inevitable change that is needed to address present trail concerns such as resource protection, increase in visitor use, and level of maintenance.

In many cases, relevant information on trail features and characteristics are drawn from trails that are no longer marked, outside park boundaries, or actively maintained by the Seal Harbor VIS or Northeast Harbor VIS. Due to the large land area, treatment specifications are presented as narrative guidelines for feature types and individual trails, rather than a detailed treatment plan for each section of trail. The narrative guidelines articulate the historical context, character-defining features, and the parameters for rehabilitation of the trail based on contemporary issues, constraints, and operational needs. The guidelines are phrased as recommendations, in recognition that each individual trail section will present a different set of issues.

The intended audience for this document includes individuals who are extremely familiar with Acadia's trails and are involved in the planning process as well as those who may be unfamiliar with the trail system and/or trail construction in general but may be involved in future trail rehabilitation efforts. As a result, this document relies heavily on graphics to complement and enhance the narrative. Numerous photographs and sketches are included to clarify the text, illustrate historic and existing conditions, and provide examples of both acceptable and unacceptable usage of specific trail features.

TERMINOLOGY

Each trail included in this study is assigned a number that corresponds to key maps and an associated database. The currently maintained trails, most of which were present during earlier historic periods, are numbered to correspond with a database and work log used by the trails maintenance program. The trails on the east side of Mount Desert Island are numbered between 1 and 99, and on the west side in the 100s. Trails numbered in the 200s are located on other park lands at Isle au Haut and Schoodic Peninsula. Trails on Mount Desert Island that are no longer marked have been assigned numbers in the 300s, 400s, 500s, and 600s according to "path districts" defined at the turn of the century by the Joint Path Committee of the village improvement associations and societies illustrated in Drawing 3. For example, the Royal Fern Path (#305), which is not currently marked, has been assigned a number in the 300s because historically it was located in the Bar Harbor Village Improvement Association path district. During the development of the park's *Hiking Trails Management Plan*, additional new routes were proposed and given numbers in the 700 series.

1–99	East side Mount Desert Island, marked, maintained trails
100s	West side Mount Desert Island, marked, maintained trails
200s	Park trails not on Mount Desert Island (Isle au Haut and Schoodic)
300s	Bar Harbor VIA path district historic trails
400s	Seal Harbor VIS path district historic trails
500s	Northeast Harbor VIS path district historic trails
600s	Southwest Harbor VIA path district historic trails
700s	Proposed new trails as listed in Appendix 2 of *Hiking Trails Management Plan*

The numbering system is encoded with some information about the location and management of each trail, but it is not correlated with the trail's construction period. The park maintenance staff established the 0–99, 100s, and 200s numbering system in the 1950s, at a time when many trails were closed or renamed. As a result, many trails are composed of sections that date to different periods. For example, the lower end of the Beachcroft Path (#13) is overlaid by earlier sections of the Wild Gardens Path (#354 and #18), and the upper end is actually the Black and White Path (#326), which originally extended from Beaver Dam Pool to the summit of Champlain Mountain. Some explanations are included in the individual trail data in the appendices. More detailed individual trail histories and descriptions are part of the rehabilitation guidelines, as shown in the five examples included in the second section of this cultural landscape report. The trail numbers should thus be used to cross-reference tables, maps, appendices, maintenance records, and the associated database.

The terminology for trails has changed over the time period of this study. Prior to automobiles, all roads were for walking and were referred to as roads, lanes, paths, or passes. During the late 1800s "sidewalks" referred to paths along roads while "wood paths" extended into the more remote parts of the island. Most new routes built by the path committees of the village improvement societies were naturally referred to as paths, such as the "path up Newport Mountain" and the "Ladder Path." Some twentieth-century VIS path maps also defined "broad graded paths" with a double red line for major routes such as the Asticou Path. Paths on which horses were allowed were referred to as "bridle paths." The term "trail," associated with pioneer wagon routes in the nineteenth century, became popular for recreational routes in the twentieth century. Early use of the word is associated with some of the steeper routes, such as the "Precipice Trail." Under National Park Service management, the term is attached to most of the routes, such as the "Ladder Trail." At present the only routes to retain the name "path" are the endowed memorial trails and routes that are no longer marked. When appropriate, names designated at the time of path construction will supersede subsequent spelling alterations. For example, the current "Beachcroft Path" was erroneously called the "Beechcroft Trail," and the "Jesup Path" was the "Jessup Path."

Changes in the names of the mountains have also created confusion. The park's first superintendent, George Dorr, renamed mountains in 1918 to highlight the island's history during the period of European exploration. For example, Newport Mountain was renamed Champlain, Dog Mountain became St. Sauveur, and Green Mountain became Cadillac. Consequently, many of the summit trail names were changed. A more detailed discussion of trail names is found in Chapter Nine. Throughout this volume present-day names are used. For example, the Jordan Pond Path was once referred to as the Jordan Pond Loop Trail and the Long Pond Trail has also been referred to as the Great Pond Trail. Where clarification is needed, alternate names are placed in [brackets].

OVERVIEW OF SITE HISTORY, EXISTING CONDITIONS, AND RELATED PROJECTS

The content of the first volume of the Cultural Landscape Report is summarized below in order to describe the foundation for the treatment guidelines. Related projects including the inventory of trail features, field documentation, and preparation of a nomination for the National Register of Historic Places are also described.

History

The earliest trails on Mount Desert Island (MDI) were probably Native American canoe carry trails between lakes. In the 1760s, English colonists settled in protected coves and widened some Native American routes for cart paths. New roads were higher and drier and linked inland farms and logging camps with coastal ports. In the late 1700s, settlement increased and roads were extended across the island, connecting distant villages. The island's tourism budded in the mid-1800s when dramatic paintings by artists of the Hudson River School drew an increasing number of summer travelers to see and write about the island. Pedestrian excursions and mountain climbs were essential components of an island visit. Popular destinations included Schooner Head, Great Head, the summit of Green [Cadillac] Mountain, Sargent Mountain, and Beech Cliffs. Early visitors scrambled up the lower sections of mountains as best they could until they could walk easily across bare rock ledges to the summit. By 1850 climbers could follow a rough road up Green [Cadillac] Mountain built to the summit station of the United States Coastal Survey.

After the Civil War, technological advances in shipping, travel, and communications contributed to a postwar boom in tourism. Mount Desert Island attracted some of the country's most influential families, who transformed the landscape that had epitomized the American wilderness into a summer resort. Individuals who would later contribute greatly to the path system first came to the island during this period, including Charles Eliot, Edward Rand, George Dorr, and Waldron Bates. A series of guidebooks printed in the 1860s, 1870s, and 1880s described popular destinations on the island, including walking routes to mountain summits and other scenic places. During this time tourists created the framework of the existing trail system. Trails departed from village roads, winding through the woods and along streams to mountain ridges and summits. By the 1880s these trails were well worn, with some marked by cairns. Some of the most popular early trails had extensive built features, such as retaining walls and gravel tread on the Shore Path (#301) in Bar Harbor and rustic wooden bridges on the Duck Brook Path (#311). Pond-side trails were less common, as boats were typically used to cross water bodies such as Eagle Lake and Jordan Pond.

A perceived loss of American wilderness in the late 1800s led to a greater interest in preserving scenic areas. The deplorable conditions of American cities and rapid growth of railroad suburbs prompted citizens to seek ways to improve their communities. As a result, civic-minded individuals initiated land preservation programs and "village improvement societies." Mount Desert Island summer residents and local businesses, heavily invested in the spectacular scenery of the island, feared that its natural beauty would be lost to overdevelopment, indiscriminate logging, railroad lines, and the urbanization from which they sought refuge. These concerns led to the formation of the Hancock County Trustees of Public Reservations and village improvement societies in Bar Harbor, Northeast Harbor, Seal Harbor, and Southwest Harbor. Individuals interested in walking paths also worked cooperatively through the Joint Path Committee of the village improvement societies. One of the lasting contributions of this civic movement was a carefully constructed, privately funded, island-wide path system from the villages to protected natural areas. A memorial path system, initiated with the naming of the Waldron Bates Memorial Path (#525) along Chasm Brook and the placement of a plaque at Cadillac Cliffs in 1910, expanded under the leadership of George Dorr, as many of the founding members of the summer cottage community were laid to rest. Friends and fellow members paid tribute to the deceased by funding the construction of a trail, placing a commemorative plaque along it, and endowing the trail with a maintenance fund in perpetuity. Highly crafted trails, such as the Beachcroft Path (#13) and Kane Path (#17) were endowed. At the same time rigorous rung trails constructed under the direction of Rudolph Brunnow, such as the Precipice Trail (#11) and Beehive Trail (#7), were funded by donations and dues to the Bar Harbor VIA in the 1910s.

The establishment of the Sieur de Monts National Monument in 1916, which later became Lafayette National Park in 1919 and Acadia National Park in 1929, ushered in a new era for the island's path system. When established, the 5,000-acre park contained a small fraction of the island-wide trail system that by this time covered over 200 linear miles. The village improvement path committees continued to be very active, maintaining and building elegant new trails on both private and federal property. This was beneficial to the new park since it had limited staff and funds for maintenance. Expansion of Rockefeller's carriage road system, construction of a park motor road system, and changes in the names of mountains sparked protests from path users and village improvement path committees. Concurrently, the construction of new summer cottages and the inflow of money to the island began to decline. Many of the activities of the village improvement path committees were suspended during American involvement in World War I. After the war, new trail construction resumed yet not with the same fervor, as path committee members felt the system complete. Memorial path construction continued during and after World War I. Six trails were endowed between 1924 and 1930, including the A. Murray Young Path (#25) and Gorge Path (#28).

Federal work programs in the 1930s created as part of President Roosevelt's economic recovery plan contributed to the expansion of the trail system. Unlike the trails built by the local village improvement societies that radiated from villages, paths built by federal work crews were laid out within the park boundaries and in conjunction with new visitor parking areas, roads, picnic areas, swimming areas, and campgrounds. With these new facilities, the park became increasingly separated from the surrounding villages and connector trails. Like the village improvement trails, those built by federal crews were of high quality due to the tremendous amount of "man-days" of physical labor, use of mechanical equipment, and carefully prepared designs by park service landscape architects and engineers. Trails built by the Civilian Conservation Corps (CCC) included the Ocean Path (#3) and Otter Cliff Path (#340) along Ocean Drive, the Perpendicular Trail (#119), Long [Great] Pond Trail (#118), and Beech Cliff Ladder Trail (#106).

During World War II there was little use or maintenance of the trails. In the first two decades after the war, park visitation increased dramatically, but trail use did not. This nationwide trend was attributed to the romance of auto-touring and camping. With new park roads and campgrounds at Blackwoods and Seawall, Acadia was an ideal motoring destination. Trails in close proximity to the roads and parking areas, such as the Ocean Path (#3), received the greatest use. Visitors rarely used the Recreational Development Areas on the island's western side at Pretty Marsh, Pine Hill, and Oak Hill, or the trails associated with them.

As a result of the park motor roads, facilities, and maps, there were in effect two trail systems. The first, located within park boundaries, was represented on park maps and used by visitors. The second was the preexisting path system built by the village improvement path committees and known by residents. Through time the second system became increasingly obscured. By the 1940s, many long-term members of the path committees were no longer able to tend the trails and many lost their homes in the 1947 fire. As a result, most maintenance responsibilities were transferred to the park service. With a limited crew and budget, the park concentrated on trails that received the heaviest use. In the 1950s the park closed trails that were seldom used, in poor condition, ran parallel to other paths, or led walkers onto private land. A few new trails, such as the Ship Harbor Trail (#127), were built between 1956 and 1966 as part of "Mission 66," a program initiated to celebrate the fiftieth anniversary of the NPS and modeled after the 1930s work programs.

Trail use remained low until the 1970s when there was a nationwide resurgence in recreational walking. With a limited budget and personnel, park maintenance crews struggled to keep up with the increased trail use. Persistent problems included trail erosion caused by heavy foot-traffic and confusion caused by trail closures and inconsistencies between trail guide maps and signs. In the 1980s and early 1990s the trails maintenance program benefited by being administratively separated from other park maintenance programs, and by the assistance provided by annual cooperative work crews from the Acadia Youth Conservation Corps (AYCC), Friends of Acadia, Appalachian Mountain Club (AMC), and Maine Conservation Corps. With a trail maintenance program endowment from Friends of Acadia donations and park funds, these treatment and maintenance guidelines will set standards for the trails program in the new millennium.

Existing —Trails Inventory and Field Documentation

Although trail documentation had been underway at the park since the mid-1980s in the form of trail feature inventories, photographic documentation of the MDI trail system's existing conditions for development of the Cultural Landscape Report began in 1997, with additional photo-documentation completed by the staff of the Acadia NP trails program in subsequent years. Many of these photographs are incorporated into the treatment plan. These investigations found that much of the original stone- and ironwork carried out by the village improvement societies and the CCC is still evident. Most wood construction, however, has decayed and been replaced once or several times. Most trails have been altered by high use, which has caused erosion of tread, widening, and the dislocation or loss of built features such as steps and coping stones. The CLR provides a brief summary of the existing conditions of built features and landscape characteristics; however, the best records are kept by the Acadia NP trails maintenance program. For each trail that is actively maintained, a computer database lists the location, number, type, and condition of built features on each trail. This inventory serves as the baseline information for work logs and field projects.

Of the 270 miles of historic trails included in the CLR, approximately 118 miles are currently marked and maintained by the park, while 107 miles within the park are no longer marked or are overlaid by roads. Some 15 miles of trails that extend beyond park boundaries are maintained by local village improvement societies, while 30 miles are no longer marked. The park's marked trail system extends over all major peaks on the island, along lake shores, streams, and the rocky coast. Trails range from flat shoreline paths to cliff climbs with rungs and ladders up nearly vertical faces, rising in elevation from sea level to 1,530 feet on the summit of Cadillac Mountain. Of the marked, maintained trails, 63 percent ascend mountains to ridgelines and summits, 29 percent lead walkers through the woods and along pond shores, and 8 percent are coastal trails. There are approximately 85 miles of marked trails on the east side of the island and approximately 30 miles on the west side. The most remote trails are on the north side of Western Mountain.

The park receives approximately three million visitors a year and most experience some part of the hiking trail system. In developing the *Hiking Trails Management Plan*, park planners classified the maintained trails according to difficulty and found 3 percent very easy, 15 percent easy, 52 percent moderate, 22 percent difficult, and 8 percent ladder trails with very steep inclines and sharp drop-offs. Certain trails receive the greatest use due to their proximity to parking areas such as on Cadillac Summit, scenic features such as Bass Harbor Head Light, and cultural centers such as Jordan Pond. The trails program estimates that 21 percent of the trails receive high use, 47 percent receive moderate use, and 32 percent receive low use.

Historical Significance of the Trail System—Nomination for the National Register

To develop appropriate treatment guidelines, an important step was to determine the historical significance of the trail system, particularly since it is the oldest and most extensive of the park's three historic circulation systems of trails, carriage roads, and motor roads. Understanding the significance of the trail system from a local, state, and national perspective involved a separate study as part of a multiple-property listing for the National Register of Historic Places. This study found the historic trail system of Acadia National Park eligible for the National Register as a historic district for its significance during the period of 1867–1942 in the areas of community planning and development, conservation, recreation, and landscape architecture. A nomination for the trail system was drafted in 1999.

The influence of the village improvement associations and societies (VIA/VIS) of Mount Desert Island is described in the context statement "Community Development and the Origins of Acadia National Park." In building the trails, the VIA/VIS groups made the scenic resources of Mount Desert Island accessible to residents and other recreational users. The system is also significant for the VIA/VIS construction and design style as described in the context of "Rustic Design—The Picturesque Style." The trails built by these civic organizations display superior craftsmanship in construction techniques that are indicative of the picturesque style, including the creative use of materials like stone for cairns, steps, ramps, bridges, walls, and drainage features; wood for bridges, signs, railings, benches, and structures; and iron for rungs, ladders, and bridges. Additionally, the trails evidence the careful selection of routes to provide access to natural features including interesting rock formations, water bodies, forested lowlands, and dramatic island vistas.

Additional significance for the system is described by the subtheme "Rustic Design in the National Park Service" for trail work accomplished during the New Deal federal and state work programs, including the Civilian Conservation Corps (CCC), Civil Works Administration (CWA), and Works Progress Administration (WPA). Through these programs, several trails were built or rebuilt, which exemplify the rustic design style popularized by NPS architects and landscape architects during this period. The paths increased accessibility for public enjoyment and were built to harmonize with the natural setting using local materials. The system reached its peak size in 1942 during the New Deal work.

Integrity of the Historic Trail System

Integrity is the ability of a historic resource to evoke its appearance from the historic period of significance. For the Acadia trail system, an evaluation of integrity was conducted as part of the National Register nomination described above for the historic period of 1867 to 1942. An understanding of the aspects of integrity inherent in Acadia's trail system is critical in the development of treatment and maintenance guidelines to ensure that historical significance is not diminished as a result of treatment actions. Seven qualities of integrity were evaluated, including location, design, setting, feeling, association, materials, and workmanship.

Location refers to the place where the trail system was constructed and the alignment of individual trails. Although many of the hiking trails on the island are still marked and maintained and retain their original route, the extent of the trail system and the number of trails marked and maintained has diminished since the historic period. The system was reduced, beginning in the 1940s, with the disuse and abandonment of trails outside the park that connected to island villages or individual residences, and in the 1950s, with the closure of trails in the park. A few trails or sections of trails have changed their route since the historic period. Reasons include the construction of motor roads, carriage roads, changes in water level due to beaver dams, and connections to new park facilities. In most cases the overall character and intent of the trail has been retained.

Design refers to the aesthetic choices made in the form, plan, and style of the trails network, the conscious layout of trail route, its winding or straight character, its width, its relationship to scenic, natural and cultural features, and the choice of materials and methods employed to construct the trails. As described earlier, the trails within the system are significant as examples of rustic design in the picturesque style carried out by the VIA/VIS and rustic design work by the NPS. Most of the original trail routes are still evident with some exceptions as described in the previous paragraph. Most scenic, natural, and cultural features that were part of the original trail design remain, such as lakes, summits, and rock formations, with the exception of cultural features like the Building of the Arts, Russian Tea House, Green Mountain House, Seaside Inn, and other hotels. Trail width has been altered in many places from the high volume of foot traffic and poor maintenance, but with rehabilitation work, improved maintenance, and/or the addition of certain trail features, foot traffic could be better contained.

Setting refers to the physical environment of the trail system. As initially conceived and constructed, the trail system allowed people to transcend on foot from the populated villages and busy wharf areas into the pristine wilderness in the heart of the island. The construction of the motor road system and carriage road system substantially dissected many natural areas, though much of this occurred during the historic period. More recently, heavy use of the trail system has changed the natural setting to one that is shared with many other people. The closure of many village connector trails altered the experience of transition from village to wilderness. Current work in progress to reestablish village connector trails and management strategies to disperse trail users will enhance the integrity of the trail system setting.

Feeling refers to the expression or historical sense of a particular period. The VIA/VIS constructed and named trails, then prepared maps, guidebooks, and signs to direct people to the natural wonders, historic sites, and cultural attractions of Mount Desert Island, such as Cadillac Cliffs, Sieur de Monts Spring, and the Jordan Pond House. Similarly, the CCC constructed trails to connect park facilities with scenic areas. Today the trails offer the same experience, or feeling, that they were originally designed to provide. One exception, however, is the use of automobiles. During the historic period, most visitors came to the island by boat or by train then boat and stayed for a week, month, or longer. The island was experienced largely on foot or by carriage. Today the island is accessed and traversed primarily by automobiles and most hiking experiences begin by parking at trailheads. Although the automobile has impacted the island in significant ways, the trails, natural attractions, and destinations remain relatively unaltered and retain their ability to evoke feelings traditionally associated with Acadia's system.

Materials are the elements and supplies used to construct the trails, including stone, iron, and wood. Much early stone work, from the turn-of-the-century VIA/VIS work to the 1930s CCC work, has survived intact. Stone steps, culverts, bridge abutments, coping stones, and stone-lined or terraced tread surfaces have endured with little or no maintenance in certain areas. Original stone cairns can still be found on many of the summit trails, especially those that are no longer marked and maintained. A large amount of ironwork, including ladders, rungs, railings, and retaining pins, still exists on many trails. Some iron has been added or replaced and is compatible with the historic material. Woodwork, including bridges, benches, and signs has required frequent replacement. With each replacement the style and method of construction has evolved with available technology. Perhaps the most notable change in the trails over the past hundred years is the condition of the tread. Due to high use, most trails are extremely compacted, and in some places the width has increased over time to as much as 10 feet. In eroded sections the trails continue to widen as hikers instinctively walk around rough spots and exposed roots. These have been exposed by the combination of foot-traffic, water, and soil erosion. Extracting gravel fill from nearby borrow pits, a practice used by the VIA/VIS groups and the NPS up until the 1970s, has not been done in the past two decades, although the *Trails Management Plan* allows limited reestablishment of this practice. For extensive rehabilitation, a mix composed of small aggregate gravel, similar to that used for the carriage road surface rehabilitation and compatible with the historic tread, is transported from off-island sources. When transporting gravel is not feasible, split log bridges or "bogwalks" are constructed to cover low areas in need of rehabilitation. The tremendous increase in use has posed the greatest threat to the historic materials and is the greatest challenge in developing appropriate treatment guidelines.

Workmanship refers to the physical evidence of the crafts of a particular period. In the process of developing treatment guidelines, park staff studied and documented the multiple styles of workmanship found on the trail system. With a forty-year period of peak trail construction, there were many hands involved in trail construction, including federal work crews and four VIA/VIS organizations. Notable differences in methods of construction, tools used, and durability are described in the histories and specifications for feature types. For example, the method of step building ranged from loosely stacked, uncut stones to carefully laid, cut, and pinned steps supported with coping stones. The higher level of workmanship has generally proved more durable. The highly crafted character of many trails is still evident, though in some cases years of heavy use and natural conditions have caused erosion of tread, slipping of stones, and decay of woodwork.

Association refers to the direct link between historic persons and events and the historic property. The trails built by the VIA/VIS groups were built in association with their respective villages of Bar Harbor, Northeast Harbor, Seal Harbor, and Southwest Harbor. The trails themselves, with associated structures and plaques, are physical evidence of the historic trail system and its builders and stewards. The integrity of the system has been diminished by natural conditions and the impacts of heavy use, which have resulted in loss of tread material, displacement of steps, dismantling of cairns, and loss of signs. The need for cyclic repair has resulted in new signs, repaired and resurfaced trails, and replacement bridges.

In conclusion, Acadia's trails retain a high level of integrity for their historical significance. As treatment and maintenance guidelines are followed, every effort should be made to retain or enhance these seven aspects of integrity. The last section of this introduction, which outlines the treatment approach and philosophy, contains a list of recommendations that will ensure historical integrity is preserved.

Historical Characteristics

The analysis carried out in the first volume of the CLR contains a description of broad categories of landscape features and qualities that are central to the character of the trail system as a whole. Characteristics include natural systems, spatial organization, land use, cultural traditions, circulation, topography, views, vegetation, structures, and small-scale features. For this volume of the CLR, additional analysis was given to individual trails to determine the most significant character-defining features that provide trails with individual character and contribute to the overall character of Acadia's trail system. This analysis has resulted in an emphasis on many small-scale character-defining features like drainage systems, crossing structures, and trail signage. However, the features discussed under the broader categories, like topography, vegetation, and views, are also addressed. The treatment guidelines identify appropriate methods and materials that will enhance rather than diminish all character-defining features that have been identified for the trail system.

HIKING TRAILS MANAGEMENT PLAN

A separate but closely related report is the *Hiking Trails Management Plan*, completed by the park in February 2002. This document sets the overall direction for managing trails and hiking in Acadia NP, with actions to be carried forth over the next twenty-five years. The plan establishes goals for protecting park resources and providing high-quality visitor experiences, identifies issues related to protecting these values, and describes the preferred management alternative. In early stages of the plan's development, four possible alternatives were considered for management of Acadia's trail system. The first alternative was no action; the second, rehabilitation with emphasis on protecting natural resources; the third and preferred alternative, rehabilitation to protect natural and cultural resources; and the fourth, rehabilitation with emphasis on protecting cultural resources. For each alternative, issues were examined, actions were prescribed, and environmental impacts were identified, leading to the selection of the preferred alternative. The following treatment issues are addressed primarily in the *Hiking Trails Management Plan*, although some are also discussed in this report.

- Size and configuration of the trails system
- Opening or closure of trails in large undeveloped areas
- Source of construction materials
- Beaver management in relation to flooded trail sections
- Vegetation management at vistas and along trail corridors
- Trail impacts on threatened and rare species, species of concern, and sensitive communities
- Trail disturbance to wildlife
- Trail and trail use impacts on water quality
- Trails with severe erosion
- Trails through wetlands
- Unauthorized abandoned trail maintenance and unauthorized new trail development
- Social trails
- Diversity of visitor experiences
- Providing trails for hikers with special needs
- Public transportation
- Connector trails
- Dogs on trails
- Helping visitors choose appropriate trails to hike
- Maps and information
- Educating visitors about history of the trail system
- Leave No Trace education
- Trail system sustainability

Additionally, several issues are addressed conceptually in the *Hiking Trails Management Plan* but are covered in more detail in this report. These include:

- Preserving the historic character of the trail system
- Level of rehabilitation or priorities for trail rehabilitation
- Trail names, signs, and markings
- Keeping hikers on trails by guidance, barriers, and ranger patrols

The list above highlights the complexity of decisions relating to the trail system. Ideally the *Hiking Trails Management Plan* and the treatment and maintenance guidelines presented in this report will work hand-in-hand to provide clear direction for all trail management and maintenance issues.

TREATMENT PHILOSOPHY AND APPROACH

The treatment guidelines that have been developed provide a long-term strategy for the care of Acadia's historic hiking trail system. They are intended to reinforce NPS tradition and its philosophical basis for the sound stewardship of cultural landscapes as outlined in "NPS 28: Cultural Resource Management" (1997) and *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (1996, hereafter *Secretary's Standards*). The management goals for the trails established by the *General Management Plan: Acadia National Park* (1992) and the *Hiking Trails Management Plan* provide the framework for the preparation of these treatment guidelines. Issues and treatment alternatives have been evaluated through a series of meetings with park staff, in consultation with the Maine State Historic Preservation Commission, and a working group of experts from several organizations. The process of recommending a historic preservation treatment approach included consideration of four possible alternatives: preservation, rehabilitation, restoration, and reconstruction. Rehabilitation was selected as the recommended treatment approach for the hiking trail system as justified below.

Treatment Alternatives Considered but Not Recommended

Preservation focuses on the maintenance and repair of existing historic materials and retention of a property's form as it has evolved over time. A preservation approach would prescribe the maintenance of trail features as they currently exist. It would allow for the replacement of existing features in kind, yet would not permit the addition of new features necessary for the increased use of the trails, such as the addition of more durable treadway on damaged woodland trails. A preservation strategy would lead to further degradation and unsafe conditions on many trails.

Restoration is undertaken to depict a property at a particular time in its history, while removing evidence of other periods. A restoration approach would require depiction of the trails to the period of significance of 1890–1942, defined in the draft National Register nomination. The implications of selecting a restoration treatment would require the obliteration of all trails built after this time, including several Mission 66 trails and the reopening of many trails that lead outside of the park onto private land. The goals set forth in the *General Management Plan* and *Hiking Trails Management Plan*—to create new connectors and loops, protect natural resources, and make the trail system sustainable—make the restoration approach inappropriate.

A **reconstruction** approach applied to the trail system would only be appropriate if the trails had been destroyed or if the pre-trail system landscape was determined so significant that its recreation was critical to the interpretive mission of the park. Reconstruction is a rarely selected treatment alternative and is not applicable to Acadia's trail system.

Justification for Treatment—Rehabilitation

Rehabilitation as an approach for the treatment of historic properties allows for compatible use of a cultural landscape through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, and architectural values. Rehabilitation acknowledges the need to meet continuing or changing uses through alterations or new additions while retaining the property's historic character. This treatment approach was deemed to be most appropriate due to the exponential increase in hikers, the need to provide safe, clearly marked trails, and the importance of protecting fragile natural resources. Rehabilitation is also the most consistent with the goals and direction of the *General Management Plan* and *Hiking Trails Management Plan.* The Maine State Historic Preservation Commission concurs that this is the preferred treatment approach for the trail system. The *Secretary's Standards* provides the following standards to apply to a rehabilitation strategy for the trail system.

- Each cultural landscape is recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features from other landscapes, are not undertaken.
- Changes to a cultural landscape that have acquired historic significance in their own right shall be retained and preserved.
- Deteriorated historic features are repaired rather than replaced. Where the severity of deterioration requires repair or replacement of a historic feature, the new feature matches the old in design, color, texture, and, where possible, materials. Repair or replacement of missing features is substantiated by documentary or physical evidence.
- Additions, alterations, or related construction do not destroy historic materials, features, and spatial relationships that characterize the cultural landscape.
- New work is differentiated from the old and is compatible with the historic materials, features, size, scale and proportion, and massing of the landscape.

GENERAL TREATMENT PRINCIPLES FOR THE TRAIL SYSTEM

The trail system on MDI has a history of expansion and reduction over time, but for more than a century there has been an underlying vision that the trails allow access to and enjoyment of the island's wonderful natural scenery. Before any modifications are made to the trails or to adjacent constructed features such as roads and buildings, changes should be carefully evaluated for their impact on nearby trails and the trail system.

The treatment and maintenance guidelines in this document are based on an understanding of the significance and integrity of the trail system and its character-defining features. However, once the repair strategy for individual sections of trails is determined, it is advisable to evaluate the overall or cumulative effect of these changes to ensure that both the trail section and trail system retain the features, materials, and feeling that define the significance of the system. The following is a list of general principles that, when adhered to, will enhance the character and integrity of the historic trail system.

- Preserve as much of the historic trail system as possible. Replace in-kind or rehabilitate historic features such as steps, bridges, walls, ladders, rungs, drainage, tread, markings, memorial plaques, and other historic trail features.
- Maintain historic names and trail routes, with their winding or straight character, where possible.
- Reroute trails only where necessary, and try to retain the character and design intent of the trail.
- Retain original trail width where possible and allow for rehabilitation work to guide and contain foot traffic on designated trails.
- Protect associated scenic, natural, and cultural features that are part of the attractions and destinations of the trail system, including rock formations, vegetation, water bodies, views, buildings, structures, developed areas, plaques, and monuments.
- Preserve the original choice of materials and methods used to construct the trails.
- Prevent further dissection of natural areas by new roads or trails to maintain the wilderness setting of the trail system.
- Preserve and rehabilitate village connector trails to preserve the feeling of hiking from a village into wilderness.
- Encourage public transportation to reduce automobile use and enhance the island experience.
- Use modern construction materials and methods that reduce material and labor costs and enhance durability where they are not visible or do not detract from the historical character.
- Use historic methods or contemporary methods that produce the same level and style of workmanship.
- Preserve association with the four villages – Bar Harbor, Northeast Harbor, Seal Harbor, and Southwest Harbor.
- Preserve association with park recreation areas and facilities.
- Preserve associated historic structures and objects, such as the memorial plaques.
- Protect associated archeological resources.

FORMAT FOR TREATMENT AND MAINTENANCE GUIDELINES

There are two major sections contained in this report. Section 1 includes ten chapters identifying and addressing feature types currently or historically present on the trail system, such as bridges, culverts, tread materials, and monuments. Each chapter contains definitions, historical information, specifications, and maintenance guidelines for the feature type. Section 2 addresses individual trails in the Acadia system. The trails' historical development, character, current use levels, and condition are discussed and used to develop recommendations for trail rehabilitation and identify appropriate features for use on the trail. The two sections are designed to work together as trail work is implemented. During early work planning, the individual trail documentation in Section 2 will recommend appropriate features for use on the trail, and as construction begins, information on feature specifications, actual building techniques, and maintenance concerns can be obtained from the detailed information in Section 1.

Research and planning for individual trails was still underway concurrent with the development of this report, and as a result all trails currently in the Acadia system were not included in Section 2 of this document. It was decided to include these five examples of individual trail documentation to illustrate how the planning process will work and how the individual feature information provided in Section 1 will be utilized as individual trails are evaluated and rehabilitated. It is anticipated that as trail planning continues, all trails within the park will be documented to the level of the five examples presented here.

SOURCES OF INFORMATION

The development of rehabilitation guidelines for Acadia's trails, consistent with the *Secretary's Standards*, is aided by several historic documents:

- The Annual Reports of the Path Committees of the Bar Harbor VIA, Northeast Harbor VIS, Seal Harbor VIS, and Southwest Harbor VIA contain reports on the construction, maintenance, and addition of features on individual trails. Within the Bar Harbor VIA 1906 report, Waldron Bates's "General Instructions for Work on the Paths" are particularly useful in understanding early trail features.

- Historic photographs from the Acadia NP archives; the National Archives in Waltham, Massachusetts, and College Park, Maryland; Bar Harbor Historical Society; and the Maine State Historic Preservation Commission in Augusta.

- CCC guidelines and reports including the three volumes of *Park and Recreation Structures*, edited by Albert H. Good in 1938; *Civilian Conservation Corps Field Training: Construction of Trails*, prepared by Guy Arthur in 1937; and *Standards for Trail Construction*, prepared by Chief Engineer Frank Kittredge in 1934.

- Trail maintenance guides produced by the Appalachian Mountain Club, Student Conservation Association, National Forest Service, and National Park Service.

Winding steps on the Beachcroft Path, a memorial path constructed in 1915, then rebuilt and endowed in 1926.

SECTION 1:

TRAIL FEATURE SPECIFICATIONS

SECTION 1: TRAIL FEATURE SPECIFICATIONS

Section 1 includes ten chapters providing detailed descriptions of types of trail features, including route, vegetation, treadway, drainage, crossings, retaining structures, steps, ironwork, guidance, and monuments and structures. The following information is provided for each feature type.

Definitions: The composition and function of each feature is defined, including distinctions between similar features. Definitions for all features are also consolidated in Appendix A.

Historical Use at Acadia: A brief history describes how, when, and sometimes why a feature was introduced to the island's trail system. Sources of information include documents, photographs, oral histories, and field examination. Trail construction techniques are summarized for the following eras:

- Pre-VIA/VIS (pre-1890)
- VIA/VIS (1890–1937)
- CCC (1933–42)
- NPS/Mission 66 (1943–66)
- NPS (1967–Present)

Historical Characteristics: A distillation of the essential characteristics of the features that contribute to the trail system's historical appearance is provided. Whether, and how, these characteristics should be preserved or rehabilitated is addressed in the sections that follow.

Treatment Issues: As part of this project, a working group, composed of park staff and experts from several organizations, evaluated trail features in the field to discuss what historical features define the character of individual trails; they also identified key issues relating to rehabilitation. These "treatment issues"—such as safety, vandalism, impacts related to high use, and resource protection—that affect the historic character, rehabilitation, and maintenance of trail features, are the crux of this treatment plan and lead directly into treatment guidelines and specifications.

Treatment Guidelines: Guidelines on how trail features should be rehabilitated are based on sensitivity to the historical characteristics of features balanced with current issues, constraints, and operational needs. For some features, such as stepping stones, the recommendations are straightforward—preserve the historic methods of construction and appearance. For others, new methods and materials are recommended while still maintaining the historic appearance. For example, the use of perforated-pipe subsurface drains instead of historic stone French drains is recommended. Although both types of drains absorb and redirect water from the treadway, the historic stone drains tend to clog and create maintenance problems. Some treatment recommendations are based on clear physical evidence and historical written and photographic documentation, such as the specifications for Bates-style cairns and signs. The construction of other features is more difficult to discern, such as the first use of steps in the trail system. In these cases, field analysis in the form of trail archeology has aided the development of specifications. Many treatment guidelines have been influenced by the relationship of increased trail use to the sustainability and maintenance of historic construction methods. For example, to ensure visitor safety, bridges constructed to be compatible with the VIA/VIS style of construction require the use of larger-diameter cedar railings and posts than were used historically.

Specifications for Rehabilitation Construction: Detailed specifications are provided for the size and type of materials, their placement, and related rehabilitation construction tools and techniques.

Routine Maintenance: For each feature, ongoing maintenance requirements are specified to ensure long-term preservation.

Fig. 1-1 The routes of many of the trails at Acadia were laid out to provide outstanding hiking experiences over varied terrain and allow the opportunity for magnificent views. Here, hikers in the 1940–50s enjoy the scenery and view along a currently abandoned route to the Bubbles.

CHAPTER 1:

ROUTE

CHAPTER 1: ROUTE

Some Acadia trails began as expedient routes to desired locations, while the design of others carefully led hikers along interesting routes through spectacular scenery. The characteristics of routes are described under two categories:

A. Alignment
B. Views

Early nineteenth-century trails, including many of those in the Acadia system, tended to have a direct, destination-oriented alignment, such as to a summit or shoreline. However, highly crafted VIA/VIS trails built in the late 1800s and early 1900s generally followed more interesting routes, leading to rock formations, attractive woodland areas, and views of distant island scenery (Fig. 1-1). Trails designed by the CCC maintained a similar focus, but also emphasized hiker comfort and trail sustainability, resulting in more evenly graded routes with switchbacks.

In some areas, views that were once open are now obscured by vegetation. Logging in the nineteenth century and the great fire in 1947 resulted in an open landscape. Although the CCC carried out some vista clearing and forest thinning, these practices are now discouraged to protect the island's natural resources.

Understanding the builder's intent in constructing the trail and selecting control points aids in maintaining the trail. Where trail sections are in poor condition, and rerouting is considered as a solution, an understanding of the original route and its control points is essential. In some cases, rerouting may be necessary as a temporary measure until a section of trail can be properly repaired. Rerouting may also be considered as a more permanent solution for some trails. In all cases, the location of the historic trail and all reroutes needs to be carefully documented.

A. ALIGNMENT

DEFINITIONS

The **alignment** of a trail refers to its placement on the landscape. When laying out a trail, a number of different alignments are possible between two points.

Significant locations along the trail are called **control points**. These may include stream crossings, summits, ridges, cliffs, passages, views, and/or significant vegetation. The ending points of a trail are called **destination points**. A **hub** is a central location at which a number of trails converge by design.

Trail alignment can generally be classified into two major categories. Alignments that proceed directly from one control point to another by the most expedient approach are called **direct alignments**. Trails that are engineered to follow a less direct path between control points are called **designed alignments**. Designed alignments are primarily used to preserve the structural integrity of the trail, achieve a desired trail aesthetic, or maintain a certain grade.

The alignment of Acadia's trails can be further subdivided into different route types. Although a trail may include several route types, the overall trail will usually be defined by a predominant type. A **ridge-line route** is a direct alignment following the top of a ridge, usually running from the base of a mountain to the summit. Nearly all north–south-running trails at Acadia are ridge-line routes, like the Cadillac Mountain North Ridge Trail (#34). A **fall-line route** is a direct alignment ascending straight up the fall line, the line representing the flow of water. Examples include the Pemetic Mountain Trail (#31) and the southern portion of the South Bubble Trail (#43). A **sidehill route** travels perpendicular to the fall line at some elevation along the side of a hill. This type of route is usually achieved by bench construction, such as the Pond Trail (#20), and may be either a direct or designed alignment. A **switchback route** is a designed alignment

Fig. 1-2 Streamside route on Maple Spring Trail (#58).

Fig. 1-3 The terminus of the Jordan Pond Carry Path (#38) at the north shore of Eagle Lake. This trail may have originally served as a portage route between water bodies.

made up of sections of sidehill route linked by reversals in direction in order to achieve a desired grade. A standard type of western construction, switchback routes can be found on most memorial and CCC trails including the Emery Path (#15) and the Beech Mountain South Ridge Trail (#109). A **varied woodland route** is a direct alignment traversing different kinds of terrain primarily through a wooded area, such as the Canada Cliffs Trail (#107), or along a spring or stream, such as the Maple Spring Trail (#58) (Fig. 1-2). A **lowland route** can be either a direct or designed alignment that follows the bottom of a contour, or traverses a low, flat, or water-side area. Examples include the Jesup Path (#14) and Jordan Pond Path (#39).

Each different route type is also associated with certain construction techniques. Fall-line routes are generally unconstructed, but may contain steps, checks, and cribbing. Sidehill and switchback routes have benching and retaining-wall construction. Lowland routes may include causeways and stepping stones.

Variations in alignment can also be described by how a trail responds to small-scale features in the landscape such as boulders or groups of trees. Alignments that are **small-gesture** tend to move around these features, resulting in many small direction changes on the trail. Many of these winding paths are unconstructed or minimally constructed, such as the South Bubble Trail (#43). However, small-gesture alignments are also used on some constructed trails, such as the Orange and Black Path (#348), primarily as an aesthetic choice.

Alignments that are **large-gesture** tend to maintain the integrity of longer stretches of straight lines or curves, or to maintain evenly spaced turns or switchbacks in spite of landscape features. Most highly constructed trails, such as the memorial paths, the Jordan Pond Path (#39), and the CCC trails, are large-gesture.

HISTORICAL USE AT ACADIA

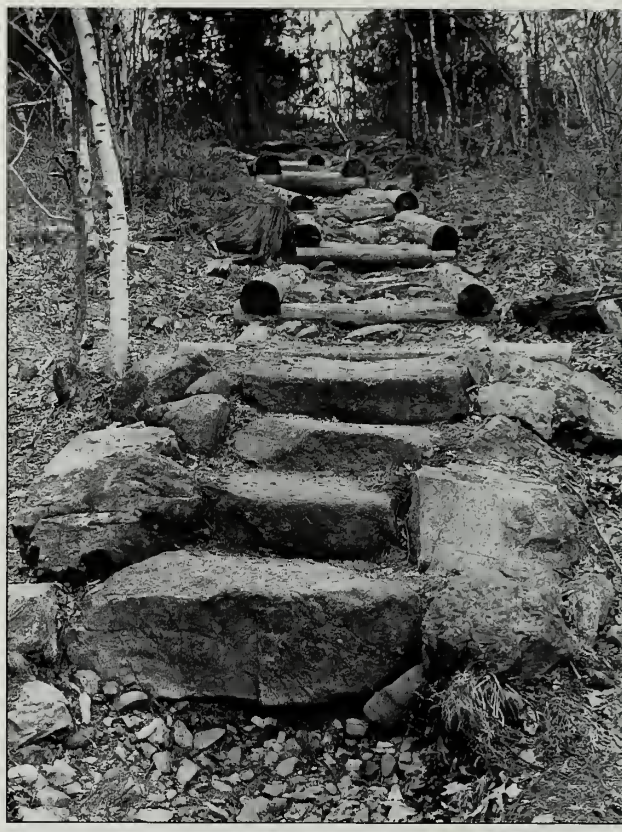
Pre-VIA/VIS

The earliest footpaths on the island, established by Native Americans, were primarily utilitarian in nature. Hunting, canoe portage, and seasonal migration routes traversed the landscape by the most direct, flat route, such as the Jordan Pond Carry Path (#38) (Fig. 1-3). With the arrival of Europeans, many of these paths were widened to become cart paths, and subsequently roads.

Olmsted Center, 6-97-13-6

Fig. 1-4 Part of the Valley Trail's (#116) origin as a cart path can be seen in its width and linear character.

For the most part, Europeans settled along the coast, relying heavily on fishing, lumbering, boatbuilding, and trade for their subsistence. Inland paths were necessary for lumbering and agriculture. These routes tended to be direct, traveling along natural benches, up moderate slopes and through saddles where the grades were reasonable for a cart. Although most of these routes are now roads, some remain as part of the trail system, including the eastern half of the Valley Trail (#116) which was originally an early cart path (Fig. 1-4).



Acadia Trails Crew, 4-99-15-3

Fig. 1-5 The Bear Brook Trail (#10) was an early route later stabilized with trail features like these stone and wooden crib steps.

Recreational travelers, artists, and writers that came to Mount Desert Island in the 1840s and 1850s were eager to ascend the mountains. They chose the most direct routes from their accommodations, mostly in Somesville and Eden [Bar Harbor]. They followed cart paths, livestock trails, drainage paths, animal paths, and scrambled across open ledges to reach the summits. Eventually, they established trodden routes and began marking them with piles of stones. The routes of the Bear Brook Trail (#10), the South Bubble Trail (#43), and the eastern half of the Beech Mountain Loop Trail (#113) are examples of early direct routes that were later stabilized and became maintained trails from the 1920s through the 1990s. Summit routes like these tended to be ridge-line or fall-line routes (Fig. 1-5).

When summer communities were established in the 1880s, most rusticators arrived by boat. Village paths and cross-island paths allowed people to walk between communities and to popular destinations such as along the shore and to the Jordan Pond House. The Shore Path (#301) in Bar Harbor, the Asticou Path (#49), and the Seaside Path (#401) were some of the earliest maintained paths, used by people of all walking abilities, in all types of dress. These routes were direct, being destination-oriented, used lowland or sidehill routes to maintain flat treadway and easy grades, with long straight and gently curved sections.

Village Improvement Associations/Societies

With the establishment of the Bar Harbor VIA in 1890, the Northeast Harbor VIS in 1897, the Seal Harbor VIS in 1900, and the Southwest Harbor VIA in 1914, the path committee chairmen and members became trail designers. Each society also hired path superintendents who oversaw construction and maintenance. Some devoted chairmen, such as Waldron Bates, may have served in all capacities. New paths were proposed, laid out, and constructed annually and described in the VIA/VIS reports. Trail descriptions offer insights into the control points selected in laying out the route. Early trails were relatively simple, with

Charlie Jacobi, Acadia NP, 5-99-59-6

Fig. 1-6 One of important features along the route of the Potholes to Eagles Crag Trail (#343) are these natural potholes in the ledge rock.

many traveling along natural benches, up saddles, and along ridges, such as the Bracken Path (#307), Black and White Path (#326), and Deer Brook Trail (#51). As interest in path construction grew, and the skills of path builders improved, new trails were built to lead walkers to views and interesting rock formations. For example, Waldron Bates laid out trails through rock slides, underneath overhangs, along cliffs, and near natural features. Examples include the Giant Slide Trail (#63), the Eagles Crag Loop (#27 and #343), and the Gorham/Cadillac Cliffs Trail (#5). These early Bar Harbor paths tended to be varied woodland or fall-line routes with small-gesture alignment that was responsive to the rugged landscape (Figs. 1-6 & 1-7).

The Dorr system of trails in Bar Harbor was the best funded of the VIA/VIS trails, especially as the practice of constructing trails in the memory of deceased loved ones came into vogue. These memorial trails, originating from a trail hub at Sieur de Monts, ushered in the highest level of construction to date. Highly crafted stone work allowed trails to follow alignments which had not been possible earlier and make the trails comfortably walkable for the clientele which had funded them. The classic Dorr alignments (Homans Path, #349, Kurt Diederich's Climb, #16, Emery Path, #15, and Beachcroft Path, #13) are large-gesture switchback routes through talus slopes and across cliffs. They required nearly continuous construction of stone steps, stone paving, retaining walls, and ironwork. As opposed to the earlier, direct routes to the summit,

Acadia NP Archives

Fig. 1-7 A group of early hikers enjoying the Cadillac Cliffs on the Cadillac Cliffs Trail (#5).

these designed alignments luxuriate in the ascent, take long, flat stretches through rock slides, switch back at stunning viewpoints, and reach for control points such as clefts in the rocks, overhangs, and waterfalls (Fig. 1-8). This was to become the standard of alignment and construction technique that later builders would struggle to duplicate.

Simultaneously, Rudolph Brunnow was aligning trails that also required extensive construction to achieve, but were substantially different from Dorr's alignments. Brunnow tended toward small-gesture alignments, taking many tight turns rather than sweeping moves through the landscape. None of Brunnow's alignments could be called switchbacks, though none are exactly direct either. Brunnow also was the first to take direct routes up vertical cliff faces, using iron rungs and ladders to ascend the Precipice Trail (#11) and Beehive Trail (#7).

Continuous trail construction created several trail hubs during the VIA/VIS period that provided easy trail access as well as gathering places for visitors of all types, not just trail users. Major hubs included Sieur de Monts Spring, the Building of the Arts, the Cadillac Mountain Summit, and the Jordan Pond House, the major hub of the Seal Harbor trail district.

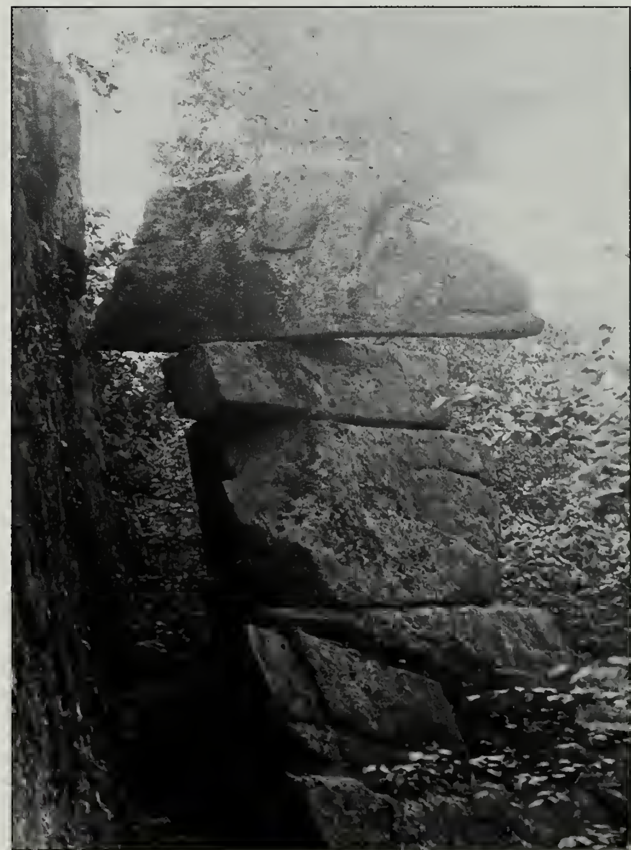
The signature alignment of Seal Harbor trails included large-gesture, lowland and sidehill routes. However, early in the period, many small-gesture, direct alignments were developed. Some of these required large-scale construction to be achieved, such as the Jordan Cliffs Trail (#48) and the Pemetic Mountain Goat Trail (#444).

As the period progressed, John Van Santvoord and Joseph Allen laid out trails along the coast, and accessing nearly every stream, hill, ridgeline, and interesting rock formation to provide Seal Harbor summer guests with various loops. Nearby rock formations serving as trail control points included Tilting Rock, the Day Mountain Caves, Bubble Rock , and Jordan Cliffs (Figs. 1-9 & 1-10). The Van Santvoord Trail, the only memorial path in the Seal Harbor district, follows an alignment that is a unique hybrid. Its woodland sections are varied woodland routes, while its steep, highly constructed areas are switchback staircases in the style of Dorr's memorial trails, which probably served as a model. At the end of the VIA/VIS period of trail construction, sidehill alignments over ledge that depended on pinned logs and ironwork were constructed on the Bubbles (Fig. 1-11).

As Acadia's trail network expanded, an increasing number of trails were without a specific destination other than to lead walkers through different areas and connect with existing trails. Examples include the Black Woods Trail (#440) and Day Mountain Caves to Pond Trail (#424). After the summer hotels closed

Olmsted Center, 8-00-s

Fig. 1-8 The route of the Homans Path (#349) takes the hiker through this unique rock formation.



Maine Historic Preservation Commission, Dana Family Collection ca.1900

Fig. 1-9 A control point along one of the early Seal Harbor VIS trails was Tilting Rock. This image shows the rock circa 1900. In 1922, the rock was toppled by vandals, but it was reset soon after by members of the Seal Harbor VIS.

in Seal Harbor, it is not surprising that many of these routes fell into disuse.

Northeast Harbor and Southwest Harbor alignments never achieved the sophistication represented on the Bar Harbor trails. They tended to be direct, small-gesture alignments of fall-line, ridge-line, varied woodland, and occasionally lowland route types. The Northeast Harbor VIS built many trails around Schoolhouse Ledge and to Eliot Mountain and Sargent Mountain to provide multiple loops. Routes followed ridgelines, streams, and natural benches below rock formations. Most are still marked and maintained by the Northeast Harbor VIS (Fig. 1-12). The Southwest Harbor VIA path system was the least developed. Many of the surviving routes are from earlier agricultural use, logging, and mid-1800s recreational trails. As a result, many of the trails are direct ascents.

Civilian Conservation Corps

Trail routes added by the CCC connected visitor use areas, such as parking, picnic, and swimming areas, with remote scenic locales, such as pond shores and mountain summits. Two major hubs were developed where hikers could park their cars and access a number of trails—the south end of Long Pond and the Beech Mountain parking area. As with all of their work, the CCC took an orderly and well-documented approach to aligning and constructing trails:

> Construction should not be started on a trail until the line has been flagged through to its destination (or to a definite control) and approved. This approval should be from all of the Branches which may have an interest in its construction. These branches will include the landscape architect who is in charge with utilizing the scenic features and blending the trail with the landscape; the engineer who is concerned with the problems of construction; the forester whose duties involve the protection and propagation of natural cover; the geologist who will assist in locating the trail so as to take advantage of geographic and geologic features and protect them from destruction; and the wildlife technician in whose care the zoological and botanical values are entrusted.

Acadia Trails Crew, 5-99-41-16

Fig. 1-10 The South Bubble Trail (#43) passes by Bubble Rock, giving hikers a close-up view of the natural formation.

Bar Harbor Historical Society

Fig. 1-11 The South Bubble Cliff Trail (#451) was a steep, sidehill alignment along ledge with pinned log supports.

Olmsted Center, 4-99-s

Fig. 1-12 The Asticou Hill to Little Harbor Brook Trail (#517) is a Northeast Harbor woodland trail that passes these ancient ocean-carved cliffs on its way from the summit of Eliot Mountain to Harbor Brook.

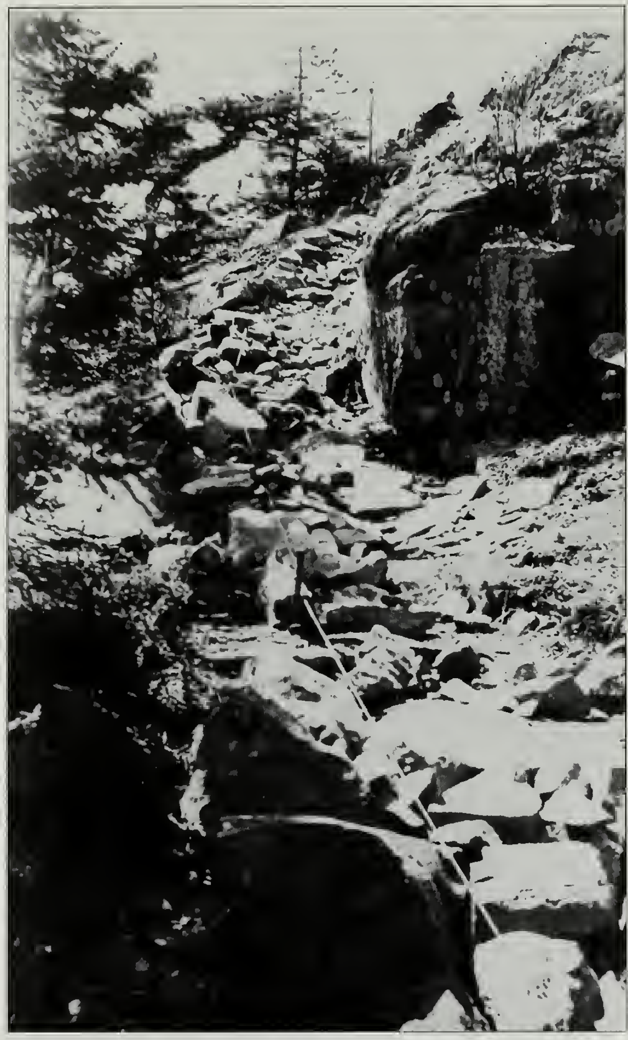


Fig. 1-13 The CCC used string to lay out the route and finished grade of their new trails, as shown at the construction of the Ocean Path (#3) at Otter Cliffs.

Fig. 1-14 Completed section of path shown in Fig. 1-13. The CCC emphasis on maintaining an even grade is evident in this newly completed section of the Ocean Path (#3) at Otter Cliffs.

Nearly all CCC trails at Acadia consist of sidehill alignments, with many containing switchback sections. Most of these trails were constructed as bench cuts in accordance with CCC guidelines. This allowed them to maintain a more consistent grade on trails like the Long Pond Trail (#118), Perpendicular Trail (#119), and much of the Ocean Path (#3) (Figs. 1-13 & 1-14). However, it is interesting to note that where the construction ends on trails such as Beech Mountain West Ridge Trail (#108), Long Pond Trail (#118), and Perpendicular Trail (#119), the alignment reverts to fall-line, otherwise avoided by the CCC. This is evidence that these trails were not intended to be left as they are today.

NPS/Mission 66

The few trails that were added during the Mission 66 period were built under guidelines similar to those issued during the CCC period. However, one of the goals of Mission 66 was to enhance visitor use and "enjoyment-without-impairment." During Mission 66, trails were added to give access to outstanding features, particularly for interpretive purposes. A new trail at Anemone Cave (#369) was one example.

> The interpretive development at Anemone Cave will be unique in showing through aquaria and other means some of the richly varied life of the sea. Elsewhere will be roadside signs and trailside signs and markers and self-guiding nature trails to make known and interpret features of interest and importance to Acadia's Story.

Mission 66 trails contained routes intended to meet the goals of increased access in interpretation. Examples include the Ship Harbor Nature Trail (#127) with its flat, wide trail corridor; the Anemone Cave Trail (#369) with its asphalt surfacing (Fig. 1-15); and the Beech Mountain Loop Trail (#113), a route over relatively easy grade that allowed access for equipment and supplies necessary to rebuild the Beech Mountain fire tower.

National Park Service

Since Mission 66, few new trail sections have been built in the park, and most of these have been reroutes of portions of existing trails. Of the new trails, all have been connectors to town, roads, or parking areas. The most significant new trail is the Great Meadow Loop, which incorporates sections of the abandoned Jesup Path (#14) and uses a similar lowland, direct, large-gesture alignment. The Western Mountain Connector (#616) is a newer multi-use trail on the western side of the island. It is a large-gesture trail that is largely outside park boundaries and follows a varied woodland route.

In the 1970s, a number of historic trail segments were rerouted as inexpensive solutions to problems such as beaver flooding, access to parking, downed trees, or trail disintegration. In most cases, these reroutes are small-gesture, unconstructed, varied woodland routes, and do not necessarily match the character of the trail segments they replaced. Reroutes tend to take the fall line and rarely make use of switchbacks. For instance, a reroute of the Gorge Path (#28) travels straight up and straight down a hill rather than take a more sustainable and more evenly graded sidehill route. In another case, the turn at the far northern section of the Long Pond Trail (#118) was short-cut due to continued wetness. A portion of historic causeway was abandoned and the reroute constructed with bogwalk. Similar reroutes were done on the Kane Path (#17), Andrew Murray Young Path (#25), the Cadillac Mountain North Ridge Trail (#34), and the Bowl Trail (#6) (in the 1990s). All of these reroutes abandoned historic stonework (causeway, stone paving, steps, stepping stones, respectively) in favor of varied woodland routes (Figs. 1-16 & 1-17). However, a 1994 reworking of a rerouted section of the Kane Path (#17) restored the trail's original character with the use of compatible stone pavement.

Additionally, two short sections of trail near intersections were rerouted in the 1970s in order to make intersections contiguous rather than offset: the Gorge Path (#28)/Cadillac–Dorr Trail (#22) intersection and the intersection of the trails at Birch Spring. Nevertheless, intersection work was not attempted park-wide and a number of offset intersections remain, especially in the Seal Harbor district.

NPS Harpers Ferry Center, JB-844

Fig. 1-15 The route of the Anemone Cave Trail (#369) provided access to the shoreline cave. Originally, the trail led directly to the cave, as shown here. However, this section has since been removed, leaving only the upper portion of the trail route from a parking area to the edge of the rocky coast. Mission 66 crews paved the trail with asphalt, thereby providing easier access for visitors and enhancing opportunities for interpretation of a significant natural feature in the park.

HISTORICAL CHARACTERISTICS OF ALIGNMENT
Pre-VIA/VIS (pre-1890)
Alignments were direct, using Native American paths, old cart paths, agricultural and lumbering paths, and open ledges. Routes through saddles between hills, direct ridge-line and fall-line routes were predominant.
VIA/VIS Period (1890–1937)
Many trails led to communities or hubs. Types of alignment varied greatly. Sidehill, switchback, and large-gesture alignments were introduced to constructed trails.
CCC Period (1933–42)
Alignments were predominantly large-gesture, sidehill routes, often with switchbacks. Some alignments reverted to direct, fall-line routes at the ends of constructed work. All trails led from parking areas.
NPS/Mission 66 Period (1943–66)
Alignments were easily accessible, relatively short, with an emphasis on interpretation and self-guided nature trails.
NPS Period (1967–Present)
Few new trail sections have been developed. Reroutes have been established for a number of reasons and generally used direct, fall-line, and varied woodland routes.

TREATMENT

1. Reroutes and/or Trail Closures

Issue: Several alignment types are vulnerable to adverse impacts causing a consistent need for trail maintenance or rehabilitation. Fall-line alignments have considerable erosion as water is following the same path disturbed by foot traffic. Lowland alignments often acquire standing or running water, depending on the trail grade, as well as exposed roots and eventually trail braiding as hikers seek higher ground. The use of historic alignments may also negatively impact adjacent natural resources, such as endangered or threatened species. However, the majority of these vulnerable routes are historic and a change in alignment may impact a trail's integrity. Rerouting trail sections with historic work may separate evidence of that work from the main trail and leave it inaccessible to hikers. Also, while trail construction techniques can solve many problems, often trails with vulnerable alignments have an unconstructed character as their defining feature, and the addition of constructed features may not be appropriate. When, if at all, should new alignments, reroutes of trail segments, or closure be recommended?

Treatment Guidelines: Since the alignment of a trail is a crucial part of its historic character, reroutes or closure of trail segments should be considered carefully, and other options should be exercised whenever possible. No reroute will be approved without the consent of Acadia resource management and the State Historic Preservation Office. The following factors should be evaluated prior to deciding to reroute.

Reroutes or trail closing may be considered if:

- Important natural resources, such as rare species or water quality, are severely threatened or currently being damaged by the use of the present route and a more sustainable route is identified.
- The present route is not maintainable and/or is subject to repeated damage from landslides, flooding, or other circumstances.
- The trail crews cannot practically get enough material to the site to rehabilitate the trail, such as in the case of very deep gullies or sunken treadway away from stone and soil sources.
- The trail is to be made accessible under ADA guidelines and the correct grade cannot be achieved on the present route.

Reroutes should be avoided if:

- A substantial amount of important, character-defining historic work exists on the route or segment in question.
- The current route is the only viable route to reach important historic control points
- The current route is the only viable route that does not threaten important natural resources.
- Any viable new route will eventually develop the same problems as the present route.

2. Offset Intersections and Trailheads

Issue: At some trail intersections, trail ends do not line up at opposite sides of the trail or road they cross. Trailheads are often located near, but not at, the parking areas intended for their use. This can cause hiker confusion, or parking in unwanted locations.

Treatment Guidelines: Offset intersections are a character-defining feature of some alignments, and should remain as a historic characteristic of these trails. Guidance features (signage, cairns, etc.) should be improved to alleviate hiker confusion. Reroutes, or the addition of short segments of trail to align intersections, should only be considered if there is an issue of hiker safety (such as at dangerous road crossings) or if a high volume of hikers are consistently getting lost and improved guidance does not alleviate the problem. More latitude can be given to rerouting trail ends to align with parking areas, but the criteria listed above for trail reroutes should be followed.

3. Beaver Dams

Issue: High water caused by beaver dams has flooded trail tread, made trails difficult or impossible to traverse, and obscured historic work. Beavers cannot always be moved, for logistical or legal reasons, and when beavers remain in an area, water levels often cannot be restored to pre-beaver levels.

Treatment Guidelines: The management of the beaver population is addressed in the *Hiking Trails Management Plan*, which states:

> When beavers impound water and threaten trails, the NPS will first attempt to manage water levels by installing fences around culverts and pipes through beaver dams. This work will be prescribed and supervised by the park wildlife biologist. If those efforts are not successful, further management actions such as rerouting the trail and adding structures such as boardwalks will be considered on a case by case basis; actions will also include an assessment of the cultural significance of the trail. Beavers will be moved to other areas if open habitat is available. Beavers will be euthanized only when other attempts have failed or are impractical and when the trail segment affected is a highly significant cultural resource. Before developing new trails or opening abandoned trails, the NPS will consider potential effects on beavers so that negative effects can be reduced or eliminated.

As discussed above, each case of beaver flooding should be examined independently to determine the best course of action for the affected resource.

There are several actions and considerations involved with removing the beaver and/or their dams. Interfering with beaver activity, including removal or relocation, may be prohibited by law in certain situations. Further, if existing beaver are removed, new beaver may simply move in to attractive areas, so a substantial commitment of resources needs to be made to keep any area "beaver free." Beaver "foolers" (pipes under a beaver dam allowing water to pass through) could be installed. This would result in a lower water level, and though this may also be regulated it will not work in all situations. Beavers can often find the end of the pipe and dam it up, resulting in the need for considerable maintenance of "foolers" by park staff. Another option is to wait for the beaver to leave the area and then destroy the dam. Most beaver dams are eventually abandoned; however, some sites are so attractive that they may not be abandoned in the foreseeable future. It is impossible to predict how long it will take beaver to leave a given site, and a solution is still necessary in the interim. The longer a beaver dam remains intact, the more that surrounding habitats adjust and therefore greater disruption to the environment may result if the dam is eventually removed. As stated above, euthanasia of the beavers would be the last resort if all other options are unsuccessful and the affected trail is of significant cultural value.

Mitigation efforts should also be performed on the trail itself, in conjunction with a selected method of beaver control. If efforts to lower the water level by beaver control are unsuccessful, the trail alignment may need to be altered. Depending on the significance of the trail, it could either be closed entirely or partially rerouted. The preferred procedure for a reroute would leave the existing trail route and historic features where they are and construct a new segment of trail above the high-water mark with compatible features. This will maintain the integrity of the historic trail, even though the original route will be underwater and not accessible to hikers. If the beaver population eventually moves and the water level recedes to previous levels, the original trail route should be reestablished and the rerouted section obliterated.

SPECIFICATIONS FOR ALIGNMENT

Once control points are identified, a number of general principles must be taken into account when choosing an alignment for a reroute.

1. Do not follow streams or lakesides closely.
2. Avoid wet areas.
3. Keep grade reasonable. A grade of less than 10 percent should be a target. Grades of greater than 20 percent should be rare, and will usually require extensive construction.
4. For drainage reasons and for maintenance of grade, avoid following the fall line; trail should angle across the fall line. This is less important if the trail is on ledge.

Acadia Trails Crew, 2001

Fig. 1-16 Historic stepping stones on abandoned segment of the Bowl Trail (#6) flooded by beaver activity.

Olmsted Center, 8-95-9-3A

Fig. 1-17 Reroute of flooded segment of the Bowl Trail (#6) shown in Fig. 1-16 located farther away from the edge of the pond. Bogwalk was installed to traverse wet, muddy areas. However, this feature is not in keeping with the historic stepping stones that are present on other sections of this trail.

5. Keep water crossings to a minimum. Cross watercourses high (where they are shallower) and use natural crossings if possible. Constructed crossings (bridges, etc.) should resemble those on the rest of the trail in character and placement.
6. If possible, locate the trail on ledge, or on the most inorganic, stable soils.
7. Generally choose long, climbing turns over switchbacks.
8. If switchbacks are to be used, avoid “stacking” switchbacks in many tight turns. Instead, gain grade with longer stretches of trail. Choose natural barriers, such as boulders, large trees, or thick vegetation to switchback around and accelerate the grade at the switchback to discourage hikers from taking off-trail shortcuts.
9. Entrances to abandoned portions of a trail should be obscured.
10. Historic work on an original alignment should be stabilized and left intact.
11. Eroded or disturbed sections of an old route should be checked if necessary and revegetated.

ROUTINE MAINTENANCE

Through annual inspections, the condition of sensitive natural and cultural resources and safety concerns should be monitored. Adverse conditions may require consideration of temporary or permanent closure or rerouting.

B. VIEWS

DEFINITIONS

A **view** is an expansive or panoramic prospect offered by a broad range of vision, which is naturally occurring or deliberately contrived. Views of island and ocean scenery are central to the layout and configuration of the trail system.

A **vista** is a controlled prospect of a discrete range of linear vision, which is deliberately contrived. Typically associated with constructed landscapes, one could argue that Acadia's trail system through expansive natural landscape scenery does not contain vistas. Several sections of highly crafted trail, however, were laid out deliberately through rock formations, to enhance one's experience of discrete natural features.

Maine Historic Preservation Commission

Fig. 1-18 1875 view from the summit of Flying Mountain (#105) looking south over Fernald Cove and Southwest Harbor.

HISTORICAL USE AT ACADIA

Pre-VIA/VIS

Spectacular views of mountain, ocean, and lake scenery have lured tourists to Mount Desert Island for centuries. In the early 1800s, artists from the Hudson River School captured dramatic views on canvas, which drew an increasing number of summer travelers to see and write about the island. In travel guides, engravings, and photographs produced in the 1860s and 1870s, views from the mountain summits and views of interesting rock formations along the coast were most often documented. During the 1800s, most of the island's lower hills and valleys were logged or used for agricultural purposes, creating open trails with distant views (Fig. 1-18).

Olmsted Center

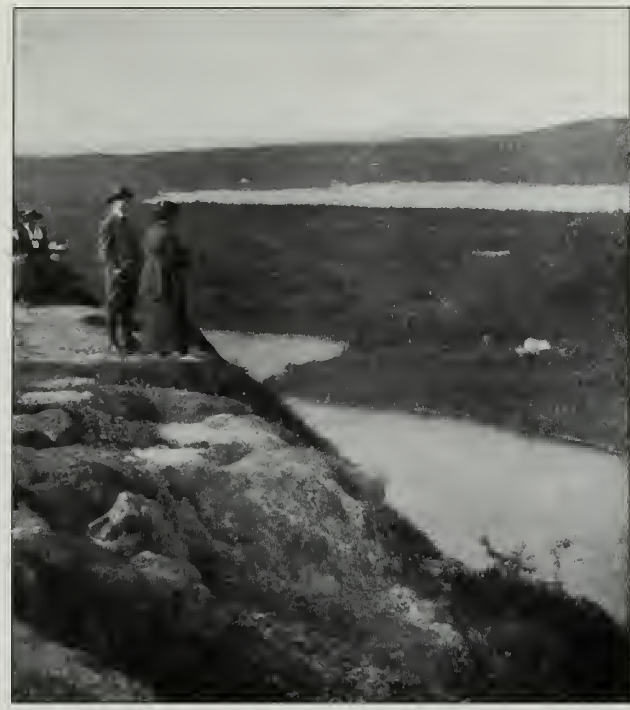
Fig. 1-19 This circa-1920 postcard shows the view from Huguenot Head into Otter Creek Gorge, on the Beachcroft Path (#13).

Village Improvement Associations/Societies

With the development of a marked and maintained path system, the VIA/VIS groups formalized a network of paths to led hikers to scenic views (Figs. 1-19 to 1-21). Though far beyond the villages, this work fit within their mission to "preserve and develop the natural beauties of the place, and to enhance their attractions, by such artificial arrangements as good taste and

Bar Harbor Historical Society

Fig. 1-20 Historic view south from Saint Sauveur Mountain (#102), circa 1920.



Bar Harbor Historical Society

Fig. 1-21 Historic view toward Somes Sound and Echo Lake from Beech Cliff, circa 1920.

HISTORICAL CHARACTERISTICS OF VIEWS
Pre-VIA/VIS (pre-1890)
Extensive logging and agriculture left open viewsheds that were both appreciated and documented by many artists and writers.
VIA/VIS Period (1890–1937)
Many trails were constructed to access scenic views and rock formations. Diminished logging, protection, and regrowth of woodlands obscured some viewsheds.
CCC Period (1933–42)
The CCC undertook extensive understory removal, or "woods cleaning," along trails to open up views. Outlook shelters were constructed at picnic areas.
NPS/Mission 66 Period (1943–66)
The fire of 1947 eliminates most woodland on eastern portion of island, opening expansive views and resulting in diminished maintenance of woodland trails and outlooks.
NPS Period (1967–Present)
Most of the park is wooded with views primarily from the summits. Development of adjacent lands has affected views park-wide.

science may suggest." The VIA/VIS path committees also became increasingly interested the island's geology. Trails to such places included the Potholes Path (#342), marked in 1896 and 1907; the path to Tilting Rock (#423), marked in 1901; and the Cadillac Cliffs Trail (#5), built in 1906. Waldron Bates, Bar Harbor VIA Path Committee chairman from 1900 to 1909, was particularly active in the construction of trails to view rock formations and water features. Following Bates, Rudolph Brunnow, who constructed the Orange and Black Path (#12/348) in 1913, and George Dorr, who constructed the Homans Path (#349) in 1916, selected routes that led through rock formations, with work accomplished by Andrew Liscomb, the superintendent of paths for the Bar Harbor VIA. By selecting a winding route, constructing steps through fissures, and placing arch stones, the trails contain a sequence of views and vistas, both natural and contrived. Statements by the path committee chairmen amplified the enthusiasm of path builders to construct over 250 miles of trails to and through scenic areas, such as by Frank Damrosch in 1911.

> There are still scores of beautiful views, and interesting trails, which should be made accessible to our summer residents, and these will be made available as rapidly as the funds at the disposal of the committee will permit.

In VIA/VIS path committee reports there is no documentation of intentional clearing of vegetation to create views. The trail system was built on private land, however, and was susceptible to logging. Some trails were temporarily obscured when tracts of land were logged. Although logging opened up views, the VIA/VIS, in alliance with the Hancock County Trustees of Public Reservations and the island's water companies, were opposed to the cutting of forests and sought protection for tracts of land for aesthetic and sanitary purposes. The shift from an island economy based on tourism rather than logging and agriculture resulted in the reforestation of much of the island, obscuring some viewsheds. With federal protection in 1916, the island's trail system became part of a national system of landscapes protected for spectacular scenery.

NPS Technical Information Center Files, Landscape Division, 1932

Fig. 1-22 This 1932 plan for the Cadillac Summit Loop Trail (#33) identifies specific lookout view spots along the trail route.

Civilian Conservation Corps

Further expansion of the trail system, under the direction of Park Superintendent George Dorr, took place in consultation with the NPS Landscape Division. Trails were added to the network that allowed an increasing number of motorists to enjoy scenic areas by relatively short hikes, such as the Cadillac Summit Loop Trail (#33), designed in 1932 and constructed in 1933. The CCC carried out additional construction between 1933 and 1942. Routes were laid out in advance on paper with designated outlook points (Fig. 1-22). The CCC also enhanced views into and through woodlands along the sides of trails by clearing brush, dead wood, and lower branches, such along the path around Lakewood (#309), near Anemone Cave (#369), and along the Ocean Path (#3) (Figs. 1-23 & 1-24). This practice would later be viewed as damaging to the landscape ecology. Also at this time, extensive clearing was done to create viewsheds from the carriage and motor roads and picnic areas. This type of clearing was not undertaken on the trail system, which became increasingly wooded.

NPS/Mission 66

Mission 66 trails focused on short trails over relatively easy hiking terrain through scenic areas, such as the Anemone Cave Trail (#369) and Ship Harbor Nature Trail (#127). Like earlier periods, vegetation clearing was emphasized for carriage and motor roads but not for hiking trails. The fire of 1947 dramatically opened up views on the eastern portion of the island, whereas the western side of the island became increasingly wooded. Views associated with the picnic areas on the western side of the island disappeared as the areas were seldom used and not maintained.

National Park Service

With limited logging for over a century, most trails at lower elevations travel through woods with limited views occurring only at rock slides and on ledges. Areas burned in the 1947 fire are now fully wooded with stands of birch and poplar. The park does not cut vegetation for trail views. Trails over ledges are very similar in character to when they were built, while mountains without summit ledges provide only limited

Acadia NP Archives

Fig. 1-23 The CCC used both coping and retaining walls along the stairs at the edge of the overlook at Otter Cliffs and on the Ocean Path (#3), view in 1937.

National Archives, Waltham, MA, 97-7-7

Fig. 1-24 The CCC often cleared vegetation from the trails to provide opportunities for observing surrounding views, as well done here on the Ocean Path (#3), circa 1937.

Olmsted Center, 8-95-8-0A

Fig. 1-25 View from the Precipice Trail (#11) toward Frenchman Bay in 1995.

views. Currently, there are some visual intrusions into the park's viewsheds, including the largely expanded Jackson Laboratory, several new homes along the coast, and a water treatment plant and dump in Southwest Harbor (Figs. 1-25 & 1-26).

TREATMENT

1. Maintaining Character

Issues: Many views, some of which were historically maintained, have been lost due to vegetation growth. However, identifying historic views is difficult, and maintaining them requires the cutting of vegetation off-trail, not currently an approved practice.

Treatment Guidelines: Current research indicates the number of identifiable historic views associated with the trail system is minimal. Possible historic views should be verified through one or more of the following methods:

1. Search written records, such as a reference in a guidebook, or personal accounts from the historic periods.
2. Locate built structures that may indicate a view spot, such as historic benches, constructed wide areas in the trail, or constructed overlooks (Emery Path, #15).
3. Locate extant historic signs identifying overlooks.
4. Examine historic photographs.

Once an historic view is identified, a decision must be made whether or not to restore the view by clearing vegetation if it has become overgrown. The *Hiking Trails Management Plan* allows for the cutting of some vegetation in order to maintain historic views or vistas. Resource management staff should evaluate the impact of vegetation removal and will participate in the decision to reestablish and maintain an historic view.

Fig. 1-26 View from the Bear Brook Trail (#10) with The Jackson Laboratory dominating the viewshed in 1999.

SPECIFICATIONS FOR VIEW MANAGEMENT

Resource management staff and, where appropriate, the park arborist, will be consulted for specifications on how vegetation is to be treated and managed in order to establish and/or maintain a view (see Chapter 2).

ROUTINE MAINTENANCE

Once a viewshed has been reestablished through vegetation removal, it should be monitored on a yearly basis for vegetation regrowth. A cyclic schedule of vegetation pruning and/or removal should be developed to ensure the view continues to be maintained (see Chapter 2).

ENDNOTES

1 Guy B. Arthur, *Civilian Conservation Corps Field Training: Construction of Trails* (1937), 2.

2 "Mission 66 for Acadia National Park," ca. 1956, Harpers Ferry, Box ACAD, B2.

3 According to law, rehabilitated trails will be built to accommodate persons with disabilities if practicable, and if such modifications do not significantly impact the historic or natural character of an area. In some cases, portions of trails designated to be ADA-accessible will need to be rerouted to avoid obstacles or achieve the proper grade. ADA-accessible trails, and trails rehabilitated to ADA standards, will be built according to current legislation.

4 *Hiking Trails Management Plan* (United States Department of the Interior, National Park Service, 2002), 23.

5 Bar Harbor VIA 1892 *Annual Report.*

6 Seal Harbor VIS 1911 *Annual Report.*

Fig. 2-1 This image of the Potholes Path (#342) shows two aspects of vegetation on Acadia's trails. First, vegetation groupings, like this stand of pitch pines, are an important characteristic of many of Acadia's trails. And second, there has been an increasing loss of summit vegetation on many of the trails, as shown here by the exposed ledgerock along the unmarked trail route.

CHAPTER 2:

VEGETATION

CHAPTER 2: VEGETATION

Acadia's trails provide access to the diverse coastal, woodland, and alpine flora of Mount Desert Island. Appreciation without degradation of trailside vegetation is critical to resource protection (Fig. 2-1).

The Champlain Society, formed in 1880, cultivated an appreciation of the island's flora. The village improvement societies perpetuated this tradition in the 1890s and early 1900s by publishing nature pamphlets, discouraging the removal of plants, and by establishing nature trails. During the 1930s, the CCC carried out extensive revegetation projects using native plants, grown from collected seeds in transplant nurseries. Through the NPS/Mission 66 program, nature trails and educational efforts emphasized an appreciation of the island's vegetation. These efforts are carried forth to the present by the park's botany and resource management program, which replants eroded areas, eradicates non-native invasive species, and protects rare species. Additionally, the interpretation division educates park visitors concerning the area's vegetation.

Rehabilitation efforts on the trail system should work hand-in-hand with natural resource management to ensure that the longstanding association between trails and vegetation can remain mutually beneficial, providing opportunities to experience both resources without degrading either of them.

DEFINITION

Vegetation is defined as the total plant cover of an area, such as a forest, marsh, or meadow. In general, vegetation contributes to the character of the trail system at Acadia through the natural placement of individual specimens or plant communities. Although species type may have some influence on the trail aesthetic, through the unique visual character inherent with certain plants, it is overall effect of the presence or absence of vegetation along the trails that is the greatest contributor to trail character.

HISTORICAL USE AT ACADIA

Pre-VIA/VIS

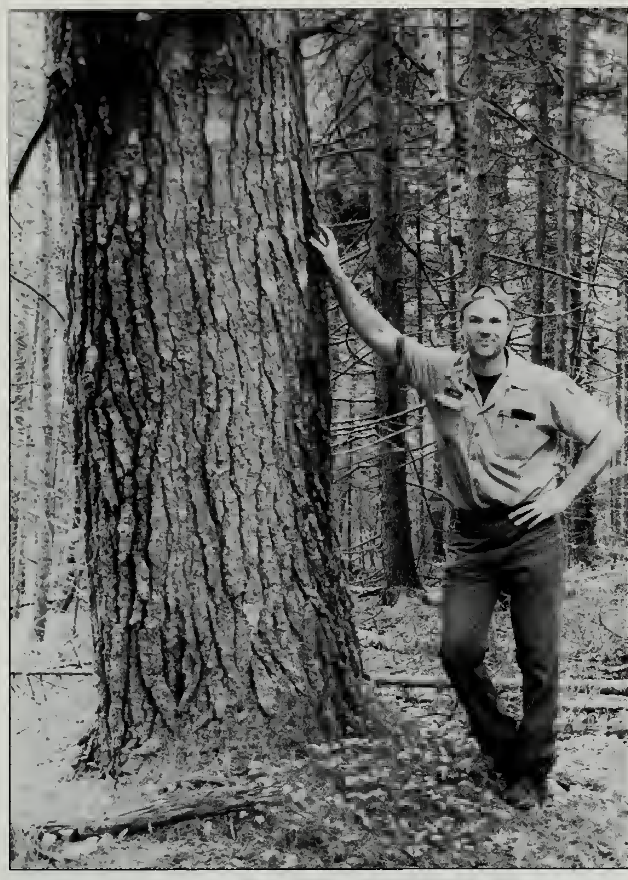
For early European settlers, the vegetation on Mount Desert Island represented a commodity. Lumber mills occupied most coves and, in combination with fishing and shipbuilding, helped sustain the island's resource-based economy. Yet by the late 1800s, the thriving tourism industry voiced their opinion for preservation of the natural woodlands.

When the Champlain Society was formed in 1880, members actively inventoried and appreciated the island's native flora. The Society's stated purpose was the "study of the natural history of Mount Desert Island to complete lists of flora and fauna as far as possible."[7] Edward Rand, then a Harvard University undergraduate, served as the director of botanical studies. Later, in 1894, Rand used his botany notes to coauthor a text with John Redfield entitled *Flora of Mount Desert Island, Maine.*

In his 1880 report for the Champlain Society, Rand wrote with great concern that summer residents were collecting many of the wild orchids and ferns for their properties. In 1900, when Rand became the first chairman of the Seal Harbor Village Improvement Society Path Committee, he directed the construction of some new trails. Yet by 1903, he considered the system so extensive that no more trails were necessary "unless to meet some real need."[8] Rand's successors did not share his opinion. After Rand resigned as chairman in 1907, many more miles of trails were constructed in the Seal Harbor path district. This dilemma of limited versus unlimited access to natural features and large contiguous habitats continues to the present day with the park's mandate to both protect resources and provide visitor enjoyment.

Village Improvement Associations/Societies

Two of the first trails cut and marked by the Bar Harbor VIA were the Royal Fern Path (#305) and Bracken Path (#307), reflecting the significance of vegetation



Acadia Trails Crew, 5-99-26-9

Fig. 2-2 Early routes often passed groves of significant trees or individual specimens like this large hemlock on the Valley Trail (#28), 1999.

National Archives, Watham MA, 97-3-9

Fig. 2-3 As shown in this 1930s photo of the Anemone Cave Trail (#369), the CCC practiced vegetation clearing of understory growth along many of their trails.

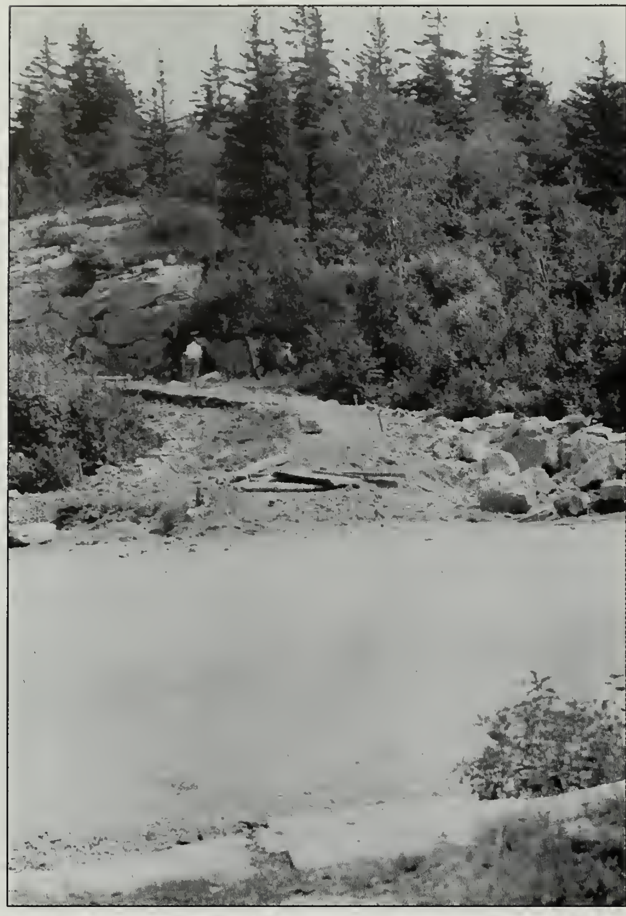
to the organization. Trails were routed to take visitors past interesting vegetation, particularly groves of large trees, such as on the Gorge Path (#28), actively used since the 1870s, and the Hemlock Trail (#23), marked by the Bar Harbor VIA in 1895 (Fig. 2-2). While there were several botanists who summered on the island, the 1915 and 1928 path guides contain very little information on notable plants, perhaps to prevent the harvesting or damage of the island's unique specimens. Other publications offered such information, however, such as *The Future of Mount Desert Island* prepared by Charles Eliot, which contained a map of notable plants and plant communities.

In 1929 the Seal Harbor VIS constructed the island's first self-guided trail, the Jordan Pond Nature Trail (#463), consisting of over seventy labeled native plants along a marked trail. The trail began at the Jordan Pond House and extended west over Jordan Stream, then south to the Asticou Trail (#49).

Civilian Conservation Corps

Forest stand "improvement," fire hazard reduction, and revegetation were a part of most CCC trail projects. To "improve" existing trails, stands of trees were thinned and pruned to open up views into the woods, nearby ponds, or distant valleys. This practice of woods cleaning involved removal of enormous amounts of understory vegetation, dead limbs, and ground logs (Fig. 2-3). To reduce fire hazards, most of the wood was burned in brush piles. While these forest management practices were deemed positive at the time, they were later viewed as highly disruptive to the landscape ecology of the area. It is also ironic that within ten years, the 1947 fire burned nearly a third of the forests on the eastern half of the island.

A separate CCC program involved the collection of native seeds and seedlings, which were planted or transplanted in three nurseries established near Kebo Mountain, Little Meadow Hill, and McFarland Hill.



National Archives, Watham MA

Fig. 2-4 **Trail on Cadillac Mountain in the 1930s before CCC seedling revegetation.**

National Archives, Watham MA

Fig. 2-5 **The same trail as Fig. 2-4 on Cadillac Mountain in the 1930s after CCC revegetation and some vegetation growth.**

Plants were then used to revegetate old road scars and abandoned quarries. Vegetation was also planted along new roads and trails. The CCC also covered recently constructed steps with moss and ferns to harmonize the new work with the surrounding landscape (Figs. 2-4 to 2-6).

NPS/Mission 66

With an emphasis on expanded visitor facilities during the Mission 66 era, there was less focus on large-scale vegetation clearing or planting than there had been during earlier periods. One exception was the eastern side of the island where the landscape was still recovering from the 1947 fire. Workers cut down thousands of scorched trees and left them lying on all the ledges of the burned area. These stumps and logs are still noticeable today. During the same period, the western side of the island was seldom visited and received little vegetative work. However, on the national level, the NPS implemented numerous programs to develop self-guided nature trails to educate visitors about local flora and fauna. At Acadia, the Ship Harbor Nature Trail (#127) was constructed as such a trail.

National Park Service

In the late 1990s, Acadia's resource management staff began to work closely with the trails program. The staff has assisted with revegetation projects and provided expertise for problem solving, plants to use, and successful planting methods. They perform site visits prior to project initiation to investigate whether rare or endangered species will be disturbed by trail work, monitor sites for invasive exotic species and treat as necessary, and remain available for consultation on future projects. At present, native plant species are grown in the park's in-house nursery and native seeds are provided for use along trails.

One of the most significant vegetation issues faced by the NPS is the trampling and loss of vegetation in summit areas. The dramatic loss of trailside vegetation, particularly in ledge areas, can be observed by comparing old and recent photographs (Figs. 2-7 & 2-8), or by walking along one of the lichen-covered trails that is no longer marked and maintained, but within park boundaries, such as the Potholes Path (#342) (see Fig. 2-1).

HISTORICAL CHARACTERISTICS OF VEGETATION
Pre-VIA/VIS (pre-1890)
Lumbering was part of the island economy until tourism industry objected. Rare flowering plants were plundered by summer residents.
VIA/VIS Period (1890–1937)
Paths were built through scenic woodlands, but specific plants were rarely mentioned in path guides.
CCC Period (1933–42)
The CCC removed understory vegetation for views and fire management and planted native trees and shrubs grown in CCC nurseries.
NPS/Mission 66 Period (1943–66)
There was an emphasis on appreciation and education about vegetation on self-guided nature trails.
NPS Period (1967–Present)
The park emphasizes the elimination of non-natives and performs minimal cutting to clear trail corridors and viewsheds. Loss of summit vegetation is a major concern.

Fig. 2-6 Photograph taken by the CCC in the 1930s showing how their crews planted mosses and ferns on these newly installed steps on the Perpendicular Trail (#119) to soften the new stone work and blend it with the surrounding landscape.

Fig. 2-7 This circa-1916 image of the Beachcroft Path (#13) shows the variety of vegetation along the trail, especially the low-growing summit vegetation, and a well-defined trail route.

Fig. 2-8 A 1999 photograph of the same section of the Beachcroft Path (#13) as Fig. 2-7 shows the dramatic loss of vegetation, particularly the summit vegetation impacted by the 1947 fire and widening trail corridor.

TREATMENT

1. Rare and Endangered Species

Issue: Many plant species within the park are considered rare within the state of Maine, although currently none are so rare as to merit federal protection. Most of these rare plants are found in three ecological communities that are considered sensitive to human disturbance: mountain summits, seashores and islands, and wetlands. The proximity of many of the park's trails to sensitive ecosystems could lead to adverse impacts on protected species.

Treatment Guidelines: As stated in the *Hiking Trails Management Plan*, "Preventing disturbance to park plants and animals, especially rare species and habitats, will be a major consideration in trail rehabilitation, maintenance, and use."[9]

Vegetation should be monitored regularly to determine the presence of rare or endangered vegetation on or near the trail system. If rare or endangered vegetation is found, trail closures and/or reroutes may be required to protect the remaining vegetation. Any decision in this regard should be made in cooperation between the park natural and cultural resource staff and will follow the guidelines established in the *Hiking Trails Management Plan* concerning the protection of rare species and habitats.

2. Trailside Vegetation Clearing

Issue: Periodic vegetation clearing along trails is needed to maintain the trail corridor and keep important viewsheds clear. However, trail corridors have often been cleared too wide in the past to maximize length of the clearing cycle. When areas are not cut often enough, growth is such that major clearing efforts are needed.

Treatment Guidelines: The *Hiking Trails Management Plan* provides general guidelines for trail clearing and for the rehabilitation of vistas, including limiting the width of clearing, addressing summit vegetation, and monitoring for exotic species.[10] Most trails will be cleared in a manner that matches historic standards. However, vegetation on trails built by the CCC would not be cleared as extensively as was done historically. Generally, trails should be cleared on a three-to-five-year cycle to provide an adequate corridor and a high-quality visitor experience. However, they should be cleared more often if necessary, on a schedule that encourages light pruning rather than heavy cutting efforts. Vistas will be researched and documented, and the cumulative effects of clearing will be considered before opening or maintaining vistas. Volunteers and new park service employees responsible for trail clearing will be provided hands-on training in proper clearing methods before undertaking trail clearing.

3. Trailside Revegetation

Issue: Revegetation is often needed for disturbed sites after trail rehabilitation. However, there is a chance non-native species may also be introduced to the disturbed area through imported construction materials.

Treatment Guidelines: Revegetation of disturbed sites will occur. If possible, imported soil and gravel would be treated to prevent introduction of non-native plants through seed. Sites will be monitored for exotic species, and treated using an integrated pest management approach.

SPECIFICATIONS FOR TRAIL CLEARING

1. Corridor Height

Trail corridors will be cleared high enough for a hiker to walk through without touching overhanging limbs and brush, approximately 8 feet above grade. Allowance must be made for brush and limbs weighted down with rain or snow, and for the increased height of a snow-covered tread.

2. Corridor Width

The width of the corridor will vary with terrain and vegetation type, and will be highly affected by visitor use. "Front country" trails such as the Ocean Path (#3) or Gorham Mountain Trail (#4) that are traveled by many visitors who are often unaccustomed to hiking, should be cleared wider than trails less easily accessed, such as the Great Notch Trail (#122) or Grandgent Trail (#66). Some trails, such as the Jordan Pond Path (#39) along the east shore, shall be cleared to the historical standard if it is known, in this case four feet wide. With no exceptions will trails be cleared in such a manner as to encourage further erosion caused by trail widening or braiding.

Generally, a V-shaped trail corridor is desirable. Cutting the trail at ankle height to no more than 18 inches wide, and at shoulder height to approximately 3 to 3 ½ feet wide, gives the corridor this narrow V shape. This allows hikers ample room, while channeling hikers and limiting trail widening.

3. Cutting

All workers should be trained in proper pruning techniques. Low shrubs and small trees will be cut flush to the ground for aesthetic and safety reasons. Stumps will be cut squarely, leaving no pointed edges. If tree tops or lateral branches need to be removed, the situation should be carefully evaluated, as removal of the whole tree may be the preferred option. The use of proper pruning techniques will avoid leaving stubs or sharp points on pruned trees and/or limbs, ensuring tree health and hiker safety. All branches and cut debris will be removed from the trail and scattered completely out of view of hikers. Brush should not be left in unsightly piles.

ROUTINE MAINTENANCE

All trails will be monitored yearly for clearing. As mentioned above, individual trails and trail sections will be cleared as needed, and all trails will be cleared on a cyclical basis, approximately every three to five years. Ongoing training should be provided for all new workers in corridor clearing, vegetation pruning, and debris removal techniques.

ENDNOTES

7 Edward L. Rand, *First Annual Report of the Champlain Society* (1880).

8 Seal Harbor VIS 1903 *Annual Report*.

9 *Hiking Trails Management Plan*, 23.

10 *Hiking Trails Management Plan*, 24.

Fig. 3-1 This circa-1916 photograph of a bench cut on the Beachcroft Path (#13) illustrates how the treadway enhances the overall trail character. Near the trailhead, the trail is highly crafted with almost continuous stone pavement along its sidehill route.
As it approaches Huguenot Head and winds through a grove of trees, the character changes to a woodland walk, emphasized by a treadway surfaced with pine needles and other organic material.

CHAPTER 3:

TREADWAY

A. BENCH CUTS

B. CAU SEWAY

C. GRAVEL TREAD

D. STONE PAVEMENT

E. UNCONSTRUCTED TREAD

CHAPTER 3: TREADWAY

On Acadia's trails, as with other hiking trails, construction of the actual treadway is central to the trail's durability and longevity in the landscape. A well-constructed tread also improves accessibility and ease of walking, while the aesthetics of the treadway, whether gravel, stone pavement, or unaltered soil, influence how the overall character of the trail is perceived by the trail user.

This chapter discusses five types of tread construction methods and materials that have been historically used at Acadia:

A. Bench Cuts
B. Causeway
C. Gravel Tread
D. Stone Pavement
E. Unconstructed Tread

Providing a solid, obstacle-free tread has been an integral part of Acadia trail construction since the formation of the VIA/VIS groups in the 1890s, when well-dressed society men and women were using the trail system to access the natural environment (Fig. 3-1). The high level of construction was perpetuated into the 1930s when the CCC adhered to rigorous standards for the careful preparation of trail subgrade and tread. Many trails that have withstood one hundred years of use still retain evidence of early tread work. Others, particularly where drainage is a problem, are in poor condition and have extensive erosion, loss of tread material, trail widening, and exposed roots. This section offers guidelines on the appropriate tread construction methods and materials needed to rehabilitate and maintain trails and prevent further degradation of the trail system.

A. BENCH CUTS

DEFINITIONS

A **bench cut** is a cross-slope treadway constructed by removing material from the slope to create a flattened surface.

A bench cut may be a full bench, a half bench, or a three-quarter bench (Fig. 3-2). These terms refer to how much of the treadway is placed in the cut area and how much of it is placed in the fill area on the downslope side of the trail. A **full bench** consists of the trail corridor fully placed in the cut area, while a **three-quarter bench** has three-quarters of the tread in the cut, and a **half bench** has half of the tread in the cut and half in the fill. Cut and fill areas are graded to the angle of repose or internal friction of a stable slope according to the composition of the material. In Acadia, since natural slopes were altered so long ago, it is often difficult to tell which kind of bench was used on historic trails.

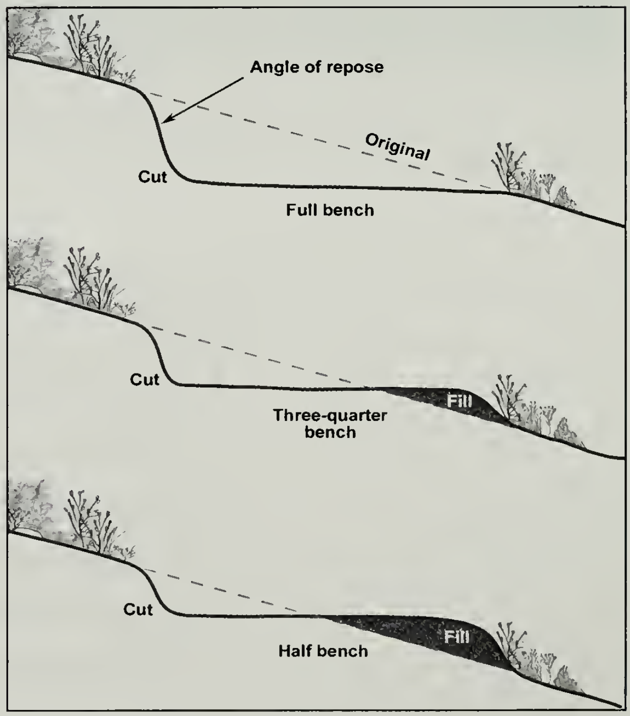


Fig. 3-2 Detail of types of bench cuts.

A bench cut may have other features associated with it, such as side drainage, cross drainage, or stone paving, a coping wall, or retaining walls on either the uphill, downhill, or both sides of the treadway. These features do not define types of benches, but they should be referenced separately when used in association with benches, and built or maintained according to the principles of their own construction.

The use of bench cuts is closely related to choice of route. Bench cuts are usually an integral part of a route following the basic rules of route layout (see Chapter 1)—cutting across rather than following the fall line, avoiding crossing the crests of ridges or the bottoms of gorges, and staying high or wide of wet areas. Ascending trails built according to these rules will use bench cuts and switchbacks. On the other hand, many of Acadia's trails go straight up the slope toward the summit, or follow drainage paths and ridges, and do not usually use bench cuts.

Bench cuts are a type of sidehill construction, but not all sidehill construction is defined as bench cut. Talus paving and pinned-log walkways are often sidehill benches but are not created by the removal of earth from a hill. Portions of woodland paths on which a trail has been trampled along the side of a hill do not usually leave a resultant "cut" in the earth substantial enough to be considered a constructed feature of any kind. Trail portions that follow natural benches, usually along the bases of hills and cliffs or along stream banks, are also not considered bench cuts.

HISTORICAL USE OF BENCH CUTS AT ACADIA

Pre-VIA/VIS

Prior to the VIA/VIS path work, many trail routes took advantage of natural benches, but there is no evidence or documentation of any constructed bench cuts.

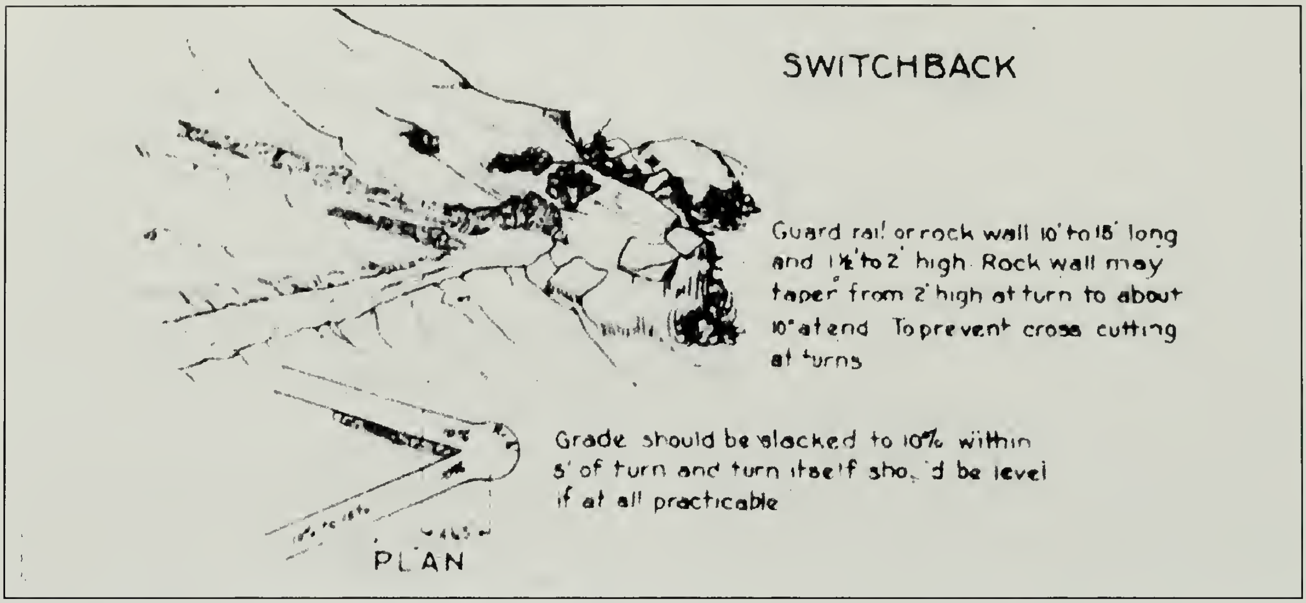
Village Improvement Associations/Societies

Most early VIA/VIS bench cuts were associated with trails which took a continuous cross-slope, neither gaining nor losing much grade. These trails include the Jordan Pond Carry (#38), the Pond Trail (#20), the Seaside Path (#401), and the Wild Gardens Path (#354). All of these trails use at least some sidewall, historic scree, and/or coping. Two Bates trails, the Eagle Crag Loop of the Cadillac Mountain South Ridge Trail (#27) and the Ladder Trail (#64), included constructed benches along climbing turns (not quite switchbacks), foreshadowing the trail construction to follow. Both of these trails were highly constructed and used retaining walls to support much of the benched treadway.

The highly crafted memorial trails built under the direction of George Dorr in the Sieur de Monts Spring area introduced switchbacks to the system and associated bench cuts. At this point, the delineation between bench cuts and talus pavement becomes confused, especially where benches have been paved with stones, and it is unclear how the bench was initially formed. Some bench cuts transition into and out of sections of talus pavement.

Nearly all the bench cuts used on highly crafted trails are retained with coping or retaining wall and surfaced with either gravel or stone pavement. For example, much of the Gurnee Path (#352) consists of long sections of bench retained with stone walls on the downslope side (Fig. 3-3). On sections of this bench work, drainage structures such as side drains and culverts are a part of the bench construction.

Fig. 3-3 This bench cut on the Gurnee Path (#352) is supported by stone retaining walls on the downslope side.



Arthur, Civilian Conservation Corps Construction of Trails, No 7, 1937

Fig. 3-4 CCC details for laying out a series of switchbacks on a bench-cut trail.

Acadia Trails Crew, 5-99-27-22

Fig. 3-5 A CCC bench cut with an outside retaining wall on the Valley Trail (#116). Note that the outslope is lost and the tread is wearing.

Civilian Conservation Corps

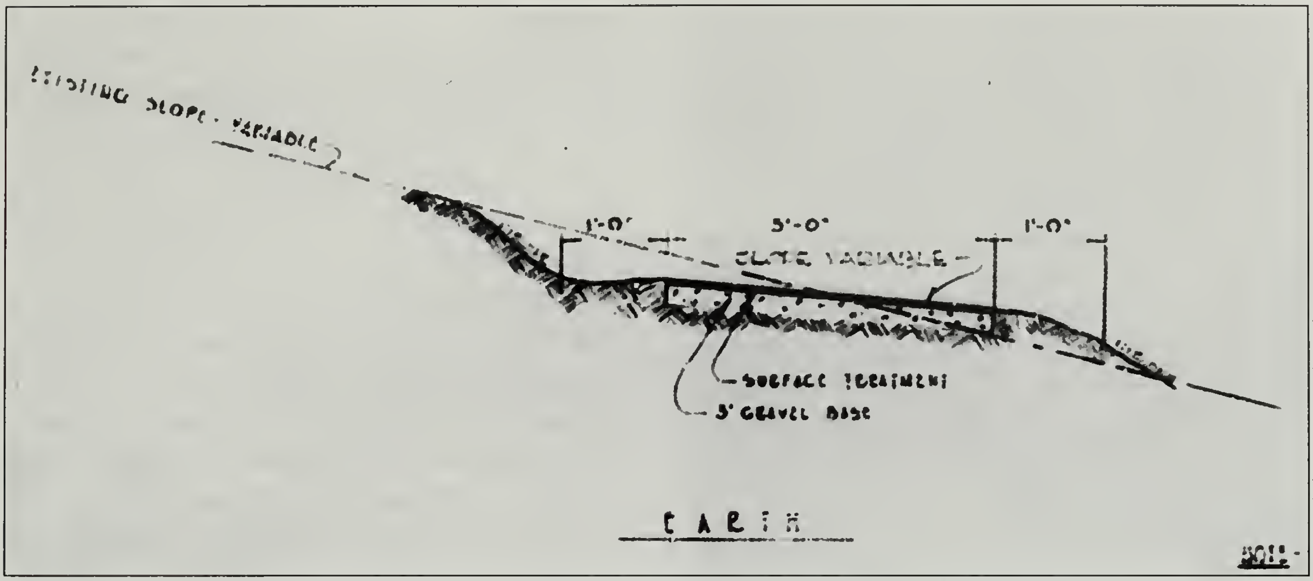
By design, a majority of the CCC mileage is sidehill construction, much of it consisting of bench cuts. The CCC introduced exacting standards for the construction of switchbacks and bench cuts. They constructed most of their benches with outside retaining wall and/or coping stones and paved the resultant treadway with gravel. The Perpendicular Trail (#119) and western half of Valley Trail (#116) are classic examples of this work. In addition, some sections of the Perpendicular Trail (#119) and the Beech Mountain West Ridge Trail (#108) are bench cuts with side drains and culverts (Figs. 3-4 & 3-5).

NPS/Mission 66

Mission 66 bench cuts were designed similar to those of the CCC, though a standard trail width of 5 feet required a larger bench. Since Mission 66 trails were predominantly in easily accessible, high-use areas, the extent of bench cuts made during this era is less apparent. Of the few bench cuts that were constructed, most included outside retaining wall and were surfaced with gravel or asphalt (Fig. 3-6).

National Park Service

Since the 1960s, when deciding upon the locations of reroutes and new trails, sidehill routes needing bench cuts have rarely been chosen. Consequently, very few



NPS Technical Information Center Files, Landscape Division

Fig. 3-6 This Mission 66–era cross-section of a bench cut design for the western half of the Beech Mountain Loop Trail (#113) shows a slight pitch on the trail with a side drain included on the uphill side.

sections of new bench cuts were created between the 1960s and 1990s. For instance, when the southern end of the Gorge Path (#28) was rerouted in 1974, the NPS chose a direct route that ascended and descended hills rather than going cross-slope and using bench cuts, which would have been much more durable.

While the associated features of old bench cuts, such as walls and side drains, have been sporadically maintained since the 1970s, only since the beginning of the latest rehabilitation efforts in the late 1990s has maintaining the shape and integrity of bench cuts themselves become a priority. As a result, many old bench cuts, such as on the Pond Trail (#20) and Valley Trail (#116), have eroded into gullies (Fig. 3-7). This situation often creates an outside berm, preventing proper drainage and trapping water on the trail.

HISTORICAL CHARACTERISTICS

The character of bench cuts used at Acadia has been relatively consistent throughout the historic periods.

Pre-VIA/VIS (pre-1890)

No evidence or documentation of bench cut use has been found.

VIA/VIS Period (1890–1937)

Bench cuts were often used to traverse moderate side-slopes. On highly crafted trails, carefully constructed bench cuts were used in switchback routes. Bench cuts were associated with retaining walls, coping walls, steps, side drains, culverts, and gravel and stone paving.

CCC Period (1933–42)

The CCC made extensive use of bench cuts in switchbacks and to traverse moderate to steep sidehills. Bench cuts were used with retaining walls, coping walls, steps, side drains, culverts, and gravel paving.

NPS/Mission 66 Period (1943–66)

A few bench cuts were used in short runs, usually with outside retaining wall.

NPS Period (1967–1997)

No new bench cuts were constructed. Maintenance of old bench cuts began in the 1990s

Fig. 3-7 Eroded bench on Valley Trail (#116).

TREATMENT

1. Maintaining Character

Issue: Adding bench cuts to some trails introduces a visible element of construction and may add a feature that is not historically compatible with the trail.

Treatment Guidelines: Bench cuts, and their accompanying features, are not historically appropriate for all trails and should not be overused. Bench cuts can be used on most VIA/VIS and CCC trails with a history of constructed features. Bench cuts can also be sporadically used on less-constructed trails, provided the bench cut is carefully blended into the trail and the use of stone walls or other constructed features is minimized. For example, benches on woodland trails should be subtle, provide a narrow trail tread, contain no or few retaining walls, and use the excavated material from the cut side of the bench as the trail surface.

2. Erosion

Issue: Bench cuts that are not maintained become eroded gullies as the outside berm traps water on the trail.

Treatment Guidelines: If constructed and maintained properly, bench cuts are the least intrusive way of building a durable tread on sidehill trails. They are preferable to the scars caused by trails that follow the fall line and the gullying and erosion of sidehill trails that are not properly benched or outsloped. Maintenance of bench cuts should be a priority, including establishing and maintaining the proper trail cross-slope and eliminating outside berms, to prevent trail erosion.

3. Natural Resources

Issue: Cutting roots to create bench cuts may endanger nearby trees and other vegetation.

Treatment Guidelines: The damage caused by cutting roots to create bench cuts is generally outweighed by the benefits of having a clear, non-eroding treadway that, in the long run, allows for healthy tree growth in the area. However, not all roots should be cut in the construction and maintenance of bench cuts. Roots judged essential to important trees should be left in place, and the route of the trail or height of the bench surface should be adjusted to accommodate them.

SPECIFICATIONS FOR BENCH CUTS

1. Type of Bench

A full bench is the most durable kind of bench cut and is the preferred type for use. As the slope of the hillside increases, the necessity of the trail tread being solid earth is greater, so that a half bench is acceptable on a 1:1 slope, a three-quarter bench on a 2:1 slope, and a full bench necessary on slopes of 3:1 or greater (Fig. 3-8). When the proper kind of bench for the slope cannot be constructed, retaining wall must be built to hold the material added to the slope to complete the trail width.

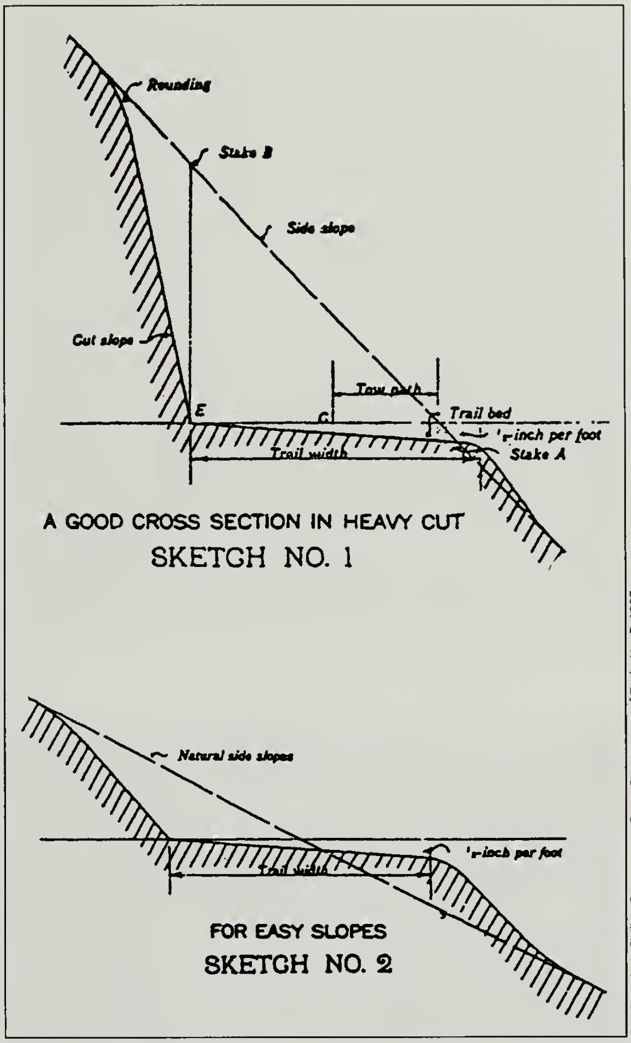
2. Construction of Bench

In the construction of a new bench, the route should be staked to delineate the two edges of the trail corridor. Bench width should be in keeping with the rest of the trail. The width for woodland trails ranges from 18 to 48 inches (Fig. 3-9).

In a full bench, none of the excavated material is used as trail tread. The material is used elsewhere. In half and three-quarter benches, the appropriate amount of excavated stone and soil is placed on the downhill side so that it creates the proper slope and is tamped until firm. Existing organic material on the trail is stockpiled, then is tamped and planted along the trail's outsloped edge. If no retaining wall is to be built, stones pulled from the hillside can be set along the outside of the new tread material in a random fashion for retention of the infill.

The bench tread should have an outslope of 1/2 inch per 1 foot. Where inside drainage is used, the trail may be crowned, outsloped, or insloped.

To prevent erosion, the bank on the uphill and downhill side of the treadway should be sloped to its angle of repose. This angle will vary, depending on the surrounding slope and the soil type, but the maximum slope is 1:1. Also, the outside edge of the treadway should be rounded over, rather than left as a sharp corner (Figs. 3-10 & 3-11).



Guy B. Arthur, Civilian Conservation Corps Construction of Trails, No. 7, 1937

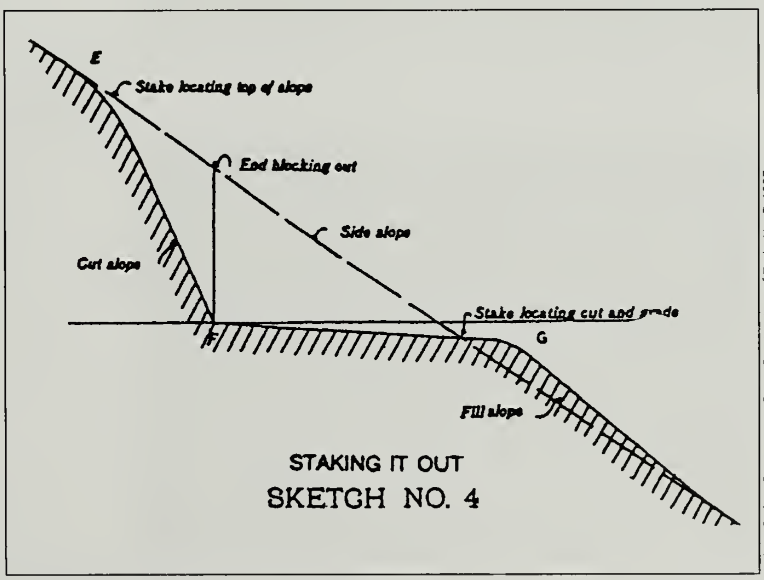
Fig. 3-8 CCC details for bench cuts illustrate the proper choice of bench type—full bench for steep slopes as shown in Sketch No. 1, and half or three-quarter bench for more gradual slopes as shown in Sketch No. 2.

3. Use of Retaining Wall

Outside retaining wall, which retains the treadway, is generally needed in the following situations:

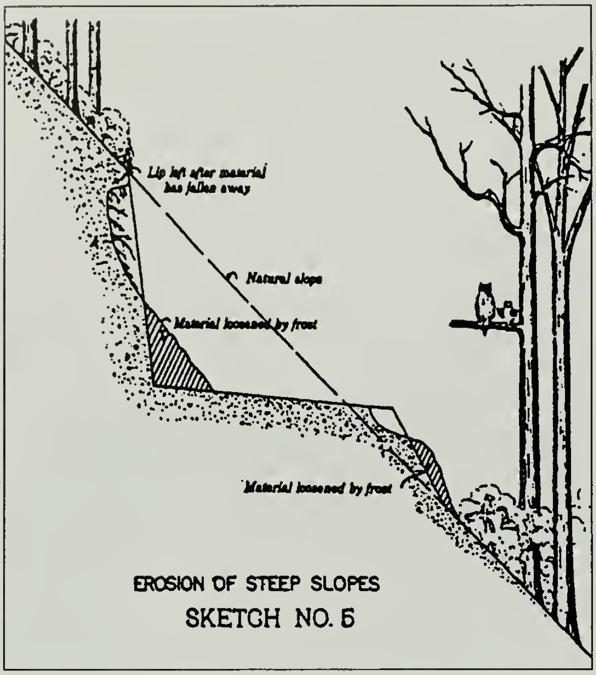
- when more fill material is used to widen a treadway than is appropriate for the slope, or
- when soil is particularly loose and an angle of repose cannot be achieved

Inside retaining wall, which retains the bank above the treadway, should be used when a sustainable angle of repose cannot be reached.



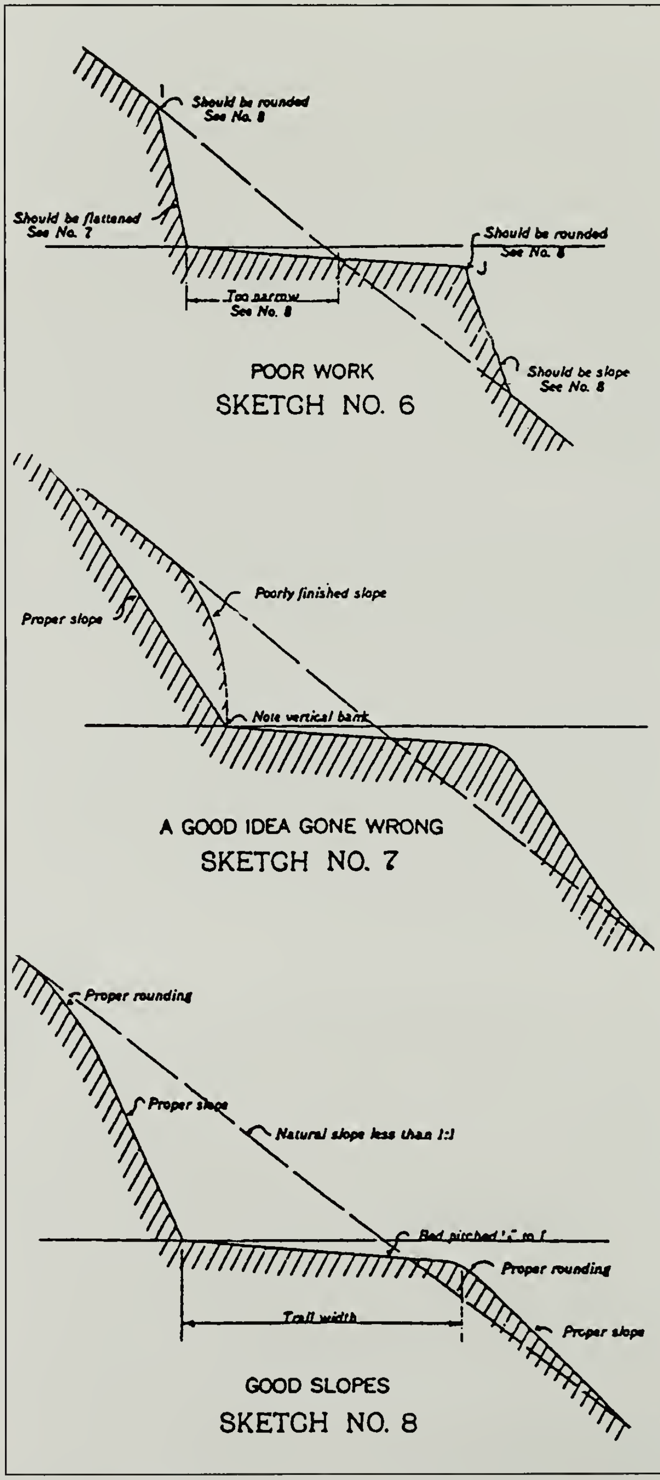
Arthur, Civilian Conservation Corps Construction of Trails, No. 7, 1937

Fig. 3-9 CCC details for staking a bench cut.



Arthur, Civilian Conservation Corps Construction of Trails, No. 7, 1937

Fig. 3-10 CCC detail of erosion on steep slopes.



Arthur, Civilian Conservation Corps Construction of Trails, No. 7, 1937

Fig. 3-11 CCC details for the correct way to finish the slopes adjacent to a bench cut.

ROUTINE MAINTENANCE

1. All bench cuts should be regularly regraded to maintain the outslope. Uphill material that has slumped into the treadway should be graded onto the treadway.
2. Any berm along the outside of the trail edge should be removed.
3. Collapsing banks on either side of the treadway should be regraded at shallower angles or, if this is not possible, retained with the proper kind of retaining wall.
4. All associated drainage, walls, and other structures should be maintained according to their specifications.

B. CAUSEWAY

DEFINITIONS

A **causeway** is a constructed earthen treadway raised above the level of the surrounding area. A causeway is commonly used to provide a durable, dry tread through a wet, swampy, or meadow area. A causeway is often referred to as "raised tread." Causeways are usually constructed in conjunction with cross-drainage features like culverts, subgrade drainage, or subsurface drains to facilitate water movement across the trail. Without drainage, a causeway can be an obstacle to the flow of water through the landscape and may permanently alter the landscape and local habitats.

A **walled causeway** is a raised gravel or soil treadway supported on both sides with retaining walls. This feature has been also called a turnpike. Single-tier retaining walls on the sides of walled causeways are called sidewalls (Fig. 3-12). Sidewalls may be set "toast" style—upright and on end, "cake" style—flat, or "header" style—sloping towards the center of the trail.

A **wall-less causeway** is a raised gravel or soil treadway, which is constructed without retaining walls. In a wall-less causeway, the subgrade edge sloped to its angle of repose serves the retaining function. The edge is often covered with soil and vegetation (Fig. 3-13).

A **stone causeway** is constructed primarily of stones and has an stone pavement, rather than graveled-over, surface (Fig. 3-14).

Log turnpiking is a causeway that consists of a series of gravel-filled log cribs laid continuously. Log turnpiking is not a historical feature at Acadia and is not a recommended treatment option for the Acadia trail system (Figs. 3-15 & 3-16).

Fig. 3-12 Historic walled causeway on the Birch Brook Trail (#429).

Fig. 3-13 The Jesup Path (#14), shown in circa 1916, was originally constructed with long sections of wall-less causeway.

Fig. 3-14 A stone causeway at the Jordan Pond Inlet on the Jordan Pond Path (#39).

Fig. 3-15 Prior to rehabilitation, the Jordan Pond Path (#39) contained many sections of log turnpiking. Fig. 3-16 shows this same segment with the addition of new walled causeway.

Fig. 3-16 Recently rehabilitated walled causeway on the Jordan Pond Path (#39) in section formerly treated with log turnpiking.

Fig. 3-17 This walled causeway on the Asticou Trail (#49) is still extant and in relatively good condition over one hundred years later.

HISTORICAL USE OF CAUSEWAYS AT ACADIA

Pre-VIA/VIS

Prior to the VIA/VIS path work there is no history of causeways in the Mount Desert Island (MDI) trail system. However, a number of raised roadbeds existed on the island, which may have served as models for the builders of causeways.

Village Improvement Associations/Societies

Beginning in the 1890s, VIA/VIS constructed trails with a stone rubble base and crowned gravel surface, creating the earliest versions of causeways at Acadia. This method was used for nearly all the "broad paths," including George Dorr's Bicycle Path (#331), the Red Path (Schooner Head Road Path, #362), and the Asticou Trail (#49) (Figs. 3-17 & 3-18). These trails aimed to provide an easy walking surface on long, direct routes, which naturally took them through much of the island's wet and boggy areas. The relatively flat routes allowed for the construction of walled and wall-less causeway.

The VIA/VIS used both walled and wall-less causeway, and combined them on several trails. This indicates that there was no single approach to the construction of causeway, even under the direction of a particular builder.

A typical VIA/VIS causeway is 3 to 4 feet wide, has a consistent height of 6 to 12 inches from surrounding grade, and is laid in straight or evenly curving routes. Most are lined at least partially with coping stones and incorporate either graveled-over stone culverts, such as on the Schooner Head Road Path (#362), or open stone culverts like on the Jordan Pond Path (#39). Frequent "borrow" pits, still visible along their routes, demonstrate the massive quantity of material needed for the construction of causeways. Historic photographs of the Jordan Pond Path (#39) attest to the high level of craftsmanship these trails achieved, providing an even, uniformly wide surface of gravel over a constructed treadway.

Several historic stone causeways are extant in the trail system, including a stream crossing on the Jordan Pond Carry Spur (#40) likely built in the 1960s and a small bit of raised stone paving on the Asticou Trail (#49). The most substantial stone causeway in the system originated in about 1896, when the Bar Harbor VIA placed stepping stones across an inlet on the east side of Jordan Pond where the water is 2 to 4 feet deep.

Acadia NP Archives

Fig. 3-18 Schooner Head Road Path (#362), shown here in circa 1916, also used wall-less causeway to traverse wet areas on the trail route.

Maine Historic Preservation Commission

Fig. 3-19 An early photograph of the Jordan Pond stone causeway, circa 1920. Note the small rocks, narrowness, and unevenness of the causeway, which would not well accommodate today's number of users.

Fig. 3-20 Circa-1934 photograph of a hiking party on Jordan Pond stone causeway that shows the popularity of the area. Refer to Fig. 3-14 for a 1997 view of the causeway after NPS reconstructed and widened it.

Improvements in the 1920s and 1930s by the VIA/VIS path committees and the CCC altered the character to that of a causeway, with a piled channel of stones and flat stones laid across its top. By 1984, this causeway had deteriorated and was reconstructed by NPS crews (Figs. 3-19 & 3-20). The reconstruction incorporated larger, squarer stones than were originally used in the causeway, resulting in a wider and flatter tread than previously existed.

Some VIA/VIS trails built in the 1910s took direct routes through large wetlands, notably in the Sieur de Monts area. The Jesup Path (#14) and Stratheden Path (#24) both contain thousands of linear feet of wall-less causeway directly through the Great Meadow and to The Tarn that are still extant. Considering the size and consistency of this wetland, these two paths must have required an unprecedented amount of material for their construction.

Civilian Conservation Corps

Like the VIA/VIS, the CCC moved extensive amounts of material to construct causeway trails in low-lying areas, including the Great Meadow Nature Trail (#365) and Long Pond Trail (#118). However, in other locations layout and design of CCC trails placed most routes in sidehill locations, avoiding low walks through boggy areas and only using causeway construction if truly needed. For instance, the majority of the Ocean Path (#3) is a walled bench sidehill construction, but in the few areas where it crosses lower, wetter ground, the CCC relied on wall-less causeway to keep the trail above the surrounding wet grade (Figs. 3-21 to 3-23).

Also, some of the lower portions of the CCC trails' steep ascents contain causeway. For instance, the section of the Beech Mountain West Ridge Trail (#108) built by the CCC contains a 1,500-foot stretch of causeway, most of it walled on both sides with graveled-over stone culverts. The Long Pond Trail (#118), mostly walled bench, contains hundreds of feet of walled and wall-less causeway on its boggy northern end, part of which has been rerouted and replaced with bogwalk.

CCC causeway is nearly identical to VIA/VIS causeway, with a continued preference for a 4-foot width. Apparently following the model of the early VIA/VIS builders, CCC crews opted for graveled-over stone culverts on nearly all their sections of causeway.

National Archives, Waltham, MA

Fig. 3-21 CCC-constructed causeway on the Great Meadow Nature Trail (#365), shown in 1930s.

National Archives, Waltham, MA

Fig. 3-22 CCC-constructed causeway on the Great/Long Pond Trail (#118), shown in 1930s.

National Archives, Waltham, MA

Fig. 3-23 CCC-constructed causeway on the Ocean Path (#3), shown in the 1930s.

NPS/Mission 66

While Mission 66 crews did a great deal of gravel surfacing, they built little causeway. It appears that only two short sections of wall-less causeway were built—portions of the Ship Harbor Nature Trail (#127) and the Anemone Cave Trail (#369). Both trails use steel pipe culverts, and the Anemone Cave Trail is surfaced with asphalt. Since the Mission 66 standard trail width was 5 feet, these causeways are wider than any of the preceding.

National Park Service

Between the CCC era and the late 1990s, very little causeway was built or repaired. During this period, a single causeway was completed by NPS crews in the early 1980s on a new trail connecting the Jordan Pond House to its overflow parking area. Gary Stellpflug remembers the construction as being "just mounded dirt" with no stone rubble subgrade, though this section of trail is still in good shape today. Also, as previously mentioned, the stone causeway near the southern end of the Jordan Pond Path (#39) was reconstructed in 1984 with modifications to stone size and overall width. Additionally, a new stone causeway was added to the Long Pond Trail (#118), near the southern end. However, this feature is out of character with this trail and should be removed (Fig. 3-24).

Fig. 3-24 This stone causeway on the Great/Long Pond Trail (#118) was constructed in 1993 by the NPS; however, it is out of character for this trail and should be replaced with walled or wall-less causeway.

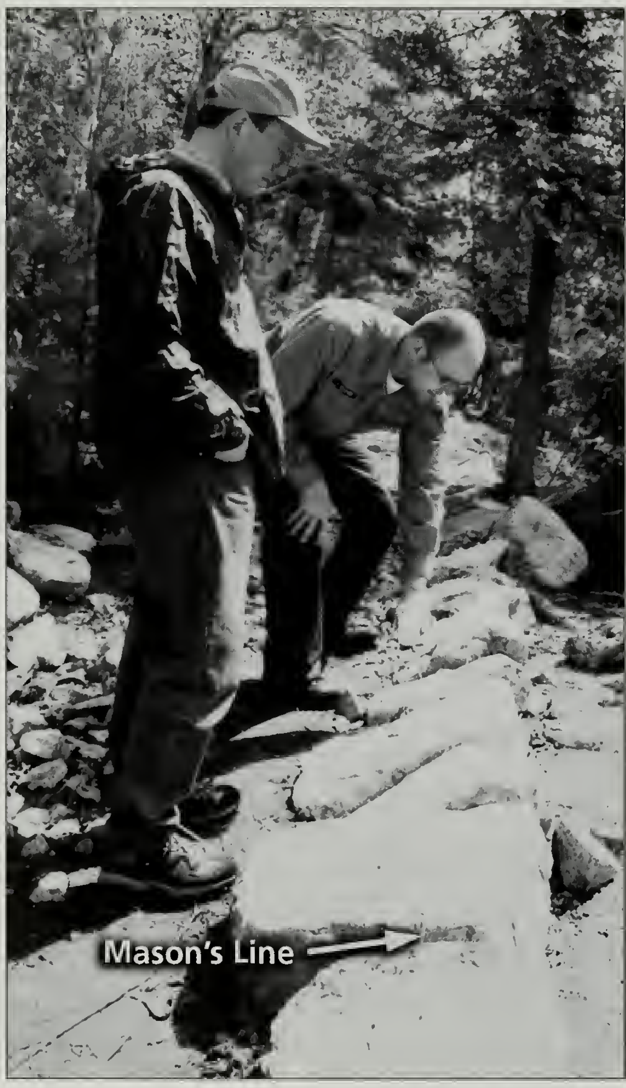


Fig. 3-25 Header-style coping stones on the Jordan Pond Path (#39). The mason's line indicates the anticipated fill level for the final tread surface.

Maintenance techniques for repairing eroded, collapsed, sunken, or flooded causeway centered on the addition of contemporary features, rather than reconstructing the original treadway. Stone boxes, log turnpiking, and bogwalks were built in many of these areas, while others were not repaired at all. For instance, the Long Pond Trail (#118) was repaired by building bogwalks over the top of a portion of flooded walled causeway; log turnpiking was introduced to the east side of the Jordan Pond Path (#39) and replaced eroded wall-less causeway on the Ocean Path (#3); and over 1,000 feet of sunken wall-less causeway on the Jesup Path (#14) was repaired with bogwalks. Additionally, old gravel pits used in the construction of causeways were reopened occasionally to obtain the material used for filling log cribs or turnpiking.

In 1998, in an effort to restore a completely obliterated trail, NPS crews began building walled causeway on the east side of the Jordan Pond Path (#39). During the first year of rehabilitation, crews imitated the style of walled causeway on the Asticou Trail (#49). Stones were laid in a single tier along the outside of the treadway, often "toast" style (set standing up). The stones were partially buried with the exposed side retaining the gravel tread. After a season, it was found that this works for large stones, stones set "cake" style (lying down), and those with more than half their height dug into the ground, but much of the other work began loosening, and some of it collapsed. On the advice of Dave Kari, an Acadia crew member who had built a number of walled causeways in Yosemite National Park, the style was altered slightly. Stones were laid "header" style (set vertically) , sloping in toward the center of the trail, with the length of the stone set into the trail and most of their volume buried by the trail surfacing (see "Specifications for Causeways"). In fact, the sidewall on the Schooner Head Road Path (#362) was later found to have been constructed in a like manner, with square paving blocks sloping in. The new Jordan Pond look is similar to extant sections of the old trail, with the occasional difference that some stones are less exposed. The old look was restored in large part by the use of a number of coping stones set completely outside the treadway (Fig. 3-25).

NPS crews have also recently rehabilitated wall-less causeway on the Ship Harbor Nature Trail (#127) and Jordan Pond Path (#39), and they have constructed new wall-less causeway on the Great Meadow Loop (#70). The use of jute mat to hold soil and vegetation on the sides of the causeway has made construction of this feature easier and more durable (Fig. 3-26).

TREATMENT FOR CAUSEWAYS

1. Maintaining Character

Issue: Causeways may not be appropriate for use on all historic trails. Although the VIA/VIS and CCC relied heavily on them, the addition of causeways to paths with little construction alters the trail's character by widening the trail corridor. A wider corridor may not be historically compatible with the trail and may result in the loss of trailside vegetation or the relocation of other natural features.

Acadia Trails Crew, 2002

Fig. 3-26 Wall-less causeway before gravel surfacing on the Jordan Pond Path (#39) in 2002. The sides are angled and revegetated to the grade line. Note the insloping culvert lintels between first and second grade stakes.

Treatment Guidelines: Extant causeways that are historically appropriate should be rehabilitated, repaired in kind, and extended as necessary. However, all work should be reviewed and approved by Acadia resource management staff (see #2, below). If the trail already

HISTORICAL CHARACTERISTICS OF CAUSEWAYS
Causeways have not changed much in character from their historic usage to the present. Minor alterations, such as the width increase during the Mission 66 era, may alter the character of individual trails slightly, but, overall, the character of causeways throughout the system has remained consistent.
Pre-VIA/VIS (pre-1890)
Roads were built with causeways; however, there is no evidence or documentation of causeway use on the earliest MDI trails.
VIA/VIS Period (1890–1937)
Extensive use of walled and wall-less causeway for long sections of gravel-surfaced paths in low or wet, flat areas. The prevailing width for causeways was 3 to 4 feet. Causeways incorporated subgrade drainage, pipe, open stone, graveled-over, and log culverts as drainage. Pits were used for quarrying material for causeways.
CCC Period (1933–42)
Bench construction was preferred where layout would allow, but walled and wall-less causeways were used on several lengthy runs of trail through low, flat, and boggy areas. Causeway width remained at 4 feet, and graveled-over bridges, pipe culverts, and subgrade drainage were used. There was a continued use of pits for material.
NPS/Mission 66 Period (1943–66)
Causeways were rarely used. The few that were built averaged 5 feet wide, were surfaced with gravel or asphalt, used steel pipe culverts for drainage, and relied on imported material for construction.
NPS Period (1967–1997)
There was little or no repair to existing causeways until the late 1990s. At this time, causeways were reintroduced or rehabilitated on appropriate historic trails and used in some new locations. Standards for construction followed the appropriate historical standards of those above, with a slight modification of stone placement on the sidewalls.

possesses a significant number of constructed features, a causeway should be the first choice for VIA/VIS and CCC trail sections needing to cross wet or boggy areas. Causeways should not be added to trails with a historically unconstructed, woodland character, and a narrow trail corridor, as other crossing features are more appropriate choices. Walled causeway should be used when it is important to maintain a narrow tread or when the walls are considered necessary to deter hikers from stepping off the trail, otherwise wall-less causeway should be used. The few stone causeways in the system should be rehabilitated as needed, but no new ones should be added.

2. Natural Resources and Drainage

Issue: Causeways can act as dams, disrupting the hydrology of the wetland by altering the natural motion of water and, perhaps, changing the overall ecosystem. The construction or rehabilitation of causeways is thought to pose risks to fragile wetland habitat in some cases.

Treatment Guidelines: Plans for rehabilitation, additions, or new causeway construction should be reviewed by Acadia resource management staff for approval. All work in currently identified wetlands, or potential wetlands, should satisfy state and federal law and adhere to NPS policy. Work in areas not designated as wetlands should be subject to in-park approval. Minor rehabilitation to extant causeway, where such work neither disturbs the surrounding area, nor causes additional blockage to the movement of water, may be accomplished without such approval at the discretion of park management. Priority should be given to maintaining the proper amount of water flow through a causeway. If there is a need for additional water flow, the appropriate historic drainage feature(s) like culverts and side drains should be used in conjunction with the causeway to achieve the desired rate of flow. If more water flow is required than can be achieved through the addition of drainage features, then sections of stepping stones, bridges, or bogwalk should be constructed between sections of causeway. If a causeway is disallowed altogether, appropriate crossing features should be used for the entire length of the affected area. Bogwalk may be considered if all other crossing features are deemed inappropriate. A trail reroute may also be considered.

3. Sidewall Durability

Issue: Many historic stones set along the outside wall of a causeway are vulnerable and may require frequent work to maintain the causeway's integrity. This is especially true for stones set toast-style.

Treatment Guidelines: In general, header-style sidewalls (see Figs. 3-25, 3-27) should be the preferred construction technique for repair of causeways, allowing for a durable construction with stones of a manageable size. However, when repairing or adding sections of causeway to trails where the extant historic style is substantially different visually from the header-style, compatibility with the original style is preferred while still maintaining the integrity of the new sidewall. Historic stones laid on the outside of the treadway that have collapsed should be reset or replaced with stones of sufficient size and of the correct shape so that a substantial portion of the stone is underground. The exposed portion of the stone should match extant work in stone size, color, and texture. New coping stones should be set completely outside the treadway at the trail edge with a frequency that matches the original trail (see Chapter 6 for coping stone specifications).

SPECIFICATIONS FOR CAUSEWAYS

Specifications are only provided for the construction of walled and wall-less causeways, as the introduction of new stone causeways to the trail system is not a recommended treatment option.

1. Walled Causeway (Fig. 3-27)

Layout: A specific route should be chosen that allows for straight or gently curving trail and requires no dramatic changes in elevation. Sufficient room should be provided on either side of the causeway for the movement of water into the drainages or away from the trail. Stakes are set in pairs outlining both sides of

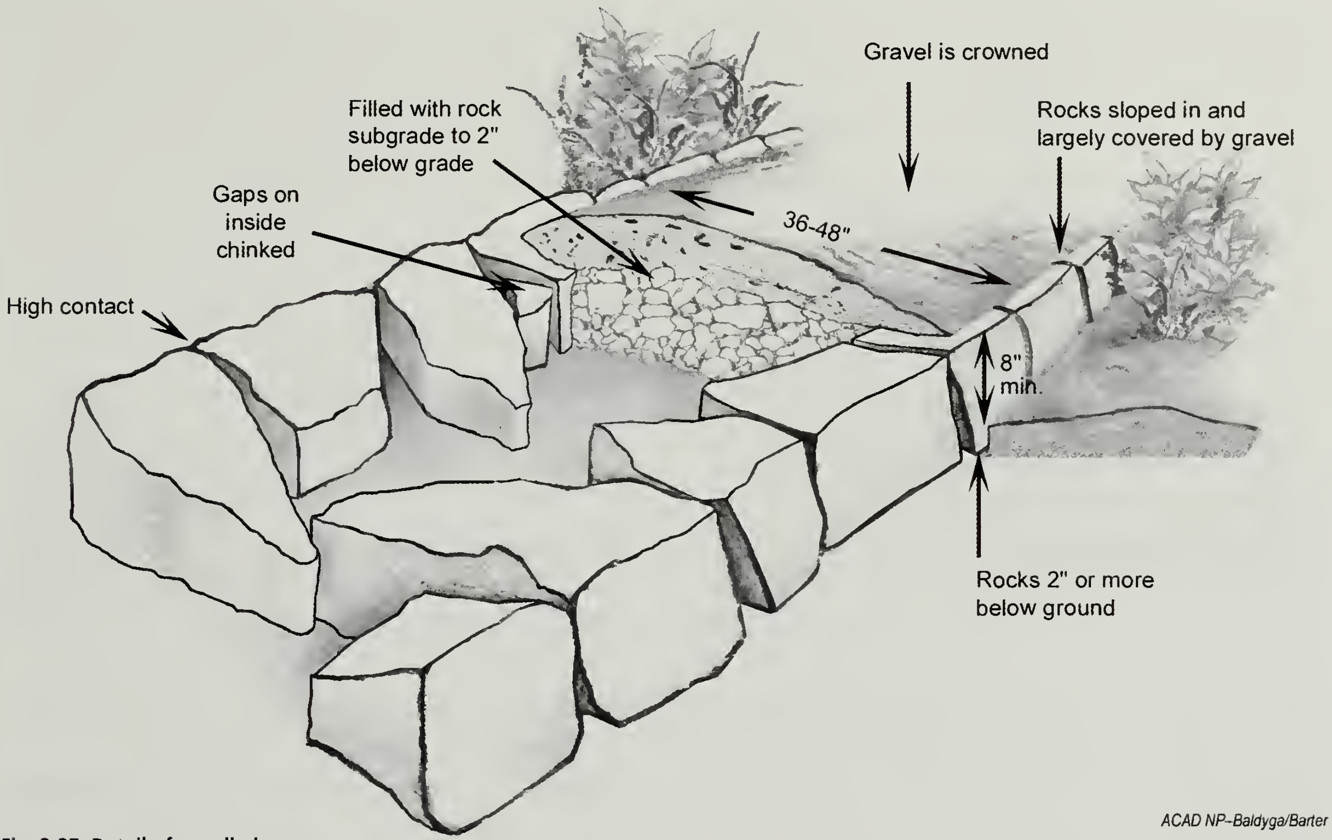


Fig. 3-27 Detail of a walled causeway.

the treadway. The corridor should be of appropriate width to accommodate foot traffic and conform to the standards of the trail. The line, which defines the height and width of the trail to the builders, is then attached to the stakes at the proper height above surrounding grade, gaining and losing elevation over the longest runs feasible. This height should be sufficient to accommodate anticipated drainage needs. Enough stakes should be used to maintain the shape of the curves; otherwise, finished wall will consist of discernible straight sections. During the building process, as a stake needs to be taken out in order to set stones, it should be replaced immediately with a stake not more than 2 feet away, so that the shape of the curve is not lost.

Excavation: All organic material should be removed from the trail corridor to a compacted base. Excavate wide enough to allow for the width of the treadway as well as the sidewalls. Wall stones and subgrade should be set in solid soil or on ledge.

Sidewalls: Sidewall stones for single-tier walls can be surprisingly small if they are of the right shape to be set properly. Stones must be at least 3 inches taller, in the manner in which they are to be set, than the height of the causeway (i.e., a 1-foot-high causeway requires a sidewall stone of at least 15 inches height). Ideal wall stones are rectangular or triangular, with a "flare" at what will be the top outside edge of the stone, to ease contact with abutting stones. Round stones should be avoided, unless they can be sufficiently shaped to allow for high contact. Stones with protrusions or other minor problems that will prevent high contact can often be shaped with a hammer or other stone tool. Large stones can often be split in half with hand tools or a stone drill, leaving a flat top and sharp edges for contact points.

All stones but the largest (those of at least two cubic feet in volume) will be set header-style, with the longest portion of the stone set into the trail, the next largest part set vertically, and the shortest dimension contributing to the length of the wall. This allows for the maximum amount of weight per length of trail, and makes the wall much stronger. Stones are set so that their tops touch the line near the outside edge of each stone but do not move the line up or in; some portion of the stone should always remain outside the line. In order to achieve this, and to "cradle" tread material between them, stones are set so that their tops slope in toward the center of the trail.

Sidewall stones must have contact with abutting stones at or above the height of the line. In some situations, a contact within 1 inch below the line is permissible. Once a point of high contact is achieved, contact elsewhere between abutting stones is not necessary, but gaps between them should be chinked. If more height is needed, the hole beneath the stone may be adjusted by adding crushed stone, but wall stones should never be set on crushed stone or shims that are exposed above the level of the surrounding ground or floor of side drainage, because these will slip out over time. When a row of sidewall stones has been set, remaining gaps between them should be packed with the largest stones possible. At this stage, wall stones should be sturdy enough to remain stable when hikers jump on them.

Treadway: The core between the sidewalls should be filled with stone to within 3 inches of the line height. Larger stones should be set first, then smaller and smaller stones should be broken in place to pack the core, and depress the overall level of the stone base to its settling point in the ground. This is the "subgrade" and will provide both a solid base for the treadway and drainage for seepage to travel under the treadway.

On historically graveled treadway, new gravel will be crushed stone as specified under "Gravel Tread" below. If gravel is an addition to a relatively unconstructed trail, it may be local bank-run gravel, or the specified manufactured gravel mixed with local gravel or soil. The gravel is laid over the crush base so that it meets the line at the outside edge, and is crowned 1/2 inch per foot of width in the center of the causeway after tamping (i.e., a 4-foot wide treadway will be crowned 2 inches). A vibrating tamper should be applied to the gravel surface to compact and harden the gravel. The finished surface should be smooth crown with no dips or dimples. Care should be taken not to apply too much gravel, as it will work its way over the edges of the walls, spilling onto the surrounding ground or into drainage channels.

Finished Dimensions: Finished walled causeway should be 6 to 7 feet wide, including walls, with a treadway width of 4 feet. A walled causeway should be at least 8 inches above surrounding grade at its edges and 10 inches above surrounding grade at the center of the tread.

2. Wall-less Causeway (Fig. 3-28)

Layout and Excavation: Wall-less causeway is laid out and excavated the same as walled causeway. However, the excavated area will be slightly wider, usually 6 to 9 feet. Without sidewalls to support the causeway, the stone rubble base will need to taper underneath the string line outside the treadway to its natural angle of repose; no steeper than 1:1 for crushed granite. Larger stones may be set along the outside of the rubble base to help retain it.

Berms: Two parallel berms are created by piling loam and soil along the outsides of the line, up to the height of the line, tapering to the ground at a 30 percent or shallower grade. Where possible, native sod or other vegetation should be planted in the soil. When sod is not available, loose soil can be held with jute mat, which will decompose as vegetation takes root in the soil and makes it "living wall."

Treadway: The resultant channel, between the berms on either side of the trail, on top of the rubble base, is filled with gravel (as specified in "Gravel Surface" section), which meets the line at the outside edges, and rises to a crown of 2 to 3 inches higher than the centerline of the trail.

Finished Dimensions: A finished wall-less causeway will be a total width of 6 to 10 feet to allow a finished tread width of 3 to 6 feet. The height of the crown of the causeway will be at least 12 inches above the surrounding grade.

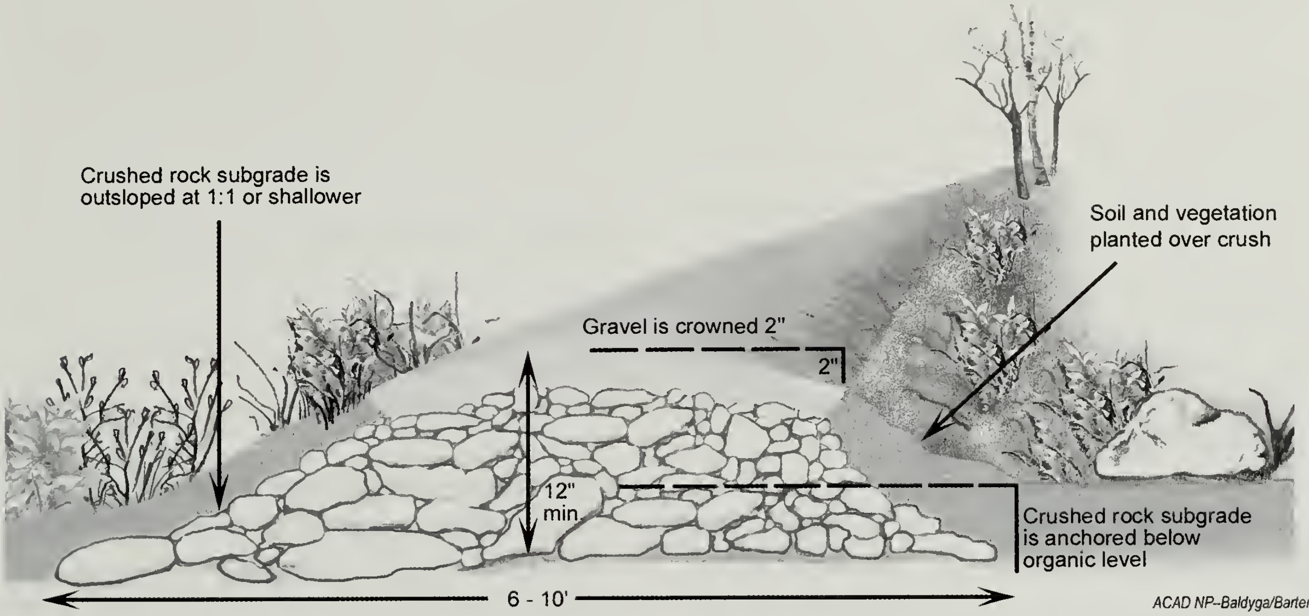


Fig. 3-28 Detail of a wall-less causeway.

ROUTINE MAINTENANCE

1. All associated drainage features should be checked annually and kept open and clear.
2. The cause of any lost gravel should be identified and remedied. Low contacts or loose stones should be fixed, plugged drains cleaned, and drains that cannot handle their loads should be replaced with sufficiently sized structures. Lost gravel should be recovered and put back on the trail surface.
3. Every year or more—depending on use, material used, and quality of construction—the crown should be reestablished by the addition of gravel, and any hollows that have developed in the treadway should be filled. The rehabilitated surface should be tamped with a vibrating tamper.
4. Vegetation growing in the treadway should be removed, and any organic material in the treadway should be replaced with gravel.
5. Collapsed or eroded berms at the edges of wall-less causeways should be reestablished with the addition of new soil and/or vegetation.

C. GRAVEL TREAD

DEFINITIONS

Gravel tread is any treadway surfaced with gravel. **Gravel** is an inorganic material consisting primarily of stones smaller than ¾ inch diameter. A surface aggregate of larger stone pieces is called **crushed rock** if it is crushed material, or **pea stone** if it consists of small, smooth pieces. The gravel used on Acadia's trails may be manufactured crushed material, or it may be **bank-run**—natural gravel made by streams or glaciers, quarried from streambeds (a practice no longer used at Acadia), from natural deposits, or from excavated pits.

Unconstructed trails that pass through gravel beds, or have eroded to a gravel sub-surface are not considered to have constructed gravel tread and are not discussed in this section.

Gravel tread is often installed in conjunction with other kinds of trail construction. It is a part of most causeway construction, much bench construction, some bridges and culverts, and is often supported by checks, coping stones, and retaining walls. Gravel tread may also be used by itself, as the surface of an otherwise unconstructed treadway.

HISTORICAL USE OF GRAVEL TREAD AT ACADIA

Pre-VIA/VIS

Prior to 1890, all trail tread was unconstructed and constructed gravel tread was not used.

Village Improvement Associations/Societies

In the VIA/VIS period, gravel tread was used extensively in the Bar Harbor and Seal Harbor districts, very little in Northeast Harbor, and not at all in Southwest Harbor. Nearly all highly crafted trails used gravel on all or portions of the treadway, and conversely, nearly all trails treated with gravel were highly crafted. Early in the period, the predominant use of gravel was on the smooth, graded or "broad" paths that used sidehill or lowland routes to travel between destinations. About half of these are in the Seal Harbor district, mostly radiating from the Jordan Pond House. Similar


National Archives, Waltham, MA, 97-2-4

Fig. 3-29 The CCC usually installed rubble base under their gravel tread, work in progress in the 1930s.

Bar Harbor broad paths include the Schooner Head Road Path (#362), the Wild Gardens Path (#354), and possibly the White Path (#329). Later, smooth, graded trails treated with gravel included the Jesup Path (#14), the Stratheden Path (#24), and the Gurnee Path (#352). Segments of these trails were constructed with benches, causeways, or retaining walls, while other segments simply had organic material excavated and a gravel tread added. In the early 1900s on memorial trails, gravel was used to surface flat sections of climbing trails, often in short runs between stone steps.

Gravel was natural and local, either bank-run or quarried gravel. Gravel pits are extant near many of the graded trails, often within 20 feet of the trail. These pits range from 3 or 4 feet in diameter, such as the smaller pits on the Jordan Pond Path (#39), to 20 or more feet long, such as a pit near the Schooner Head Road Path (#362) and Red Path (#328). Some trails, including as the Seal Harbor graded paths, have many pits near them, often within a hundred yards of each other.

The large number and volume of borrow pits located near these trails attest to the volume of gravel tread used. Many gravel-surfaced trails required constant resurfacing because the proper trail construction and drainage were not in place to maintain the tread, or if drains were present, they were not adequately maintained. Subsequently, the surface has been lost completely from many trails and they currently contain many exposed roots, are often rutted, and/or are consistently muddy during wet periods. In other cases, drainage patterns were altered by road construction uphill of a trail, resulting in washouts in places where drainage features were not needed at the time of the trail's original construction.

Civilian Conservation Corps

The CCC constructed miles of gravel tread. Opting for a continuous constructed surface, the CCC consistently applied gravel to any sections of trail that were not stone paved or stepped. The exceptions are the unconstructed portions of the Perpendicular Trail (#119), Long Pond Trail (#118), and Valley Cove section of the Flying Mountain Trail (#105), all of which appear to be unfinished segments and not part of the

National Archives, Waltham, MA, 97-2-5

Fig. 3-30 Newly installed CCC gravel, photograph showing completed work in the 1930s.

original trail's design. The CCC provided drainage, but again, it was insufficient and/or not maintained. While some CCC gravel tread has survived, most has washed away or been seriously eroded and has not been replaced. Gravel washouts have been extensive on the Long Pond Trail (#118), Beech Mountain South Ridge Trail (#109), and parts of the Ocean Path (#3). However, as opposed to many VIA/VIS trails, much of the CCC work contains a rubble stone base. In many cases, this base is still extant and only needs resurfacing and the maintenance or addition of drainage structures or checks (Figs. 3-29 & 3-30).

NPS/Mission 66

Mission 66 surfaced all trails with either gravel tread or asphalt. Due to poor construction and relatively few drainage structures, most of the gravel on Mission 66 trails has washed away.

National Park Service

In the NPS period, gravel tread was used sporadically as a technique for new construction, a method of rehabilitating historic graveled paths, and a stop-gap for repairing washouts on trails where its use is inappropriate. New construction using gravel tread include the Jordan Pond overflow parking lot trail in the 1970s and the Bass Harbor Head Light Trail (#129) in 1997 (Fig. 3-31). Rehabilitation of gravel tread was completed on the Ocean Path (#3) and Jordan Pond Path (#39). Stop-gap repairs using gravel tread were done on historically unconstructed sections of the Bowl Trail (#8) in 1994, but most of it has since eroded due to inappropriate construction.

Olmsted Center, 5-99-6-16

Fig. 3-31 New gravel tread was installed by the NPS on the rehabilitated Bass Harbor Head Light Trail (#129) in 1997.

HISTORICAL CHARACTERISTICS OF GRAVEL TREAD
Pre-VIA/VIS (pre-1890)
There is no evidence or documentation for the use of gravel paving.
VIA/VIS Period (1890–1937)
Gravel paving was used extensively on the classic graveled, or "broad" paths that were relatively flat, destination oriented trails. It was also used in short runs on other highly constructed trails.
CCC Period (1933–42)
Gravel paving was the default mode of trail surfacing.
NPS/Mission 66 Period (1943–66)
Gravel paving was the default mode of trail surfacing.
NPS Period (1967–1997)
Gravel paving was used on a few short, highly used trails. Some historic trails were re-graveled with a non-local, engineered gravel. A few trails are inappropriately treated with gravel tread.

TREATMENT

1. Gravel Color

Issue: Historically, gravel was bank-run taken from nearby pits, and its color was the color of local stone surrounding the trail and used in its construction—ranging from gray to pink. However, the "carriage road mix" of gravel currently being used on trails is a manufactured, basaltic, crushed gravel that is slightly bluish colored. This mix is different in appearance from surface stones in any part of the trail system, especially pink granite. However, local pink granite is not available for use, and gravel manufactured of similarly colored granite is prohibitively expensive. Further, quarrying local bank-run gravel from pits is restricted in the park, and would not be practical.

Treatment Guidelines: Due to the above limitations, and the large quantities of gravel required, gravel used to resurface trails with traditional gravel tread will be non-local, crushed material that meets the specifications identified below. It is acceptable to continue using the carriage road mix now being used as the color problem should be ameliorated over time by weathering and local materials such as pine needles becoming mixed with the surface. However, the preferred option would be to develop a gravel mix specifically for the trail system. Mixes with different colors should be investigated for compatibility with the native stone. If local pink gravel cannot be exactly matched or readily obtained at a reasonable cost, a gray or brown mix should be considered as a reasonable alternative.

2. Use of Gravel on Unconstructed Trails

Issue: Gravel is a more durable and hiker-friendly surface than an unconstructed tread which may have small obstacles, be soft, and hold moisture. However, the use of gravel will alter the appearance and character of traditionally unconstructed tread.

Treatment Guidelines: In the rehabilitation of unconstructed trails, care should be taken to maintain the natural character of the treadway. The first choice for treadway material should be local gravel, preferably with some soil content, which has been produced in doing trail work, or small amounts taken from local pits. According to park guidelines, "up to four cubic yards of soil, gravel, or stone per 50 linear feet of trail may be removed from natural areas near work sites for trail rehabilitation."[11] However, if the amount of material needed exceeds these parameters, or if using local gravel is not feasible for other reasons, the imported gravel trail mix (or carriage road mix) may be used. If imported gravel will be used, it should be a thin coat mixed with local soil to blend it with the surrounding landscape and subdue the aesthetic appearance of a complete gravel tread.

3. Maintaining Gravel Tread

Issue: Gravel is a mobile material and will settle to the bottoms of slopes and often wash away if running water passes over it. Historically, not enough constructed features, such as side drains or checks, were used to direct water flow and preserve gravel paving. Rehabilitating gravel tread to its original state without adding these features will often result in the quick loss of the gravel surface.

Treatment Guidelines: If gravel tread is to be restored, trail construction should be sufficient to ensure that the tread will be sustainable. Any area where gravel has washed out is probably in need of better construction prior to gravel replacement. New features should be compatible with historic trail features, and unconstructed trails should be treated with appropriate features as described elsewhere in the this document. In general, subgrade drainage and/or subsurface drains should be used in all but totally dry areas. Elevated gravel paving should be constructed according to the specifications for causeways. Gravel paving on slopes over 5 percent (or any slopes with drainage issues) should contain checks, high-contact walls, or soil berms (whichever is most appropriate). Benches with gravel tread and ditching or inside drains should be used as necessary and appropriate.

SPECIFICATIONS FOR GRAVEL TREAD

1. Gravel Mix

The following specifications were developed for the carriage road system. The mix contains 8 percent clay, which binds the mix for a durable walking surface. The specifications state that aggregate shall consist of hard, durable particles or fragments of crushed stone or gravel conforming to the following requirements and gradations:

Los Angeles abrasion, ASTM C131 and C535	50 percent max.*
Fractured faces (one face)	95 percent max.*
Fractured faces (two faces)	75 percent max.*
Soundness loss, five cycles, ASTM C 88 (magnesium	18 percent max.*
Flat/elongated (length to width) >5 ASTM D4791	15 percent max.*
* Based on the portion retained on the 3/8-inch sieve.	

Materials shall be free from organic material and lumps or balls of clay.

Material passing the No. 4 sieve shall consist of natural or crushed sand and fine mineral particles. The material, including any blended filler, shall have a plasticity index of not more than 6 and a liquid limit of not more than 25 when tested in accordance with ASTM D4318.

Aggregate shall contain a minimum of 5 percent clay particles but no more than 50 percent of that portion of material passing the No. 200 sieve size shall be clay. Inorganic clay to be used as binder shall conform to the following:

Passing No. 200	75 percent
Liquid Limit	30 min.
Plastic Index	8 min.

The fraction of material passing the No. 200 sieve shall be determined by washing as indicated in ASTM D1140, "Amount of Material in Soils Finer Than the No. 200 Sieve." The fractured faces for the coarse aggregate portion (retained on the No. 4 sieve) shall have an area of each face equal to at least 75 percent of the smallest midsectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces. Fractured faces shall be obtained by mechanical crushing. Gradation shall be obtained by crushing, screening, and blending processes as may be necessary. Material shall meet the following screen analysis requirements by weight.

Sieve Designation	Percent Passing
¾ inch	100 percent
½ inch	90–100 percent
No. 4	55–70 percent
No. 40	20–30 percent
No. 200	12–16 percent

2. Excavation

The ground should be excavated below the organic level, usually about 6 inches deep. Large roots should be left, and large stones that will not protrude above the gravel surface may be left. Sod or duff pieces should be saved and used along the edges of the gravel where a berm needs to be constructed. If the area is damp or seasonally wet, but not wet enough to warrant the construction of causeway, then the ground should be excavated to mineral soil, at least 1 foot deep, to better stabilize the trail, and to provide room for subgrade drainage, as described below. The shape of the trail should be appropriate to the trail's design, and the edge of the excavation should be the exact desired edge of the trail.

3. Subgrade Drainage

In areas in which any amount of water will need to pass through the trail corridor, or where the ground is soft, subgrade drainage and/or subsurface drains should be constructed. Crushed stone or imported blown ledge material, as described previously for walled causeway, should be applied to the excavated treadway to a height of 2 inches below the level of the surrounding grade and tamped until stable. If seepage is moderate rather than light, perforated-pipe drains should be considered.

4. Applying, Shaping, and Tamping Gravel

Gravel is applied to the trail surface. The outside edges of the gravel surface should be even with the surrounding grade, walls, or berm. If the tread is elevated, as in causeway, or if the surrounding ground is flat, the gravel should be crowned and sloped at 1 inch cross-slope per 1 foot of trail width. For example, a trail that is 4 feet wide and is crowned in the middle will have 2 feet on either side of the crown and thus be 2 inches higher at the crown than at the edges. If the tread is to drain on only one side, such as in a bench or where there is an inside drain only, the tread should be sloped toward the drainage side of the trail (outsloped for a bench, or insloped for an inside drain) at ¾ inch per foot of trail width. A trail that is 4 feet wide will be insloped or outsloped 3 inches.

The gravel surface should be smooth, with no dips or lumps. The surface should be packed with a vibrating tamper, which should be passed over every part of the trail surface at least once, or until the surface becomes hard.

ROUTINE MAINTENANCE

1. All associated drainage features must be checked and cleaned regularly, as gravel is particularly susceptible to washouts. If washout or excessive wear on slopes, is occurring, the reason should be identified, and the appropriate features (such as checks or dips) maintained or added.
2. Proper slope, crown, and outslope should be maintained by reshaping or replacing old gravel, or by adding new gravel as needed. Where possible, reshaped gravel paving should be tamped. The maintenance schedule for reshaping gravel will vary based on use, drainage factors, and the desired appearance of the trail, but a typical interval between reshaping is five to eight years.

D. STONE PAVEMENT

DEFINITIONS

Stone pavement is a constructed, continuous stone treadway with individual stones, often called pavers, serving as the tread. Stone pavement used to traverse talus fields is called **talus pavement**. Stone pavement used to harden the surface of a soil treadway, typically on a woodland trail, is called **tread pavement** (Figs. 3-32 & 3-33).

Olmsted Center, 6-97-16-11

Fig. 3-32 Talus pavement on the Champlain East Face Trail (#12).

Acadia NP Archives

Fig. 3-33 Tread pavement at Sieur de Monts, circa 1916.

A causeway with a stone pavement surface is called a **stone causeway** and was discussed previously in Section B of this chapter.

HISTORICAL USE OF STONE PAVEMENT AT ACADIA

Pre-VIA/VIS

Prior to the VIA/VIS, there is no physical evidence or documentation of stone pavement on the trail system.

Village Improvement Associations/Societies

The early use of stone for tread is described by Waldron Bates in 1906 when workers under the supervision of Andrew Liscomb were "putting large stones through wet places in the Witch Hole Path" (#313). Over the next ten years, the use of stone for tread increased dramatically for trails through wet places, especially rocky areas with heavy ice and seasonal water flow.

From the 1890s through the turn of the century, the VIA/VIS laid talus pavement to improve the western side of the Eagle Lake Trail (#42), the western side of Jordan Pond Path (#39), the Jordan Bluffs Trail (#457), and the Beech Cliff Trail (#625). Like early VIA/VIS Bates-style steps (see Chapter 7), the stones used as pavers on these trails were small. The lay of uncut flat stones followed the existing landscape rather than rearranging it, and stone pavement occurred in sporadic, often short, runs.

During this same time period, stone tread pavement was also used on several other trails, with the Gorge Path (#28) and the Canon Brook Trail (#19) containing the most extensive examples. These trails were each endowed with maintenance funds years after their initial construction. Both were built by the Bar Harbor VIA at the turn of the century and improved in the 1910s and 1920s. Each follows a streamside route and is highly crafted. They contain stone pavement of small, uncut stones in a single row, laid continuously between runs of staircases and stepping stones (Figs. 3-34 & 3-35).

Nearly all the highly crafted trails built between 1913 and 1937 that either gain elevation or cross talus slopes incorporate tread or talus pavement, and most trails contain examples of both. The memorial paths, constructed under the direction of George Dorr, used long sections of stone pavement. Beginning with the Kane Path (#17), constructed between 1913 and 1915, larger stones were commonly laid as pavers. The Schiff Path (#15) and Gurnee Path (#352), built in the 1920s, have sporadic sections of large, square pavers set into a dirt treadway, while the Beachcroft Path (#13), rebuilt in the 1920s, contains nearly a half-mile of continuous stone pavement, much of it narrower tread through wooded sections of trail (Figs. 3-36 to 3-38). On this trail, unpaved sections are the exceptions, and it should be noted that these unpaved sections have suffered the greatest amount of erosion damage. Why certain sections were left unpaved is still somewhat of a mystery, but in general it can be observed that inclined sections were paved, while relatively level sections were left with a gravel tread.

The talus pavement from circa 1910 through the 1920s is some of the most remarkable work the island. The wide, smooth, level walkways of Kurt Diederich's Climb (#16), constructed under the supervision of George Dorr, and the Orange and Black Path (#348—a section now called the Champlain Mountain East Face Trail, #12), built under Rudolph Brunnow's direction, are two of the finest examples of stone pavement. Talus paved sections of these trails were constructed as scenic overlooks and impressive points of interest. Stones up to 30 square feet were used to construct a treadway between 6 and 10 feet wide, which was elevated 5 or more feet above the downhill side (Fig. 3-39). The East Face "horseshoe" is a 115-foot-long section of talus pavement evenly tracing a 90-degree arc. A widened place in the pavement once provided a patio for a stone bench, but this feature was destroyed by a rock slide in the 1970s.

During the 1920s, stone pavement continued to be used. On both the Andrew Murray Young Path (#25) and the Beachcroft Path (#13), new sections of stone


Acadia Trails Crew, 5-99-19-23

Fig. 3-34 VIA tread pavement on the Gorge Path (#28).


Acadia Trails Crew, 2002

Fig. 3-35 VIA stone paving on the Eagle Lake Trail (#42).

Acadia NP Archives

Fig. 3-36 Tread pavement leading to a set of steps on the Emery Path (#15), circa 1920.

Acadia NP Archives

Fig. 3-37 Talus pavement on the Beachcroft Path (#13), circa 1920.

Charlie Jacobi, Acadia NP, 4-99-53-4

Fig. 3-38 Tread pavement through a wooded section of the Beachcroft Path (#13).

Olmsted Center, 5-98-7-18

Fig. 3-39 This talus pavement on a section of Kurt Diederich's Climb (#16) is one of the fine examples of VIA/VIS stone pavement in the trail system.

pavement contained pavers held in place with iron pins (Fig. 3-40). The circa 1930 section of the Jordan Cliffs Trail (#48) is perhaps the last major specimen of VIA/VIS stone pavement; its use of larger stones, retaining wall, and iron pins sets it apart from the earlier stone pavement on the Jordan Bluffs Trail (#457) (see Section 2, #48 Jordan Cliffs Trail).

Civilian Conservation Corps

Stone pavement was used very little during the CCC era as they generally preferred other methods of tread construction. One method was the use of retaining wall and gravel tread for crossing talus fields. As discussed earlier, examples of this can be seen on the Long Pond Trail (# 118) and the Perpendicular Trail (#119). The CCC also relied on the use of steps and switchbacks for ascending grades, as on the southern end of the Beech Mountain South Ridge Trail (#114).

However, a few trails rehabilitated or constructed by the CCC did incorporate stone pavement. On the Perpendicular Trail (#119), there is one 40-foot stretch of talus pavement. On the Ladder Trail (#64), hundreds of feet of Dorr-style tread pavement were rehabilitated or installed by the CCC (Figs. 3-41 & 3-42). Neither exception is surprising since Dorr directed CCC work on as park superintendent. Additionally, the CCC probably improved stone pavement in the major tumbledown on the west side of the Jordan Pond Path (#39). Records show they were working in this area, and blast marks and the use of larger, cut stones point toward the CCC rather than early VIS work.

NPS/Mission 66

There was no stone pavement built during the Mission 66 era. Gravel and asphalt were the predominant tread material used at this time.

Fig. 3-40 Pinned tread pavement on the Andrew Murray Young Path (#25).

Fig. 3-41 CCC tread pavement at the trailhead for the Ladder Trail (#64) in the 1930s.

Fig. 3-42 Stone pavement on the Perpendicular Trail (#119).

Acadia NP Archives

Fig. 3-43 A historic view of the talus pavement on the Kane Path (#17), circa 1916.

Olmsted Center, 8-97-23-14

Fig. 3-44 A 1997 view of the same section of the Kane Path (#17) as Fig. 3-43. Note the change in water level and vegetation.

National Park Service

Since 1970, little stone pavement has been added to the system. There are two primary reasons for this. Installing stone pavement is one of the most labor-intensive construction techniques, and other tread options can usually be substituted at less expense. Additionally, historic stone pavement has proven to be extremely durable at Acadia. It generally requires very little repair, and most extant pavement on the trail system remains in good to excellent condition.

During the 1990s, sections of stone pavement were repaired in the talus fields on the Jordan Pond Path (#39) with mixed results and on small sections of the Beachcroft Path (#13) with better results. However, both trails are in need of more repair. In a misguided effort, over 100 feet of stone pavement was added to the Ledge Trail (#103), which is otherwise a woodland path. (During future rehabilitation, this pavement should be removed, and the tread replaced with a style that is more compatible with the woodland character of the trail.)

The most substantial, and the most appropriate addition of stone pavement was a new section of talus pavement completed by the NPS in 1994 on a reroute of the southern end of the Kane Path (#17) along The Tarn. By 1975, the original route had become swamped by The Tarn's higher water level and was in need of rehabilitation. A reroute was constructed just west of the original. It began at the southern end of the original stonework and continued to traverse the talus slope toward a section of stone pavement on the northern end that had been installed in 1917. Attempting to provide an easier walking surface while adhering to the original character of the trail, the 1994 crew constructed 262 feet of new talus pavement, the length of this reroute. The new work adheres to the old standard, using large, often cut stones set adjacent to one another with a flush tread surface along a large-gestured route (Figs. 3-43 & 3-44). (Scree was added at a later date and should be removed since it is not historically compatible with the style of pavement, and it is not integral to the pavement's construction.)

TREATMENT

1. Maintaining Character

Issue: Stone pavement, although a durable tread alternative, is not appropriate for all historic trails.

Treatment Guidelines: Stone pavement should only be used on appropriate VIA/VIS trails and the relatively few CCC trails where it was historically present. It is not recommended for use on trails with historically unconstructed treadway. Extant stone pavement should be rehabilitated in-kind, and new, compatible sections may be added as needed. New sections of stone pavement may be added to VIA/VIS trails where it was not historically present, provided the trail already contains constructed features and the addition of the pavement does not conflict with the overall character of the trail. When rehabilitating or adding new stone pavement, the appropriate style and period of construction should be followed. If there is trail-specific evidence of preexisting pavement of another type, the earlier type should be followed.

2. Stone Size

Issue: The smaller stones used in early VIA/VIS talus pavement are vulnerable as they are typically set directly on other stones and loosen over time, either from foot traffic or minor shifting in the talus.

Treatment Guidelines: Every effort should be made to rehabilitate early VIA/VIS work to its original state. However, smaller pavement stones that cannot be locked satisfactorily between other stones may be replaced with pavers large enough to remain intact. In many cases, deep stones with a surface size similar to historic work can be set as "pegs," thereby imitating extant work while being well-anchored. When incorporating larger stones into extant or new stone pavement, care should be taken to ensure the larger stones do not visually detract from the overall character of the run of stone pavement. Maintain an overall appearance of smaller stone sizes by only relying on the introduction of larger stones when no other option is available.

3. Creep

Issue: Over a period of years, steeply sloped talus fields "creep" toward the base of a hill and slant outwards, negatively impacting talus pavement.

Treatment Guidelines: Creep is inevitable and cannot be slowed or prevented by construction or maintenance. Trails must be periodically rehabilitated to re-level talus pavement and repair collapsing walls. Repairs should be made as early as possible after "creep" is detected. If caught in time, pavers can often

HISTORICAL CHARACTERISTICS
The use of stone pavement evolved from no use prior to the VIA/VIS, to extensive use during the VIA/VIS period, moderate use during the CCC period, and no use in the NPS periods up until the rehabilitation era began in the late 1990s. As a result, the defining character of stone pavement at Acadia was set during the peak VIA/VIS years.
Pre-VIA/VIS (pre-1890)
No evidence or documentation has been found supporting the use of stone pavement.
VIA/VIS Period (1890–1937)
Early VIA/VIS trails used stone pavement on a small number of trails. Tread pavement used small, uncut stones set in a single row on sloping treadway for extensive runs. Talus pavement used small, uncut stones in short, sporadic runs, usually routed around objects in the landscape. Later VIA/VIS trails, particularly memorial trails, used larger, cut stone pavement and covered wider corridors, often two stones wide. Talus pavement often included paved overlooks.
CCC Period (1933–42)
There was some use of tread and talus pavement, but use of gravel treadway and switchbacks was more common.
NPS/Mission 66 Period (1943–66)
Graded gravel and asphalt treadway was commonly used, but not stone pavement.
NPS Period (1967–1997)
There was sporadic construction and repair of stone pavement with variable success.

be reset without extensive excavation or reconstruction. If let go, pavers and wall can be lost or seriously compromised, requiring extensive repair work.

4. Pondside Routes

Issue: Pondside talus pavement is sometimes dislocated by rising water, typically resulting from beaver activity or ice.

Treatment Guidelines: When a section of trail is threatened by rising water from beaver activity, a management decision must be made in order to address the issue (for general guidelines regarding reroutes, see Chapter 1). Possible solutions include installing a pipe drain, removal of the beaver, rerouting a section of the trail, closing a portion of the trail, or closing the entire trail. If the trail is to remain in place, pondside stone pavement should be rehabilitated using as much of the original design and material as possible. The addition of larger stones may strengthen the tread and reduce the deteriorating effects of rising water. If rerouting is chosen, the new route should be sited well away from the anticipated high water mark. The extant stone pavement on the original route should remain in its original location and should be stabilized as necessary to slow or stop deterioration if possible. If stone pavement is used on the new route, additional stone should be brought in as needed to construct the pavement. Do not relocate historic material from the original route to construct stone pavement on the new route.

SPECIFICATIONS FOR STONE PAVEMENT

Specifications are provided for the construction of talus and tread pavement in the VIA/VIS styles only. The small amount of stone pavement completed by the CCC followed these earlier styles. Subsequently, rehabilitation work on these trails should follow the specifications for the particular VIA/VIS style appropriate to the trail in question (Figs. 3-45 & 3-46).

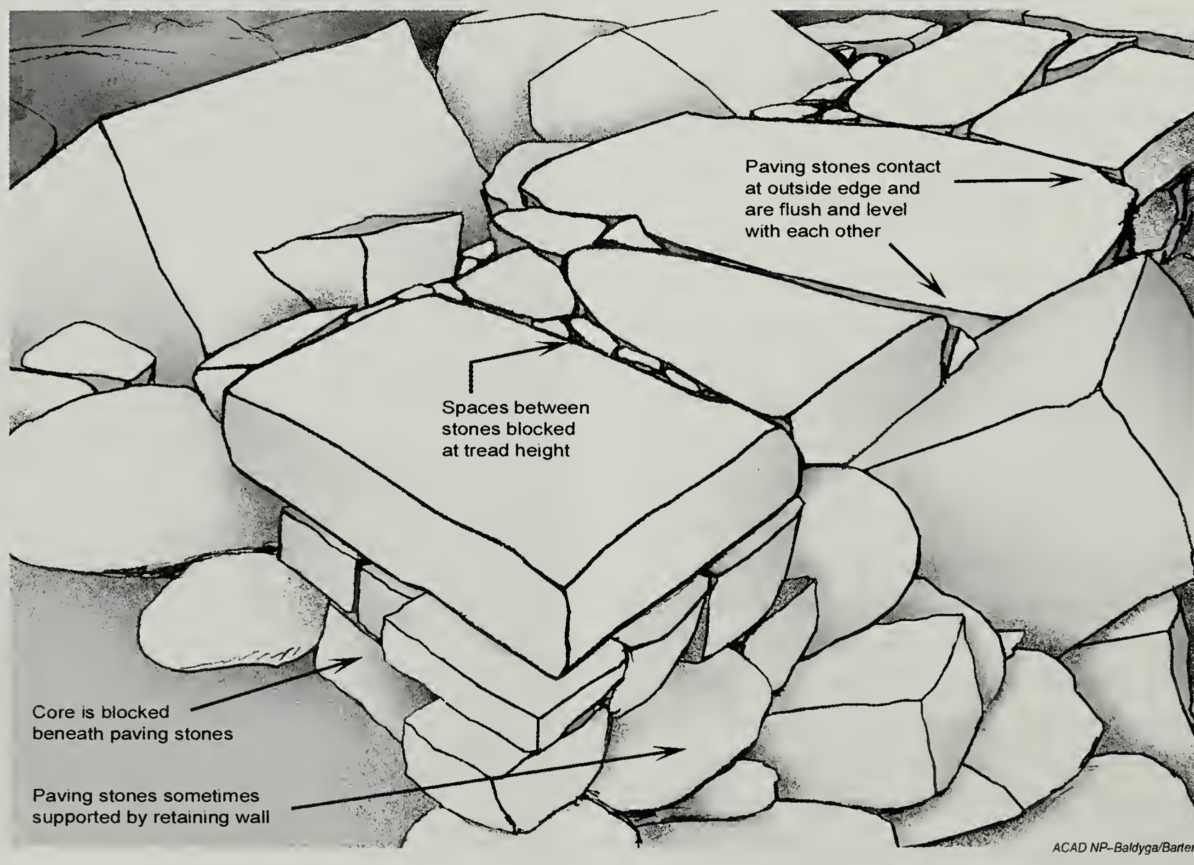


Fig. 3-45 Detail of talus pavement.

1. Early VIA/VIS Talus Pavement

When planning out a new section, or extensively rehabilitating old section of early VIA/VIS talus pavement, large boulders, trees and other significant items in the landscape should not be removed, and the overall grade and shape of the landscape should not be altered.

Pavers can be of any size or shape, although they typically should range in size from 1 to 4 square feet of tread surface. Pavers for any stone pavement (tread or talus) should be acquired from local stone that is compatible in color and texture with other stone on the trail. They may be uncut or cut stone.

Generally, pavers should be set in a row one stone wide, flush at the tops, either abutting or with small gaps. The overall trail width should be narrow at 1 to 2 feet in width. The gaps should be chinked with the largest stones possible, at or below the top surface of the pavers. Rarely will pavement stones be set side-by-side. However, if the prevailing style of work on a trail contains side-by-side stones, this characteristic may be followed during subsequent work on that trail. Steps up and down are acceptable with no greater than a 10-inch rise. Level runs of pavement between steps should be at least 6 feet in length. Exceptions can be made to circumvent existing objects in the landscape. However, single pavers should not be set above surrounding pavement, requiring a step up and then an immediate step down. Very large stones in the trail's path or ledge may be used as trail surface if they provide a negotiable walking surface. These need not be completely flat or level.

When adding new pavers to existing work, pavers are set on and between existing stones so that they are solid and level, preferably having contact with pavers on either side of them. Shims and retaining wall are not used; however, stones may be aligned at the sides of the pavers to "pinch" them into place. Side stones should have a natural look rather than appearing as coping or retaining wall.

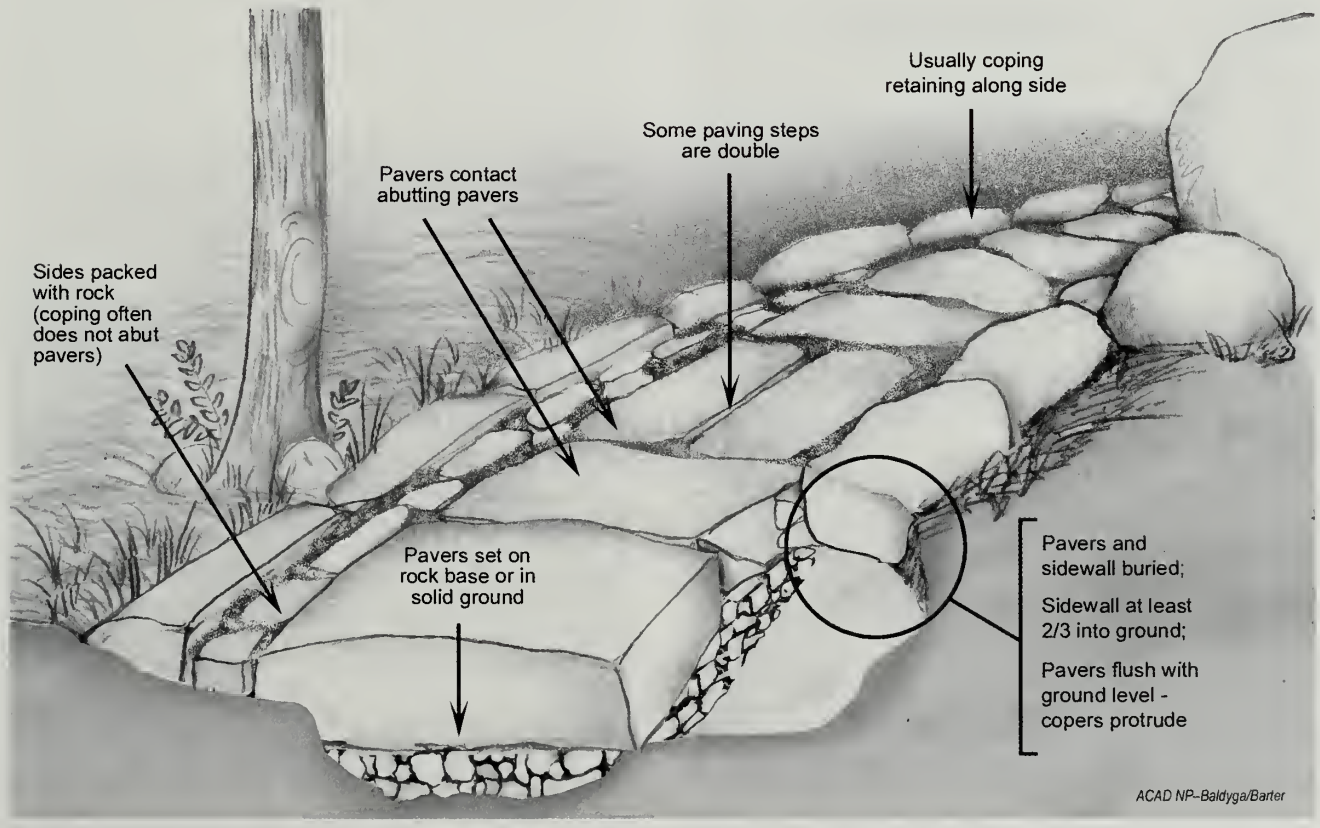


Fig. 3-46 Detail of tread pavement.

2. Memorial Trails and VIA/VIS Talus Pavement

The following information generally applies to all memorial trails; however, detailed specifications are required for each memorial trail. Specifications for two memorial trails, the Schiff Path (#15) and Homans Path (#349), are provided in the "Individual Trail Descriptions" section of this document.

Generally, the VIA/VIS stone pavement on the memorial trails should have a more highly crafted appearance than the early VIA/VIS work. The entire section of talus pavement should be designed as a unit. The trail should be straight or in one or several engineered curves. The trail should be uniformly level or nearly level, or in stretches of 20 feet or longer of nearly level tread. Multiple pavers may be set side-by-side to achieve the desired trail width. Average trail width should be 3 feet; however, it may be as wide as 10 feet. Width may be uniform, or may conform to peculiarities of the landscape, or may widen periodically for "turnouts" or overlooks.

The primary pavers should be large, rectangular stones with at least 4 square feet of surface area; smaller pavers may be worked in between them. They may be cut or uncut (as described above) and should be at least 6 inches thick; thicker if they are smaller than 4 square feet.

After measuring the thickness of the larger pavement stones, a base should be prepared. If elevation needs to be gained, the base should be constructed of rough-laid wall and backfill, following the rules of retaining wall building (see Chapter 6). The top course will be the pavers. If elevation gain is not needed, talus stones should be excavated and/or reset to create a solid base at the desired depth.

The largest pavers are set first, solidly on the base, using backfill and core-packing as necessary. Shims are not used. The pavers are set to the outside of the trail corridor so that their edges form the edge of the trail. These stones may have gaps between them. The gaps are later filled with smaller stones which may be cut or uncut. Contact between stones should remain continuous and the tops kept flush. Additional, smaller gaps are chinked to trail height.

3. VIA/VIS Tread Pavement

The early VIA/VIS pavers are set in the treadway on grades between 5 and 15 percent, typically along streamsides. Pavers are gathered from near the trail. They should be uncut, rectangular stones with a width of 16 to 24 inches. They may vary in length and should be at least 6 inches thick. Pavers are not usually set side-by-side, but in a row of single stones. The resultant paved treadway is usually 16 to 24 inches wide

The treadway is excavated to mineral soil, deeper if necessary to accommodate the depth of the pavers. Thinner pavers are set on a base of stone rubble so that they achieve grade, the others are set directly into soil. They span the width of the trail and only the tops should remain visible. Pavers should contact each other and gaps should be chinked at or below tread level to maintain a continuous tread surface.

For highly crafted memorial trails, the trail width should be between 20 and 36 inches. Pavers may be set side-by-side to achieve width but not in a riprap or "random" lay pattern. The prevailing character should be one square stone following another. The pavers are often cut.

ROUTINE MAINTENANCE

1. Check and repair any retaining wall holding up stone pavement.
2. Keep all associated drainage maintained and construct any new drainage necessary to ensure that the soil around tread pavement does not erode.
3. Check for loose stones in talus fields, especially smaller stones, and reset or replace as necessary.
4. Chink or rechink gaps between pavement stones.
5. Watch for "creep," and repair as soon as possible to prevent further deterioration.

E. UNCONSTRUCTED TREAD

DEFINITION

Unconstructed tread, also called **natural treadway**, is a section of trail on which there has been no alteration of the landscape and no construction of a trail surface. An unconstructed tread consists of gravelly soil, exposed ledge, and/or organic matter, such as roots, duff, and moss, as is typically found on the forest floor (Figs. 3-47 & 3-48).

Of the treadway surfaces, ledge provides the most durable tread. In contrast, soil and organic matter on the forest floor are easily disturbed and quickly erode with even minimal foot traffic if compounded with drainage issues or slope. However, if foot traffic does not destroy the natural roots and duff, unconstructed tread is more durable than loose gravel; a healthy forest floor is stable and will not easily erode.

Many trails, especially trails established prior to 1920, are completely unconstructed. But even most of the highly crafted trails have sections of unconstructed treadway. These tend to be flat, woodland sections, or the upper portions of summit trails, where the grade levels off, the availability of stone lessens, or the tread becomes ledge. These sections of tread may contain constructed non-tread features, most commonly water dips and waterbars, sometimes ditching or coping stones. The tread does not contain structures that alter the landscape, such as retaining walls or relocated soil or gravel. For example, ditch and fill is considered a constructed feature.

HISTORICAL USE AT ACADIA

Pre-VIA/VIS

Prior to 1890, all trails in the system were unconstructed tread, with the exception of the early cart roads. Routes were chosen that were accessible without the aid of constructed features. Trails traversed fragile areas, such as across the forest floor, presumably with some resource damage. Trail use was relatively light and erosion was apparently not a concern. The South Ridge Trail on Cadillac Mountain (#26) and the Great Head Trail (#2) are examples of early trails that are still predominantly unconstructed tread.

Fig. 3-47 Unconstructed tread across ledge on the Jordan Cliffs Trail (#48) near Sargent Mountain summit.

Fig. 3-48 Unconstructed tread through forest on the Norumbega Mountain Trail (#60).

Village Improvement Associations/Societies

More than 60 miles of trails with unconstructed tread existed on the island when the Bar Harbor VIA formed in 1890. VIA/VIS work focused first on new construction, then on repair, resulting in a patchwork of trail work where some areas are highly constructed and others are almost completely unconstructed (Figs. 3-49 & 3-50). In many places it is impossible to tell whether an eroded treadway was once natural soil or quarried gravel surfacing. The presence of borrow pits, sidewalls, and closed culverts can offer clues in some of areas to the presence of constructed tread.

Heavily used flat woodland paths, such as the Seaside Path (#401), demonstrate the VIA/VIS tendency to construct trails completely for comfortable walking, with walls and paving on even flat, stable areas. Some trails, such as the Champlain Mountain colored paths and the Potholes Path (#342), had short sections of steps incorporated into long sections of unconstructed treadway. The Eagles Crag Path (#27) and the Canada Cliffs Cutoff (#632) contain both highly crafted work and unconstructed tread sections. Some pondside trails were carefully constructed by the VIA/VIS, such as the Jordan Pond Path (#39); others were not, such as the wet, low-lying route of the Lower Hadlock Trail (#502) (Fig. 3-51).

Some mountainside trails, such as the Van Santvoord Trail (#450) and the Upper Ladder Trail (#334), contain staircases in areas of modestly graded ledge which could have been left natural without posing problems to the hiker or the landscape. In contrast, many trails were left unconstructed, such as the Pemetic Mountain Trail (#31), Bear Brook Trail (#10), and Norumbega Mountain Trail (# 60). Many of these routes predated the VIA/VIS. With increased use, some sections of these trails have continued to erode (Fig. 3-52).

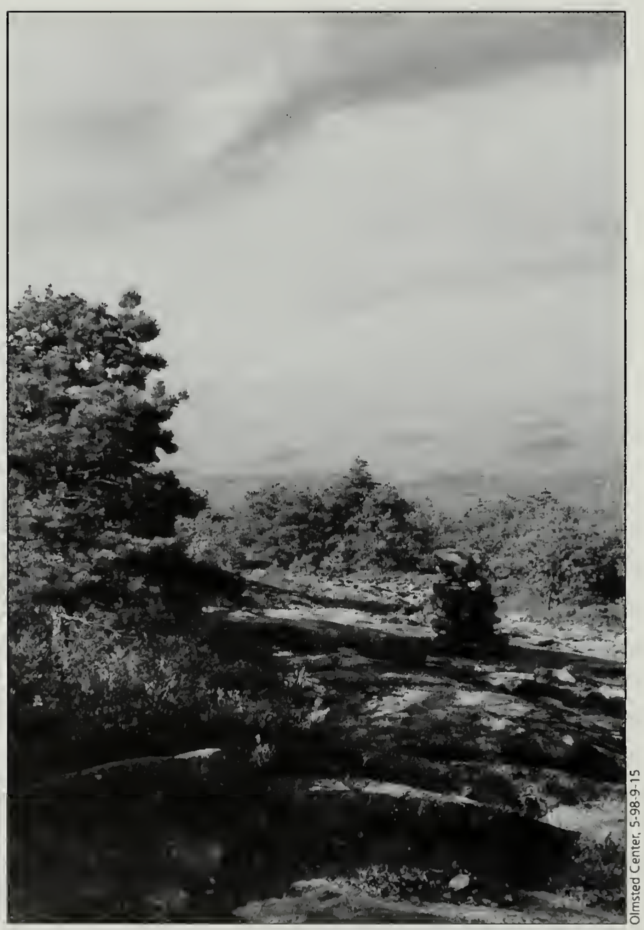


Fig. 3-49 Unconstructed tread across ledge near summit of the otherwise highly constructed Schiff Path.

Fig. 3-50 Steps with unconstructed tread and ledge on the Upper Ladder Trail (#334).

Even the most highly crafted trails, including the memorial trails built between 1913 and 1930, contain sections of unconstructed tread. For instance, the Schiff Path (#15) reverts to a natural ledge treadway once it reaches a modest incline over ledges near the summit. Yet, the nearby and parallel upper end of the Upper Ladder Trail (#334) has continued step construction through similar terrain. The Van Santvoord Trail (#450) showcases relatively short sections of highly crafted stonework between long sections of unconstructed tread. On many other VIA/VIS trails, such as the Orange and Black Path (#348) and the Precipice Trail (#11), constructed and unconstructed tread alternate. Some sections of unconstructed tread on highly crafted trails remain a mystery, such as a section on the Beachcroft Path (#13) and the upper end of the Homans Path (#349).

Many VIA/VIS trails that were marked as connectors or cut-offs, such as the Parkman Mountain Trail (#59) and Grandgent Trail (#66), had completely unconstructed treadways. However, the majority of trails built by the VIA/VIS in the 1910s and 1920s contained substantial areas of constructed treadway. During this period, the VIA/VIS also added stonework to unconstructed trails, such as the 177 steps added to unconstructed tread on the Cadillac Mountain North Ridge Trail (#34), which had been relocated by the motor road, and extensive stonework on the Duck Brook Path (#311), which had been marked thirty years earlier.


Olmsted Center, 10-98-66-14

Fig. 3-51 The Lower Hadlock Trail (#502) contained unconstructed tread, and segments of it are currently in extremely poor condition.

On those paths that alternate between constructed and unconstructed treadway, two common characteristics are apparent. Ledge treadway was typically left as such, unless it was so steep as to require steps or ironwork. The choice to leave soil or gravel as the unconstructed tread was usually made in the higher portions of these trails, near summits, once the trail had climbed the steeper, rockier part of the route. This choice was perhaps due to the moderate overall grade or to a lack of suitable stone for steps or paving.

Civilian Conservation Corps

The CCC followed standards similar to those of the most highly crafted VIA/VIS trails. They fully constructed nearly all treadway except ledge. The few non-ledge trail sections left by CCC crews as unconstructed tread are such anomalies that they have been the cause of much speculation. On both the Perpendicular Trail (#119) and the Long Pond Trail (#118),


Acadia Trails Crew, 5-99-12-23

Fig. 3-52 Unconstructed tread on the Norumbega Mountain Trail (#60) has continued to erode from increased use, leaving the trail corridor more than 10 feet wide in some places.

the treadway construction ends, leaving the upper quarter or so of the trail completely unconstructed. On the Beech Mountain West Ridge Trail (#108), a steep section of unconstructed trail is in poor condition with tread in a 1-foot-deep gully. It is possible that practical matters, such as distance from materials or the ending of a work project, resulted in these long sections of unconstructed treadway on otherwise highly constructed trails (Figs. 3-53 & 3-54).

NPS/Mission 66

Mission 66 builders did not use unconstructed treadway, preferring gravel or asphalt paving.

National Park Service

Beginning in about the 1970s, increasing use of the island's trail system resulted in heavy erosion of many pre-VIA/VIS trails with unconstructed tread. Stabilization efforts introduced extensive log cribbing and log water bars, features that were not in keeping with the rustic stonework of the VIA/VIS and CCC. Beginning in the 1990s, the use of stone checks and stone steps served as more appropriate treatment for sections of eroded or gullied trails, such as on the North Bubble Trail (#42). High use of wet trails has also required construction of tread. Examples include ditch and fill

HISTORICAL CHARACTERISTICS
Pre-VIA/VIS (pre-1890)
All tread was unconstructed except early cart roads.
VIA/VIS Period (1890–1937)
Most established trails remained unconstructed. New trails were nearly completely constructed, but with unconstructed sections. Highly crafted memorial trails, contained sections of stonework and unconstructed tread. Unconstructed sections tended to be connectors and cutoffs or sections across ledges and summits.
CCC Period (1933–42)
Most trails were highly constructed, but sections appeared unfinished, perhaps because the work period ended before trail completion.
NPS/Mission 66 Period (1943–66)
All tread was constructed.
NPS Period (1967–1997)
Nearly every type of feature, both appropriate and inappropriate, was added to sections of unconstructed tread. Recently, an emphasis has been placed on drainage swales, checks, and fill as the preferred alternatives for rehabilitating eroded unconstructed treadway.

Fig. 3-53 A 1998 photograph of the upper section of the Perpendicular Trail (#119), which apparently was never finished by the CCC.

Fig. 3-54 Unconstructed tread near top of Perpendicular Trail (#119).

sections on the Long Pond Trail (#118) and Western Mountain Trail (#120) and the addition of bogwalk over wet areas, such as on the west side of the Jordan Pond Path (#39).

Additions to the trail system and reroutes since the 1970s are predominantly unconstructed tread. Examples include sections of the Andrew Murray Young Trail (#25) or the Gorge Path (#28), both of which replace sections of stone pavement. These decisions were due to lack of resources to either repair old work properly or build new trail in a like manner.

TREATMENT

1. Maintaining Character

Issue: Poor layout, poor drainage, and increased hiker use have caused the deterioration of much unconstructed treadway. Most repairs to unconstructed tread alter character.

Treatment Guidelines: Once unconstructed tread is damaged or lost, it is difficult to retrieve without altering its character. Preventive routine maintenance will alter character slightly but is often necessary to retain tread material. Built features must be added to raise tread through wet areas, to narrow widened sections of trail, or stop erosion. Bogwalk and ditch and fill are the preferred alternatives for saturated tread. A combination of checks, fill, and drainage dips are the preferred alternative for gullies. Other features, such as steps or log cribbing, can be used when they are necessary to preserve the trail. The goal is to minimize intervention of visible built features while maximizing the stabilization efforts.

2. Trail Width

Issue: With no or few constructed features, trail sections with unconstructed tread may get as wide as 20 feet or more.

Treatment Guidelines: Definition of the trail corridor is particularly important on heavily used trails and summit areas. Introduction of guidance elements, such as cairns, boulders, log scree, or occasional sets of steps, as on VIA/VIS trails, will help to define trail width.

3. Roots

Issue: Tree roots are often exposed by tread erosion on unconstructed trails. They make the trail difficult to hike. However, large-scale root removal can kill a substantial number of trees. Further, tree roots are often the only stabilizing mechanism preventing the trail from eroding more seriously.

Treatment Guidelines: In dealing with erosion problems or exposed roots in unconstructed tread sections, a feasible solution that maintains the most natural character possible should be chosen. Roots can be left alone if they present no major problems to hikers or trail character. Select roots may be cut if they do not pose a serious threat to surrounding trees. Water dips and water bars should be added as necessary to provide proper drainage. Crush wall and tread surfacing with local gravel can be an excellent solution, combined with checks and water dips on slopes; this technique most closely resembles unconstructed tread. Log cribbing may also be an option in certain areas (see Chapter 6).

4. Reroutes

Issue: Poor layout compounded by high use has resulted in the deterioration of trail sections with unconstructed tread, particularly on pre-VIA/VIS summit trails.

Treatment Guideline: Reroutes may be considered in certain cases, as described in Chapter 1.

5. Unfinished Trails

Issue: Certain portions of unconstructed treadway on otherwise highly crafted trails appear to have been left unfinished; examples include the Beachcroft Path (#13) near the intersection with the Wild Gardens Path (#354), Homans Path (#349), the Perpendicular Trail (#119), and the Long Pond Trail (#118).

Treatment Guidelines: It is now a part of the historic character of these trails that portions were left unconstructed. Therefore, in areas where no construction is needed, none should be done simply to create an historic scene. If trail work is needed to preserve tread, correct erosion, or address some similar concern, then those preferred methods for repairing unconstructed trail with the least impact, as outlined in the guidelines above, should be the first choices of treatment. However, if there is a need for more substantial trail work, this construction should be done in a way that is historically compatible with more highly constructed sections of the trail. For example, if it is determined that stone stairs are needed on the unconstructed upper part of the Perpendicular Trail (#119), then the new stairs will be constructed in the style of CCC steps predominant on the lower section of the trail.

SPECIFICATIONS FOR UNCONSTRUCTED TREAD

There are no specifications for constructing unconstructed tread. Repairs should be performed according to the guidelines above, and those features constructed as outlined in their respective sections of this plan. If extensive repairs are needed, consider a new route as discussed in Chapter 1.

ROUTINE MAINTENANCE

1. Unconstructed treadway needs to be watched carefully for erosion damage, excessive wear, exposed roots, and trail braiding.
2. Water dips and water bars should be installed as necessary and cleaned regularly (see Chapter 4, Sections D and E).
3. A marked loss of material on trails of some grade will often require the installation of checks (see Chapter 6, Section A).
4. Roots should be cut or covered according to the treatment guidelines above.
5. If there are no outstanding problems, unconstructed tread requires no routine maintenance.

ENDNOTES

11 *Hiking Trails Management Plan*, p. 23.

Fig. 4-1 A large capstone culvert on the Schiff Path (#15).

CHAPTER 4:
DRAINAGE

CHAPTER 4: DRAINAGE

Proper drainage is the most important aspect of trail construction, rehabilitation, or maintenance because moving water is the greatest threat to the durability of the trail and its environment. The construction of any trail feature, especially the tread itself, must allow for drainage. Various characteristics such as location, slope, grade, and construction materials are crucial to effective drainage. In addition, five categories of specific drainage features are used at Acadia to direct the flow of water under, across or away from the trail. These include:

A. Culverts
B. Subsurface Drains
C. Side Drains
D. Water Bars
E. Water Dips

Most of Acadia's hiking trails were constructed with too little consideration of drainage in the trail layout and too few drainage structures. For the most part, these trails were built between 1890 and 1940 and have received relatively little drainage maintenance since then. Surviving trail sections generally contain solid rock construction like stairs and stone pavement, occur in naturally draining areas such as talus slopes or where running water is not an issue, contain raised tread through flat land, and/or receive relatively little hiker use. Trail sections in the worst shape are those that ascend the fall line with little stone construction.

This chapter provides guidelines for the use of different drainage features and specifications for their construction. In deciding on the appropriate solution for a drainage issue, consideration should be given to surrounding topography, amount of water flow, and direction of trail slope. Some general guidelines include:

- If water can be diverted without crossing the trail, a side drain or ditch may be used.
- If water must cross the trail and the flow is light, water can be directed across the trail surface using a water bar or dip, or by adjusting the cross-slope of the tread.
- If flow is heavy, water should be directed from one side of the trail to the other using a culvert, or over a durable surface such as stone paving or a rubble-lined drainage swale.
- If the trail crosses a narrow stream, a culvert may suffice. However, a large stream should not be treated with a culvert; here a bridge or other crossing feature may be needed (see Chapter 5).
- If crossing a stream with shallow banks, stepping stones should be considered for trails constructed by the VIA/VIS.

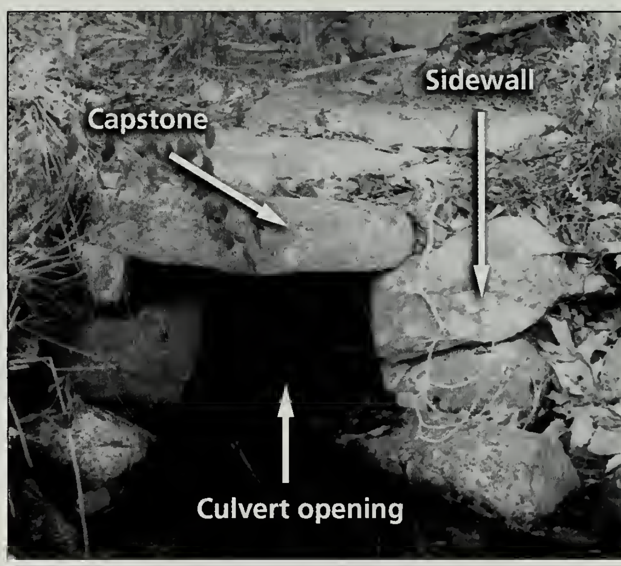


Fig. 4-2 A graveled-over culvert on the Kane Path (#17). The lintels were once completely covered with gravel and vegetation.

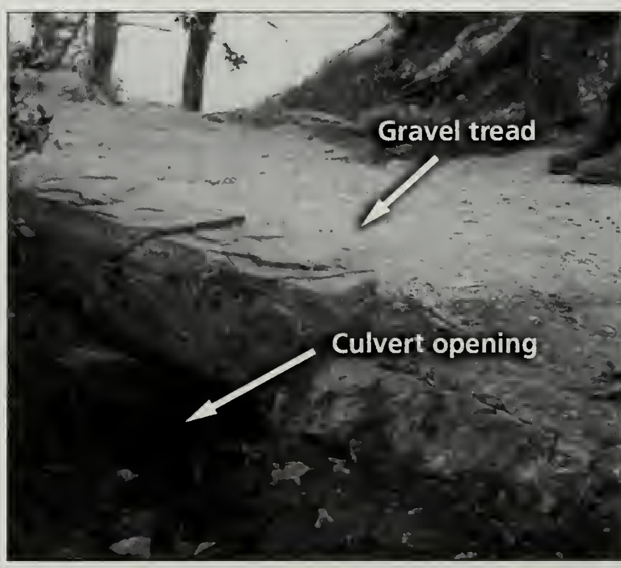


Fig. 4-3 A graveled-over culvert on the Ocean Path (#3).

A. CULVERTS

DEFINITIONS

A **culvert** is a stone, pipe, or log structure built to carry water under or across a trail. **Closed culverts** have built sides, a base and top, and direct water under the trail, allowing for an uninterrupted treadway. **Open culverts** have built sides and usually a stone base, but no top, resulting in an interrupted treadway. Three types of closed culverts and two types of open culverts are used in Acadia NP.

A **capstone culvert** is a closed culvert topped with one or more flat stones that also serve as the treadway (Fig. 4-1).

A **graveled-over culvert** is a closed stone culvert overlaid with a gravel treadway (Figs. 4-2 &. 4-3).

A **pipe culvert** is a closed culvert, the channel of which is a pipe or pipes set underneath the tread surface (Fig. 4-4).

Some large closed culverts are built in combination with catch basins. A **catch basin** is a dry well or inlet, located where a ditch meets a culvert. The basin "catches" debris carried by fast-flowing water, preventing the debris from flowing into and clogging the culvert.

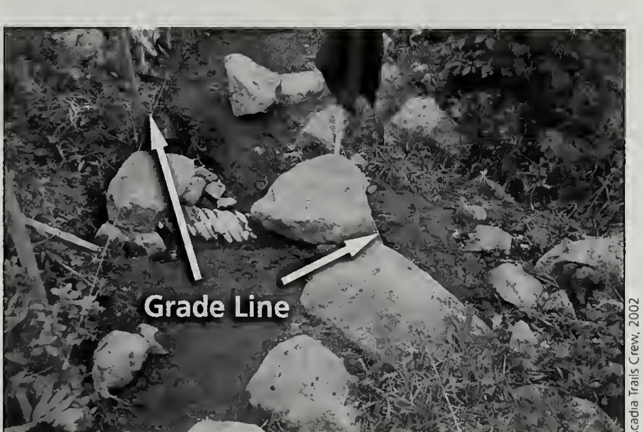


Fig. 4-4 A new 2002 pipe culvert on Jordan Pond Path (#39). The photo shows header stones before crush and gravel surfacing, which will completely cover the pipe. Note lintel stones meet grade line at outside edge.

An **open stone culvert** is a culvert with stone sides and base whose top is open. Most open stone culverts have sides of single-tier walls, or even single stones, while some sides are small retaining walls (Fig. 4-5).

A **stepstone culvert** is an open culvert with a stepstone placed between the sides to lengthen the width of the water passage. It may be simple, consisting of three large stones with a gap for water to flow through, or it may have sides that are built retaining walls. A water crossing with more than three stepstones in the channel is considered a set of stepping stones (see Chapter 5, Section C) (Fig. 4-6).

Fig. 4-5 A recently constructed open stone culvert on the Jesup Path (#14) with walls of single stones. This is not an appropriate culvert style for a trail that historically contained graveled-over stone culverts and wooden bridges.

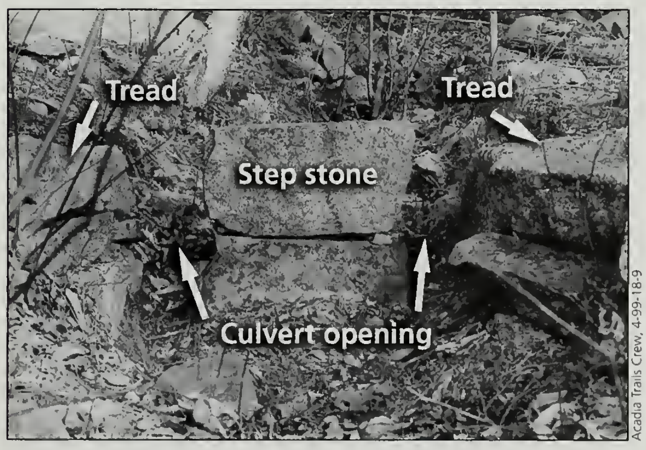


Fig. 4-6 A stepstone culvert on the Kane Path (#17).

Additionally, **log culverts** are currently extant in the park. Some of these are open culverts with log sidewalls and may have a stone-lined base. **Open log culverts** are not historic features for the trail system and are currently being replaced with stone and pipe culverts. Specifications for open log culverts are not included in this document.

Closed log culverts, composed of logs covered with gravel placed over log abutments, are historic features. They are classified in this document as small bridges with short spans. Of ten closed log culverts located in the park in the 1970s, only three currently remain on the Jesup Path (#14), Kane Path (#17), and Canon Brook Trail (#19). These may have been built by the CCC. The others have been replaced with small plank bridges. Specifications for these bridges are included in Chapter 5.

HISTORICAL USE OF CULVERTS AT ACADIA

Pre-VIA/VIS

Initially, most wet areas were crossed on pole bridges or the trail was rerouted. There is no evidence or documentation of culvert use prior to the VIA/VIS era.

VIA/VIS

Beginning in the 1890s, Bar Harbor VIA path builders constructed "more permanent crossings for streams and boggy places."[12] A number of trails built before 1900 have drainage features including closed and open culverts (Kane Path, #17; Red/Schooner Head Road Path, #362; Asticou Trail, #49; Jordan Pond Path, #39). Although some or all of these features may have been added later, it is likely that many of them were a part of the original construction, as the craftsmanship is indistinguishable from that of other original work of those trails.

The first trail to receive a constructed drainage system may have been George Dorr's Bicycle Path (#331) around Beaver Dam Pool. In 1899, four years after the trail was initially constructed, Dorr described drainage work:

> The path, which had become badly washed by rains and worn by water dripping from the trees, has been resurfaced throughout its whole extent. Several additional culverts also have been laid across it with open catch drains leading to them, where surface water used to flow upon the path, so that there will be less washing in the future.[13]

In 1906 Waldron Bates also recommended that path builders "drain wet places or put in stepping-stones, or place cedar-pole bridges on the ground."[14]

Many trails constructed without adequate drainage systems were plagued by washouts and wet areas. These trails often required substantial reconstruction, particularly streamside trails such as the Jordan Stream Path (#65), heavily used trails such as the Seaside Path (#401), and cross-slope trails such as the Ox Hill Path (#420) in Seal Harbor. Culverts were used by the VIA/VIS, though mentioned only a few times in their annual reports. In fact, evidence on the ground suggests that some trails, such as the Red/Schooner Head Road

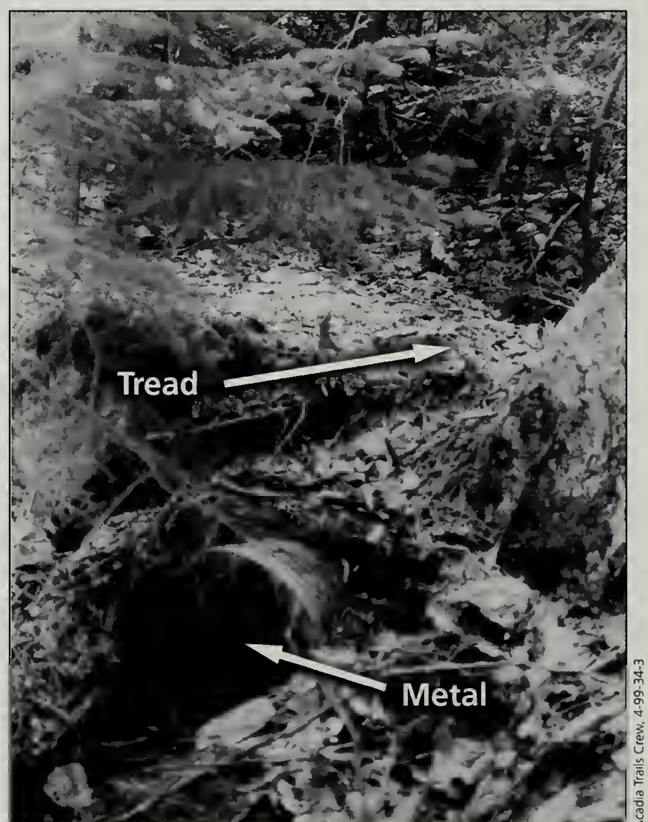


Fig. 4-7 A VIA/VIS pipe culvert on the Seaside Path (#401), located south of the Stanley Brook Bridge.

Path (#362), were constructed with extensive drainage features (closed culverts and raised tread side ditches) very early in the period, perhaps before 1900. In 1937, A. Fitz Roy Anderson, chairman of the Bar Harbor VIA Path Committee, described annual maintenance including "reconstruction [of] bridges and culverts."[15] In 1952 Robert DeRevere, president of the Seal Harbor VIS, reported for the Seaside Path (#401), "new culverts and gutters installed from the beginning of the trail to the Stanley Brook Bridge."[16] These closed pipe culverts are still visible (Figs. 4-7 to 4-9).

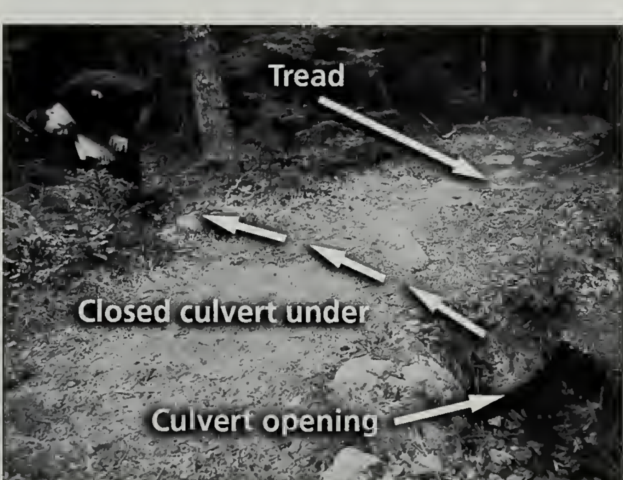
On highly crafted trails such as the Beachcroft Path (#13) and the Ladder Trail (#64), many drainage problems were solved without culverts, while some were not addressed and are still in need of a solution. Features like extensive stone paving and steps were used to withstand cross-trail flows of water and ice. However, the trails on Dorr Mountain apparently had excellent drainage, combining use of capstone culverts (Emery Path #15), graveled-over culverts (Schiff Path, #15, Homans Path, #349), and stepstone culverts (Kurt Diederich's Climb, #16) (Figs. 4-10 & 4-11). On the Jesup Path (#14) and Kane Path (#17) near the beginning of the Canon Brook Path (#19), small closed log culverts and large closed stone culverts were built (Fig. 4-12). These VIA/VIS culverts may have been reworked by the CCC, who carried out extensive repair work in the Dorr Mountain area. Unlike most small VIA/VIS closed culverts, the Gurnee Path (#352), completed in 1926, contains one of the largest graveled-over stone culverts in the trail system, with an opening 6 feet high and 2 feet wide, and an enormous capstone supporting the gravel tread (Fig. 4-13).

Acadia Trails Crew, 4-99-34-12

Fig. 4-8 A defunct VIA/VIS vitrified clay pipe culvert on the Seaside Path (#401), south of the Stanley Brook Bridge.

Acadia NP Archives

Fig. 4-10 A 1920 view of capstone culvert with walled side drain on the Emery Path (#15) constructed in 1916 by Bar Harbor VIA.



Olmsted Center, 4-99-49-s12

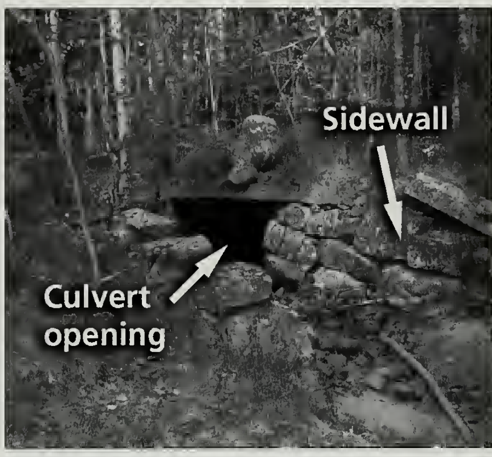
Fig. 4-9 VIA/VIS graveled-over culvert on the Asticou Trail (#49).

Arthur, Civilian Conservation Corps Construction of Trails, No. 7, 1937

Fig. 4-11 A VIA/VIS or CCC graveled-over road culvert near the Jesup Path (#14) between The Tarn and Sieur de Monts Spring.

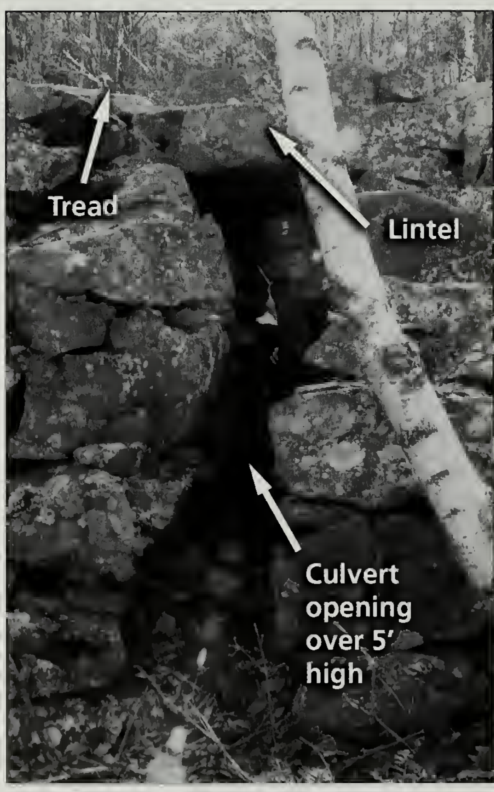
Civilian Conservation Corps

In the 1930s, graveled-over and capstone culverts were used extensively in CCC work to direct water under the trail from ditches on the uphill side. Construction methods were fully described in the CCC handbook for trail work (Fig. 4-14). On the Perpendicular Trail (#119), the CCC built their culverts as exhibition pieces, constructing the sides with smooth-faced dry laid wall that tied neatly into the retaining wall holding the treadway. The CCC then topped these culverts with massive, cut capstones that were left exposed as the treadway, and framed at the edges with large coping stones. These culverts were apparently modeled after the capstone culverts of the Emery Path (#15). Many of the larger CCC capstone culverts also included catch basins (Figs. 4-15 to 4-17).



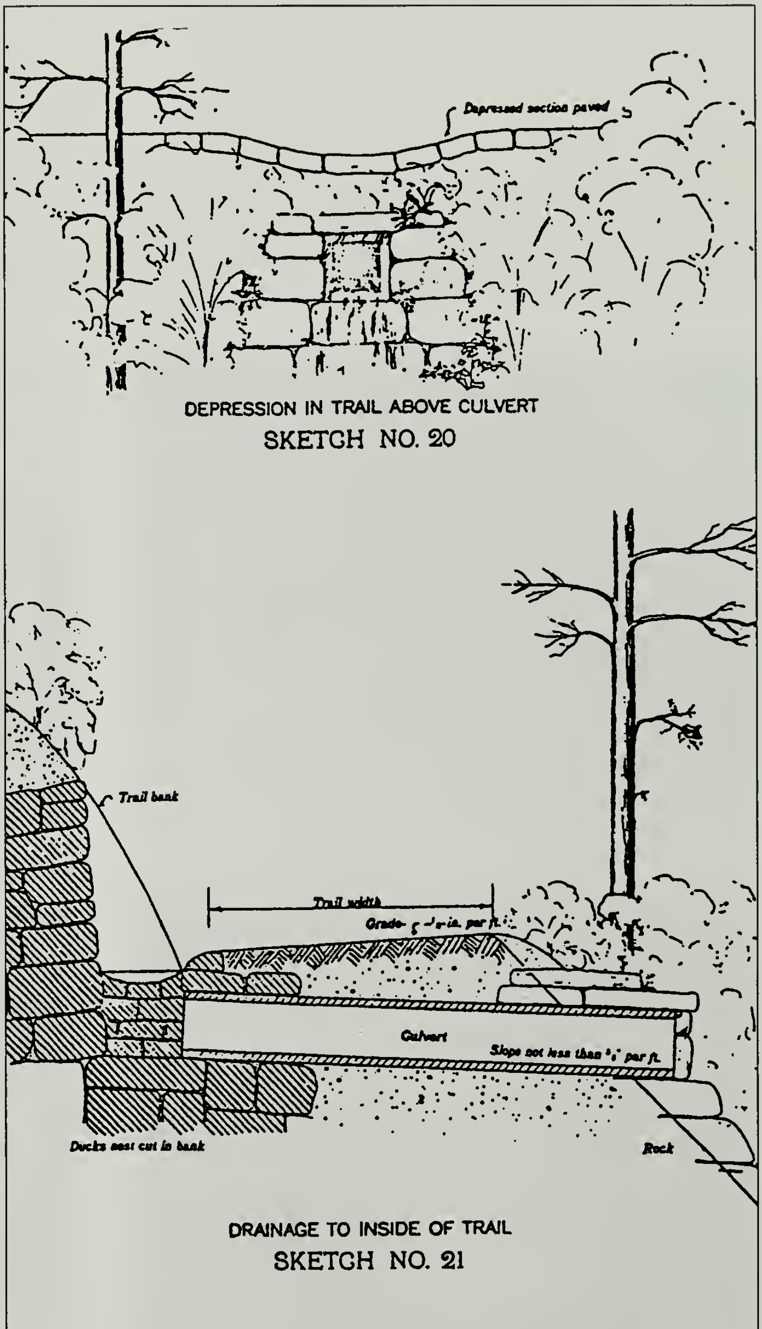
Olmsted Center, 8-95-1-16

Fig. 4-12 A VIA/VIS or CCC graveled-over road culvert near the Jesup Path (#14) between The Tarn and Sieur de Monts Spring.



Charlie Jacobi, Acadia NP, 4-99-52-3

Fig. 4-13 A VIA/VIS graveled-over culvert on the Gurnee Path (#352). This is one of the larger culverts on the trail system.



Arthur, Civilian Conservation Corps Construction of Trails, No. 7, 1937

Fig. 4-14 CCC specifications for graveled-over culverts. Note "depression in trail above culvert," now termed a "dip" by the NPS trails crew and "ducks nest cut in bank," now described as a "side drain and catch basin."

However, the predominant choice of culvert was the graveled-over stone culvert. These are extant on the Long Pond Trail (#118), Beech Mountain West Ridge Trail (#108), Valley Trail (#116), Beech Cliffs Ladder Trail (#106), Beech Cliffs Loop Trail (#114), and Ocean Path (#3).

After the CCC crews left, the closed culverts were often overlooked, not maintained, and consequently filled with organic matter and clogged. By the time the level of trail use and maintenance increased in the 1970s, many closed culverts were no longer functioning and are currently nearly completely obscured. Examples include graveled-over culverts on the Beech Mountain West Ridge Trail (#108).

NPS/Mission 66

Trails constructed during the Mission 66 period of the late 1950s and early 1960s typically used corrugated metal pipe culverts, which are still evident on the Anemone Cave Trail (#369), Ship Harbor Nature Trail (#127), and Beech Mountain Loop Trail (#113) (Fig. 4-18). Culverts on these trails were covered over with asphalt or gravel. Insufficient headwalls, tread loss, and low maintenance have allowed frost to heave many of these pipes out of the ground.

National Park Service

Beginning in the 1970s, NPS built additional culverts, and replaced or removed existing culverts. Many closed culverts were converted to open culverts due to ease of construction and maintenance, such as on

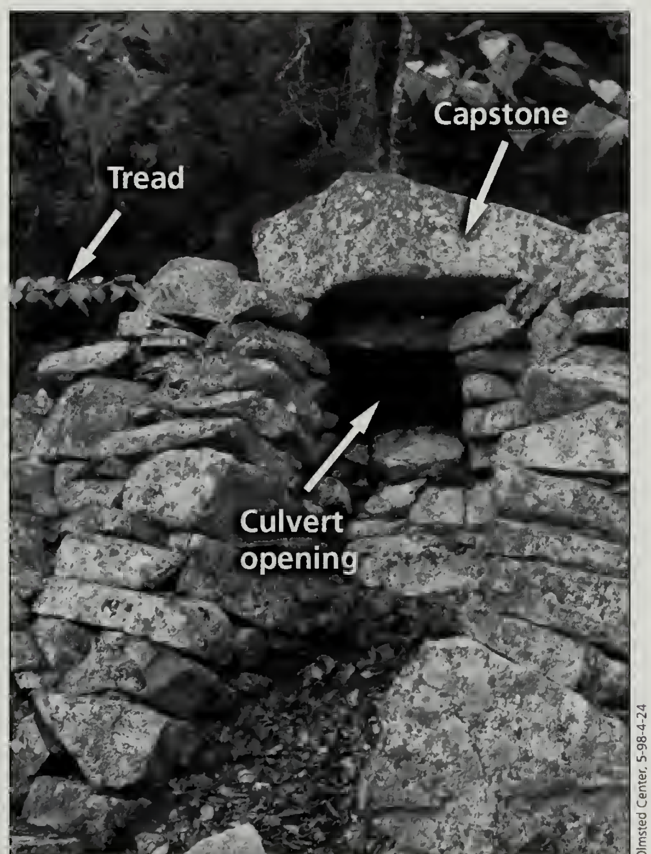


Fig. 4-15 A massive CCC capstone culvert on the Perpendicular Trail (#119).

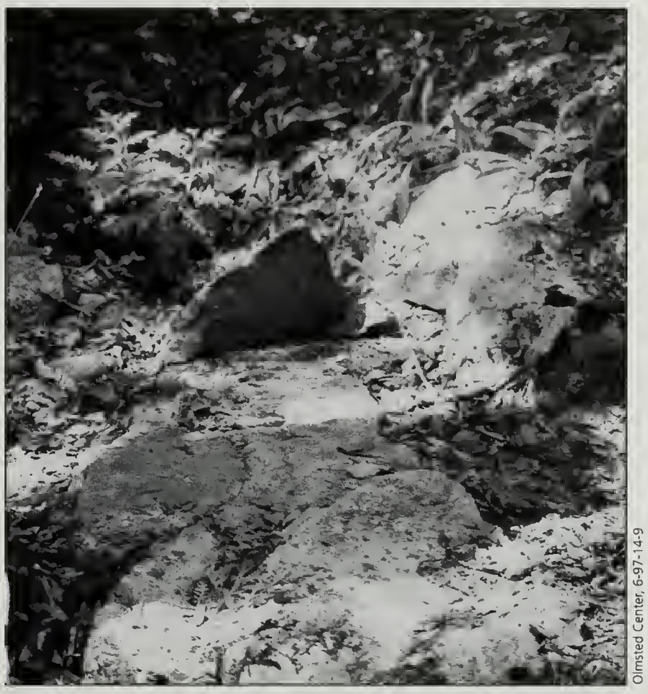


Fig. 4-16 Located near the base of the Perpendicular Trail (#119), a small CCC graveled-over culvert now has underlying capstones visible due to loss of gravel. A catch basin (difficult to discern in the photo) is in the foreground and a coping stone is visible on far side of treadway.

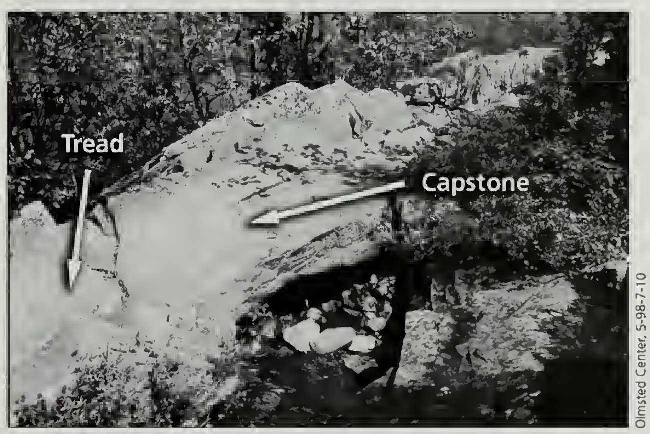


Fig. 4-17 Large capstone culvert on the Emery Path (#15).

the Long Pond Trail (#118). Since the mid-1990s, NPS has focused on locating and cleaning existing closed culverts. New closed and open culverts have been built using historical prototypes, such as on the Pond Trail (#20), and using new materials like steel pipes, as seen on the Jordan Pond Path (#39) (Figs. 4-19 to 4-21).

Note: To date, the use of plastic perforated pipes with geotextile material has been limited to subsurface drains and not typically used with culverts.

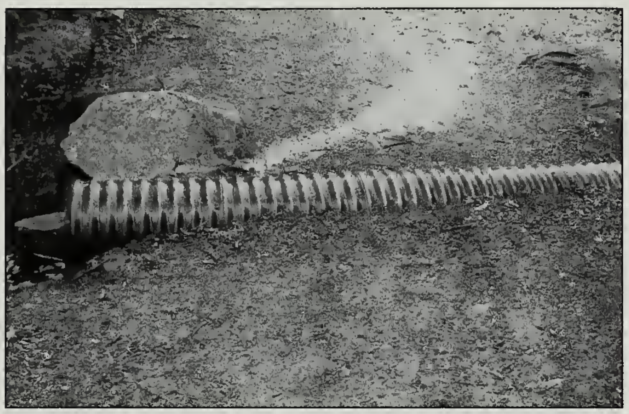


Fig. 4-18 This 10-foot-long corrugated pipe culvert, installed by Mission 66 crews on the Beech Mountain Loop Trail (#113), has been exposed by frost heave and tread loss.

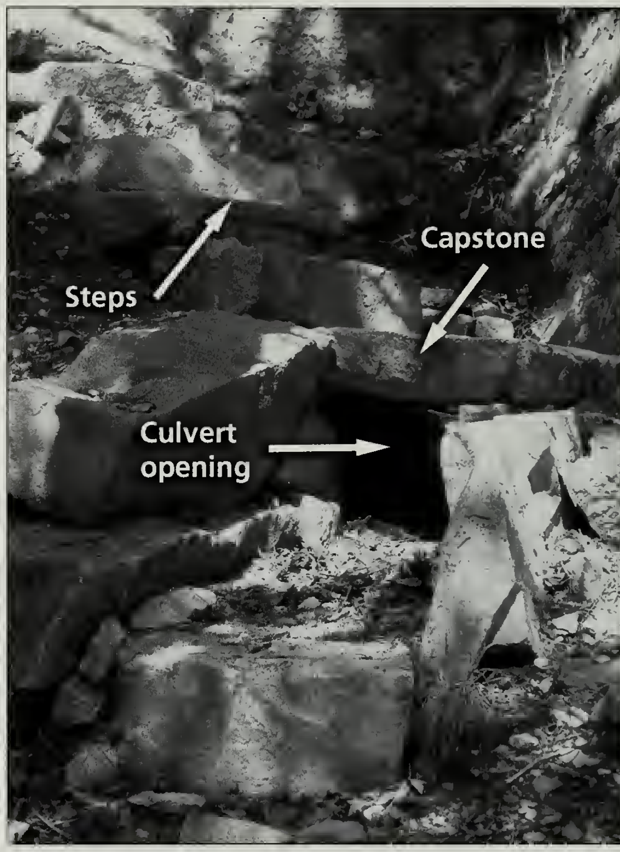


Fig. 4-20 This repair of a washed-out section on the Pond Trail (#20) consists of a closed capstone culvert incorporated into a stone stairway. It was constructed by NPS crews in 1995.

Fig. 4-19 A stone-lined open culvert on the Long Pond Trail (#118). This culvert may have originally been a graveled-over stone culvert.

Fig. 4-21 A 2002 finished pipe culvert on the Jordan Pond Path (#39) in which pipe is obscured by insloping lintels and support rocks that are mostly covered with gravel. Lintels tie in to crush wall on one side and retaining wall on the other.

HISTORICAL CHARACTERISTICS OF CULVERTS
Pre-VIA/VIS (pre-1890)
No evidence or documentation for culvert use has been found.
VIA/VIS Period (1890–1937)
Graveled-over culverts, open stone culverts, stepstone culverts, and closed log culverts were used. Vitrified clay pipes may have been included. On streams too large for culverts, stepping stones, bridges, and stone pavement were the preferred options.
CCC Period (1933–42)
Large closed culverts were often highly visible showpieces of dry laid stonework. Graveled-over culverts were also used.
NPS/Mission 66 Period (1943–66)
Corrugated metal pipes were introduced and used almost exclusively for new culverts.
NPS Period (1967–1997)
All types of culverts were used, although not necessarily in the right places or with the right construction techniques. The use of open stone and log culverts was predominant.

TREATMENT FOR CULVERTS

1. Maintaining Character

Issues: Historically inaccurate culvert styles have been added to many trails in an effort to ease installation, safety, and maintenance concerns. Some problems with historic culvert styles include:

- Closed culverts are more difficult to construct, locate, and maintain than open culverts.
- Open culverts can be tripping hazards for hikers. They also impede ADA accessibility.
- Some historic materials like vitrified clay pipes have not proven to be long-lasting, and are hard to find through local suppliers.

Treatment Guidelines: Culverts fall into categories according to type and era of construction. In order to maintain the trail system's historic character, the appropriate culvert type should be identified for each situation. As a result, some maintenance and safety concerns will have to be addressed and concessions made. For example, given the historic predominance of closed culverts, their use will likely be increased, even though it will mean additional maintenance on the trail system. They are more historically appropriate and are less of a safety concern for hikers than open culverts.

Historic materials are preferred in new construction or rehabilitation; however, substitutions may be made for materials that are not exposed or easily seen by the average hiker. When constructing new VIS/VIS style pipe culverts, steel or other appropriate pipe materials may be used in place of the vitreous clay pipes.

SPECIFICATIONS FOR CULVERTS

Choosing which type of culvert to build and precisely how to build it should be based on three considerations:

- What is the appropriate era and/or builder of the trail?
- What is the historical character of other culverts on the trail?
- What are the topography and drainage conditions of the area surrounding the trail?

A VIA/VIS trail section with light to medium level of flow generated by either side drains or a narrow stream crossing, should be treated with a graveled-over culvert, a stepstone culvert, or an open stone culvert. A shallow VIA/VIS stream crossing that is too wide for a graveled-over culvert should be treated with stepping stones or a stepstone culvert. In cases where the stream banks are both steep and wide, a bridge may be needed (see Chapter 5).

A CCC trail should be treated with culverts in the style of its extant culverts. In general, stepped or stone-paved sections will use capstone culverts, and gravel-paved sections will use graveled-over culverts, or possibly pipe culverts. For example, the stepped

Perpendicular Trail (#119) contains mostly capstone culverts. New culverts added to the trail, or rehabilitation of existing culverts will follow this style. Similarly, graveled-over culverts are the preferred choice for gravel-paved sections of the Valley Trail (#116) since the majority of this trail's extant culverts are of this type.

For CCC and VIA/VIS trails reworked by the CCC, a catch basin may be added to large closed culverts, provided the construction of a catch basin is possible and will not substantially affect the character of the culvert or the surrounding area. In considering the addition of a catch basin, the relative need should be the deciding factor. Because of the difficulty of construction and maintenance, catch basins should not be used unless absolutely necessary. If the trail is in danger of being substantially damaged by the failure of a single drainage feature, or if there is a vulnerable tread surface protected by few drainage features in danger of receiving large volumes of water with substantial debris, a catch basin may be needed. For instance, some large open stone culverts on the Jordan Pond Path (#39) protect yards of graveled treadway. These features are responsible for streams with substantial seasonal flow that regularly wash branches and small stones into the culvert opening. Catch basins are an appropriate consideration for use with these culverts.

While it is impossible to discern on Acadia's trails today, a common practice recommended in CCC literature may have been used at Acadia. A constructed treadway forms a slight dip over or near closed culverts, and to either side of open culverts. This directs water over the trail in a controlled way in the event of culvert failure.

General recommendations for culvert construction may be borrowed from 1937 CCC trail guidelines:

> In gullies, nature has already determined the type of structure to be employed, which is a culvert big enough to carry all the water that comes down. The gully has already established a temporary balance between the scour of the stream and its bed. This balance should not be disturbed, so the floor of the culvert should be at the level of the gully bed. Then the elevation of the trail, compared with the elevation of the gully bed, may dictate a wide, shallow culvert, or a deep, narrow one. But the wider the culvert the easier it will take water, and the less danger there will be of destructive cutting on the discharge side.
>
> There is no satisfactory information on the size of culverts required for different watersheds. The area of the watershed, the steepness of its slopes, the amount of natural impounding in its basin, the amount and kind of cover, and the condition of the soil, combined to absorb or shed water. The best practice is to judge as competently as possible from local conditions how large a drainage structure should be. It should not be less than one foot in width or height, to avoid choking....
>
> Established channels determine the location of culverts, and the amount of water to be served can be estimated with reasonable accuracy. Any depression, even one coming from a small spring, is the established drainage channel in that area. This can be proved by the absence of erosion, and the presence of cover, on nearby surfaces. The amount of run-off at flood stage can be estimated by lines of drift left by high water, scouring at the bases of tree, root systems exposed by scouring, fresh surfaces on rocks below old stain-bands, shrubbery tilted down hill, and other signs.
>
> The culvert must be large enough to carry flood water. And its floor must be at the level of the channel bed. These two factors determine the size and shape of the structure. Where there is any choice, the culvert should be wide, rather than deep....
>
> Preferably all culverts should be made of stone, using dry or mortar joints.... The ends of the walls should be flared, as a usual practice, to...prevent scouring by flood water. Care should be taken to keep the inside surfaces uniform and smooth, to prevent debris from catching. A culvert should extend a foot or two beyond the edge of the trail on each side, and the trail widened to the head walls of the culvert. The bottom of the culvert should slope not less than 3/8 inch per foot.[17]

Specifications follow for the construction of specific drainage features.

1. Capstone Culvert (Fig. 4-22)

Historic capstone culverts are found on three VIA/VIS trails: the Emery Path (#15), the Schiff Path (#15), and the Homans Path (#349). Examples of CCC use are located on the Valley Cove part of the Flying Mountain Trail (#105), the Beech Mountain West Ridge Trail (#108), the Perpendicular Trail (#119). Capstone culverts tend to be bigger than most graveled-over culverts. The capstone culvert has a stone base, side retaining walls, and a capstone at the top serving as the treadway.

Dimensions: The area and depth of construction for the culvert is determined by the amount of water flow, the topography, and trail surface elevation. The total length of the culvert ranges from 4 to 6 feet (width of trail plus coping stones, if coping stones are to be used). The height of the side retaining walls ranges from 1 to 5 feet. The typical opening for water flow is 2 to 3 feet wide by 1 to 2 feet high.

Construction: Sidewalls should be set 6 inches or more below the floor of the culvert to lock them in place. Sidewalls may consist of single large stones, or may be small retaining walls constructed of several stones. The faces of the walls on the inside of the culvert are vertical. The ends of these walls at the edges of the trail form 90-degree angles with the trail retaining walls, which are themselves usually battered. Wall courses should be interlaced at the corner. The size of the stone used in these walls varies widely. It is rectangular stone, often as small as 2 inches thick by 6 inches wide and long. However, such stones can share a wall with larger blocks 2 feet square. Sidewalls do not extend beyond the width of the capstone and any coping laid beside it.

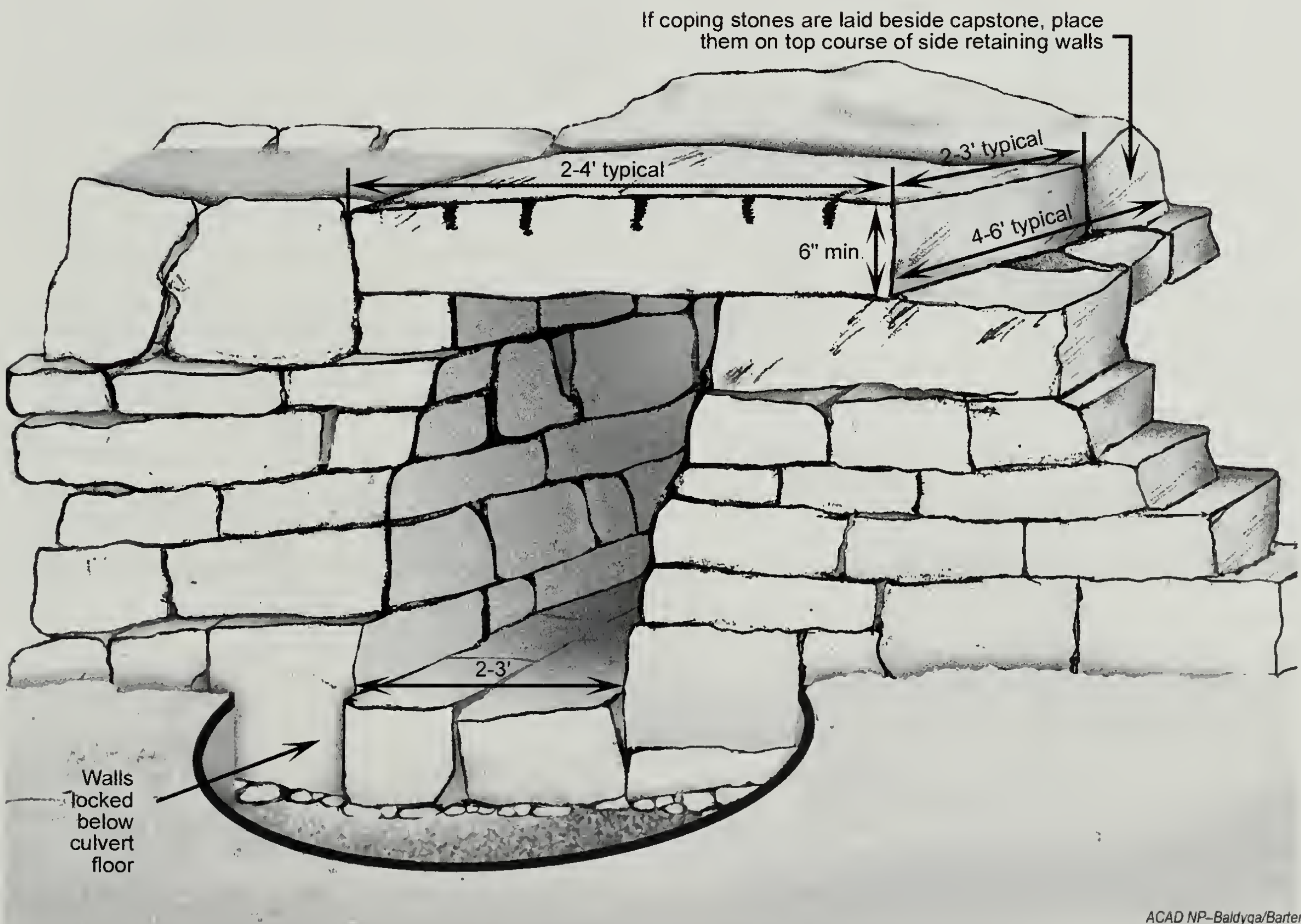


Fig. 4-22 Detail of a capstone culvert.

The top of the side retaining walls is at a height below the surface of the trail so that the capstone will be flush with the final surface.

The floor of the culvert is then laid between the walls. It may be "tiled" with flat-laid stones contacting each other, with the remaining gaps chinked, or it may be packed stone rubble. The floor of the culvert should extend into the drainage on both sides of the culvert so that it surrounds the edges of wall stones. On the downhill side of the drainage it should extend beyond the point at which scouring is likely to occur. Rubble culvert floors should be locked into place at their outlets by stones set into the ground, the tops of which are flush with the top of the culvert floor.

A capstone spans the width and length of the culvert and sits level on the sidewalls. In some cases, this capstone is actually a step up as well as a culvert (Perpendicular Trail, #119). The average size of the capstone is 2 to 4 feet long and wide and 6 or more inches thick. However, the capstones on the Dorr Mountain trails are much larger; one is 10 feet long by 5 feet wide by 1 foot thick. In some cases, the top of a CCC culvert will be more than one stone. Capstones may be cut or uncut.

In some CCC capstone culverts, coping stones that span the culvert opening are set on one or both sides of the capstone. Typically the coping stones are not set on the capstone but, instead, on the sidewalls. The coping stone(s) span the gap in the trail retaining wall that is either the inlet or outlet of the culvert. There is no rule for whether culverts have coping stones on one or both sides of the trail, or for which side of the culvert a single coping stone should be placed. Where culverts are breaks in tall retaining walls, or in retaining walls that already have coping stones, coping should be set beside capstones so that they span the opening in these walls.

2. Graveled-over Culvert (Figs. 4-23 & 4-24)
Graveled-over culverts are found on VIA/VIS trails with gravel treadway and on some CCC trails. Differences in construction details for the two periods are noted in the specifications that follow. Relevant VIA/VIS trails include the Seaside Path (#401), Asticou Trail (#49), Red/Schooner Head Road Path (#362), Jesup Path (#14), and Kane Path (#17). Examples of CCC use are located on the Ocean Path (#3), Valley Trail (#116), and Long Pond Trail (#118).

The graveled-over culvert has a stone bottom, retaining walls on its sides, and lintels and is intended to be under the treadway. There are two variations of graveled-over culverts in Acadia. Some use vegetation over the lintels at the edge of the treadway to retain low sidewalls and gravel. Examples of these culverts were used on the Red/Schooner Head Road Path (#362). Others have coping or insloping lintels at the edges to retain gravel, like examples on the Gurnee Path (#352).

Dimensions: Area and depth of construction for the culvert should be determined by the amount of water flow, topography, and trail surface elevation. The total length of the culvert should be 6 to 9 feet, including the 1- to 3-foot extension beyond the edge of the treadway on both sides. The culvert opening ranges from 1 to 2 feet wide by 6 inches to 2 feet high. However, it may be as large as 6 feet high. VIA/VIS endowed paths such as the Jesup Path (#14) and Gurnee Path (#352), and CCC paths fall towards the larger end of this spectrum, while earlier paths contain the smaller-size culverts.

Construction: Sidewalls should be set 6 inches or more below the floor of the culvert to lock them in place. Sidewalls may consist of single large stones, or may be small retaining walls constructed of several stones. The top of the side retaining walls is at a height below the surface of the trail so that the lintel can be laid over them, and the coat of gravel over the lintels will be flush with the final surface. In other words, if 6-inch-thick lintels are to be used, and 3 inches of surfacing, then the wall height should be 9 inches below the finished grade of the trail.

The floor of the culvert is then laid between the walls. It may be "tiled" with flat-laid stones contacting each other, with the remaining gaps chinked, or it may be packed stone rubble. The floor of the culvert should extend into the drainage on both sides of the culvert so that it surrounds the edges of wall stones. On the downhill side of the drainage it should extend beyond the point at which scouring is likely to occur. Rubble culvert floors should be locked into place at their outlets by stones set into the ground, the tops of which are flush with the top of the culvert floor.

Lintels are then spanned over the culvert opening so that they are laid with one side on each wall. They are set side by side, spanning the culvert length. Lintels average 1 foot wide and 2 to 3 feet long. Their thickness ranges from 3 inches for narrow spans to a foot or more for wider spans. There should be no gaps between lintels that cannot be completely chinked closed. Gaps allow gravel from the tread surface to filter through. It is not necessary for the surface of the lintels to be flat, or at all even, as it will be covered with gravel. Some lintel stones may be rounded on top, or have protruding pieces.

In a Gurnee-style culvert, the lintels set at each end of the culvert should meet the grade line similar to causeway wall stones, slope inwards like pipe culvert headers (see below), and have good contact points on each side

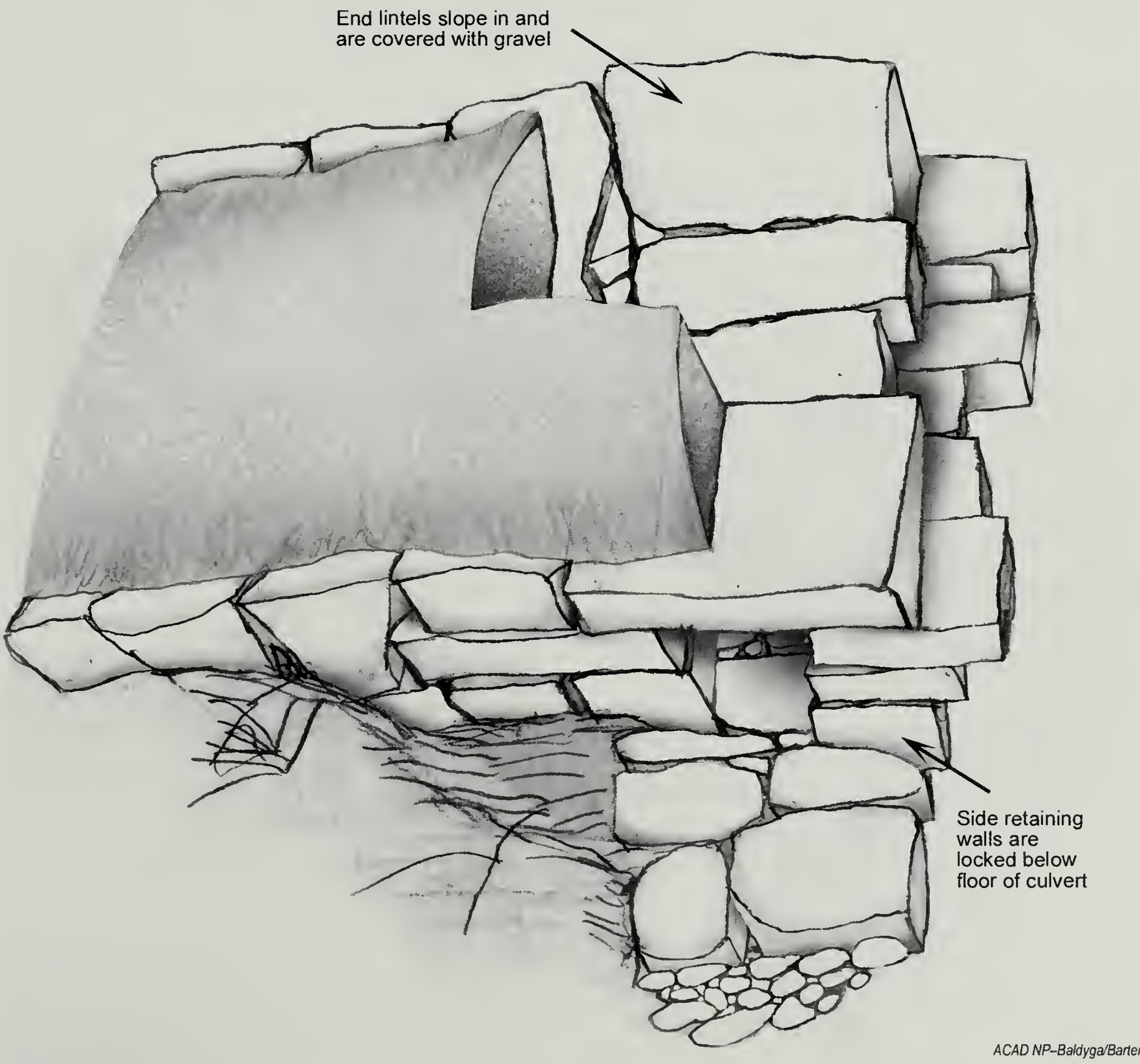


Fig. 4-23 Detail of a VIA/VIS graveled-over culvert, as was built on the Gurnee Path (#352).

so that they hold gravel. In Kane Path and Red/Schooner Head Road Path (#362)–style culverts, the lintels set outside the trail need only be laid as the others, as they will be covered with 3 to 4 inches of stones, gravel, and vegetation.

In Kane Path (#17) and Red/Schooner Head Road Path–style culverts, a single row of coping stones is placed on top of the top stones, framing the width of the trail and holding the gravel treadway. The VIA/VIS often used softball-sized stones. If abutting stones are used, each should be of a size compatible with other coping or sidewall on the trail. When possible, single long stones spanning the culvert width are recommended to increase durability. The length of stone will vary with width of culvert, but width and height of stone should be between 6 inches and 1 foot. Coping stones should be locked in place with smaller stones, then covered with soil and transplanted vegetation. Small stones may be laid along the outside of the revegetated top of the culvert to retain the material. Sod should be planted immediately in the vegetated area to ensure the retention of coping, soil, and trail material.

For CCC trails a dip should be constructed in the treadway somewhere above the culvert, ideally several feet from it, so that water flowing through the dip doesn't destroy the culvert. Such a depression ensures that water flowing over a clogged or overstressed culvert will cross the trail above it, instead of traveling down the trail and washing out long sections of treadway. The dip dimensions are determined by the flow of water, the slope of the treadway, and the width of the drainage. The width of the dip should exceed the width of the culvert beneath it by a foot on either side.

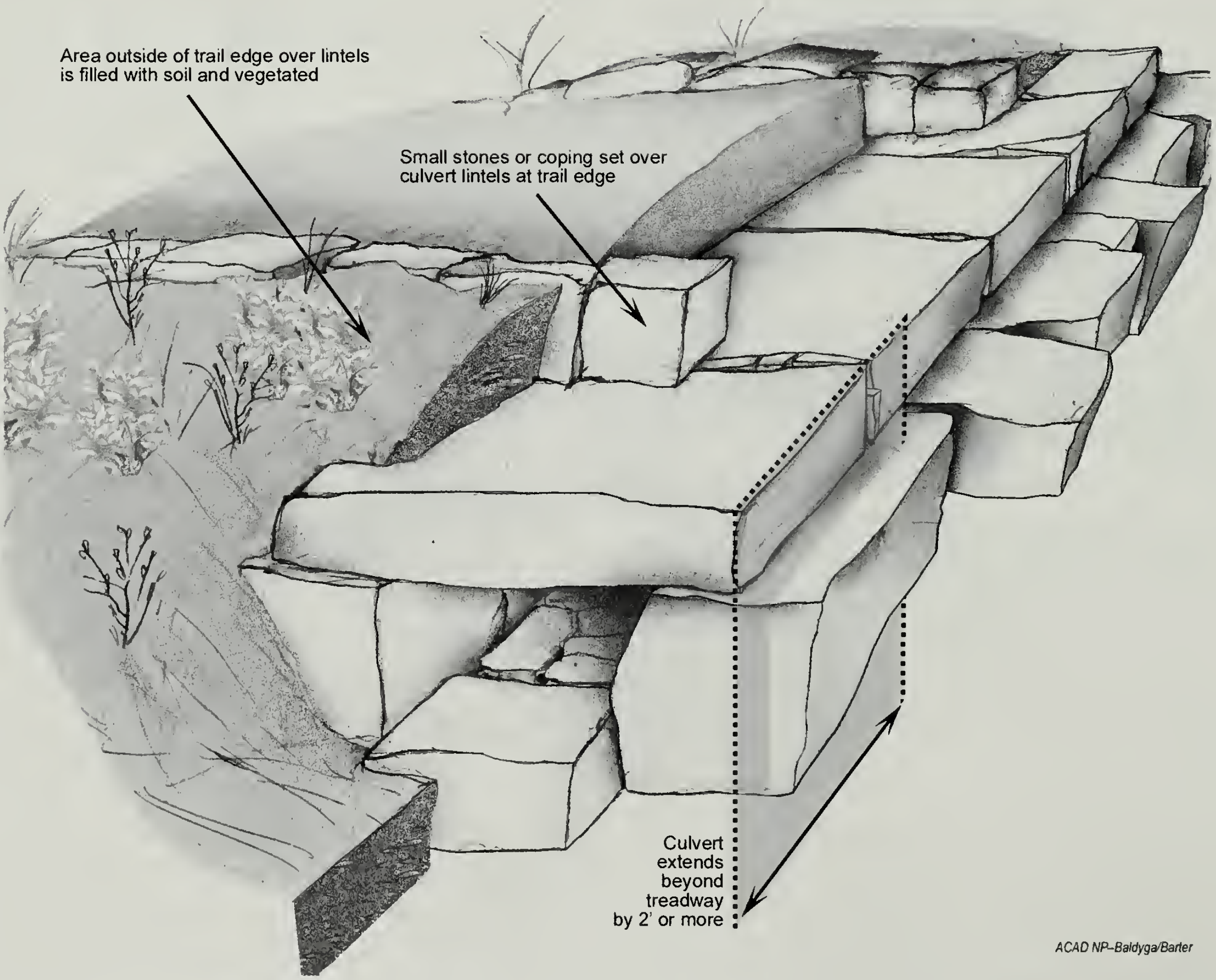


Fig. 4-24 Detail of a graveled-over culvert with vegetation cover, as was used on the Schooner Head Road Path (#362).

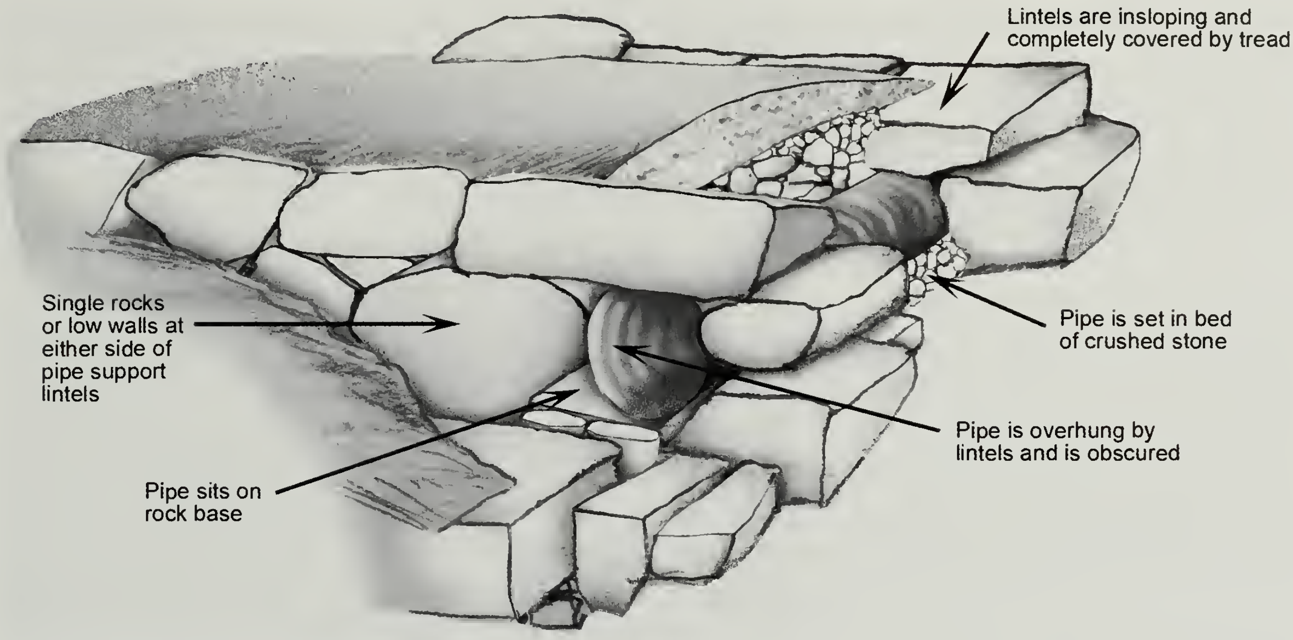


Fig. 4-25 Detail of a pipe culvert with stone headwalls.

3. Pipe Culvert (Fig. 4-25)
VIA/VIS and CCC pipe culverts appear in raised tread areas incorporating side drains. Pipe culverts serve the same function as graveled-over culverts. The pipe is protected and obscured at each end by a stone headwall, which consists of a stone base, side support walls, and lintel. Usually in VIA/VIS pipe culverts the side retaining walls are single stones.

Dimensions: Dimensions are dictated by width of trail and amount of flow. Pipe diameter should be at least eight inches to facilitate cleaning. The ends of the pipe should be set back two to four inches from the outside edges of the header walls in order to obscure and protect the pipe.

Construction: Stone rubble is laid in the drainage channel beneath the pipe. One pipe should be laid across the trail following the angle at which the water crosses the trail. Pipe culverts draining inside ditches should be laid perpendicular to the trail if possible.

At each end of the pipe, lintel supports and lintels are placed. The supports, or support walls, are usually single stones laid on each side of the pipe, well below grade, header style, and sloping into the trail. The height of the support stones should be just above the pipe, but below the grade line so that the lintel will exactly reach the grade line when it is laid across them. The lintel is laid so that it slopes in, exactly reaching the grade line at the edge of trail. Lintel stones should completely span support stones and have contact points on each side so that gravel is retained. Lintels that do not slope into the trail and become covered with surface materials *do not stay in place.* Support stones are held in place by abutting causeway stones, or in the case of wall-less construction, by stone rubble.

Rubble is packed around the pipe to secure it in place, and at least 6 inches of surface material is laid over the top of the pipe and over the insloping portions of the lintels, to prevent frost heave.

4. Open Stone Culverts (Fig. 4-26)
Open stone culverts were used by the VIA/VIS to allow small and medium streams to cross trails, and to drain side drains. NPS has built a number of these features since the 1970s, not all of them in appropriate places. Original open stone culverts can be found on many VIA/VIS trails, including the Jordan Pond Path (#39), the Seaside Path (#401), Eagle Lake Trail (#42), the Jordan Pond Carry Path (#38), and Kurt Diederich's Climb (#16).

This type of culvert encompasses a broad range of individual styles, influenced by builder and era, but all are of the same basic design with a single channel, stone retaining wall sides, and open top creating a gap in the treadway. The sidewalls may be single-tier or multi-tier, and the floor may or may not be lined.

Dimensions: The culvert should extend the width of the trail. The culvert opening varies between 8 and 16 inches. Less than 8 inches clogs too easily and greater than 16 inches is difficult to step across. Historically, the depth of open culverts has varied greatly, from 8 inches to 3 feet. For rehabilitation, shallower channels are preferred for visitor safety. They should average between 8 inches and 1 foot. Deeper channels should be avoided.

Construction: Single-tier walls may be built of stones set in various styles, including "toast" (standing up), "cake" (lying down), or "header" (set vertically, but with the greatest length of the stone extending back into the trail). However, while historical examples exist, "toast"-style sets are far weaker and are not recommended unless rocks are very large (over 3 cubic feet), and set halfway or more into the ground; "toast"-style sets are never used in multi-tier walls. Wall footings should be set at least 3 inches below the floor of the culvert, and all retaining wall sides should conform to standards for retaining wall construction (see Chapter 6). In order to retain tread material, there should be high contact between stones at the top of the culvert side walls. Sidewalls should extend at least 6 inches below the surface of the culvert floor. Bottom courses should be set in solid soil or on a base of stone rubble. Outside edges of the culvert walls should usually be locked in place with large stones set deep in the ground, to prevent separation.

The floor of the culvert may be stone tiled, stone rubble, or earth and should be constructed the same as with a capstone culvert.

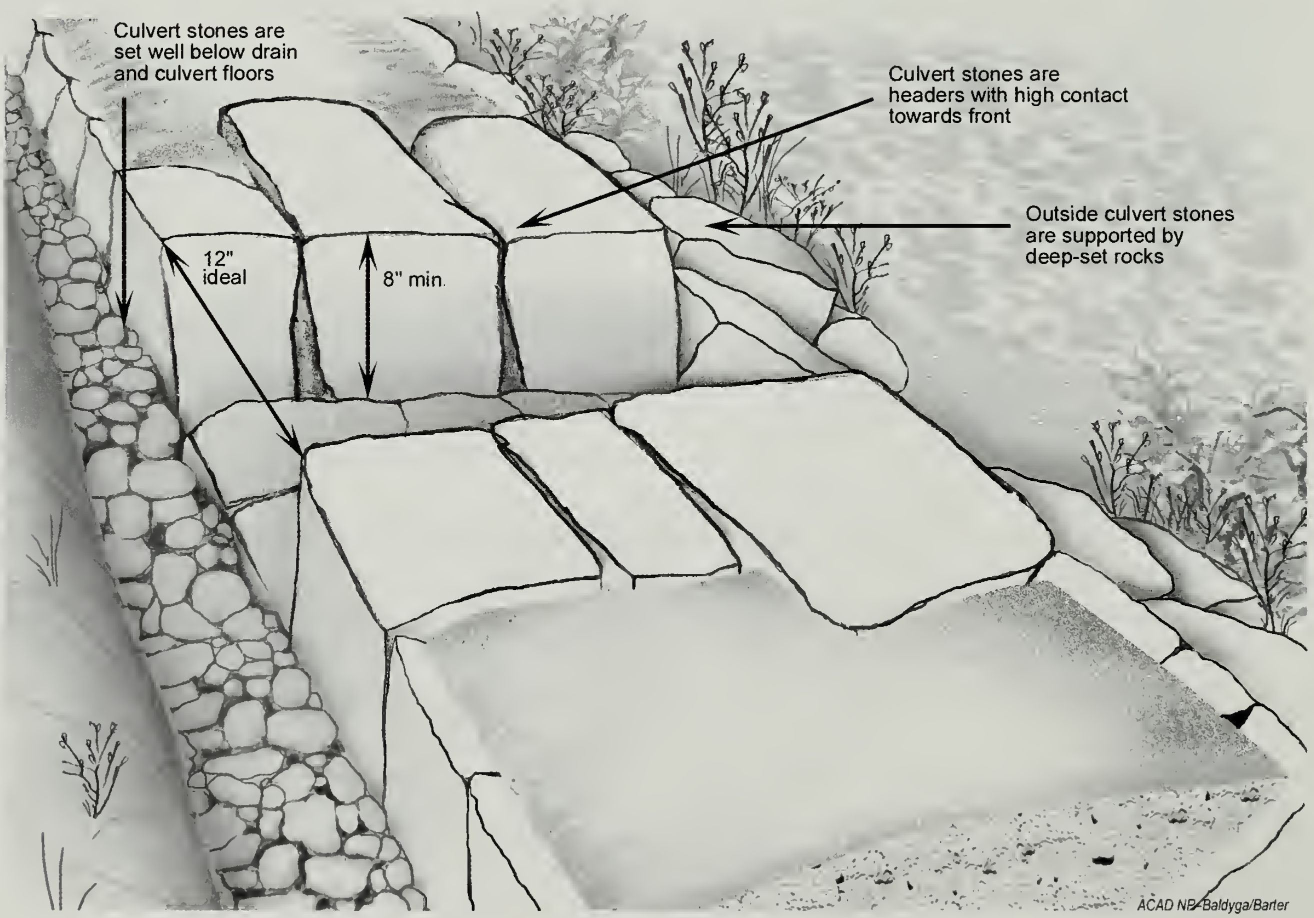


Fig. 4-26 Detail of an open stone culvert.

Fig. 4-27 Newly installed stepstone culvert on the Jordan Pond Path (#39).

5. Stepstone Culverts (Fig. 4-27)

Stepstone culverts are open stone culverts with two or more drainage channels separated by one or more stepstones. The addition of a stepstone or stones to the drainage path of a culvert allows for a substantial widening of the drainage path. For the purpose of clarity, drainage features with three or more stepstones between the walls at their edges will be considered stepping stones. Stepstone culverts are the rarest of the culvert types, but they appear on several VIA/VIS trails, including the Jordan Pond Path (#39) and Kurt Diederich's Climb (#16).

Dimensions: The length of the culvert should extend the width of the trail. The width of the opening is usually greater than 16 inches. Any narrower width, and a stepstone is not usually needed as the open culvert can be easily traversed. The depth of the channel should be 8 inches to 1 foot.

Construction: For the construction of the culvert sidewalls and floor, see "Open Stone Culverts" above.

The stepstones should generally follow the specifications for stepping stones for stream crossings as described in Chapter 5, Section C. These stones vary between 1 and 6 square feet of stepping surface. They have flat or nearly flat tops and are set level with one another and the culvert sidewalls. They may be set directly in the earth, on or between existing stones, or on built-up beds of stone rubble.

6. Catch Basins (Fig. 4-28)

As noted in treatment recommendations, catch basins are not intended for use with all culverts. Generally, if the culvert opening is 18 inches or wider, a catch basin should be considered, particularly if there is heavy water flow laden with organic matter.

Dimensions: When catch basins are constructed, they should conform to the dimensions of both the culvert opening and the side-drain width (if a side drain is used). A catch basin serving a culvert whose opening is 2 feet wide and whose drainage ditch is 18 inches wide will be 2 feet by 18 inches. One foot square is a minimum size for catch basins, to allow for both effective trapping and cleaning. An ideal depth is 6 inches below the surface of the drainage floor, though massive culverts may require more depth.

Construction: Construction of a catch basin should blend with that of the culvert and drainage. A stone-lined drain that empties into a stone culvert may have a catch basin. If so, it will have a square catch basin with four sides constructed of stone and a paved or crushed stone bottom. On the other hand, culverts that terminate at unlined ditches containing catch basins will have a single built side at the terminus of the culvert with a simple crushed-stone base.

Sidewalls should be constructed of single stones buried eight inches or more in the ground, though laid wall may be used for deeper catch basins. At their tops, catch basins should have high contact between stones to retain material behind them and keep the catch basin from silting in unnecessarily.

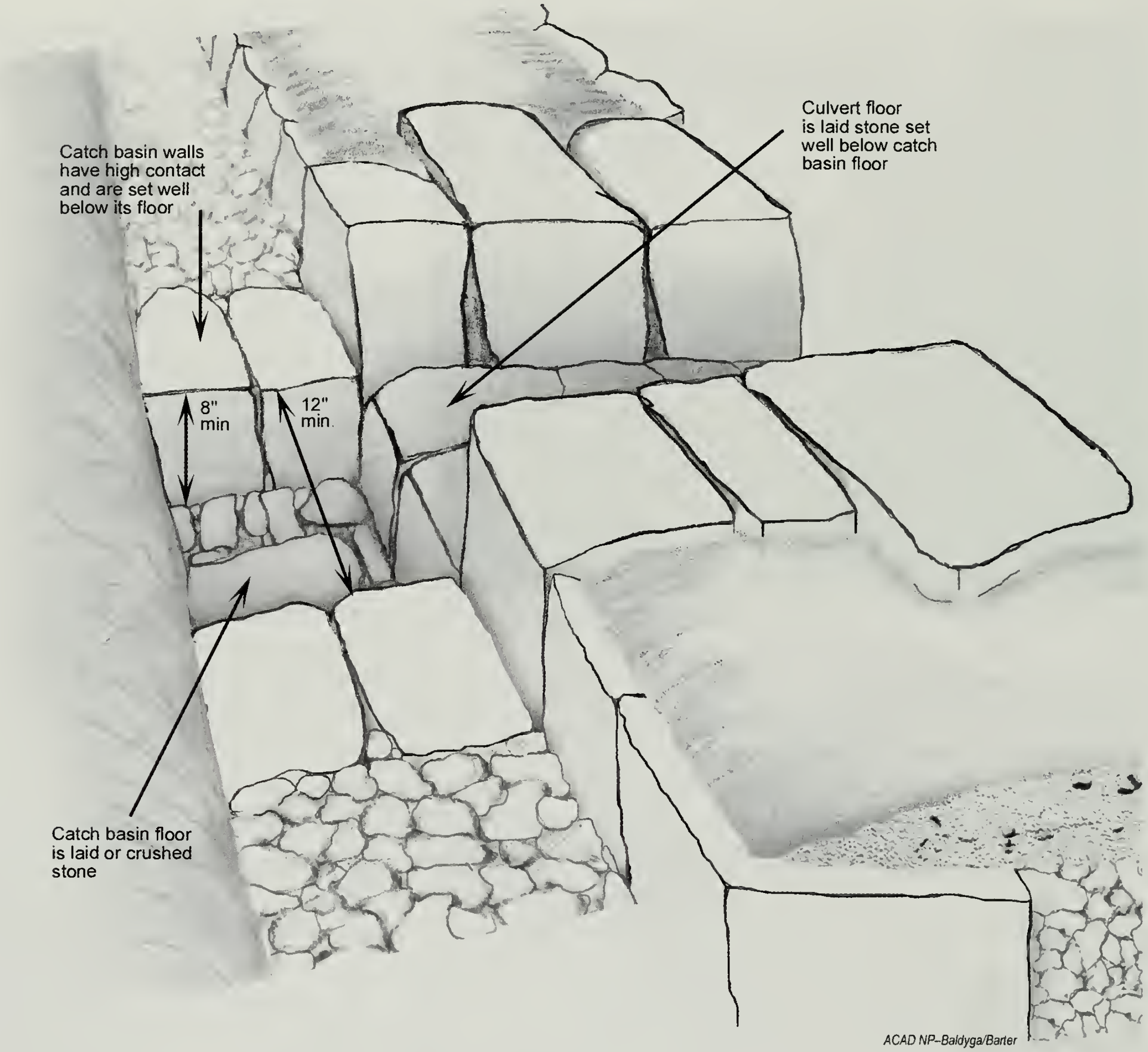


Fig. 4-28 Detail of a catch basin.

ROUTINE MAINTENANCE

1. All types of culverts and associated inflow and outflow drains should be cleaned annually and kept free of debris, soil, and stones. Culverts with stone bases should be scraped clean to the stones. Culverts with gravel or soil bases should be cleaned to the level consistent with drains flowing into them; care must be taken not to dig too deep, as this could expose and weaken the sides of the culvert.
2. Outflow drains should be cleaned and re-dug as far as necessary to ensure that water flows unimpeded from the culvert. Dams in outflow drains can cause water to back up onto the trail, or ice to freeze inside the culvert and destroy it.
3. Catch basins should be cleaned annually by removing silt and gravel buildups.
4. Check for loose or collapsed stones in the sides and tops of culverts. Loose sidewalls should be rebuilt. Loose top stones can sometimes be shimmed, but will normally have to be relaid. In the case of graveled-over culverts, check the interior of the culvert for evidence of separation between the top stones. Failure in this area would allow gravel to fall in and clog the culvert. Repair as necessary.
5. For pipe culverts, reset pipes that have been lifted by ice and resurface the treadway.

B. SUBSURFACE DRAINS

DEFINITIONS

A **subsurface drain** is a covered drain, also called a hidden or blind drain, that allows water to percolate alongside and/or under the trail. This type of drain can absorb large volumes of slow-moving, seeping water. Three types of subsurface drains are found at Acadia. The first two types, French drains and subgrade drainage, are features used historically on the trail system. The third type, perforated-pipe drain, is a contemporary substitute for the French drain.

A **French drain** is a covered channel of stone laid underneath the trail surface or the surrounding ground. A French drain may run along the uphill side of the treadway and/or underneath the treadway, extending across to the downhill side of the treadway. The stones allow water to percolate through. This type of drainage was used historically on the trail system. Over time, French drains may silt in and become ineffective.

Subgrade drainage is non-channeled subsurface drainage that moves through the subgrade of the entire length of trail sections. The subgrade is constructed of clean stone rubble that allows percolation through the trail beneath the surface of the treadway. For more information on this type of drainage, see Chapter 3, Section B and C.

A **perforated-pipe drain** consists of sections of perforated plastic pipe surrounded by gravel and wrapped in geotextile material. Perforated-pipe drains may run parallel to the trail on its uphill side, functioning as side drains, or they may cross underneath the treadway, functioning as culverts. Plastic perforated-pipe drains allow unimpeded flow of water with minimal siltation and are considered a preferable alternative to French drains.

HISTORICAL USE OF SUBSURFACE DRAINS AT ACADIA

Pre-VIA/VIS

There is no documentation or evidence of the use of subsurface drainage prior to the VIA/VIS era.

Village Improvement Associations/Societies

The first trail that included subsurface drains was likely George Dorr's Bicycle Path (#331) around Beaver Dam Pool. In 1901, six years after the trail was initially constructed, Dorr described revegetation of a bank "that covers a drain upon the western side and protects the path from overflow by surface water from the higher ground above."[18] On other later VIA/VIS trails, the treadway was improved by the construction of subgrade drainage under raised treadway. Water could then percolate into and under the trail surface. In such cases the entire section of trail functioned as a subsurface drain. Trails built in this manner include the Red/Schooner Head Road Path (#362) and Seaside Path (#401). This method is described in more detail in Chapter 3, Section B.

Civilian Conservation Corps

The CCC used French drains, both alongside and under the trail treadway, and subgrade drainage. Evidence of their work is found in historical photographs taken during the construction and reconstruction of the Ocean Path (#3) at Otter Cliffs and the Ladder Trail (#64). CCC stone drain work is also still evident on the Long Pond Trail (#118) and the Valley Trail (#116).

NPS/Mission 66

Design drawings prepared for the construction of trails during the Mission 66 period indicate that subgrade drainage was the only type of hidden drainage employed by Mission 66 builders, often in conjunction with side drains and pipe culverts.

National Park Service

NPS crews began to use subsurface drainage more consistently during the rehabilitation efforts in the 1990s. In 1999 the NPS trails crew installed the first perforated-pipe drains on the Jordan Pond Path (#39) to capture seepage from the slope above the pond.

This feature was also successfully used on the Great Meadow Loop (#70).

TREATMENT FOR SUBSURFACE DRAINS

1. Trail Erosion and Tread Saturation

Issues: Inadequate subsurface drainage can be a substantial threat to trail integrity. If the water is not adequately channeled from the trail or allowed to percolate underneath the trail, erosion, trail saturation, or other problems will result. French drains, although historically used on the trail system, are not effective for the long term. Siltation eventually renders them ineffective, and they are difficult, if not impossible to clear out and maintain. Historically, subgrade drainage was not used frequently enough.

HISTORICAL CHARACTERISTICS
Pre-VIA/VIS (pre-1890)
There is no evidence or documentation for subsurface drain use.
VIA/VIS Period (1890–1937)
Concealed French drains on the uphill side of the trail were used to capture cross-trail water flow in combination with stone rubble under the treadway.
CCC Period (1933–42)
Concealed French drains on the uphill side of the trail were used to capture cross-trail water flow in combination with stone rubble under the treadway.
NPS/Mission 66 Period (1943–66)
The use of subsurface drainage diminished as open ditches and pipe culverts were routinely used.
NPS Period (1967–1997)
Concealed perforated-pipe drains were first used in the system. Like concealed French drains, these were located on the uphill side of a trail to capture cross-trail water flow in combination with stone rubble under the treadway.

Treatment Guidelines: Subsurface drainage should continue to be used as the trail system is rehabilitated to protect the trails' structural integrity, prevent erosion, and eliminate tread saturation.

French drains are historic features on many trails, and should be preserved and rehabilitated as necessary. However, given their likelihood of failure, they are not recommended for addition to existing trails or new trail construction.

Perforated-pipe drains and subgrade drainage are the two features recommended for constructing new trails, or adding drainage to existing trails. Since these features are hidden underneath the trail, they do not interfere with the trail's historic aesthetic, yet still provide an effective solution to subsurface drainage problems.

SPECIFICATIONS FOR SUBSURFACE DRAINS

Specifications are provided for French drains and perforated-pipe drains. Construction of subgrade drainage is integral to construction of the trail's tread. See Chapter 3 for specifications concerning tread material.

National Archives, Waltham, MA, 97-5-23

Fig. 4-29 A circa 1935 photograph of a CCC rehab of the lower section of the Ladder Trail (#64) shows a rubble French drain being installed along the side of a staircase with coping retaining wall.

1. French Drain (Fig. 4-29)
French drains were installed by the VIA/VIS and CCC using a technique similar to the description below.

The wet or boggy section of trail is excavated to create a channel underneath the trail approximately 2 feet below the treadway and 2 feet wide. The section is filled with stone rubble or coarse gravel. The drain should extend 2 or more feet in length on the downhill side of the trail, to provide more area for the water to drain. Larger stones are placed at the base of the drain with progressively smaller stones toward the surface and a final covering of tread material. Geotextile material may be used to cover stones underneath the final layer of tread material.

2. Perforated-Pipe drain (Fig. 4-30)
Perforated-pipe drains have been installed by the NPS trails crew on the Jordan Pond Path (#39) and Great Meadow Trail (#70) according to the following procedures.

A 4-inch-diameter, flexible plastic, perforated pipe and lightweight, non-woven, water-permeable geotextile material are the primary materials used.

In one type of application, the lengths of pipe are installed in a trench running alongside, or just under the edge of the trail. Depending on the volume of drainage needed, more than one pipe may be laid in the trench. Multiple pipes are placed directly adjacent to one another, or with a slight interval in between. The pipes may terminate at another drainage feature, like a culvert or stream that crosses under the trail, or the pipes themselves may cross under the trail, terminating on the trail's downslope side. When crossing under the trail, the pipe is simply bent to a 90-degree angle and directed to the other side of the trail.

In another, more common, application, perforated-pipe drains are used simply as cross-drains for seepage. In this case, the pipe terminates just beyond the edge of the trail on either side, as described below.

In either case, individual pipes or groups of pipes are laid into a bed of clean, crushed, or round stone between 1 and 3 inches diameter. The bed of stone should surround the pipe or pipes by at least 3 inches on each side. To prevent the pipe from silting, the entire bed of gravel and pipe is covered on the top and

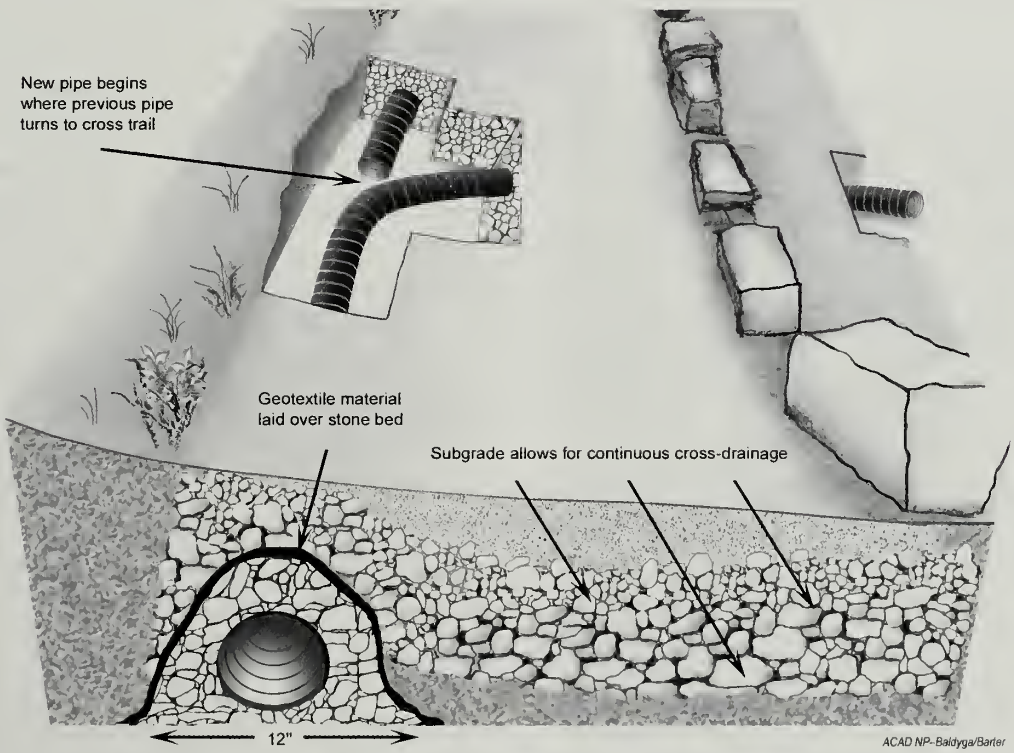


Fig. 4-30 Detail of a perforated-pipe drain.

sides with geotextile material. Geotextile material is not needed underneath the pipe. At least 4 inches of material, either soil or gravel, should be placed above the geotextile to prevent frost heave and to hold it and the pipe in place.

Either end of the pipe may be buried in a bed of clean crush, tucked between stones of a sidewall or retaining wall, or protected by a header roughly like those used for pipe culverts. If the header is off trail, it need not conform to any grade line and will be easier to build. Crush that covers the end of a perforated pipe should not be revegetated as wall-less causeway is, but rather left clean, with only a good strip of sod used along the trail edge to retain gravel. Pipes should not terminate partway across the trail.

ROUTINE MAINTENANCE

1. Subsurface drains are often completely hidden, and the clues that reveal them to a crew six months after construction will often be gone a few years down the road. Therefore, careful logs must be kept of their locations for future maintenance.
2. Drains leading into and out of subsurface drains must be kept clean.
3. The ends of the pipes, which are all that are accessible, should be checked annually for clogs or fractures. Stones set in front of the openings should be removed for checking and cleaning, and then put back in place.
4. Standing water on the uphill side of a subsurface drain, or scouring of the trail above a subsurface drain indicate a problem underneath the ground. In most cases, stones obscuring the ends of the pipe can be removed, and a stick or tool handle used to clean out the pipe. If problems can't be resolved by cleaning, the drain must be excavated and the cause of the failure resolved. Possible reasons for failure include clogging, a crushed pipe, or insufficient pipe area for the volume of water.

C. SIDE DRAINS

DEFINITIONS

A **side drain** is an open drain that runs parallel to the trail and collects water before it reaches the treadway. The collected water runs parallel to the trail on one or both sides of the treadway, usually crossing or flowing under the trail through a culvert.

A side drain is generally located directly adjacent to the side of the trail and built as a part of the overall construction of the treadway. However, it may be located 10 or more feet from the trail, in which case it may be called "off-trail drainage." A side drain may be stone-lined, a simple earthen ditch, or the drainage path created by the construction of raised tread.

Three types of side drains are used at Acadia. Walled side drains and fully constructed side drains are fully or partially constructed of stone, while earthen ditches have no associated stone elements.

A **walled side drain** is a partially constructed drainage channel consisting of a stone wall on the side adjacent to the trail, and no construction on the side of the drain away from the trail. The stone wall may be a single or multi-tiered wall. The wall retains the tread and ensures the integrity of the drain. The floor of the drain may be flat-laid stones, packed stone rubble, or earth.

A **fully constructed side drain** is one in which both sides and the floor of the drainage are laid stone. The drain may have two vertical sides, like an open culvert, or be "V-shaped" (example on the Beech Mountain West Ridge Trail, #108) or "U-shaped" (example on the Emery Path, #15).

A **ditch** is a simple drain that collects and directs water adjacent or near the side. Ditches can be constructed more quickly, but are more susceptible to scouring and collapse. The practice of ditch and fill can be used to restore a wet area by ditching along one or both sides of the treadway to create drains, and using the excavated material on the trail as fill, creating a raised treadway. Examples of this technique can be seen on the Western Mountain Trail (#120).

Off-trail drainage refers to ditches constructed away from the trail, sometimes as far away as 100 feet or more. These are generally used to connect tributaries or concentrate sheet flow into a single drainage path in order to reduce the need for side drains alongside the trail itself.

HISTORICAL USE OF SIDE DRAINS AT ACADIA

Pre-VIA/VIS

There is no evidence or documentation of side drain use prior to the VIA/VIS era.

Village Improvement Associations/Societies

Side drains of various types were included on many early VIA/VIS graveled trails. The Red/Schooner Head Road Path (#362) is a raised treadway. Though no ditches are now visible, regularly spaced culverts demonstrate the anticipation that sheet water would collect and run along the inside of the treadway. The Jordan Pond Seaside Path (#401) appears to have some walled side drains created by the raised treadway, and the Asticou Trail (#49) has sunken walled side drains with stone-lined bottoms (Fig. 4-31). These trails used side drains with culverts to drain water both perpendicular to and parallel with the treadway. There is also evidence of historic off-trail drainage on the Jordan Pond Path (#39).

Some later VIA/VIS trails used side drainage in conjunction with causeway, including the southern part of the Kane Path (#17) and the Jesup Path (#14). However, there is little use of side drains on the stone paths, with a few notable exceptions, such as short sections of walled side drains on the Gurnee Path (#352) and Emery Path (#15), and the fully constructed "U-shaped" drain at the base of the Emery Path (#15). This features shown in a 1916 photo and is part of the trail's original construction, although it was once believed to be a CCC addition.

Civilian Conservation Corps

The CCC made extensive use of all types of side drains on nearly all their trails. The Perpendicular Trail (#119) uses walled side drains (Fig. 4-32). The Valley Trail (#116) and Ocean Path (#3) combine raised tread with ditching. The V-shaped drain was introduced to the system by the CCC, and the two examples of its use are on the Beech Cliff Loop Trail (#114) and the Beech Mountain West Ridge Trail (#108) (Fig. 4-33). It seems certain that the Valley Cove Trail (#105) had no side drains, or other drainage features except for two culverts. This trail and portions of the Long Pond Trail (#118) have been degraded due to the lack of drainage features, while the Perpendicular Trail (#119) has maintained its integrity thanks in part to adequate drainage.

NPS/Mission 66

Mission 66 used ditching with raised treadway on the Ship Harbor Nature Trail (#127) and Anemone Cave Trail (#369).

National Park Service

Ditch and fill was used by the NPS crew in the 1990s to restore miles of chronically wet treadway. The result in many cases was a smooth, dry walking surface with effective side drainage on one or both sides of the trail.

Olmsted Center, 4-99-49-s34

Fig. 4-31 An original VIA/VIS side drain on the Asticou Trail.

Fig. 4-32 A walled side drain along a stone cliff face on the Perpendicular Trail (#119).

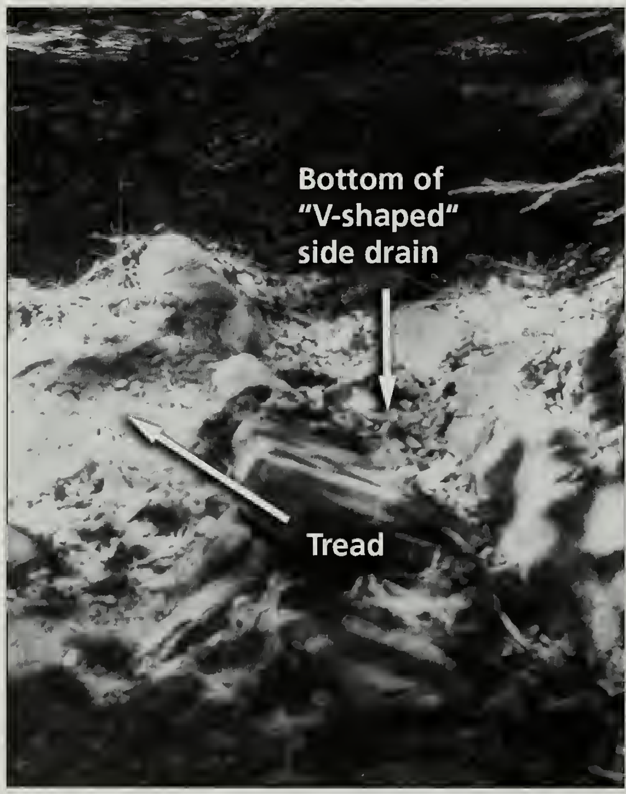


Fig. 4-33 A CCC-era "V-shaped" side drain along the Beech Mountain West Ridge Trail (#108).

Water in the ditches is diverted away from the trail when possible, or else across the trail with stone water bars or open stone culverts. Trails rehabilitated in this way include the Western Mountain Trail (#120), the Cadillac South Ridge Trail (#26), the upper portion of the Long Pond Trail (#118), and Deer Brook Trail (#51) near the intersection with the Jordan Pond Path (#39) (Figs. 4-34 & 4-35).

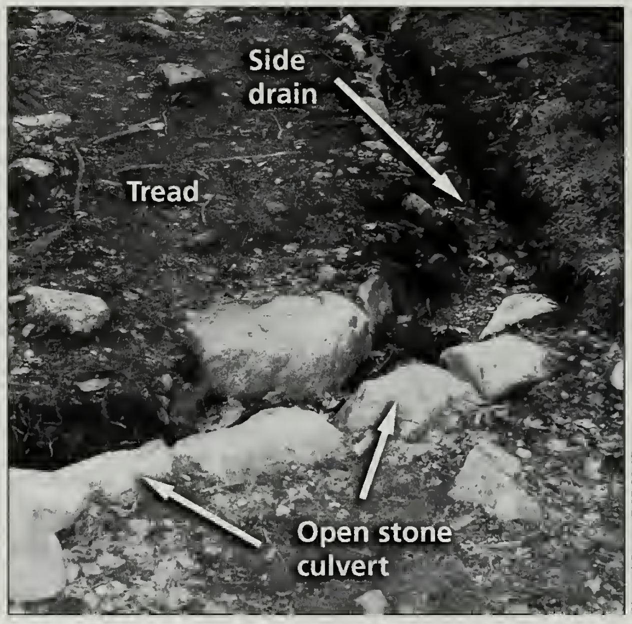


Fig. 4-34 Ditch and fill work with an open stone culvert on the Long Pond Trail (#118).

Fig. 4-35 Ditch and fill on Deer Brook Trail (#51) with tread constructed of material taken from the ditch. Sides of the ditch are sloped and the ditch (in foreground) has been angled properly.

HISTORICAL CHARACTERISTICS OF SIDE DRAINS
Pre-VIA/VIS (pre-1890)
There is no evidence or documentation for side drain use.
VIA/VIS Period (1890–1937)
Side drains and ditches were used in early VIA/VIS work. These were generally not highly constructed. Side drains were occasionally used on memorial or other highly-crafted VIA/VIS trails.
CCC Period (1933–42)
The CCC relied on highly constructed side drains and ditches to rehabilitate old trails and for new construction.
NPS/Mission 66 Period (1943–66)
Side drains and ditches were used with pipe culverts, but they were not highly crafted. Little effort was taken to preserve extant side drains during rehabilitation of older trails.
NPS Period (1967–1997)
Ditch and fill was the preferred type of side drain, with little or no use of highly constructed side drains or ditches. Exceptions included rehabilitation of preexisting historic work.

TREATMENT FOR SIDE DRAINS

1. Trail Widening

Issue: The addition of side drains widens the original corridor of a trail, and creates the need for culverts or subsurface drains to carry water across the trail.

Treatment Guidelines: In many places where they were never constructed, side drains are needed in order to rehabilitate and preserve graveled paths and other trails with a historical standard of uninterrupted treadway. The introduction of side drains, often by means of building a causeway, is considered the most acceptable drainage alternative for gravel paths whose drainage problems cannot be solved with dips. On the Long Pond Trail (#118), for instance, side drains will be a necessary component in the rehabilitation of many yards of washed-out treadway. Generally, the resulting widening of the trail corridor is an acceptable compromise to ensure the preservation of the trail's structural integrity.

However, in certain situations, the widening of the trail corridor that results from the construction of side drains is unacceptable, such as when important natural trail-side features, such as large boulders or trees, would have to be removed. In these cases, other options should be considered including off-trail drainage, subsurface drainage, or durable tread such as stone paving.

2. Durability

Issue: Ditches and walled side drains without constructed floors, though often historically accurate, can collapse or scour when subjected to heavy flows.

Treatment Guidelines: Existing historical side drains should be rehabilitated to retain the character with which they were built. However, in some cases extra construction is required. In general, stone bottoms should be restored or added to all side drains showing signs of collapse or scouring. This will prevent stones along the side from being undermined by moving water. In most cases, crushed rock can be pounded into the bottom of a drain to prevent scouring, and as the rock silts in it will be obscured and the drain will appear unconstructed. Native rock should be used for this application since some of it may be visible.

SPECIFICATIONS FOR SIDE DRAINS

1. Walled Side Drains (Figs. 4-36 & 4-37)

The drainage path of a typical walled side drain should be at least 8 inches deep and 12 inches wide. Walled side drains may include either a wall with a single tier of stones, or a wall with multiple tiers.

Wall stones on the trail side of a side drain should be set well below the bottom of the drain, at least 3 inches, to withstand scouring. Walls should be built according to specifications for walled causeway described in Chapter 3, Section B. The contact between stones should be at tread height or above to prevent gravel from washing out of the tread and/or silting the drain.

In walled side drains, the bottom is reinforced with either laid or crushed stone. If the drain is steep or carries an excessive amount of fast-moving water, checks should be added to the floor of the drainage to avoid scouring and the subsequent loss of sidewall (see Chapter 6, Section A).

2. Fully Constructed Side Drains (Fig. 4-38)
V-shaped side drains consist of two, single-tiered stone walls set at a 1:1 slope so their bases come together at roughly a 90-degree angle, forming a V shape between the opposing stones. Flat, rectangular stones are recommended. To avoid separation between stones, the bottoms of the stones in one wall should rest on the stones in the opposite wall. All stones should contact abutting stones at their tops. Joints between stones should be staggered with joints in the opposing wall.

Fig. 4-36 A walled side drain installed on the Jordan Pond Path (#39) along new walled causeway in 2001. Temporary wood planks cover the new open stone culvert.

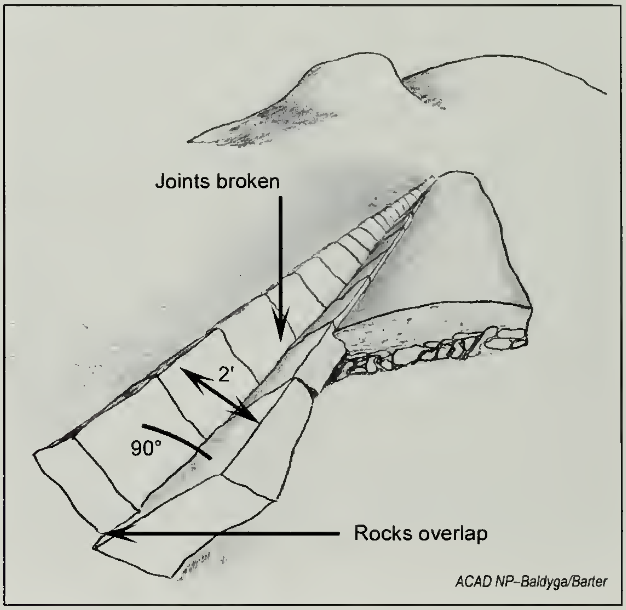


Fig. 4-38 Detail of a fully constructed "V-shaped" side drain.

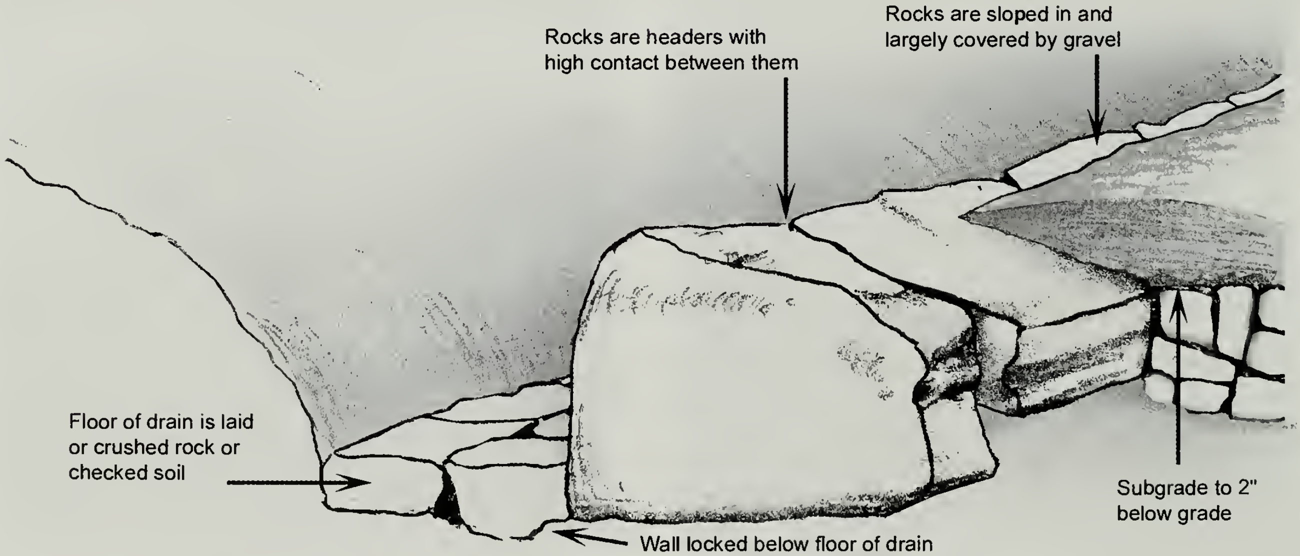


Fig. 4-37 Detail of a walled side drain.

Target dimensions for a V-shaped drain are 2 feet wide and 1 foot deep. An example of a V-shaped side drain can be seen on the Beech Mountain West Ridge Trail (#108).

U-shaped side drains consist of a shallow drain with a curved bottom that is reinforced by laid stone. The drain should be at least three times as wide as it is deep. The stones may be either square or rounded stones, but they should form a relatively smooth surface for the water to traverse, and should provide a continuous stone surface. Beware of excessive slope in the sides of the drain as small stones will fall easily into the drain bottom.

3. Ditches

The sides of a ditch should be sloped to avoid collapse with a batter no steeper than 1:1 slope. In loose soils, the sides should be dug at an even lower grade. In no case should the side of a ditch be vertical after construction. Due to the batter of their sides, ditches will always be at least twice as wide as they are deep. A typical size for a ditch is 8 inches deep and 16 inches wide.

ROUTINE MAINTENANCE

1. Clean all side drains annually. When cleaning, make sure to maintain the correct shape and not to eat away at the bottom corners of an unlined ditch. A ditch cleaned so that it has vertical walls will cave in. Likewise, make sure the bottom of a stone-lined side drain is not dug out so deep as to compromise walls partially buried beneath it.
2. Repair any dilapidated stonework in keeping with the specifications above.
3. If repeated scouring occurs at the base of unlined side drains or ditches, it is likely that the water flow is too heavy and moving too fast for an earthen bottom. Line the ditch or drain with crushed stone, or tile it with flat laid stones. The floors of graded drains that show signs of scouring should be treated with checks, just as a tread surface (see Chapter 6, Section A.)

D. WATER BARS

DEFINITION

A **water bar** is a structure consisting of a depression crossing a treadway which is reinforced by a log or row of abutting stones on the downhill side. The main function of a water bar is to divert water that is flowing on a sloped treadway. Stone water bars consist of a row of abutting stones. Log water bars use a single log for reinforcement. A backed water bar is a water bar "backed" or held in place by steps or checks constructed below it to help retain the water bar on steep grades (Figs. 4-39 & 4-40).

Olmsted Center,2-99-s

Fig. 4-39 A recently constructed stone water bar on the Pond Trail (#20), located between the motor road and the Jordan Pond Path (#39).

Acadia Trails Crew, 5-99-35-7

Fig. 4-40 A series of log water bars on the Jordan Pond Carry Spur (#40).

HISTORICAL USE OF WATER BARS AT ACADIA

The history of water bars in Acadia is uncertain. In the early 1970s, Acadia Trails Foreman Gary Stellpflug first observed stone and log water bars on the trails, though many have been built since then. These early water bars possibly dated to three periods of construction, though there is no historical documentation or photographs to support this inference. On several trails built by the VIA/VIS, including the Pond Trail (#20), Jordan Pond Carry Path (#38), and the Bowl Trail (#8), there were stone water bars appearing to be very old. They were all similar in construction with small, square stones set with flush tops. Some of these features are still extant on the Pond Trail (#20). Other VIA/VIS trails, including the Asticou Trail (#49) and Bernard Mountain South Face Trail (#111), had log water bars, which may have been added by the CCC or later builders.

Stellpflug found only log water bars on CCC trails, including the Long Pond Trail (#118) and the Beech Cliff Loop (#114). This observation is supported by Arthur's CCC trail construction manual, which contains specifications for the construction of log water bars (Fig. 4-41). Log water bars were also used by the Mission 66 crew on sections 2 and 3 of the Beech Mountain Loop Trail (#113), and in at least one place on the Ship Harbor Nature Trail (#127). However, it is impossible to determine how old these were in the 1970s, and, in the case of wood water bars, whether those in existence were replacements of original features.

Some of the log water bars observed by Stellpflug were poorly constructed and may have dated to the 1940s, '50s and '60s, when there was not much trail maintenance. Since 1990, most of these water bars, constructed with thin logs too short to span the treadway, and set at poor angles, have gradually been replaced with stone water bars. Many new water bars have been built, often on trails that previously had none, and nearly all of these have been stone. A contemporary alternative, water

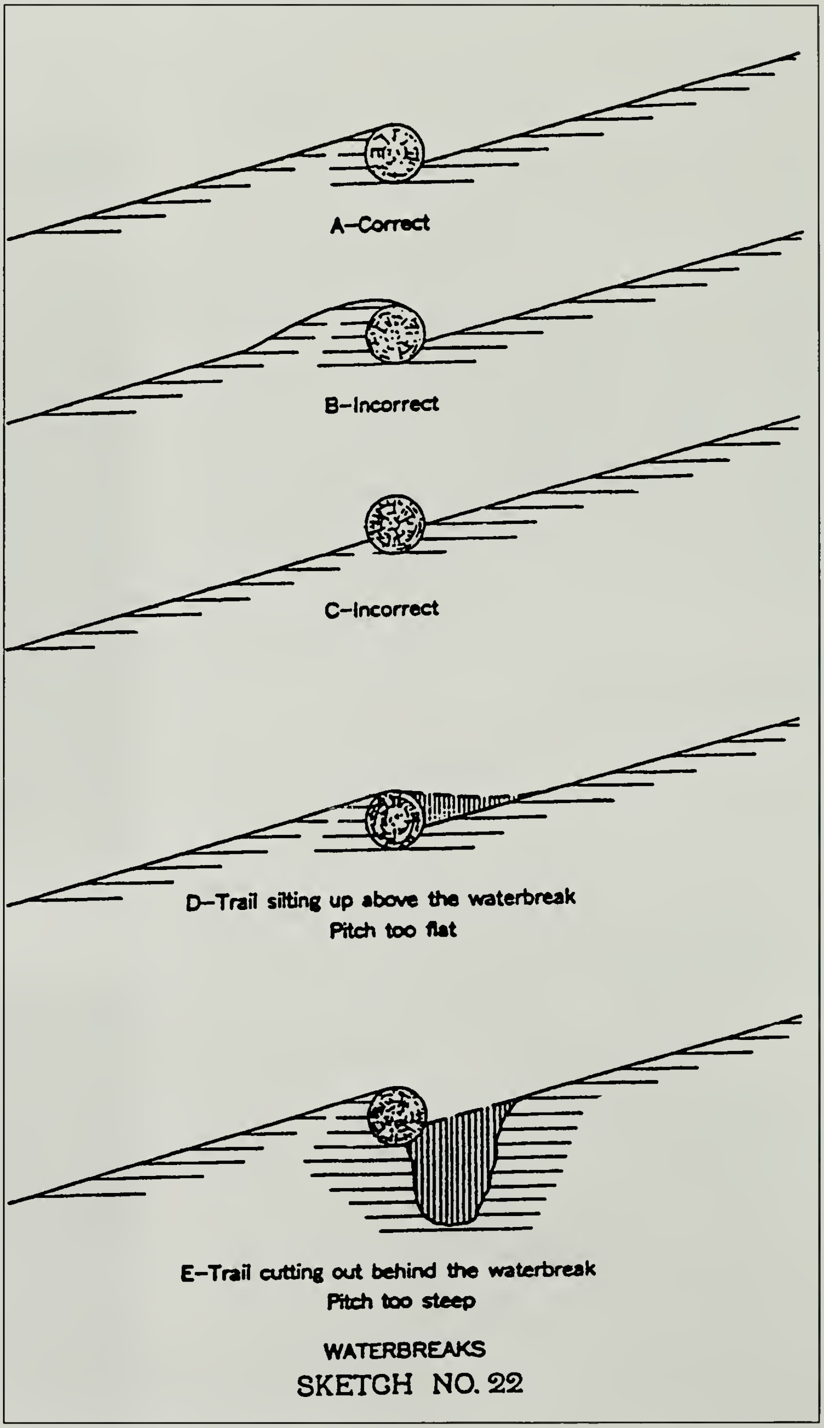


Fig. 4-41 CCC detail for log water bars or "waterbreaks." (#15), circa 1920.

Arthur, Civilian Conservation Corps Construction of Trails, No. 7, 1937 dips, was introduced to Acadia in the late 1980s by the AMC, and dips have been increasing in number since, often as replacements for old log water bars.

HISTORICAL CHARACTERISTICS OF WATER BARS
Pre-VIA/VIS (pre-1890)
There is no evidence for water bar use.
VIA/VIS Period (1890–1937)
Stone water bars may have been used on a limited basis.
CCC Period (1933–42)
Log water bars were likely used. Specifications were written for their use.
NPS/Mission 66 Period (1943–66)
Log water bars may have been used.
NPS Period (1967–1997)
Log and stone water bars were used extensively, often in places where they were not historically appropriate.

TREATMENT FOR WATER BARS

1. Maintaining Character

Issue: There is uncertainty surrounding the earliest use of water bars at Acadia, and whether they are an appropriate feature to use on the trail system.

Treatment Guidelines: Given the uncertainty surrounding the origins of Acadia's water bars, their use should be limited to trails where they will not adversely affect the historic character. The general rule of thumb is that water bars should not be added to trails that use other historic drainage features to serve the same purpose—for instance, side drains and culverts. For example, the character of the VIA/VIS-era Emery Path (#15) or the CCC-era Perpendicular Trail (#119) should never be confused by the addition of water bars. On the other hand, water bars may be used on trails without substantial character-defining features.

SPECIFICATIONS FOR WATER BARS

In deciding whether a trail has a reached the threshold beyond which water bars should not be added, the primary consideration should be given to extant drainage features. A trail whose only historical work is stone culverts is not a candidate for water bars, whereas a trail whose only historical work is a stone staircase, such as the Mansell Mountain Trail (#115), would be. Those trails with historical water bars should be rehabilitated using water bars where appropriate. In such cases, care must be taken that new water bars resemble the old both in type (log or stone) and in the details of construction (Fig. 4-42).

On those trails where water bars have been deemed appropriate, but history has not dictated which type to construct, stone water bars will be the first option. Stone is more durable than wood, and closer in character to most of the historical features on Acadia's trails. The exceptional cases in which wood water bars may be added as a feature are those in which no stone is available within a circumference of 200 feet. This is not only because of the difficulties involved with the transport of stone, but because a stone water bar looks out of sync with nature in areas where trees and forest floor are the only natural features visible to the hiker.

The function of water bars is to collect water that is channeled in the treadway, and direct it away from the trail. To accomplish this, some amount of grade (at least 5 percent) is required for water bars to be functional, as they require the water to be in motion in order to redirect the flow away from the trail. Standing water problems cannot be resolved with water bars. On the other hand, water bars built on unconstructed trail with a grade over 20 percent will continually silt in and clog, or else erode away altogether. Such sections require that steps or checks be used in conjunction with, or instead of, water bars.

Since water bars and water dips (see below) both perform similar functions—redirecting water that is using the treadway as a channel—a decision about which structure to build must often be made. Three factors must be considered: (1) historical character, (2) desired walking surface, and (3) grade. Because they are more subtle, dips are often an alternative for trails on which history precludes the building of a water bar. Further, dips allow the maintenance of a smooth—even wheelchair-accessible—hiking surface, while water bars create small steps for the hiker. However, dips are not an option for grades above 12 percent. On such slopes, they lose their shape more quickly than water bars and need additional maintenance.

On slopes where grade is more than 15 percent, backed water bars should be considered, especially in loose gravel or light soils.

After deciding a water bar is necessary and appropriate, the next question is exactly where to install it. The Student Conservation Association trail guide, *Lightly on the Land,* offers some good advice:

> In determining where to place a water bar, select a site where travelers will be discouraged from going around the ends of the bar. A tree or boulder can be a good barrier. If no natural barriers present themselves, embed a few large stones near one or both ends of the water bar to direct traffic toward the center of the trail.[19]

CCC specifications said the following about placement and spacing:

> The spacing of breakers cannot be determined by any rule, but there are three particular locations where they should be placed: (1) Where there is a depression or wash, the breaker should be set below, (2) On sharp curves, the breaker should be set at the uphill entrance of the curve; and (3) At changes in the trail grade, the breaker should be set just above the break in grade.[20]

The water bar consists of three elements: the bar, the apron, and the outlet ditch.

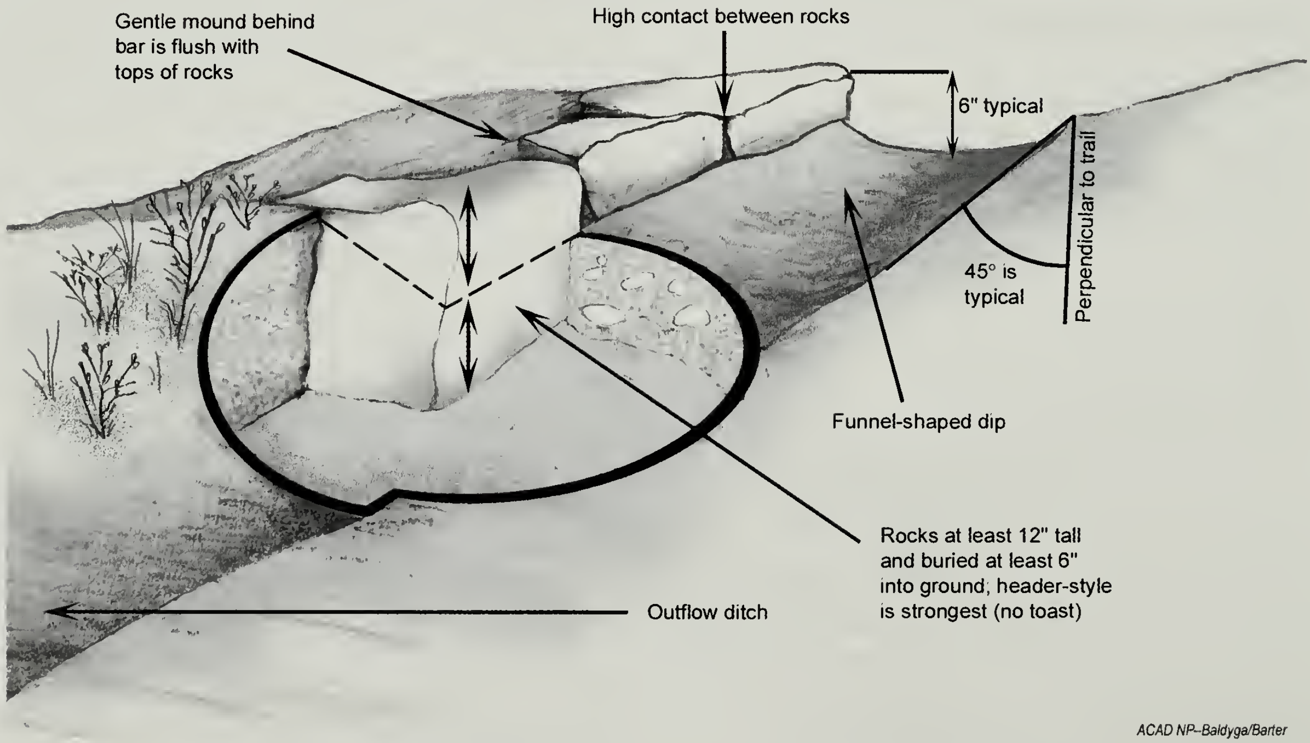


Fig. 4-42 Detail of a typical stone water bar.

1. Bar

A general description water bar construction is given in the SCA trail-building guide:

> Angled across the trail, the bar stabilizes the apron and serves as the barrier of last resort to redirect water that has not been turned from the tread by outsloping. The factors determining the angle of a water bar in relation to the tread are the grade of the trail and the velocity of the water that will approach the barrier. On gentle trails, a bar set at a 20 to 30 degree angle may be enough. On steeper routes where the speed of the water may wash out barriers embedded at shallow angles, bars may need to be set at angles of 45 degrees or more. The smaller the angle, the less material will be required to build the barrier and the easier it will be for travelers to step across. Water slowed by bars without much of an angle may drop silt against the barrier, while bars set at sharper angles may be self-cleaning because the water moves past them quickly enough to carry silt off the trail.[21]

Whether log or stone, when properly installed and graded, the top of the bar should be flush with surface on the downhill side of the water bar.

Stone Water Bar: The bar in a stone water bar is a row of abutting stones set in a trench at the appropriate angle (see above). The bar should be set into the backslope on the uphill side of the trail at least 12 inches and extend at least to the edge of the treadway on the outlet side, where it meets the outlet ditch. The bar as a unit should sit about 2 inches above the level of the tread before it is trenched or backfilled; after building the dip, the bar should be at least 6 inches above the lowest point in the swale, and level with the highest point of the backfill behind the bar.

Each stone in the bar should have at least half of its mass completely buried, which means that each must be at least 12 inches in vertical height. Other dimensions may vary, as long as the combination of overall mass and sturdiness of set stones yield a row that does not budge underfoot, even when jumped upon by a large person. Stones should be set in their most stable position, which is with the main portion of the weight down and buried in the trench and with the weight low (in a "cake" or "header" style) rather than upright ("toast" style").

Contact between stones should be as high as possible, and within an inch of the top of the bar. Low contact is not necessary, but gaps between stones at their bases should be chinked, and the chinks locked in with the gravel or stone at the base water bar.

Stones should be laid so water sheds well from one to the next as it moves from the top to the bottom of the water bar. Techniques to achieve this effect vary. The AMC depicts cake-style stones set with flush faces along the inside of the drainage, and thinner, toast-style stones set overlapping, like shingles on a roof, with the downhill side of the uphill stone overlapping the top edge of the one below it. Lester Kenway at Baxter State Park in Maine sets his stones so that the line of contact between each points back uphill, and does not worry about flushness between them, as water would have to turn in between the stones and actually flow uphill to get through the row of stones. Header style is also appropriate. All of these techniques have been used with success at Acadia, provided the other rules are followed.

The top of the bar should provide a walkable surface, which almost always results if the rules of high contact of stones are observed. The hiker should have at least one flat surface 12 inches wide to step on, and ideally, the top of the entire bar will be a single, flat unit. Avoid tripping hazards caused by round stones without high contact, stones that slope dramatically to the front or back of the bar, and stones with vertical protrusions. As with a retaining wall, the area directly in front of and behind the bar should be packed with stone, rather than just filled in with soil that could erode and allow stones to loosen.

Wood Bar: The bar in a wood water bar is a single log, set at the appropriate angle, that extends at least 12 inches into the backslope, and to the edge of the trail or beyond it on the downhill side where it meets the outlet ditch. The log should be cedar, at least 8 inches in diameter. If it is not possible to key the bottom of the log against a natural feature, a stone should be set in the ground at the end of the log to hold it in place. Staking water bars is not done at Acadia. On the water-shedding side, the dip in the water bar should expose between 4 and 6 inches of the total diameter of the log.

2. Apron

The apron is the dip on the uphill side of the bar that directs most of the water off the trail before it reaches the bar itself. The apron is funnel shaped, the top of the funnel being on the side of the backslope, and the outlet of the funnel being at the outlet ditch. The apron begins sloping toward the outlet ditch about 5 feet back from the bar, and reverses trail grade to slope up to the bar about a foot from it. Except in times of very heavy flow or poor maintenance, water does not travel along the bar, but down the bottom of the apron's dip to the outlet ditch. The total depth of the dip in the apron (measured from the top of the bar) should be between 6 and 12 inches, depending on the overall size of the water bar.

3. Outlet Ditch

The SCA describes the outlet ditch:

> Complete the water bar by digging an outlet ditch from the low point of the apron far enough to assure that water will be carried away from the trail. Steep sides-lopes may not require ditches at all, while a water bar ditch on a moderate hillside may extend several yards or more. Cut each ditch wider than the blade of a shovel to facilitate easy maintenance in years to come. On steeper slopes, stones placed below the end of the ditch will dissipate the force of exiting water and help protect the downslope from erosion.[22]

The ends of outlet ditches should be graded into the landscape, not ended at a blockage or simply stopped so that there is a sudden step up at the end of the ditch; such terminations encourage blockage and backup that eventually can clog the entire drainage.

ROUTINE MAINTENANCE

1. Water bars should be cleaned annually, and, if possible, following severe storms. During cleaning, the original, gradual funnel shape of the apron should be restored and the outlet ditch dug out as far as necessary to ensure that water leaves the trail and does not reenter. Care must be taken not to dig the apron too deep; the bar should never be fully exposed on the drainage side. Regrade the end of the outlet ditch so that water can smoothly exit. With soil tread trails, material dug from the ditch should be used to back up the water bar; in the case of gravel tread, only gravel from the apron cleaning can be used in the treadway. In any case, do not use material larger than 2 inches in diameter. Reshape the grade behind the bar.
2. Water bars that continually fill with silt should be reset at a steeper angle. Those that scour to the point of undermining the bar should be reset at a shallower angle.
3. For stone water bars, reset any loose stones.
4. For log water bars, check logs for rot, and replace them when they are no longer solid enough to retain the shape of the apron. The life expectancy for an 8-inch cedar log bar is thirty years.

E. WATER DIPS

DEFINITION

A **water dip** is an angled depression in the trail that diverts water off the trail.

Dips add little to, and take little from, a trail's character. Just slightly more visible than subsurface drains, their subtlety is their most important asset in the way of character. If built correctly (long and shallow), they are virtually unnoticed by most hikers, and of little interruption to the prevailing appearance of a trail corridor. They can also be incorporated into ADA trails.

HISTORICAL USE AT ACADIA

Water dips were introduced to Acadia's trail system in the 1980s by the AMC. In the 1990s, they were used extensively as a drainage technique on nearly every trail in Acadia, often as replacements for wood water bars.

HISTORICAL CHARACTERISTICS OF WATER DIPS
Pre-VIA/VIS (pre-1890)
There is no evidence or documentation for water dip use during any of the historic periods.
VIA/VIS Period (1890–1937)
There is no evidence or documentation for water dip use during any of the historic periods.
CCC Period (1933–42)
There is no evidence or documentation for water dip use during any of the historic periods.
NPS/Mission 66 Period (1943–66)
There is no evidence or documentation for water dip use during any of the historic periods.
NPS Period (1967–1997)
Water dips were first used in the 1980s.

TREATMENT FOR WATER DIPS

1. Maintaining Character

Issue: Water dips are not a feature associated with the historical period for Acadia's trails.

Treatment Guidelines: Although not a historical feature, water dips are an appropriate feature for use at Acadia. When constructed correctly, water dips do not adversely impact a trail's historical character. Water dips are the least intrusive of the treadway drains, which include water bars and open culverts. Water dips should be the first consideration for those trails without an established feature for removing substantial amounts of water from the treadway. In particular, dips are an appropriate solution for mild erosion problems on graveled paths (such as the Ocean Path, #3, or the Jordan Pond Path, #39).

Water dips should not be used if:

- The soil will not hold its shape, such as exceptionally rocky or clay-poor soil.
- The trail has a grade of greater than 20 percent.
- The flow of water, due to volume, speed, or a combination of the two, is sufficient to wash the dip out.
- The frequency and nature of foot traffic would flatten the dip before it could reasonably be rebuilt.

In any of the above cases, water bars, steps, checks, stone paving, side drainage, and rerouting may all be considered.

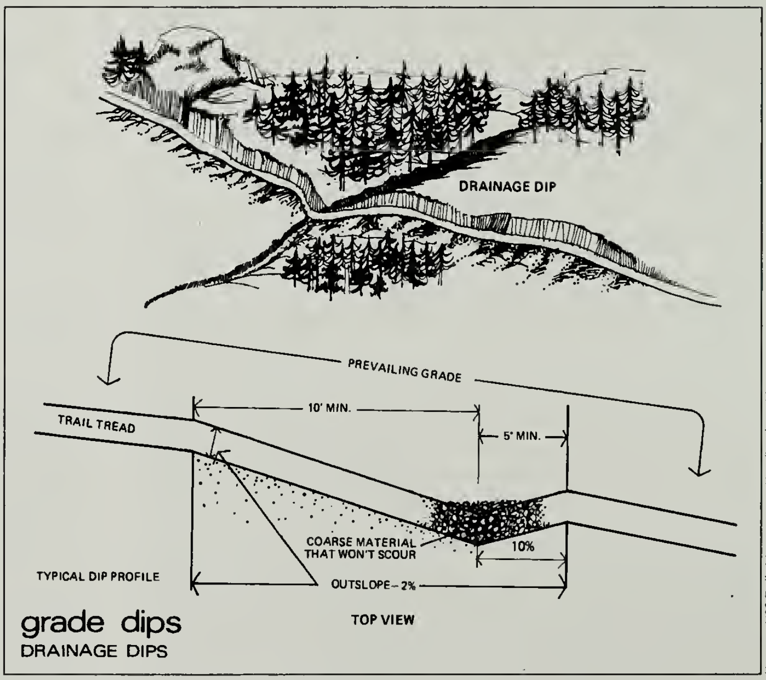
SPECIFICATIONS FOR WATER DIPS

The entrance into a water dip starts at the prevailing grade, and then the grade accelerates slightly toward the low point of the dip. The dip is angled slightly downslope to direct water off of the trail at a "spill point."[23] The grade then is reversed, rising approximately 1 foot in elevation, and then resumes the downhill at the prevailing trail slope. Exact sizes and shapes of water dips will vary with terrain. However, a good target is laid out in Hooper's handbook[24] (Fig. 4-43). The entrance should be 10 feet long, the reversal in grade 5 feet long at a 10-percent slope. As in a water bar, a target angle for the depression should be 45 degrees and should be adjusted according to whether the dip silts-in (increase the angle) or scours (decrease the angle and/or replace with another type of drainage). Slopes into, out of, and back down the trail below the dip should be long and gradual in order to maintain the shape of the dip, provide ease of hiking, and remain visually unobtrusive.

The "spill point" should empty off the trail at a point where water cannot reenter the treadway, or should empty into an outlet ditch that will carry the water to a place where it cannot reenter the treadway.

ROUTINE MAINTENANCE

1. Water dips should be cleaned annually, and, if possible, following severe storms. During cleaning, the original, gradual shape of the dip should be restored and the outlet ditch dug out as far as is necessary to ensure that water leaves the trail and does not reenter. Care must be taken not to dig the depression too deep. Regrade the ends of outlet ditches so that water can smoothly exit. With soil trails, material dug from the depression should be used to back up the water dip, rebuilding the reversal in grade. Do not use material larger than 2 inches.
2. Dips that continually fill with silt should be rebuilt at a steeper angle. Those that scour should be reset at a shallower angle, or, if the flow is too great, replaced with water bars or another form of drainage. Those dips that flatten or are routinely overrun should, if already built properly, be replaced with another form of drainage.



Hooper, *NPS Trails Management Handbook*, p 29

Fig. 4-43 Detail of a typical water dip.

ENDNOTES

12 Bar Harbor VIA 1891 *Annual Report.*

13 Bar Harbor VIA 1899 *Annual Report.*

14 Bar Harbor VIA 1906 *Annual Report.*

15 Seal Harbor VIS 1937 *Annual Report.*

16 Seal Harbor VIS 1952 *Annual Report.*

17 Albert H. Good, *Park and Recreation Structures* (National Park Service, 1938), 17–18.

18 Bar Harbor VIA 1901 *Annual Report.*

19 Robert C. Birkby, *Lightly on the Land: The SCA Trail-Building and Maintenance Manual* (Seattle: The Mountaineers, 1996), 132.

20 Guy B. Arthur, *Civilian Conservation Corps Field Training: Construction of Trails* (1937).

21 Birkby, 131–32.

22 Birkby, 132.

23 Birkby, 131.

24 Lennon Hooper, *NPS Trails Management Handbook* (Denver: United States Department of the Interior, National Park Service, no date), 29.

Acadia NP Archives

Fig. 5-1 The Bar Harbor VIA constructed many small gravel-surfaced bridges as stream crossings in the Sieur de Monts area like this one across Kebo Brook on the Stratheden Path (#24), circa 1916.

CHAPTER 5: CROSSINGS

A. BOGWALKS

B. BRIDGES

C. STEPPING STONES

CHAPTER 5: CROSSINGS

As one of the most essential and appealing features along a trail, crossings require careful attention to hiker safety and style of construction. At Acadia, three categories of features are used to cross streams, wet areas, and areas with fragile vegetation or difficult footing.

A. Bogwalks
B. Bridges
C. Stepping Stones

From the 1890s to the 1980s, the construction style of crossings shifted from aesthetics to durability. With a rehabilitation approach, the preservation of existing crossings or new construction will balance the need to retain historic picturesque and rustic crossings while providing for higher use. In some cases this will result in greater construction costs and increased maintenance. For example, natural cedar poles may be specified for bridges rather than pre-cut, pressure-treated planks. The type of crossing is determined by the trail's historical character and current needs. Bogwalks are not historical, and are less durable than other features. However, they may still be the first choice for traversing boggy ground, especially in areas with many exposed roots, or where construction of other features would be detrimental to adjacent resources. Bridges have historically been used to cross large drainages with steep banks and remain appropriate additions to the trail system (Fig. 5-1). The use of stepping stones continues to be an option for crossing shallow streams, consistently boggy ground, or areas that are intermittently wet.

Note: Narrow stream crossings are often achieved with culverts, while longer sections of trail through a drainage may be a constructed causeway, as described in Chapters 3 and 4.

A. BOGWALKS

DEFINITIONS

A **bogwalk** is a wooden walkway providing a raised, even, and dry tread. It is used to traverse wet or boggy areas, eroded trail sections with many exposed roots, and areas containing fragile vegetation.

The walking surface of a bogwalk consists of one or more **treadlogs**. These have been milled flat on two sides, are laid parallel with the trail, and are supported on each end by a **bedlog**, or short log set perpendicular to the trail. The bedlogs may rest directly on the ground, or may be supported by individual stones, or log piers.

Log piers are enclosed support structures built of logs and serve the same function as bridge piers: to support and elevate bogwalk between sections. Log piers are sometimes referred to as "log cribs," but should not be confused with retaining structures described in Chapter 6. A pier may contain three or four sides with the logs notched together, "Lincoln Log" style (Fig. 5-2).

A **bogwalk bridge** is a hybrid between a bogwalk and a bridge and is used to cross small streams. It differs from regular bogwalk in two ways. Bogwalk bridges are wider and generally contain three parallel tread-

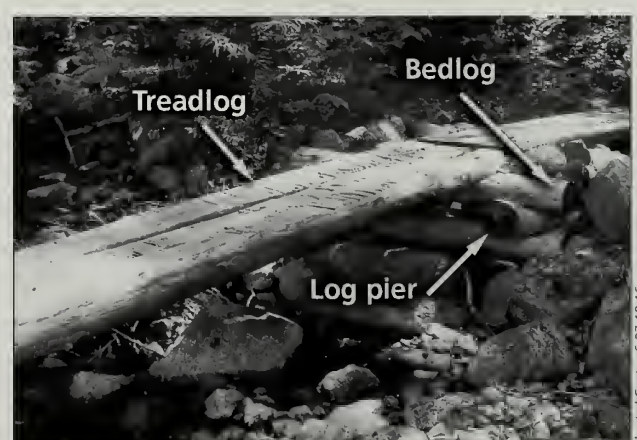


Fig. 5-2 A bogwalk bridge supported by a log crib on the Pond Trail (#20).

logs. They are also positioned higher above the surrounding grade and are supported by log cribs, stone abutments, or piers.

HISTORICAL USE OF BOGWALKS AT ACADIA

Pre-VIA/VIS

There is no physical evidence or documentation of bogwalks on trails prior to the VIA/VIS period.

Village Improvement Associations/Societies

When the Bar Harbor VIA began constructing trails in the 1890s they laid down "cedar-pole bridges" across wet areas. Path Committee Chairman Waldron Bates instructed workers to"[d]rain wet places or put in stepping stones, or place cedar-pole bridges on the ground."[25]

On many VIA/VIS trails the raised gravel treadway eventually washed away, leaving the original boggy trail base. On pondside trails, an elevated water level caused by beaver dams aggravated this problem, or created a new one. These factors, coupled with increased foot traffic, resulted in extensive wet and eroded trail sections with compacted soils and exposed roots. Thus many pondside and woodland trails described by the VIA/VIS as offering scenic and easy walking became some of the most difficult and unattractive. Annual VIA/VIS reports suggest a preference for stepping stones and causeway solutions for these wet areas. Examples include the stepping stones on the Kane Path (#17), and the stepping stones, raised tread, and closed culverts on the Asticou Path (#49) and the Jordan Pond Loop Trail (#39).

The VIA/VIS later used corduroy tread and bridges (a tread consisting of continuously laid parallel logs). Outside park boundaries, the Seal Harbor VIS and Northeast Harbor VIS used different types of log crossings through wet areas as early as the 1930s or 1940s. Examples of this work appeared on the Upper Hadlock Trail (#501), where the NHVIS used a bogwalk similar to a corduroy bridge, and on the Jordan Stream Path (#65) where planks were used by the SHVIS (Figs. 5-3 & 5-4).

Civilian Conservation Corps

There is no physical evidence or documentation of bogwalk construction on CCC trails.

David Goodrich

Fig. 5-3 This bogwalk on the Upper Hadlock Pond Trail (#501), shown here in 1967, was likely built by the Northeast Harbor VIS in the 1930s or 1940s. This bogwalk is more similar to a bridge, with its stringers and corduroy decking, than it is to the contemporary style of bogwalk used in Acadia.

Acadia Trails Crew, 5-99-38-1

Fig. 5-4 This 1990s plank bogwalk (possibly 2-by-6-inch lumber) on private land on the Jordan Stream Path (#65) may be Seal Harbor VIS construction.

Olmsted Center, 7-97-14-21

Fig. 5-5 Log bogwalks, like these single-treadlog examples, were first introduced to the Acadia system in the 1980s to stabilize tread in wet areas on the Great/Long Pond Trail (#118).

NPS/Mission 66

Bogwalks were not used by the NPS during the Mission 66 era.

National Park Service

Bogwalks as they exist within the park boundaries today were introduced to Acadia in the early 1980s by Trails Foreman Gary Stellpflug. He adapted the design from bogwalks designed by Lester Kenway in Maine's Baxter State Park. The bogwalks were first used on a reroute at the northernmost bend of the Long Pond Trail (#118). These were constructed in 1982 and were still extant at the time of this report. In 1988, extensive bogwalk construction began on the west side of the Jordan Pond Loop Trail (#39). Since the work in the 1980s, bogwalk has been used throughout the park as a solution to wet or eroded trails in flat areas and near ponds (Figs. 5-5 to 5-7).

In 1994, a bogwalk bridge was constructed on the east end of the Pond Trail (#20). Since that time, several of

Olmsted Center, 7-97-21-12

Fig. 5-6 Bogwalks are an effective, easily constructed way to provide stable tread over wet or exposed root areas such as on the west side of the Jordan Pond Loop Trail (#39).

Acadia Trails Crew; Olmsted Center, 5-99-12-2

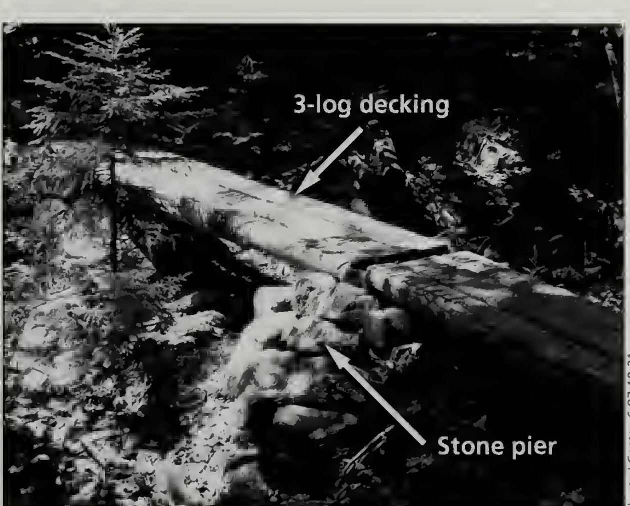
Fig. 5-7 Bogwalks are often installed to protect fragile vegetation, like this section surrounding The Bowl on the Beehive Trail, West (#8).

these structures have been built throughout the park, ranging in size from a single span on the Jordan Pond Carry Path (#38) to an 80-foot-long bridge on the Beech Mountain West Ridge Trail (#108) (Figs. 5-8 & 5-9).

The first bogwalks in Acadia were logs “topped” with a chainsaw and ax, and set side by side on bedlogs or cribs. They were generally 8 to 10 feet long. Logs were notched flat at the joint and then spiked together. Later, larger logs were “ripped” with chainsaws into halves whose flat sides were used as tread. In the 1990s, logs were cut 16 feet long. The increase in span between supports led to a need for a log diameter of 16 inches or more. Also, spikes were driven through the sides of treadlogs in the middle of the run to connect and thus distribute load between the logs. Nonetheless, tread spans greater than 12 feet continued to break or sag.

The most recent evolution in the design of the bogwalk came full circle back to Lester Kenway, who now uses a modified bogwalk made of logs pre-milled on two sides. The advantages of the current method are:

- increased thickness resulting in additional strength and rigidity of the stringers,
- a subsequent extension in the longevity of the bogwalks, and
- faster, easier construction without a need for notching logs in the tread, bedlogs, or cribs.



Olmsted Center, 6-97-18-21

Fig. 5-8 A bogwalk bridge with stone supports on the Pond Trail (#20). This feature is a hybrid between a bogwalk and a bridge.

HISTORICAL CHARACTERISTICS OF BOGWALKS
Pre-VIA/VIS (pre-1890)
No evidence for bogwalk use.
VIA/VIS Period (1890–1937)
On early trails, cedar-pole bridges were laid across wet areas. On most trails, stepping stones, stone paving, and raised tread were predominantly used to solve drainage problems. On later trails, corduroy bogwalks were occasionally used.
CCC Period (1933–42)
Bogwalks were not used.
NPS/Mission 66 Period (1943–66)
Bogwalks were not used.
NPS Period (1967–1997)
Bogwalks were used extensively in wet areas, over exposed roots, and areas with fragile vegetation, particularly through bogs and on pondside trails.

Acadia Trails Crew, 4-99-21-41

Fig. 5-9 A bogwalk bridge on the Jordan Pond Carry Path (#38).

TREATMENT FOR BOGWALKS

1. Maintaining Character

Issue: Bogwalks were not used consistently during the historic periods on Acadia's trails and may not be appropriate long-term solutions for crossing wet areas.

Treatment Guidelines: For non-historic trails, bogwalks are an appropriate long-term solution for crossing wet areas and eroded sections. They may also be used long-term on persistently wet or severely eroded sections of historic trails when there is no alternate solution that is historically appropriate and/or previously in use on the trail. If another crossing feature is compatible with the trail's historic character, it will be used and the long-term use of bogwalk will not be considered.

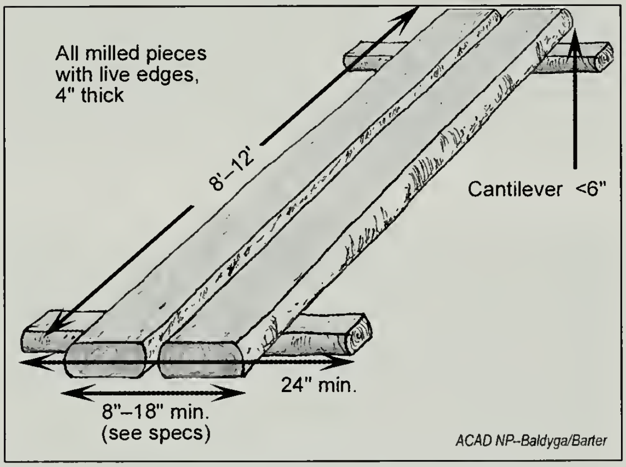


Fig. 5-10 Detail of a bogwalk on bedlogs.

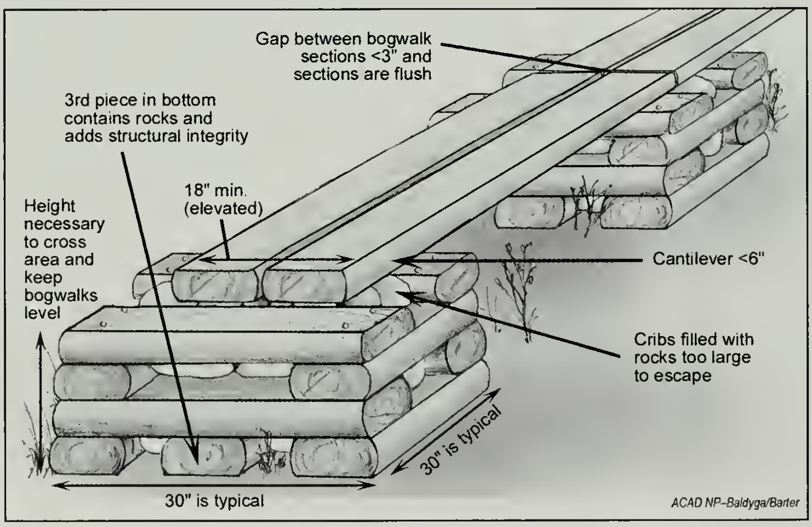


Fig. 5-11 Detail of a bogwalk on log cribs (or piers).

Because they are by far the easiest and quickest remedy available for crossing wet and eroded areas, bogwalks may be used as temporary solutions on both historic and non-historic trails until an appropriate crossing feature can be constructed.

2. Maintenance

Issue: Bogwalk is a more high-maintenance feature than a stone structure. Since bogwalks are wooden structures, they need to be checked regularly for rot and structural damage and replaced cyclically.

Treatment Guidelines: When considering the use of bogwalks, maintenance and longevity are major concerns that must be included in long-range planning. If only used as a short-term solution, cyclic replacement of bogwalks should not be a concern, since the bogwalk will eventually be replaced with another feature type. However, if bogwalks are determined to be the best long-term solution for an area, then a schedule of periodic replacement in-kind should be developed.

SPECIFICATIONS FOR BOGWALKS

Bogwalks are constructed of milled white cedar logs. A typical section of bogwalk consists of two bedlogs or cribs (piers), overlaid with one or two treadlogs (Fig. 5-10).

Bogwalk bridges typically contain three treadlogs, and may be supported by log cribs, stone piers, or abutments (Fig. 5-11). Although the construction of bogwalks and bogwalk bridges is similar, some elements of bogwalk bridge construction are more closely associated with bridge construction. For additional information, see "Bridges" in the following section of this chapter.

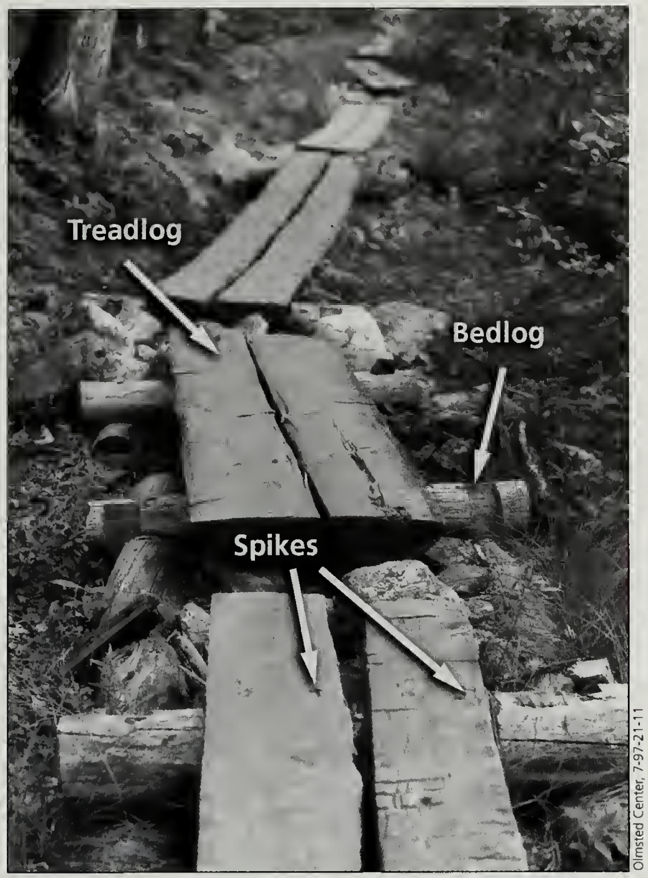


Fig. 5-12 Bogwalks with bedlogs laid on stone, installed on the west side of the Jordan Pond Path (#39). These treadlogs have only one milled side. The preferred method is to mill two sides of the treadlog.

1. Treadlogs (Fig. 5-12)

The treadlogs are milled leaving a 4-inch-thick log, sawn on two sides, and a minimum of 8 inches wide on one good surface. The unmilled edges are left "live" with bark on. Width of walking surface should be at least 8 inches.

Treadlogs are spiked to bedlogs or cribs with 8-inch spikes or timber screws. Treadlogs should cantilever no more than 6 inches beyond their supports to avoid levering up or, as the wood deteriorates, breaking off.

The standard walking surface of a bogwalk consists of milled logs laid side by side with a flat surface facing up. For backcountry bogwalks, a minimum tread width is 10 inches. On front-country trails constructed to an easier walking standard, such as on sections of the Jordan Pond Path (#39) near the Jordan Pond House, bogwalks should be up to 18 inches wide. Bogwalks elevated more than 1 foot off the ground should have

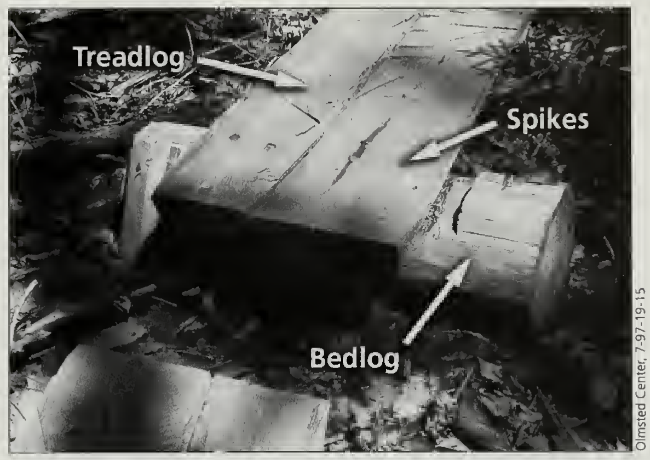


Fig. 5-13 Bogwalk construction detail on the Pond Trail (#20). Stakes are no longer used to anchor bedlogs due to frost heave. Bedlog notching is not needed if the treadlog and bedlog are both milled flat on two sides.

a minimum width of 12 inches, and bogwalks elevated 2 feet or more should have a minimum width of 18 inches. The walking surface may be a single treadlog if that log is wide enough to meet the width standard, but generally two or more treadlogs will be needed.

On heavily used trails, parallel sections of bogwalk should be installed occasionally to allow hikers to pass each other without stepping off the tread. Frequency of parallel sections will be determined by the number of hikers.

The current recommended length for strength and durability is between 8 and 12 feet, though lengths may be shorter if needed. Lengths greater than 12 feet are not recommended, as rigidity is compromised over longer spans.

Ideally, bogwalks should have no cross-slope and a running slope of no greater than five percent. Gentle grades may be gained by stepping bogwalk sections where they meet, with no step between bogwalk sections greater than 6 inches. Gaps between connected bogwalk sections should be no greater than 3 inches.

2. Bedlogs or Piers (Fig. 5-13)

The treadlogs are supported by individual bedlogs, stone piers or abutments, log piers, or a combination of these. Bedlogs are sections of the milled logs cut 30 inches long or greater and set in the ground perpendicular to the trail. The treadlogs are spiked to the bedlogs with 8-inch spikes or timber screws. Since both the treadlogs and bedlogs are milled flat on two sides, notching is not necessary.

Log piers are used either to elevate the tread or to provide a firmer base in areas where bogwalks might sink or shift. Piers are constructed with logs, stacked in alternating tiers, generally with four sides forming a box. Treads are spiked to the top two logs of a pier, which function as bedlogs. Piers should be filled with rocks to weight them down. To keep piers from riding up, a third cross-piece may be placed in the middle of the first tier. The spaces between tiers allow water to drain.

In past applications, bedlogs have been staked into the ground to keep the bogwalk from shifting out of place. However, this has not proven effective. The stakes tend to heave out of the ground during freeze/thaw cycles, causing the bogwalk to be displaced. Staking bedlogs is therefore unnecessary. The weight of the treadlogs on the bedlogs is generally sufficient to keep the bogwalk from moving. If needed, large stones can be placed on the bedlogs for added weight.

ROUTINE MAINTENANCE

1. Inspect for decay and structural integrity. The longevity of a bogwalk is generally less than twenty years, so a cyclic program of replacement must be established.
2. If bogwalks have been moved out of place by ice or water, weight the bedlogs down with rocks or connect them with rock-filled cribs. Do not use stakes to anchor bedlogs, as frost heave will push the entire structure off the ground.
3. If the tread becomes slippery, roughen the surface with a chainsaw.

B. BRIDGES

DEFINITIONS

A **bridge** is a structure providing passage over an impediment such as a waterway, gully, or crevice. There are a variety of different components involved in constructing a bridge. These are defined below.

Elements that are used to support bridges include abutments, sills, piers, and/or log cribs.

An a**butment** is a stone or wooden substructure supporting the ends of a bridge. It may also act as a retaining feature, preventing tread material from sloughing into the stream or drainage.

A **sill** is the timber set perpendicular to the trail under each end of the bridge. Sills generally rest on top of the abutments and serve as a base on which the stringers rest. Sills are sometimes called sleepers.

Piers are support structures between bridge spans. They may be constructed of stacked stones, logs, or a combination of both.

Log piers or cribs are enclosed support structures built of logs. They typically contain three or four sides with the logs notched together, “Lincoln Log” style. They can be used in single layers, for retention, or stacked in tiers and used to support bogwalk and bridges.

Structural elements of the actual bridge itself include stringers, decking, curbrails and/or handrails, and bracing.

Stringers are supporting beams that span the distance between abutments or piers. They support the decking and are usually made of cedar logs.

Decking describes the walking surface of the bridge. Generally, decking consists of milled cedar boards or logs laid perpendicular to the stringers. However, decking may also be simply one or more split logs laid parallel to the trail, forming a narrow footbridge. In this case, the split logs act as both stringers and decking.

Plank, or **planking**, is a decking type consisting of milled cedar boards. This may either be full-dimensioned lumber milled especially for a particular bridge, or it may be readily available lumber, such as five-quarter decking.

Corduroy decking is composed of cedar logs laid side-by-side, perpendicular to the stringers, giving the finished treadway a textured or corduroy appearance. The decking may be constructed of full-round logs or half-round logs.

Gravel surfacing is an addition to the decking that carries the gravel tread material right over the top of the bridge. It is constructed by installing a geotextile fabric over the decking, which is typically corduroy decking, and placing a 4- or 5-inch layer of gravel tread material on top.

Various types of railings and bracing are used with different bridge types. Depending on the style of bridge constructed, one, none, or any combination of these features may be added.

A **curbrail**, or **bullrail** is a low barrier, usually not over 4 inches high, placed along the side edges of the bridge, parallel to the treadway. Typically a single log is used. This feature serves to guide walkers across the bridge. It often provides structural support and is required when gravel surfacing is used to retain the gravel tread.

A **handrail** is a waist-high barrier, to aid or guide walkers across the bridge. Individual situations may call for no handrail, a single handrail, or one on each side of the bridge. Handrails are supported by posts attached to the bridge decking, stringers, adjacent ground, or any combination of these. (**Note**: Handrails were also used at various locations without bridges, throughout the trail system. A short discussion follows the description of individual CCC bridge examples.)

Fig. 5-14 A bridge constructed by the Youth Conservation Corps on the Jordan Pond Carry Path (#38) in 1987.

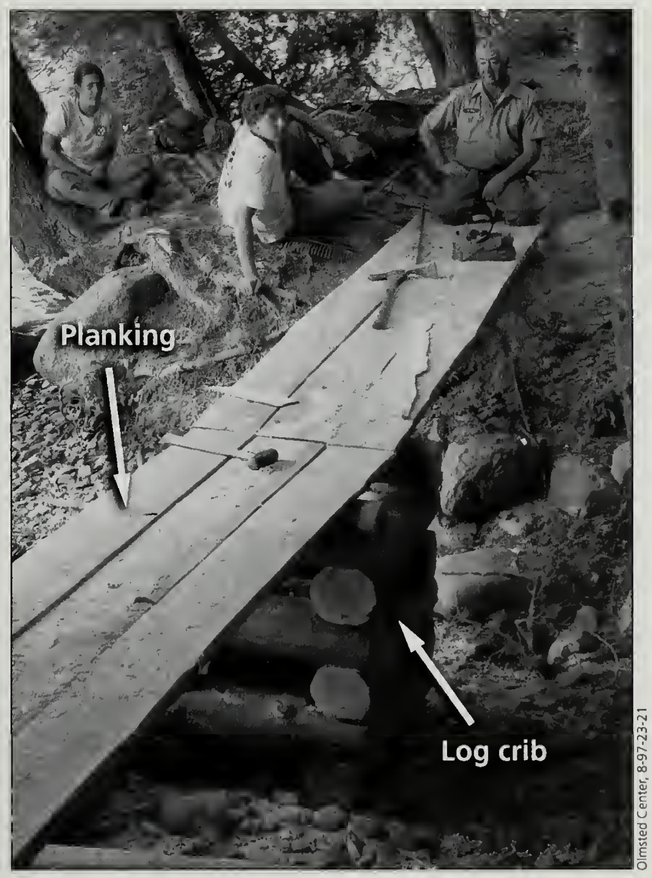


Fig. 5-15 Youth Conservation Corps bridge on the Beech Mountain West Ridge Trail (#108), built in 1997.

Fig. 5-16 Corduroy bridge at the Cold Brook Fish Hatchery.

Fig. 5-17 Plank bridge over Harbor Brook on the Asticou Trail (#49).

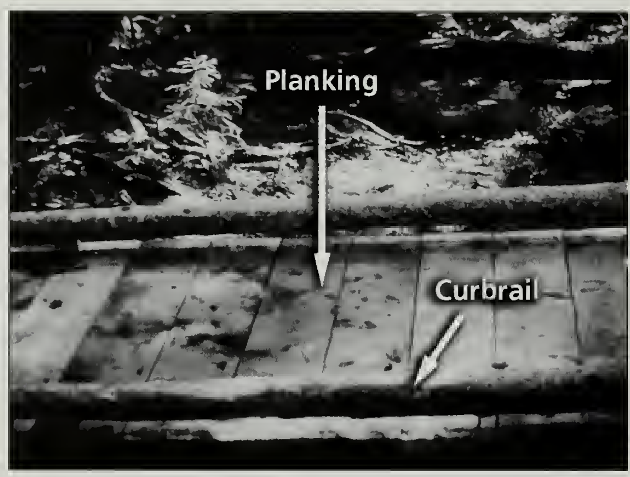


Fig. 5-18 Plank bridge on the Pond Trail (#20) at the junction with the Triad Pass Trail (#29), shown here in 1958.

Stepped-down railings are extensions of handrails at the ends of the bridge. These are typically placed at an angle, connecting the end of the handrail with the bridge decking, or the ground, several feet away from the base of the handrail post and the end of the bridge.

Bracing is used with the handrail structure to give it added stability. **Diagonal bracing** connects the top of one handrail post with the bottom of the next post. Two of these may be installed in one section of handrail, creating an "X" pattern. **Outrigger bracing (outrigging)** gives lateral support to the handrail structure by connecting the top of the handrail with extensions of the decking that are cantilevered out from each side of the bridge.

Note: Some bridges are more appropriately described as closed wood culverts, due to their short length. However, for this document, they will be included in the "Bridges" section as their construction typically involves bridge features like abutments, stringers, and decking.

Figures 5-14 to 5-19 show a small sampling of the various bridges currently extant at Acadia. None of these examples date from the historic period of 1890–1942, but a few have features with historic precedents, like corduroy decking. Features typically associated with bridge construction are identified in the labels.

HISTORICAL USE OF BRIDGES AT ACADIA

Pre-VIA/VIS

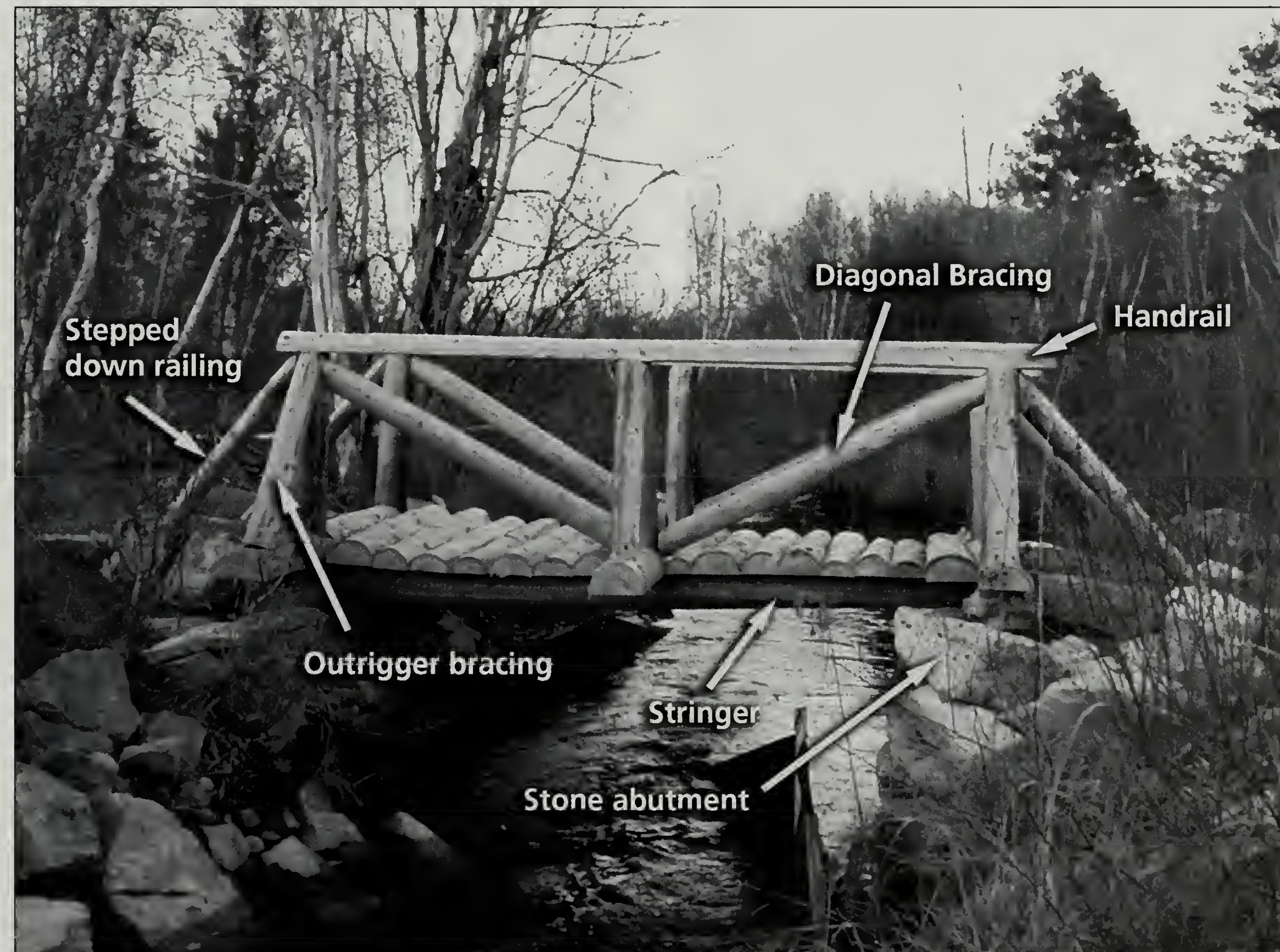
The earliest photographs of footbridges on Mount Desert Island date to the 1870s. A rustic bridge with shade roof and seats over Duck Brook was built by the landowner. A second bridge may have also crossed Duck Brook (Figs. 5-20 & 5-21). Though the bridges did not last long in Maine's harsh winter climate, the photographic images were popular as souvenir postcards. These bridges were built in the picturesque style espoused by Andrew Jackson Downing's *Treatise on the Theory and Practice of Landscape Gardening*, first published in 1841. Downing advocated for the con-

Maine Historic Preservation Commission, 97-9-3

Fig. 5-20 This rustic bridge with a thatched roof and seats over Duck Brook was built by a local landowner. The bridge was erected in the vicinity of a path later marked as the Duck Brook Path (#311), photograph circa 1870s.

Maine Historic Preservation Commission, 97-9-13

Fig. 5-21 Rustic bridge, possibly constructed over Duck Brook, photograph circa 1870s.



Olmsted Center, 12-99-d

Fig. 5-19 A bridge along the Great Meadow Loop (#70), constructed in 1999.

struction of man-made features, including rustic seats and thatched-roof shelters, to enhance the beauty of the natural landscape setting.

Village Improvement Associations/Societies

When the Bar Harbor VIA path work began in the 1890s, simple bridges constructed of cedar stringers were laid through wet areas. However, ice easily dislocated these bridges in the winter. By the early 1900s, VIA/VIS path committee chairmen appeared to have a preference for stepping stones, "stone bridges" (which may actually have been capstone culverts), and trail reroutes instead of bridge construction.[26] Some wooden bridges continued to be used, but these "rustic style" VIA/VIS bridges were still dainty compared to later bridge construction. Few images have been found of these early bridges, and it is unlikely that there were unified standards for bridge construction.

There is much commentary in the VIA/VIS path committee annual reports about the frequent need for replacement and repair of bridges. In particular, the bridges for the path along Jordan Pond Stream (#65) required constant maintenance. A circa-1904 photograph shows one of several bridges along the path (Fig. 5-22). This bridge of thin cedar logs and cut planks may have lasted fifteen years, as the 1919 Path Report indicates that five new cedar bridges were built that year. Another VIS bridge, photographed circa 1908, was also built with a combination of rough cedar logs and cut planks (Fig. 5-23).

By the late teens there were a number of bridges with gravel surfacing, notably in the Sieur de Monts area (see Fig. 5-1). Some of these bridges had a span as short as 18 inches and were similar in size to culverts. Logs were either laid parallel to the treadway across the drainage, or perpendicular to the treadway on wooden stringers. The structure was then covered with gravel to match the existing tread surface. As of 2002, remnants of a few of these bridges remain in the Sieur de Monts area.

According to the annual reports, by the 1920s several wooden bridges were located on the Kebo Brook Path (#364), Fawn Pond Path (#309), Cadillac Cliffs Trail (#5), Bracken Path (#307), and White Path (#329). However, none of these bridges are extant and no supporting photographs have been found.

In 1926 construction began on a large stone "rustic" bridge over the outlet on the north end of Lake Wood.[27] The bridge was designed by noted landscape architect and summer resident, Beatrix Farrand and was built during the latter period of endowed and memorial trails, as a memorial bridge. The bridge was dedicated in 1929 as the "Kane & Bridgham Memorial Bridge."

After the 1920s there was little documentation of bridge construction, as most paths were turned over to NPS park maintenance and work programs including the CCC and Mission 66. Two of the last surviving VIA/VIS bridges built during the 1930s may have been on the Maple Spring Trail (#58), which was photographed in the 1960s and removed in the early 1970s (Fig. 5-24), and the bridge at the north end the Jordan Pond Path (#39). This bridge was replaced by the NPS in 1983 with a slightly modified design that still stands. The original bridge was slightly shorter and smaller, as described in greater detail in "Specifications for Bridges."

The Seal Harbor VIS and Northeast Harbor VIA still build and maintain bridges on trails outside of the park. Most Seal Harbor VIS bridges are constructed of cut planks, whereas the Northeast Harbor VIS continues the tradition of rustic cedar pole bridges, including arched stringers, curved railings, and thin, full round saplings for corduroy tread. Northeast Harbor VIS president Dan Falt spent several years searching for two matching arched cedar poles (of downed trees) to serve as stringers for an arched bridge on a Northeast Harbor trail (Figs. 5-25 to 5-28).

Civilian Conservation Corps

Similar to the individual approach for VIA/VIS bridges within the island's trail system, the CCC bridges built between 1933 and 1942 exhibited individual character and were built in the rustic design style. However, the CCC bridges adhered to some guidelines for "good

Maine Historic Preservation Commission, Dana Family Collection

Fig. 5-22 An early footbridge over the Jordan Stream on the Jordan Stream Path (#65), photographed in 1904.

Maine Historic Preservation Commission, Dana Family Collection, 97-10-30

Fig. 5-23 A bridge of cut boards and rough-hewn logs, shown in 1908, along the rocks near Seal Harbor built by the Seal Harbor VIS, circa 1908.

David Goodrich

Fig. 5-24 This log bridge with a single railing, shown in 1961, was constructed possibly by the Northeast Harbor VIS over Hadlock Brook in a gorge near pulpit rock on the Maple Spring Trail (#58).

Olmsted Center, 10-99-66-8

Fig. 5-25 This corduroy bridge was constructed in 1998 by the Northeast Harbor VIS below Asticou Gardens on the Asticou Brook Trail (#514). Rough split cedar decking is laid on stripped cedar log stringers and supported by stone abutments.

Acadia Trails Crew, 5-99-10-10

Fig. 5-26 This arched corduroy bridge with a single railing was constructed by the Northeast Harbor VIS circa 1998 on the Lower Hadlock Trail (#502). The cedar stringers are naturally curved logs, typical of trees found along pond shores or stream banks.

David Goodrich

Fig. 5-27 This wooden bridge with cedar log stringers and plank decking on the Great/Long Pond Trail (#118), shown in 1968, may contain underpinnings of a CCC-era bridge.

Acadia Trails Crew, 5-99-49-8

Fig. 5-28 This corduroy bridge on the Lower Hadlock Trail (#502) has a single wooden railing nailed to adjacent trees. It was constructed in the 1990s by the Northeast Harbor VIS.

Fig. 5-29 A 1930s view of construction of a CCC corduroy bridge shows the installation of the stone abutments and three log stringers.

Fig. 5-30 The completed corduroy bridge with log curbrail and gravel over the decking photographed in the 1930s. Its smaller scale is typical of CCC work on the west side of the island.

practice and procedure" as outlined in Guy Arthur's 1937 CCC training publication *Construction of Trails*. These guidelines, or design standards, are also articulated in Albert Good's three-volume, 1938 publication, *Park & Recreation Structures*. The book describes and illustrates footbridges with no handrails, a single rail, a single rail with a curbrail, and double handrails. Outrigger bracing is used for many, but not all, of the handrails.

At Acadia NP, historic photographs indicate most CCC footbridges were built with dry-laid stone abutments and cedar log stringers, decking, and handrails. Bridge construction style was diverse including flat corduroy bridges, arched corduroy bridges, split and whole log-decked bridges, bridges with curbrails, and bridges with double handrails and outrigger bracing. On many bridges the log decking was covered with gravel to provide an uninterrupted walking tread. Some bridges on walking paths were built with a treadway over 5 feet wide, to support fire control equipment, such as the

Fig. 5-31 CCC crews working on a wooden bridge in the Great Meadow, circa 1930s.

Fig. 5-33 CCC bridge near Sieur de Monts Spring with diagonal and outrigger bracing, circa 1930s.

Fig. 5-32 CCC bridge in Great Meadow with stepped-down railings and outrigger bracing, 1930s.

Fig. 5-34 An end view of the CCC bridge on the Great Meadow Nature Trail (#365) shows continuous gravel surfacing, circa 1930s.

bridge over Great Brook on the Long Pond Trail (#118) and those in the Great Meadow.

In general, CCC bridges on the eastern side of MDI had larger structural members, with railings, braces, trusses, and the use of gravel surfacing. CCC bridges on the western side were often closer to the VIA/VIS style, with smaller members or arched stringers. Photos of bridges on the west of the island show no railings, braces, trusses, or gravel (Figs. 5-29 to 5-34).

NPS/Mission 66

No documentation has been found for Mission 66 period bridges.

National Park Service

By the 1970s, many park bridges were in extreme disrepair. Trail crews began replacing bridges whenever possible. In 1986, a Youth Conservation Corps (YCC) project replaced seventeen bridges throughout the park. By the mid-1980s, all pre-1970 bridges had been replaced with new cedar log bridges. They were generally uniform in design, similar to the bulky CCC style bridges. Construction was very simple, with stringers of 8 to 12 inches diameter laid across sleepers or rock cribs, and planked over with boards of varying dimensions (2-by-8 inches, 2-by-10 inches, etc.), depending where or when the bridge was built, and who built it. Some were full cut planks, some not. The material was spruce, sometimes pressure-treated, or redwood leftover from other projects. Few had railings, exceptions being three at Sieur de Monts Spring, one on the Long Pond Trail (#118), and one on Penobscot Mountain (#47) in the cliffs area (Fig. 5-35). A CCC-style bridge on the Precipice Trail (#12) had wooden railings, but these railings were replaced with galvanized pipe prior to 1974 (Fig. 5-36).

In 1982, NPS crews replaced a CCC bridge on the Long Pond Trail (#118). The CCC bridge was 5 feet wide and had no railings. The new bridge was constructed in the CCC style of bridges historically used in the Sieur de Monts area. The treads for the new bridge were split cedar logs approximately 8 inches in diameter, flat side down (Fig. 5-37).

HISTORICAL CHARACTERISTICS OF BRIDGES

There is no single style of bridge that is representative of each of the historic periods. On the contrary, each bridge reflected its builder and chosen materials. However, there are generalizations that apply to certain periods of construction. For example, the VIA/VIS bridges started out as dainty or fanciful representations of the rustic style. Through the period, the use of this whimsical character diminished, but the later bridges were still constructed with a high degree of skill and attention to detail. VIA/VIS builders traditionally relied on local rather than imported materials. By contrast, bridges constructed or rebuilt by the CCC on the island's eastern side typically used more substantial structural members and often included features like trusses, outrigging, and handrails. Like the VIA/VIS, the CCC used a variety of styles and sizes in their bridges. Bridges built during the same period on the western side of the island tended to be smaller, and some used curved stringers, emphasizing a different aesthetic.

Pre-VIA/VIS (pre-1890)

Rustic bridges were built by private landholders, in conjunction with some of the first summer estates.

VIA/VIS Period (1890–1937)

Typical bridges were constructed with relatively thin cedar stringers, planks, or 1-inch board decking, and often included handrails. Some were gravel surfaced.

CCC Period (1933–42)

Bridge styles included a mix of small corduroy flat and arched bridges, and large cedar log bridges with either curb or hand railings, outrigging, or trussed bracing. Some were gravel surfaced.

NPS/Mission 66 Period (1943–66)

No documentation has been found for the style of bridge construction used.

NPS Period (1967–1997)

Typically cedar stringer pole and plank bridges in the heavier CCC style were used, as well as bogwalk bridges. The 1970s and 1980s saw conscientious effort to standardize construction for ease of maintenance. Emphasis on historical precedence influencing bridge construction began in the mid-1990s.

Acadia Trails Crew, 99-40-19

Fig. 5-35 Bridge with railing built by NPS in the 1990s along the Penobscot Mountain Trail (#47).

Olmsted Center, 7-97-20-14

Fig. 5-37 This corduroy footbridge on the Great/Long Pond Trail (#118) was constructed in 1982, replacing an earlier CCC bridge. This new bridge is 23 feet long, 30 inches wide, and has a 3 foot railing.

Olmsted Center, 2000 s

Fig. 5-38 This CCC-influenced log bridge was constructed in 1999 on the Great Meadow Loop. A side view of the bridge is shown in Fig. 5-19.

Acadia NP Archives

Fig. 5-36 A group of hikers in the 1950s on a wooden bridge connecting ledges along the Precipice Trail (#11). The wooden bridge railings were eventually replaced with iron. Notice the iron handrails along the edge.

Between 1980 and 1990, approximately a dozen shorter, 4- to 6-foot-long bridges were removed throughout the park. Their abutments were reworked into open culverts or drainage dips.

The most recent bridge constructed in the CCC large-scale style was built in 1999 on the Great Meadow Loop, a new connector trail between Bar Harbor and the park. This bridge was constructed using CCC photographs as a guide and incorporates split log decking, round-side up, and handrails on each side. The finished construction generated discussion as to whether the tread surface is too uneven. Original CCC bridges of similar design contained a gravel surfacing over the log decking, with curbrails on each side to keep the gravel in place, resulting in a smoother walking surface. This detail was not incorporated into the new bridge, and a few other items, such as bracing, differ from CCC work, but overall, the CCC character is retained in this modern addition to the trail system (Fig. 5-38).

Park crews constructed three bridges along the eastern shore of the Jordan Pond Path (#39) in 2000 and 2001. These are 4 feet 8 inches wide, with 4 inches of gravel surface over split cedar logs on stringers. At present, these are the only gravel-surfaced bridges in the park imitating this early 1900s feature.

The only remaining bridges from before the 1970s are several small gravel-surfaced bridges that are actually more like closed culverts than true bridges. Approximately four of these are located on the Canon Brook Trail (#19). There are also a few on closed sections of Stratheden Path (#24) and on the Jordan Pond Carry Path (#38). These bridges are in extreme disrepair and are generally unnoticeable to casual hikers.

At present there are approximately 128 footbridges in the park, averaging 8 feet in length, for a total of about 1,000 linear feet.

TREATMENT FOR BRIDGES

1. Maintaining Character

Issue: There were various bridge styles used throughout the trails' historic periods. VIA/VIS styles adhered to the taste of individual builders. The CCC was more standardized, but also used various styles in different park locations. This makes replication of specific bridges open to conjecture.

Treatment Guidelines: Maintaining a variety of historically compatible bridge styles is essential to preserving the trail system's overall character. This can be accomplished by careful consideration when rehabilitating an existing bridge, rebuilding a lost bridge, or adding a new bridge. In any of these situations, first determine what is the most significant period of construction for the individual trail, and then choose a bridge style that is compatible with this period. Historic photographs and other documentation should be used for reference.

For example, a trail that primarily reflects VIA/VIS features should contain bridges built to be compatible with the VIA/VIS style. Generally these types of bridges will contain rustic construction materials and maintain a relatively delicate or graceful appearance, as seen currently seen in the Northeast Harbor VIS District and Jordan Pond Path (see Fig 5-26 & Fig. 5-39). On a CCC trail, bridges should generally have a heavier feel, with larger members and more substantial construction, particularly on the eastern side of MDI. The bridge recently constructed on the Great Meadow Loop is a good example (see Figs. 5-19 & 5-38). CCC bridges on the western side of MDI tended to be smaller in scale, and more similar to the VIA/VIS style. Examples of this can be seen in the extant (though extremely decayed) bridges at the former Cold Brook Fish Hatchery near the outlet of Long Pond, as well as in historic photographs of the many small CCC bridges constructed on the Long Pond Trail (#118) (Fig. 5-40).

In many cases, a particular trail may have historically been worked on during more than one period of construction. Although every effort should be made to determine which period is most significant for the trail, and the appropriate style chosen, it is permissible to have some cases where more than one bridge style is present on a trail, as long as each is compatible with the trail's overall character.

2. Use of Bridges

Issue: In some areas, structures such as culverts have been added to replace bridges. Likewise, a few bridges have been added to the system where stepping stones or other features traditionally may have been used. These alterations may affect the character of any given section of trail.

Treatment Guidelines: Careful consideration should be given when choosing a crossing type. Stepping stones, bogwalk, or closed culverts may be the more appropriate choice for a particular location, depending on the individual trail history, as well as the current usage. Maintaining the historically appropriate crossing feature is preferred. However, if the surrounding conditions have changed drastically, then a new compatible crossing feature may be substituted.


Acadia Trails Crew, 2001

Fig. 5-39 Gravel-surfaced bridge on Jordan Pond Path (#39), constructed in 2001.


National Archives, Waltham, MA. 97-6-1

Fig. 5-40 This historic image shows an arched CCC corduroy bridge near the Cold Brook Fish Hatchery on the Great/Long Pond Trail (#118) soon after construction in 1935.

For example, if a bridge was historically used at a stream crossing, then a bridge is the preferred choice for modern use. However, if the stream is no longer as large, or is dry for part of the year, then stepping stones or bogwalk may be considered as an alternative to a bridge. The choice will depend on what feature types are most compatible with the trail's historic character.

3. Durability

Issue: Durability and structural integrity of all bridges is a concern. In particular, the more "delicate" bridge styles are prone to maintenance problems and need frequent replacement. Primarily, this is due to smaller pieces decaying more rapidly or failing from repeated stresses. These bridges often cannot accommodate increased hiker traffic in high-use areas because of the increased frequency of use and weight loads.

Treatment Guidelines: In order to meet structural requirements and maintain bridge durability, historic styles may be adapted with the addition of modern materials. For example, steel stringers may be added to some large bridges that sustain consistent heavy loads. Abutments may be reinforced with steel or concrete as needed. Pressure-treated lumber may be used for decking, railings, or other bridge members that do not come in contact with the ground (reducing environmental concerns about leaching). Some bridge modifications may also be necessary due to higher levels of use, such as the addition of handrails or other safety features. Generally, modifications can be easily made to most bridge styles in an unobtrusive manner without sacrificing historic character.

4. Sills versus Abutments

Issue: Most bridges in Acadia have their stringers placed directly on sills rather than stronger, longer-lasting, non-rotting abutments.

Treatment Guidelines: Most bridges are small and light enough to be placed on log or rock sills. To maintain the character of Acadia's bridges, this practice should be continued. However, abutments should be considered in certain instances. If the stability of the bank is in question from vegetation loss, soil scour, or a historically high rate of erosion, a durable abutment should be built. If the bank slopes back such that a long span is required, constructed abutments may shorten that span. When tread repair necessitates a higher stringer than possible on existing banks, abutments should be used. Abutments should also be used in places where there is an existing historical abutment. If the construction of abutments will greatly alter the character of a trail or area, they should be only be considered as a secondary choice if absolutely necessary.

SPECIFICATIONS FOR BRIDGES

1. Location

At Acadia, bridges are typically constructed over streams in high-use areas, in areas frequented by inexperienced hikers, over streams where an unimpeded flow of water is required, where there is a sharp dip in grade, where there is a gap between ledges, or to solve erosion problems, for example at the banks of a stream or gully. New bridges are also regularly installed as replacements for existing bridges, as most cedar bridges have an average longevity of approximately twenty years. Not all stream crossings require the use of a bridge. Stepping stones, culverts, and causeways are additional options that should be considered.

The CCC guidelines state, "foot logs and foot bridges are not recommended except where the stream is sufficiently large to justify them." Fords and stepping stones are the preferred alternatives in these situations. For locating and constructing footbridges, the guidelines suggest using any natural formation available to make the structure fit the surrounding area, and using existing boulders or formations as abutments.[28]

Albert Good states there should be a clear necessity for construction of a bridge. For example, the crossing of dry ravines or gullies may require a bridge only in an intensive use area. He cautions against the construction of flimsy or overly ponderous bridges and stresses the importance of using local material to achieve a "harmonious medium of structural interpretation." He advocates for the use of wood and stone rather than steel or concrete.[29]

For the selection and design of timber bridges, Good recommends simplicity in construction so as to blend with the natural surroundings and the use of either round or squared timber. Bridges of an open wood-truss type are discouraged, as are the construction of unnecessary trusses. Finishing touches to the bridge are paramount. Furthermore, he suggests variety in bridge construction, "avoiding the commonplace at one extreme, and the fantastic on the other."[30]

2. Structural Materials

All wood should be decay-free, fresh-cut Northern white cedar. For all bridge structural components that are visible such as railings and railing posts, remove splinters and jagged or sharp edges, rough knots, and sharp chainsaw or axe cuts. Do not use CCA (chromated copper arsenate) pressure-treated wood on park bridge or rail structures. However, treated woods approved by the NPS Integrated Pest Management Office are allowable for bridge members that do not come in direct contact with soil. Pressure-treated members must be visually compatible with the chosen bridge style.

Nails and bolts should be galvanized (or comparable non-corrosive material). Nail sizes vary with the materials joined, from a minimum 10d nail for 1-inch-thick boards, to 10-inch spikes for logs in abutments and stringers. All lag or carriage bolts should be 3/8 inch diameter or larger. To prevent splitting wood, pre-drilled holes are suggested for nails and required for bolts.

3. Abutments (Figs. 5-41 & 5-42)

It is imperative the abutments do not impede stream flow. They shall be constructed on stable banks, above high water, and far enough from streamside so as not to erode underneath and be undermined. The height above the stream depends upon the stream itself. Usually, one can gauge high water by observing bank side

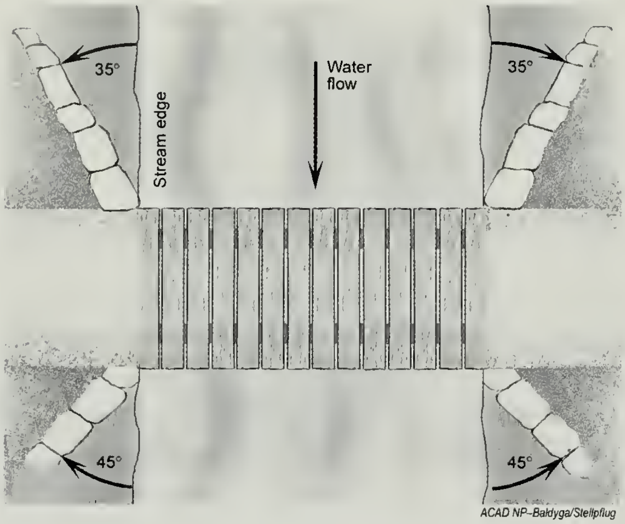


Fig. 5-41 Detail of stone abutment angles and placement.

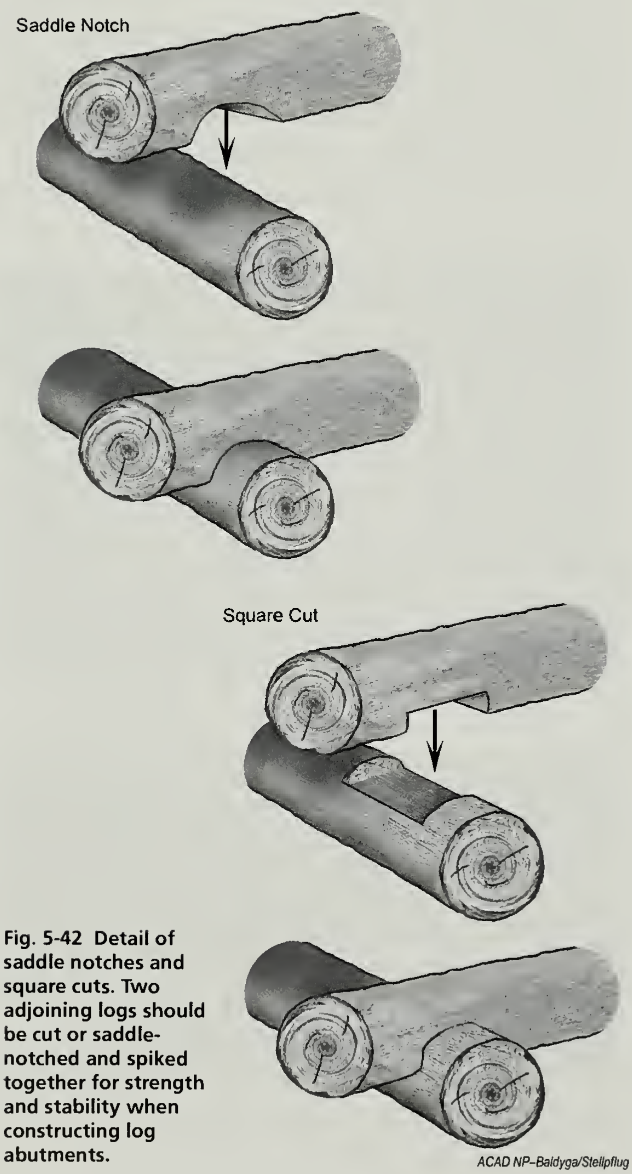


Fig. 5-42 Detail of saddle notches and square cuts. Two adjoining logs should be cut or saddle-notched and spiked together for strength and stability when constructing log abutments.

scour or debris piles, and following the lay of the land for that area. Also consider the known history of a particular stream.

Natural rock formations, including existing boulders and/or ledge rock, are appropriate for use as abutments. They are preferred because they involve no alteration of stream flow or banks. Boulders larger than 2 cubic feet in size per stringer can also be used. If stringers cannot securely rest on natural surfaces, they should be pinned to the ledge with 3/4-inch steel.

If natural formations are unavailable, stone abutments are the preferred choice. The stone used should reflect the stone type, color, texture, and scale of those lying naturally within the stream itself. When constructing stone abutments, Good recommends using "pronounced horizontal coursing, breaking of vertical joints," and a "variety in size of stones — all the principles productive of sound construction and pleasing appearance in any use of masonry."[31]

Stone abutments are constructed using the best accepted drywall masonry techniques. This incorporates large footing stones with a 1-cubic-foot minimum size, headers, packing, and large top tier coping stones, again, at least 1 cubic foot in size. The top-tier rocks may be flush with the tread surface in order to maintain even height from bridge decking to trail tread. The footing tier should be 12 to 18 inches below minimum water level, or to ledge, to prevent undermining, and ends should turn and be constructed in excavations in the stream banks. This will prevent scouring. The SCA manual recommends an angle of 35 degrees to the stream flow, upstream, and 45 degrees downstream.[32] In some instances it will be possible to build abutments above stream flow entirely, constructing a simple wall sufficient to support stringers and retain tread. This is suggested only for areas with stable banks that are not actively eroding. The style of rock construction should reflect the characteristics of the surrounding trail features or era.

Stone abutments are superior to log abutments due to longevity. However, log abutments may be used if necessary. For log abutments, care should be taken to ensure no high water undermining or scouring, incorporating the same angles as in stone abutments. Use cedar logs, at least 8 inches in diameter, joined with saddle notches and spikes. Header logs need to extend at least 3 feet into the stream banks. A single sill laid well above stream flow, on a small, intermittent stream, may suffice as an abutment for a bridge under 4 feet long. See Chapter 6 for more information on constructing stone retaining walls.

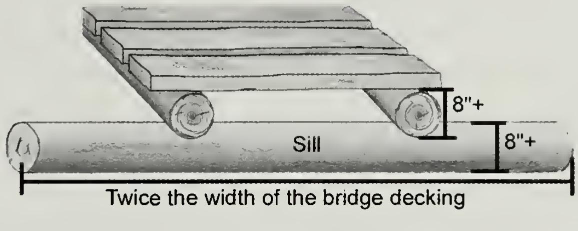


Fig. 5-43 Detail of sill sizing.

4. Sills (Fig. 5-43)

Sills are the logs supporting the ends of bridge's stringers. They are set perpendicular to the tread. They are a minimum of 8 inches in diameter, and buried at least two-thirds into the soil or bank sides. They should be approximately twice the width of the bridges. Not all bridges require sills, as stringers can be set directly upon stone or log abutments. Often, in place of sills, stringer ends can be placed on rocks larger enough to support their weight.

5. Stringers

Most bridges are sufficiently sturdy with two stringers of at least 8 inches minimum diameter. For longer spans, stringers need to be 12 to 18 inches in diameter. Bridges over 4 feet wide and 6 feet long, where "five-quarter" lumber (1 inch thick) is used as decking, may require three stringers. When placing the stringers, lay them with the crown, or bow, facing up. Notch stringers as little as possible, as this compromises strength; if needed, notch sills instead. Stringers should be placed on abutments, large single rocks, crushed stone, or sills. Do not place stringers directly on bare soil. If there is a chance of high water, stringers should be pinned to ledge or otherwise attached to abutments so as not to shift at high water or with ice flow.

6. Decking (Fig. 5-44)

For milled planks, use full-cut 2-inch-thick planks, a minimum of 8 inches wide. IPM-approved pressure-treated wood may be used for decking. Planks should extend equally to the outside of each stringer, between 6 to 8 inches maximum to the outside of stringer centerline. Limit spacing between decking boards to 1 inch

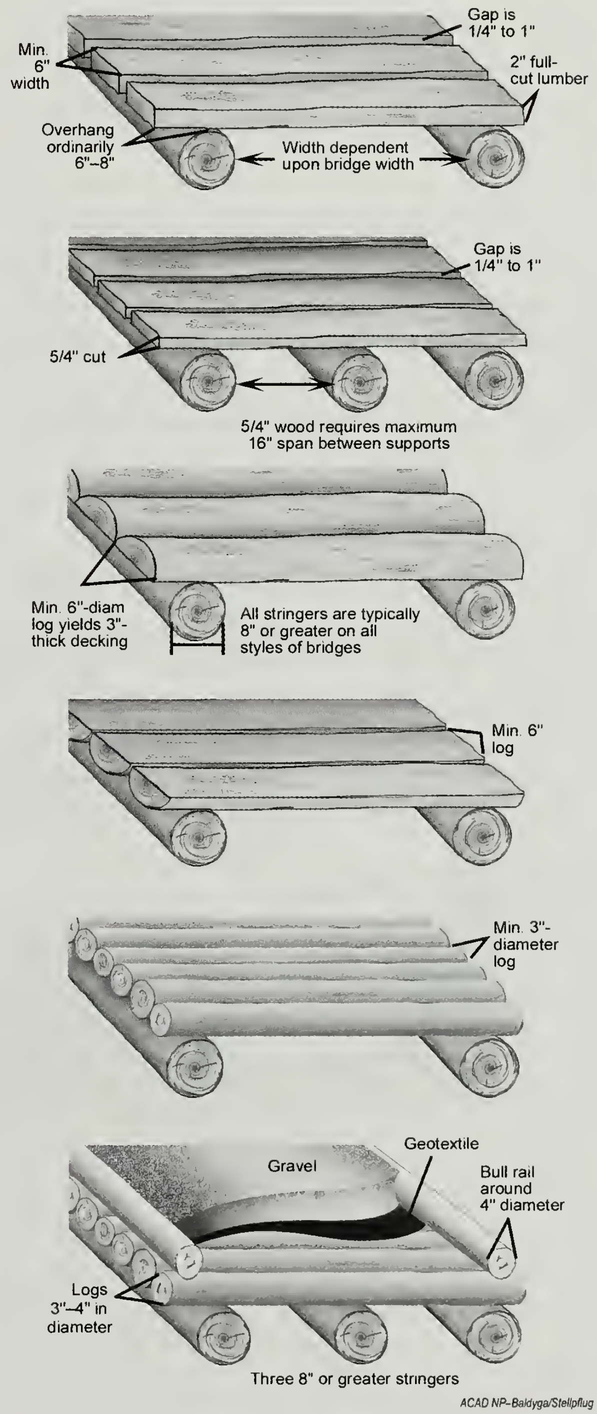


Fig. 5-44 Details of various decking options.

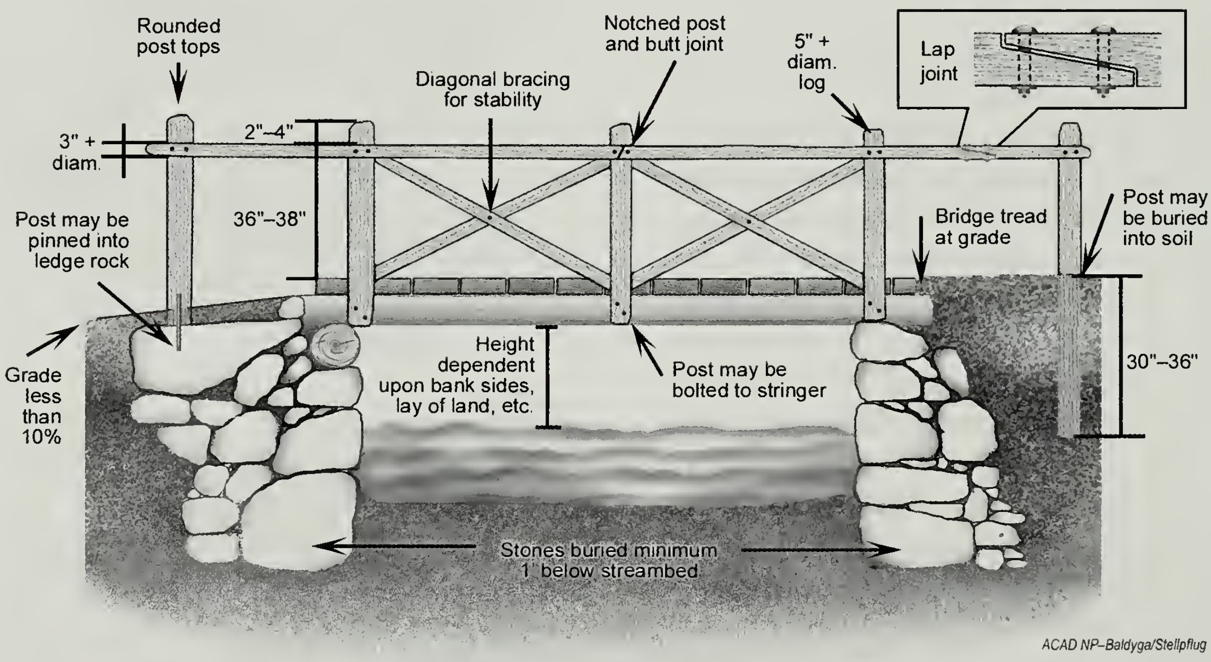
in remote trail areas, and to ¼ to ½ inch in high-use areas. To date, Acadia crews have used nominal, 2-inch full-cut redwood recycled from other park projects, as well as pressure-treated and untreated lumber.

Five-quarter decking may be used to capture the characteristics of the "delicate" VIA/VIS bridges. This material is typically 1 inch thick by 5 ½ inches wide. It may be either cedar or a pressure-treated spruce or pine that has been approved by the NPS Integrated Pest Management Office. If five-quarter decking is used, a third stringer is required any time the span between stringers reaches 16 inches or greater.

For unmilled decking, use half-round cedar at least 6 inches in diameter, or full-round a minimum of 2 inches diameter. Though some original bridges probably had full-round decking as thin as 1 to 1 ½ inches in diameter, this is far too thin for practical application. Two-inch-diameter wood is suggested for VIA/VIS and smaller CCC bridges. For the sturdier-style CCC bridges, larger 4- to 6-inch-diameter wood is suggested.

Where decking runs perpendicular to tread, decking ends must be cut to uniform length. With milled plank decking, bridge treads must be smooth with an even height, to prevent hazard.

Gravel surfacing can be applied to bridge decking. The decking should be half-round or full-round cedar for VIA/VIS or CCC appearance. Cover decking with a very thin, woven geotextile blanket, to stop silting of gravel fines through cracks in bridge decking. Curbrail sides must be installed along the bridge to contain gravel. Maintain even tread continuity from bridge surface to trail tread surface. A minimum of 4 inches of gravel should be applied. Because of increased weight, surface should not exceed 5 inches thick. A gravel-surfaced bridge should use three very solid stringers



*Handrails are typically needed if the bridge is 30"–36" above the grade.
*Handrails should be at least 3" diameter.
*Posts should be at least 5" diameter.
*Handrails should be at 36"–38" above decking.
*Top of posts should be 38"–42" above decking, extending 2"–4" above handrail.
*Post should be securely anchored to the stringers, bedrock, or buried in the soil.
*Handrails should be securely attached to posts with notching, lap joints, and spikes or carriage bolts.
*Diagonal bracing may be used for added stability, depending on bridge style.

Fig. 5-45 Detail of bridge handrails.

of at least 8 inches diameter up to 8 feet long. Longer bridge spans require stringers of greater diameter.

Some original gravel-surfaced bridges used log decking running parallel with the tread. Poles of 4 to 6 inches diameter were laid parallel, sides touching, on sills or abutments, and covered with gravel. This style rarely exceeded 6 feet in length. To replicate this form of bridge, use poles a minimum of 6 inches diameter.

7. Curbrails and Handrails (Fig. 5-45)

Curbrails are low beams or logs, typically less than 3 inches diameter, affixed to the edge of bridge decking. They provide both a visual and physical barrier to keep the hiker from stepping off the edge of the bridge when no handrail is present. They can also be used to add support to bridge stringers and decking. Nevertheless, curbrails are rarely used with standard decked bridges, but they are a necessity for gravel-surfaced bridges. The curbrail constrains the gravel to the bridge tread surface. Typically, curbrails used for this purpose are not over 5 inches diameter, since the gravel surfacing should be no thicker than this due to weight concerns.

Handrails are the more common bridge feature used for visitor safety. They should always be used if the bridge is located in a high-visitor-use area, like Sieur de Monts Spring. In other locations, handrails should be considered whenever the bridge-to-base distance exceeds approximately 36 inches. However, the bridge style and location should always be taken into consideration when the need for handrails is addressed. In some cases a broader bridge may use curbrails in addition to handrails.

Weak or poorly secured handrails can be hazardous. Handrails should be sturdy enough to support the weight of a group of hikers leaning against the handrail. Historically, VIA/VIS handrails were often less than 2 inches diameter. However, modern handrails should be a minimum 3 inches diameter, notched into posts, and located approximately 36 to 38 inches above the decking. Connecting railing sections need to be attached to the posts with lap joints. Rails can be held to posts with spikes, allowing at least 4 inches of penetration into uprights. However, carriage bolts through the posts and rails are preferred. Pre-drilling of the holes is recommended. Rough knots should be smoothed and ends rounded to ensure there are no sharp edges or splinters.

Handrail posts should be a minimum of 5 inches diameter and not more than 10 feet long. Post tops should be approximately 38 to 42 inches above deck level. Diagonal knee or interior truss braces may be installed to eliminate excessive rail or post shimmy, depending on the bridge style. End posts that are placed in the ground should be buried 30 to 36 inches. If the end posts cannot be inserted into the ground, they should be pinned to ledge and/or solidly nailed or bolted to stringers with 3-inch or larger lag bolts or carriage bolts. Posts can also be set directly upon decking, using a curbrail as added support for the post bottom. Post tops should be rounded over or bevel cut to shed water and snow. Smooth rough knots and round ends to ensure there are no sharp edges or splinters.

8. Ramps and Approaches

Tread and deck should meet at level even grade if possible. If this is not possible, cribs or stepping stones must be built to bring the tread up to deck level. Grade to bridge level must not exceed twelve percent. This should provide for easy, user-friendly approaches. Ramps should aesthetically fit the landscape and the bridge style.

9. Site Cleanup

The construction site should be picked up during and after completion of the work. Silt fencing should be installed during construction for erosion and sediment control around the stream. If on-site materials are used, gather them from far enough away so as not to leave scars. Carry in materials to the site whenever possible. Clean up and restore the area after construction. If an old bridge is removed, always carry out pressure-treated material for proper disposal. Haul other planks, such as stringers, far away from the site, and scatter and hide debris so it is not seen from the trail. Take into consideration seasonal foliage changes when hiding debris. Cut material into small pieces.

Never leave metal hardware; remove it from the site and dispose of it properly.

10. Bridge Examples

To guide construction of bridges in the VIA/VIS or CCC styles, several sample bridges that were historically present or are currently extant are described below. Information is provided on the location, setting, materials, construction methods, and modifications addressing modern safety issues and structural improvements to accommodate higher use levels.

VIA/VIS bridges:

a. 1904 cedar bridge over Jordan Stream (#65)
b. Circa-1908 cedar bridge along the Seal Harbor Shore Path (#427)
c. Cedar bridge on the Maple Spring Trail (#58),
d. 1983 VIS-style bridge on the Jordan Pond Loop Trail (#39)
e. Bridge remains on the Maple Spring Trail (#58) and the Amphitheater Trail (#56)
f. Gravel-surfaced bridge on the Stratheden Path (#24)
g. VIA/VIS stone bridge

CCC bridges:

h. Cold Brook Fish Hatchery area
i. Long Pond Trail (#118)
j. Great Meadow/Sieur de Monts area

VIA/VIS Bridges

a. 1904 cedar bridge over Jordan Stream (#65) (see Fig. 5-22). A bridge was chosen instead of stepping stones or a stepstone culvert for this medium-flow, year-round stream. Apparently there were no abutments for the stringers. In all probability the stringers sat directly on large rocks or sills. Site examination would suggest the necessity of abutments for streamside protection. The stringers appear to be 4-inch-by-6-inch planks, which are sufficient for this short span. Eight-inch-diameter logs would also suffice for this structure. The decking is apparently 1 inch thick and provides sufficient support; however, the random spacing between the decking is unsafe. Replacement decking should be spaced with 1 inch between boards. The railing is approximately 2 inches diameter and attached to supported posts. A present-day substitute would require 3-inch-diameter material to meet safety and durability needs.

b. Circa-1908 cedar bridge along the Seal Harbor Shore Path (#427) (see Fig. 5-23). A trail reroute or cliffside railings could have dealt with the technological problems of surmounting this crevice. Choosing a bridge allowed the VIS to vary and showcase construction methods along their trail, maintain the continuity of the relatively straight path, and increase the dramatic effect of the crevice. The abutments were natural ledges, and the stringers were held in place with iron pins. Some of the original pins can still be found. The 10-inch-diameter stringers were supported by knee braces, located approximately one-third the distance from each end. On this long span, the braces compensate for sag in the stringers, and reduce lateral movement. Careful examination suggests some form of plank running along the top of the stringers, which appears unnecessary. In constructing a similar bridge, 2-inch-thick decking and 3-inch-diameter railings and bracing would be the minimum needed for visitor safety. The suggested width of this bridge would be 3 feet.

c. Cedar bridge on the Maple Spring Trail (#58) (see Fig. 5-24). A bridge was located over the year-round stream on the Maple Spring Trail (#58), although it is no longer extant and no replacement has been constructed. Remains of this bridge were discovered along the stream in 2000, including stringers, decking, and handrail It is likely the bridge was built by the Northeast Harbor VIS, or it may have been constructed by some other group or individual copying the VIS style. The stream is very difficult to cross during high-runoff times, and a bridge should be reestablished at this site to allow safe stream crossing and protect the streamside resource. Evidence indicates the abutments for the original structure included a low rock wall on the western end, with the eastern end of the bridge pinned to existing boulders. This is sufficient, providing adequate clearance for high water and construction to eliminate undermining and scouring of the abutment on the western end. The original 7-inch-diameter stringers would need to be replaced with a minimum of 8-inch-diameter logs for improved structural stability. The original decking was full-cut 2-inch-thick milled lumber with no spacing, but a ¼ inch minimum spacing is needed. The width of the tread was adequate at approximately 42 inches. The original handrail was only 1 ¼ inches in diameter and would need to be upgraded to 3 inches at a minimum. It had a downward curve at the ends, and this feature should be maintained if the handrail were reestablished. Four upright posts, 6 inches in diameter, supported the handrail with additional support provided by 1- to 2-inch-diameter outrigger bracing. The posts were of sufficient size, but the bracing would need to be increased to 3 inches diameter. Note the single railing on the downstream side.

d. 1983 VIS-style bridge on the Jordan Pond Loop Trail (#39) (Fig. 5-46). At the northern end of Jordan Pond, a VIS-style bridge was built in 1983. Differences between it and the original bridge are illustrated in the size of construction members, the height above the water, the length of approach, and the larger abutment piers.

The log crib piers are 5 feet square on the outside, with logs a minimum of 5 inches diameter logs. The piers sit approximately 40 inches above the lake bottom. The original stringers were single curved logs. Each stringer of the present bridge is made of two logs connected with a scarf joint in the center. This is sufficient, as long as the diagonal truss braces are maintained. The stringers rise 8 inches from pier to center, with a span from sleeper to sleeper of 19 feet 3 inches. The weight of the arch is held by three construction members acting in conjunction—upright center bracing, diagonal bracing, and the use of the piers to stop the outward thrust of the arch.

The original decking was of 1-by-6-inch boards. At present the decking is full-cut 2-by-10-inch planks. The original method of decking was imitated. Stringers were topped with 2 ½-inch half-round logs, perpendicular to the tread, spaced evenly along the bridge length. Decking planks are laid across the logs, parallel with the tread.

The diagonal bracing above the deck was replicated. It helps give firmness to the walking surface, support the weight of the arch, and it also serves as a handrail. A minimum of 4 inches diameter is necessary for the bracing logs. Another interesting feature is under the tread. Again copied from the original, there is diagonal bracing between the stringers to lessen any lateral movement of the bridge. This bracing is similar to the trusses under historic covered road bridges. Given that the original design element used in the construction of this bridge have lasted over forty years, any subsequent replacement should remain as true as possible to these historical precedents.

e. Bridge remains on the Maple Spring Trail (#58) and the Amphitheater Trail (#56) In the trails inventory conducted in the 1980s, Gary Stellpflug documented the decaying remains of a bridge on Section 3 of the Maple Spring Trail (#58). There was also a smaller, similar bridge stored under the Amphitheater carriage road bridge, likely from the Amphitheater Trail (#56). Nothing remains of either bridge.

Presently there is no crossing feature where the original Maple Spring bridge was located, and the replacement of this feature is appropriate. The original structure was a 3-foot-wide corduroy bridge, decked with closely spaced, cedar full-round logs that were less than 2 inches diameter. The logs were laid

Fig. 5-46 This wooden bridge was constructed in 1983 by NPS crews on the Jordan Pond Loop Trail (#39) at the north end of the pond.

National Archives, Waltham, MA

Fig. 5-47 A CCC worker rolls gravel tread on a corduroy bridge on the Stratheden Path (#24) in the 1930s. Notice the stone abutments, corduroy decking, and curbrails, common features on many of the gravel surfaced bridges.

Acadia NP Archives

Fig. 5-48 The Kane & Bridgham Memorial Bridge was constructed between 1926 and 1929 at the outlet of Lakewood in Bar Harbor. Designed by noted landscape architect and summer resident Beatrix Farrand, the bridge consisted of large stone slabs set on stone piers. Photograph circa 1932.

Olmsted Center, 6-97-13-6

Fig. 5-49 A 1997 view of the Kane & Bridgham Memorial Bridge showing the remaining pieces of the bridge. Rising waters from beaver activity along with ice damage have taken their toll on this structure, and at times it is almost completely submerged.

perpendicular to the trail tread. It is interesting to note the decking difference with the previously described bridge, suggesting different-style bridges, even on the same trail.

The bridge on the Amphitheater Trail (#56) was also corduroy, decked with small cedar full-round logs. It was approximately 8 feet long, narrow, with distinctly curved stringers. These were under 6 inches thick, the bare minimum for structural stability.

These two bridges probably had the appearance of the arched and flat corduroy Northeast Harbor VIA bridges on Lower Hadlock Trail (#502) and the Asticou Brook Trail (#514), or the long corduroy bogwalk on the Upper Hadlock Pond Trail (#501). (See Figs. 5-3, 5-26, and 5-28)

f. Gravel-surfaced bridges on the Stratheden Path (#24) (Fig. 5-47, also Fig. 5-1)
Excellent examples of gravel-surfaced cedar bridges were located on the Stratheden Path (#24). On one bridge, the rock wall abutments were built to a height to allow continuation of tread grade and width. The bridge had 8-inch-diameter stringers. Full-round 6-inch-diameter logs were placed perpendicular to the tread, very tightly spaced. The entire wooden surface was covered with gravel. These bridges rarely had handrails. A 6-inch-diameter curbrail ran the length of the bridge, in order to contain the gravel. These specifications were typical for other bridges of this type and are suitable for modern usage, with the addition of geotextile material underneath the gravel.

g. VIA/VIS Stone Bridge (Figs. 5-48 & 5-49). In the 1920s, landscape architect Beatrix Farrand designed a granite bridge for the outlet of Lake Wood. Constructed between 1926 and 1929, the bridge consisted of granite block abutments and piers, topped with granite block decking and curbrails. Though collapsed, most of the bridge pieces remain, and it could be reconstructed using some of the original materials. If the bridge is rebuilt, further research should be conducted to locate the original design drawings and specifications. This is the only known bridge of this type located in the park, and because of its uniqueness, it would be inappropriate to reconstruct a bridge of this type in any other location.

CCC Cedar Bridges

As previously discussed, CCC bridges showed similar diversity to the VIA/VIS bridges and encompassed a wide variety of styles. Examples of the variety of CCC work included stocky structures in Great Meadow and Sieur de Monts, small gravel-surfaced bridges in the same area, planked bridges like ones near Long Pond, and a delicate curved stringer bridge on Cold Brook.

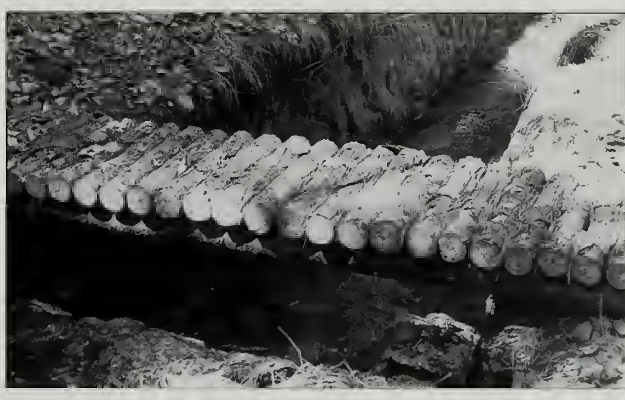
Three examples from Acadia are presented here, providing an introduction on how future bridge work based on the CCC style might be achieved. For a broader discussion of the general design parameters of CCC bridges, refer to Albert Good's *Park & Recreation Structures*, Part I: Administration and Basic Service Facilities, pages 175–200.

h. Cold Brook Fish Hatchery area (Fig. 5-50, also Figs. 5-16 & 5-40). A historic corduroy bridge in the former Cold Brook at the Fish Hatchery was less than 4 feet wide. The stringers were curved cedar logs, and the deck was full or round cedar approximately 4 inches in diameter. Several other small corduroy bridges were found in this area. Typically, railings were not used with these bridges.

i. Long Pond Trail (#118) (Fig. 5-51, also Fig. 5-37). Two pre-1970s bridges were documented in the 1980s on the Long Pond Trail (#118) and have since been replaced. The first bridge, across the Great Brook, had substantial log abutments, a width of 5 feet, and 2-inch-thick decking. A smaller bridge was only 4 feet wide and probably also had 2-inch decking. It was supported by small stones. By the 1970s, neither of these bridges had handrails, although handrails may have been an original feature. Gary Stellpflug remembers both of these bridges being extremely rotted and hazardous prior to their 1982 replacement. There is an assortment of other small bridges on this trail, many constructed over original CCC stone abutments.

j. Great Meadow/Sieur de Monts area (see Figs. 5-18 & 5-38). As previously stated, CCC bridges on the eastern side of MDI were typically stockier than CCC bridges built on the western side of the island. In the Great Meadow/Sieur de Monts area, bridges typically had substantial stone abutments, stringers composed of larger logs (up to 12-inch-diameter), with large upright posts and railings (up to 8 inches diameter). These bridges were firmly trussed with outrigger bracing, even though the bridge span was less than 12 feet. The decking was approximately full or half-round logs approximately 5 inches in diameter. These were covered with a layer of gravel contiguous with the trail tread surface.

In 1999, a bridge based on this CCC style was added to the Great Meadow Loop. Using historic photographs as a design reference, the bridge was constructed with brawny railings, stringers, and trusses. Although the original bridges of this type often were gravel surfaced,



Acadia Trails Crew, 5-99-42-2

Fig. 5-50 A recently reconstructed corduroy bridge at the Fish Hatchery was built in the style of historic bridges on Cold Brook.

National Archives, Waltham, MA, 97-6-6

Fig. 5-51 Small CCC corduroy bridge on the Great/Long Pond Trail (#118) in 1935. The delicate style, similar to earlier VIA/VIS work, complements the gravel tread and coping stones.

the current structure is not. However, if this is desired, it could be accomplished with the addition of geotextile cloth covering, curbrails, and gravel.

ROUTINE MAINTENANCE

1. Inspect bridges for decay and structural integrity. The longevity of a bridge is generally less than twenty years, so a cyclic program of replacement must be established.
2. Check abutments and piers annually for shifting, failure, or decay.
3. Check treads for decay and raised nails.
4. Check railings, particularly smaller railings, for sturdiness, splinters, and raised nails.
5. Clean out dams and jammed logs below the bridge, on piers and abutments, and along surrounding banks.
6. Grade the approach tread to the bridge so that there is little transition from the tread to the bridge deck.
7. Routinely clean debris and organic material from the tread surface.
8. Grade and maintain gravel surfacing.
9. Drain the treadway so water does not run onto the bridge.
10. Replace sills as needed to save stringer ends.
11. When replacing planking and decking, replace all boards on the bridge at one time, as opposed to just replacing the rotten boards. Bridge components are usually evenly aged, and as some components begin to fail, the entire structure may need replacing.

Acadia NP Archives

Fig. 5-52 A stream crossing was a typical location for stepping stone use by the early VIA/VIS trail builders. Shown in circa 1916, the stones cross a shallow stream over the dam at the outlet of The Tarn. These stream-style stepping stones proved to be a more durable option than a bridge, as they are still extant nearly ninety years later.

C. STEPPING STONES

DEFINITIONS

Stepping stones are stones set in a single row, a stepping distance apart. They provide an elevated walking surface for crossing streams and wet areas. Stones usually have a flat upper surface, are comfortable for stepping, and are gapped, allowing water to flow through. Stepping stones that are placed in combination with sidewalls or abutments are described as **stepstone culverts** in Chapter 4. Stones that abut or are more than one stone-width across are described as **stone causeways** in Chapter 3.

Stream-style stepping stones, used at stream crossings, are made up of large blocks set level to each other, in a straight or curving line, with regular, substantial gaps between. Any blocking used to elevate or stabilize a stepstone is set completely underneath the step, to allow the free flow of water. The large stone size resists movement by ice and water. Usually these steps are uniform in size, rectilinear, often cut, and set to exacting standards. Most wide, shallow streams were crossed in this manner. Streams with steep banks were often bridged, and narrow streams were often crossed with culverts (Fig. 5-52).

Acadia Trails Crew. 5-99-7-6

Fig. 5-53 It is unknown whether these stepping stones on the Eagle Lake Trail (#42) are original VIA/VIS work, but they reflect the style of VIA/VIS stepping stones used in boggy areas.

Bog-style stepping stones are used to traverse low, wet areas with standing water. They are defined structurally by smaller, more irregularly shaped and set stones. These stones are usually elevated slightly by setting them into a causeway of crushed or piled stone. Because water need not pass quickly through them, smaller stones are often used to fill the spaces between the stepping stones, and sometimes two or more stepping stones in a row abut. Examples can be found the Eagle Lake Trail (#42), the Jordan Pond Carry Path (#38), and the Canon Brook Trail (#19) (Fig. 5-53).

HISTORICAL USE AT ACADIA

Pre-VIA/VIS

There is no evidence that stepping stones were used prior to the VIA/VIS trail work at Acadia.

Village Improvement Associations/Societies

Stepping stones were first introduced to the trail system during the VIA/VIS period of the late 1800s to early 1900s. Typically, stepping stones were a primary choice by trail builders for crossing wet areas and they were used frequently on many VIA/VIS trails, including the memorial trails.

Both styles of stepping stones were used. Examples of bog-style stones can be found on several trails, including the Asticou Trail (#49), Gorham Mountain Trail (#4), and the Bowl Trail (#6), Canon Brook Trail (#19), and Eagle Lake Trail (#42). Additionally, many stepping stones added during later periods closely resemble this style of VIA/VIS work (Figs. 5-54 to 5-57).

Olmsted Center, 4-99-49-s35

Fig. 5-54 Although these original VIS bog-style stepping stones on the Asticou Trail (#49) have settled into the ground, the irregularity of stone sizes can still be discerned.

Acadia Trails Crew, 5-99-3-8

Fig. 5-55 These VIA bog-style stepping stones are located on on the Gorham Mountain Trail (#4).

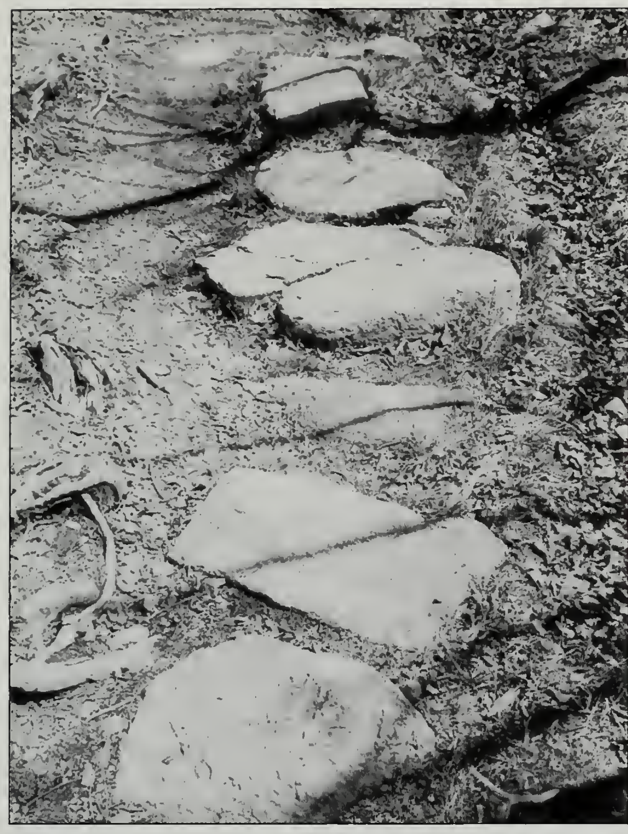
Stream-style VIA/VIS stepping stones include the more substantial stones used at wide, shallow stream crossings, where the flow of water is constant. They are defined by larger blocks of stone, which were often cut, and set to exacting standards. This style of stones appears to have been the first choice for stream crossings by the VIA/VIS. This style of stepping stone accounts for nearly all the stream crossings of this era, excluding crossings where the banks of the stream are particularly steep. (Bridges and culverts were the alternatives used when stepping stones were not feasible.)

This style of stepping stone was used on many of the endowed and memorial paths. One outstanding example was constructed circa 1915 at the outlet of The Tarn on the Kane Path (#17). These stepping stones are still in relatively good condition, but as the water level has risen, the stones have become less exposed than they were historically. Several other examples of this style of stepping stone can still be seen throughout the trail system. There are several on the Asticou Trail (#49), where some stones remain in place and others have been dislodged over time. A set can also be seen on the Andrew Murray Young Path (#25), although some of these stones have settled below the water level of the stream (Figs. 5-58 to 5-65).

Civilian Conservation Corps

Stepping stones were rarely used on CCC-era trails, and there are few extant examples of work from this period. On the Flying Mountain Trail (#105), a series of sixty-eight stepping stones is extant at the northern end of the trail. According to Trails Foreman Gary Stellpflug, these stones predate the 1970s. However, their construction is inferior to other CCC work on the remainder of the trail, indicating they may or may not have been a part of the original construction. Most of these stepping stones have been overlaid with bogwalk by the NPS Trails Crew (Fig. 5-66).

One documented example of CCC-era stepping stones is located on the Ladder Trail (#64). During the 1930s, the lower part of the trail was reconstructed by the CCC under the direction of George Dorr. Part of the



Acadia Trails Crew, 5-99-13-18

Fig. 5-56 These bog-style stepping stones on the Bowl Trail (#6) may be original VIA work.

Olmsted Center, 4-99-1-6

Fig. 5-57 These bog-style stepping stones on the Canon Brook Trail (#19) are in the VIA/VIS style, but it is not known if these are original trail features.

Acadia NP Archives

Fig. 5-58 Miss Cottoriet and Miss Grant stroll on the Tarn stepping stones near the entrance to the Kate Path a year or so after the the stones' installation in ca. 1916. The water level is down slightly, revealing the actual size of the stones.

work included the installation of stepping stones over a small stream near the trailhead (Figs. 5-67 to 5-69).

In both cases, the CCC work did not vary significantly from the earlier VIA/VIS styles of stepping stone construction. They relied on the precedents set forth by earlier trail builders when choosing the appropriate construction style for stepping stones.

NPS/Mission 66

No Mission 66–era stepping stones have been found in the trail system.

National Park Service

From the 1970s to the 1990s, stepping stones were often used as a stopgap measure to cross wet areas on trails of any era. Such sections were usually constructed of small, often round stones, stuck in the mud, and are almost always easily distinguishable from any historical work. More recently in 2002, large bog-style stepping stones were installed on the Jordan Pond Loop Trail (#39) to replace a section of small, ineffective stepping stones along the northern beach area (Figs. 5-70).


Acadia NP Archives

Fig. 5-59 A circa 1916 view of the VIA large-scale stepping stones across the Tarn outlet. Note the even curve of the layout, and that the stones are equal to the width of the trail.


Olmsted Center, 5-99-6-10

Fig. 5-60 A contemporary view of the Tarn stepping stones, looking west toward trailhead of Kurt Diederich's Climb (#16).

HISTORICAL CHARACTERISTICS

Stepping stones were predominantly used during the VIA/VIS periods, where the two styles of stepping stone construction originated. The characteristics of all historic stepping stones at Acadia can be traced to this period. Some sets of stepping stones were added during later historic eras, but generally other features like raised tread, bridges, and bogwalk were relied on for crossing shallow streams and wet areas. All later additions of stepping stones are based on the historic VIA/VIS styles.

Pre-VIA/VIS (pre-1890)

No evidence of stepping stone use has been found.

VIA/VIS Period (1890–1937)

Stepping stones were introduced to the system. Two styles were generally used, one for boggy areas and another for crossing wide, shallow streams.

CCC Period (1933–42)

Stepping stones were rarely used and no new styles were introduced. Raised tread was used to cross wet areas, and bridges and culverts were used to cross streams.

NPS/Mission 66 Period (1943–66)

Stepping stones were rarely used and no new styles were introduced. Raised tread and culverts were used to cross wet areas.

NPS Period (1967–1997)

Stepping stones were used sporadically to cross wet areas and streams. No historic precedent was followed in the style of stepping stone used.

Maine Historic Preservation Commission, 2003-d

Fig. 5-61 This circa 1920 postcard view shows original stream-style stepping stones on the Asticou Trail (#49) crossing Harbor Brook. These stones probably date to the trail's improvements by the Northeast Harbor VIS and Seal Harbor VIS in the early 1900s.

Olmsted Center, 4-99-49-s23

Fig. 5-62 By the 1990s, the set of VIS stepping stones shown in the previous image had been dislodged and were no longer in place. However, some of the stones were recovered from downstream and incorporated into piers and abutments for this recently built bridge. Ideally, the bridge should be removed and the stepping stones reset as they were originally.

Olmsted Center, 4-99-49-s20

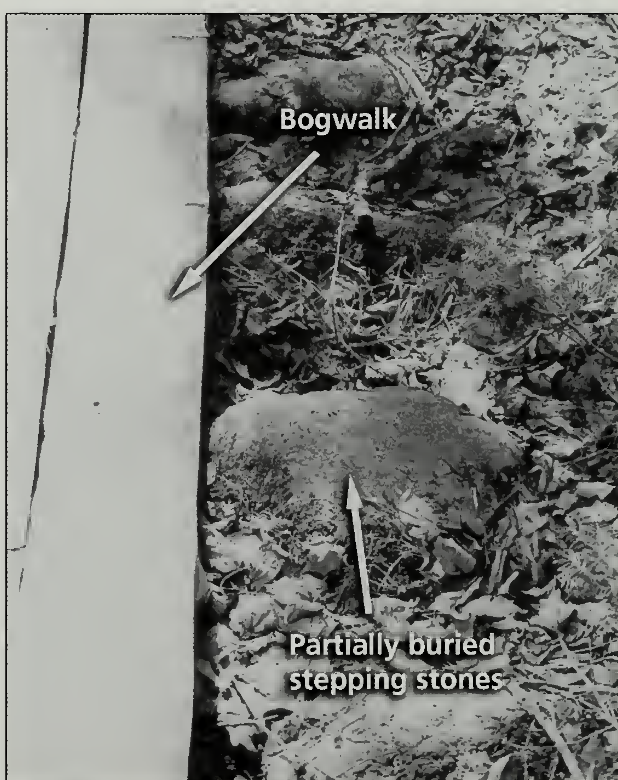
Fig. 5-63 Another set of original VIS stream-style stepping stones at a crossing on the Asticou Trail (#49).

Olmsted Center, 4-99-49-s16

Fig. 5-64 This set of VIS stepping stones on the Asticou Trail (#49) is one of the longer sets on the trail. Originally, the stones likely spanned the entire stream, but now a recently built wooden bridge crosses the water channel.

Olmsted Center, 4-99-1-18

Fig. 5-65 Some of the original VIA stream-style stepping stones at this stream crossing on the Andrew Murray Young Path (#25) have sunk below the water level.



Acadia Trails Crew, 5-99-23-24

Fig. 5-66 Stepping stones on the Flying Mountain Trail (#105) could be from the CCC period. Bogwalk has been installed over the narrow, ineffective stones.

National Archives, Waltham, MA

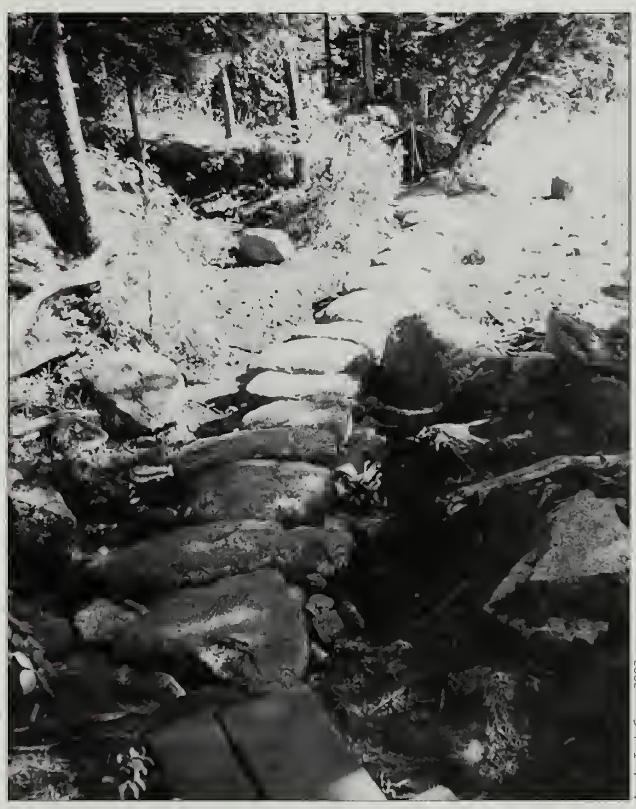
Fig. 5-67 A 1930s CCC photograph of a set of stepping stones installed across a small stream near the Ladder Trail (#64) trailhead during the CCC rehabilitation of the trail.

Olmsted Center, 5-98-8-17

Fig. 5-68 The CCC stepping stones on the Ladder Trail (#64) shown in Fig. 5-67 as they appear today.

Olmsted Center, 8-97-25-14

Fig. 5-69 A side view of the CCC stepping stones shown in the previous two figures.



Acadia Trails Crew, 2002

Fig. 5-70 Replacement bog-style stepping stones installed by NPS in 2002. Note the even curve, level, flat tops, and crushed rock.

TREATMENT

1. Use of Stepping Stones

Issue: The predominant use of stepping stones occurred during the VIA/VIS period. There is no historical precedent for their widespread use throughout the system during other historical periods. This may limit their contemporary use.

Treatment Guidelines: The use of stepping stones will be dictated by historic precedent. The style chosen will be based on whether the location of the crossing is over a stream or an intermittently wet area. Existing or collapsed stepping stones will be rebuilt or replaced in kind if they are original features, or are historically appropriate additions to the trail. New stepping stones may be added to historic trails when trail history, function, and builder indicate they would have been used. However, because of the problems associated with stepping stones, in wet areas in which causeways are a viable solution they will be the first choice (see Chapter 3). Stepping stones will not be used on trails on which there is no historical precedent for their use.

2. Hiker Avoidance

Issue: Stepping stones are more difficult to walk on than either raised tread or bridges. Hikers tend to walk around stepping stones if the surrounding area becomes dry, or otherwise easily traversed. This causes trail widening and braiding.

Treatment Guidelines: To lessen hiker avoidance of stepping stones, stones should be as large and flat as historical precedent and available stone allow. They should be spaced no more than 1 foot apart. Obstacles such as dead logs and rocks should be used around the stepping stones to discourage hikers from veering from the trail.

3. Constricted Water Flow

Issue: Stream-style stepping stones can hinder the flow of water in the drainage path. If debris is not cleaned out regularly, they can become dams. Silt may also build up behind stepping stones if flow is particularly strong. In some cases, this may cause streams to erode the banks on either side of the stepping stones, widening or changing course.

Treatment Guidelines: In several areas, stream-style stepping stones must be cleaned annually and after severe rainstorms. In some cases, historic stepping stones may not be maintainable. If a stream is constantly changing course around stepping stones, other solutions must be sought for a crossing, even in the case of historic work. A bridge may be needed to span the stream, or one or two stones may need to be removed and that shorter gap spanned by a small bridge. This alteration should only be made as a last resort, as it will substantially alter the historical character of the trail.

SPECIFICATIONS FOR STEPPING STONES

All stepping stones must be set below organic soil on a firm foundation of mineral soil or rock. For individual stones, a hole is dug the size of the stone until mineral soil or rock is reached. For several stones in a long run, the whole area is excavated at least a foot wider than the average stone width, and crushed rock is used as bed in the excavated area.

1. Stream-Style Stepping Stones (Fig. 5-71)

Since this style of stepping stone is intended primarily for stream crossings, there should be no more than fifteen stones in each run. Large, rectangular, cut or naturally shaped stones of similar size should be used. They should be a minimum of 2 cubic feet in volume: at least 12 inches wide, 18 inches long, and 8 inches deep. Stones should be set in a uniform line, with a level treadway, and equal spacing between stones, ideally 12 inches.

The stones are set directly into the streambed or upon other base stones to achieve the appropriate height. Blocking under stepping stones should be completely under the stone to allow for maximum water movement; water flows not only between the stepping stones, but also between the footings.

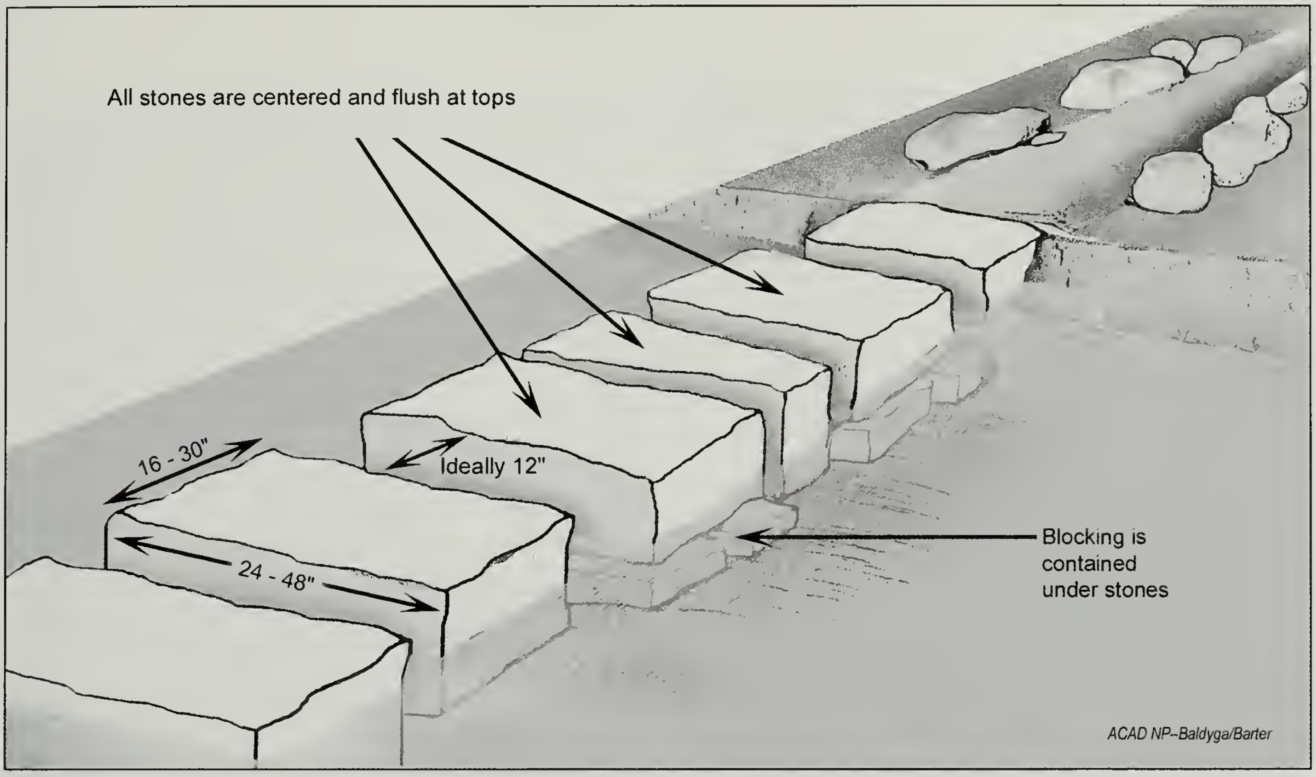


Fig. 5-71 Stream-style stepping stones.

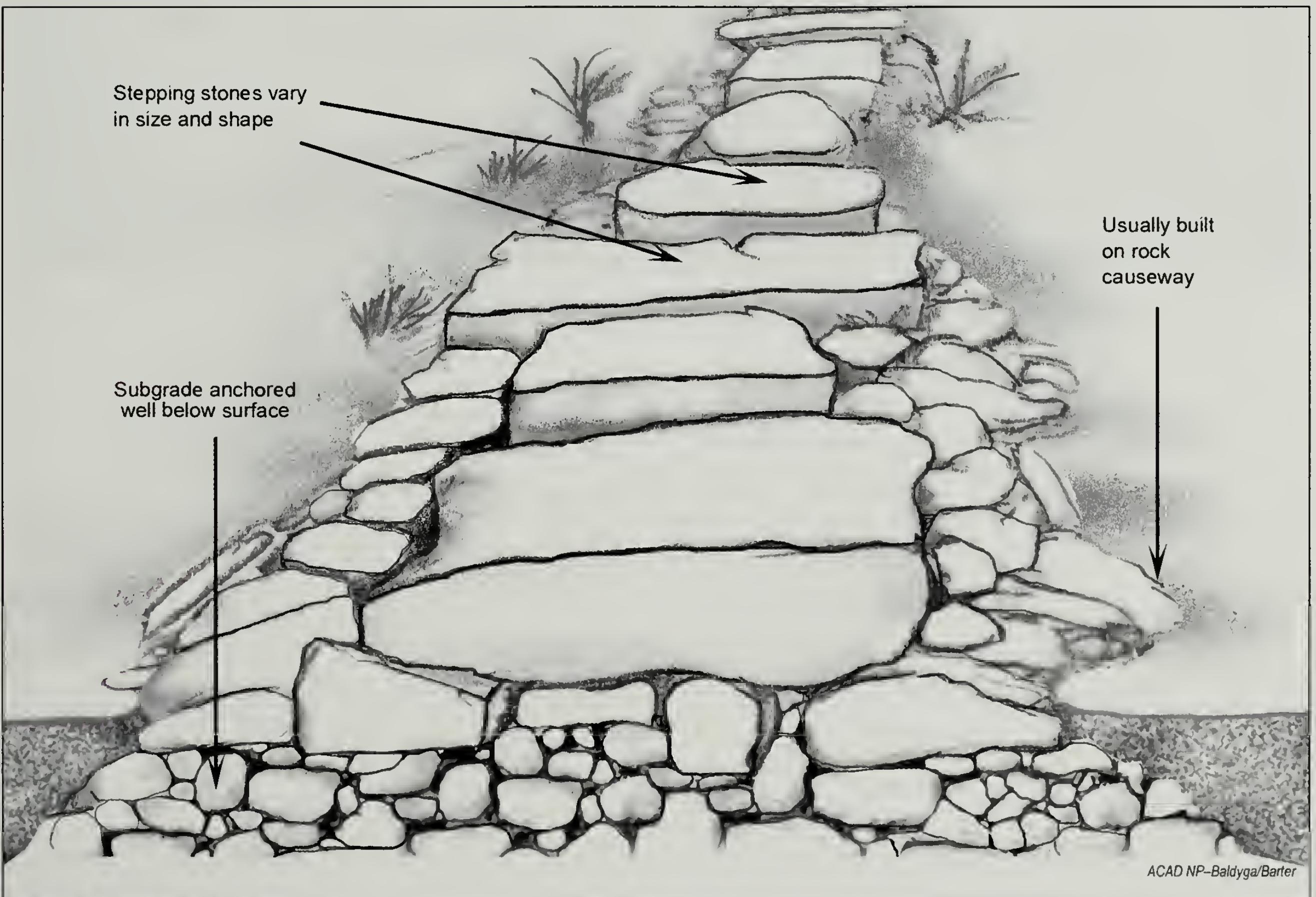


Fig. 5-72 Bog-style stepping stones.

2. Bog-Style Stepping Stones (Fig. 5-72)

As a rule, these stepping stones are constructed on top of a bed of stone rubble or mounded soil tall enough to lift the stones at least 12 inches above the terrain. The rubble base is constructed like the subgrade of a wall-less causeway and should extend at least 6 inches into the ground, farther if the ground is soft, and extend beyond the sides of the stepping stones.

These stones should vary in size and shape, both between sets and within the same set of stepping stones. Stones should have between 1 and 6 square feet of stepping surface. Steps are generally gapped at regular intervals, up to 12 inches. Some stones may abut. Though usually not uniform in stone size, the set of stepping stones should be laid out in a straight or uniformly curving line, maintain a level treadway with flat or nearly flat stone tops, and generally form a line that is uniform in width, varying from 1 to 3 feet. Since these stepping stones are intended to cross boggy or seasonally wet areas, the runs can be much longer than stepping stones intended for stream crossings. Some extant runs of these stepping stones are over 100 feet in length.

ROUTINE MAINTENANCE

1. Check for loose, shifted, or sunken stones. Rebuild footings and reset steps as necessary.
2. Cut out excess vegetation that may impede the flow of water between stones or obscure stones.
3. Clean out leaf dams and built-up mud if necessary.

ENDNOTES

25 Bar Harbor VIA 1906 *Annual Report.*

26 Bar Harbor VIA 1902, 1904, 1906 *Annual Reports.*

27 Bar Harbor VIA 1926 *Annual Report.*

28 Guy B. Arthur, *Civilian Conservation Corps Field Training: Construction of Trails* (1937), 15.

29 Albert H. Good, *Park and Recreation Structures* (National Park Service, 1938), Part I, 175–76.

30 Ibid.

31 Good, Part I, 175–76.

32 Robert C. Birkby, *Lightly on the Land: The SCA Trail-Building and Maintenance Manual* (Seattle: The Mountaineers, 1996), 198.

Fig. 6-1 Retaining features on this section of the Schiff Path (#15) include retaining walls and coping stones. These elements hold the tread and steps in place, and provide guidance for the hiker, perhaps preventing a misstep off the trail. Photograph circa 1920.

CHAPTER 6:
RETAINING STRUCTURES

A. CHECKS

B. COPING STONES

C. RETAINING WALLS

D. LOG CRIBS

CHAPTER 6: RETAINING STRUCTURES

Four types of retaining structures are used at Acadia as essential elements of trail construction and maintenance.

A. Checks
B. Coping Stones
C. Retaining Walls
D. Log Cribs

Each of these features serves a different type of retaining function. Checks are built into the tread and are buried at tread height. They hold back the tread material, preventing erosion and/or gullying of the trail surface. Coping stones are stones set at the edge of a treadway. They may be the top course of a retaining wall, or they may serve some retaining functions themselves (Fig. 6-1). Coping stones also serve to delineate the edge of a treadway and guide hikers, as well as having aesthetic value. Retaining walls typically hold back soil on the uphill side of the trail, or retain the tread itself when used downslope of the trail corridor. They are often used with bench construction.

Note: Nearly all historic features on Acadia's trails are built of stone. Generally, stone is the most appropriate material to use in construction of new features or rehabilitation of existing features. However, in some cases log structures, including log checks and log cribs, may be used. For instructions on how to determine when log work is appropriate, see the last section of this chapter.

A. CHECKS

DEFINITION

Checks are rows of stones used to retain the treadway from moving in the direction of the trail on graded slopes. They are often used to rehabilitate an eroded area where the original trail surface has washed away and a gully has formed. The rows of stones are set perpendicular to the trail with high contact between them. The checks are backfilled with rubble and then covered with a top coat of tread material, or left exposed at the top. To prevent failure of the checks due to continued erosion or a lack of maintenance, the bottom of each check stone is placed at an elevation below the top elevation of the preceding downhill row of check stones. The checks act as "hidden steps" underneath the tread surface, holding back, or "checking" the uphill fill material. In worst-case scenarios where tread material wears away and is not replaced, checks hold the remaining treadway in a series of flat terraces (Figs. 6-2 & 6-3).

Note: Log checks may be used in certain situations; however, these are usually constructed as log cribs and will be discussed in the last section of this chapter.

Fig. 6-2 Although a standard feature in other trail systems, particularly in the Western parks, checks have only been used at Acadia since 1995 when these were first installed on the Ocean Path (#3). The slope at this location is approximately 15 percent, and after five years there has been a loss of approximately 3 inches of tread material.

HISTORICAL USE OF CHECKS AT ACADIA

The use of checks is a relatively recent introduction to the trail system and was not traditionally used during the VIA/VIS, CCC, or Mission 66 eras.

Historically, sections of woodland, oceanside, and summit trails built by the VIA/VIS and CCC were gravel surfaced, winding up and down gentle slopes. Many of these trails were located in areas where runoff was a continued problem, and often the trail itself was the only place for the water to travel. In the early days of relatively light trail use, there were fewer erosion problems, and gullies that did form were often left untreated. The native gravel tread remains on flat or very dry sections of trail without the need for retention features. Growing park visitation led to an increase in trail usage. The additional foot traffic resulted in a looser tread that was more susceptible to erosion. At the same time, a decrease in the maintenance of drainage features was a major contributor to greater erosion of many of the trails, resulting in increased gullying and rutting. In an effort to curb the erosion problem, the use of stabilization methods, like log cribbing and log checks, was introduced to the trail system. The most recent feature added to mitigate the problem are stone checks.

Acadia Trails Crew, 5-99-25-5

Fig. 6-3 This section of the Beech Mountain Loop Trail (#113) is a perfect candidate for the use of checks to reverse ongoing erosion and tread loss.

HISTORICAL CHARACTERISTICS OF CHECKS
Pre-VIA/VIS (pre-1890)
It is probable that no tread stabilization was needed due to relatively light use of trails and well-maintained drainage features. Tread stabilization was not incorporated into the design of gently sloped trails.
VIA/VIS Period (1890–1937)
Checks were not incorporated into the design of sloped trails.
CCC Period (1933–42)
Checks were not incorporated into the design of sloped trails.
NPS/Mission 66 Period (1943–66)
Checks were not incorporated into the design of sloped trails.
NPS Period (1967–1997)
Stone checks were introduced as increased use of trails and lack of maintenance of drainage features required extensive tread stabilization with retention features.

TREATMENT FOR CHECKS

1. Trail Erosion

Issue: With current heavy trail use, inadequately installed or maintained drainage, and poorly placed or designed trails, sloped sections become increasingly unstable and susceptible to erosion. If left "unchecked," sloped tread can eventually become an eroding gully.

Treatment Guidelines: Although checks are not a construction method used during the pre-VIA/VIS, VIA/VIS, CCC, or Mission 66 periods, they are a recommended addition to the trail system. With proper use and maintenance, stone checks are an effective trail feature for use in restoring and maintaining the tread surface at its original grade, thereby preserving the historical appearance of the tread. Ideally, checks should be used on any grade greater than five percent on which a smooth, surfaced treadway is desirable; they can also be used with local fill material to restore gullies on any trail, including unconstructed tread.

SPECIFICATIONS FOR CHECKS (FIG. 6-4)

Checks are used to stabilize sloped sections of trail that have eroded or have the potential to gully. The use of checks, cribbing, or steps is especially important on trail grades when it is not possible to shed water from the trail surface through the use of drainage structures, like water dips or water bars. Checks may also be an option when it is desirable to maintain a continuous sloping surface without steps.

Checks can be considered a method of tread stabilization for grades of less than 20 percent. For greater grades and in areas where it is not critical to maintain an even slope, consider using steps or terraced steps as an alternative (see Chapter 7).

To determine placement of the checks, set a string line from the bottom of the slope to the top. This establishes the uniform height to which the top of all checks will be set. Check stones will be set in rows across the treadway and extend into the embankment on each side of the trail a minimum of 8 inches. If there is no embankment, a retaining wall or a living berm (such as for "wall-less causeway") should be constructed to lock the checks to each other and to retain the tread. The top of the finished check should be a level, flat surface with contact between each stone within ½ inch of the check's top, and toward the front of the check. The top of the finished check should be level with and perpendicular to the grade string at that place in the trail.

Checks should be placed evenly along the trail according to the slope. The frequency of checks is determined by the desired height of the risers that will result when the material has eroded to level behind each check. Each riser should be no more than 8 inches. The number of checks is determined by figuring the overall rise of a section of trail and dividing by the desired riser height. Distance between checks is determined

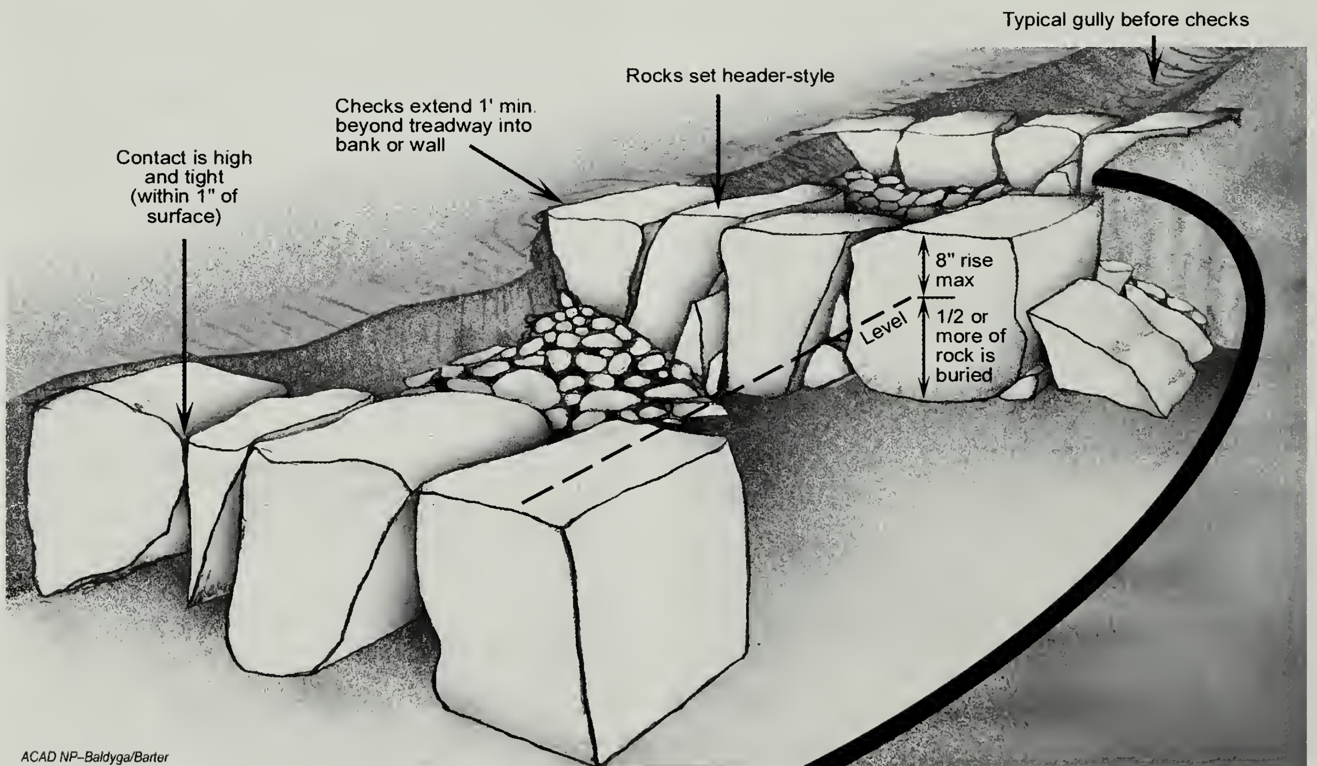


Fig. 6-4 Details for the installation of checks.

by dividing the overall length of a trail piece by the number of checks to be constructed.

For instance, if a 6-inch rise (typical size) is desired on a 64-foot section of trail with an overall rise of 8 feet (96 inches), then to determine the number of checks, divide 96 inches by 6 inches, which equals sixteen checks. The distance between the checks will be the length of the section (64 feet) divided by the number of checks (sixteen), or 4 feet.

In all cases the bottoms of check stones shall be deep enough that they are firmly set into the ground and will not become exposed. The elevation at the bottom of a row of checks will usually be six to 8 inches lower than the top of the previous downslope row of checks. This will ensure that when erosion of the tread material occurs, the checks will not be undermined and the fill will continue to be held in place.

The ideal orientation of the stone is header-style, but cake setting may be used, and even toast if half or more of the stone is buried beneath the height of the next lower check. High contact should be within 1/4 inch of the trail surface if a smooth gravel surface is desired, and within 1 inch in woodland settings; contact elsewhere between stones is not necessary. Lower gaps between stones are blocked, and checks are blocked and crushed firmly into place from both sides. The row of check rocks should be firmly squeezed toward the center from both ends, either by wedge rocks jammed between the end rocks and existing earth or rocks, or by large rocks (2 cubic feet or more) set deep in the ground at the edges of the checks, such as on the downhill side of a bench.

After checks are set, backfill on the upslope side with stone rubble to fill in the eroded trail section. Finally, cover the top of the rubble and checks with tread material.

Figures 6-5 to 6-8 show the installation process for checks and rehabilitation of an eroded tread on the Ocean Path (#3). The eroded tread is excavated to allow installation of the checks. A retaining wall is constructed, and the checks are installed with tight and

Olmsted Center, 7-97-21-3

Fig. 6-5 Eroded trail section on the Ocean Path (#3) before check installation.

Olmsted Center, 7-97-21-5

Fig. 6-6 Checks, wall, and rubble infill in place.

high contact points, at the original grade. The checks are backfilled with rubble, and the tread surfacing is installed to cover the checks and establish the desired new grade.

As shown in Figures 6-9 & 6-10 after approximately three years of use, the checks on the Ocean Path (#3) are becoming exposed as the gravel begins to wear away from the surface of the trail. Eventually, if left alone, this situation will create a series of terraced steps along the trail. This may be avoided by a periodic application of gravel on the trail's surface to cover the checks and maintain the grade. However, even if this maintenance is not performed, these features will continue to serve their intended function of preventing gullying, since material will erode no lower than to level with the check retaining it and the check stones, being locked in behind each other (if well built), cannot work out of place.

Olmsted Center, 7-97-21-6

Fig. 6-7 Checks, wall, and rubble infill in place.

Olmsted Center, 8-97-25-8

Fig. 6-8 Rehabilitated section of the Ocean Path (#3) with new tread.

Olmsted Center, 10-00-d

Fig. 6-9 The Ocean Path (#3) rehabilitation, approximately three years after completion.

Olmsted Center, 10-00-d

Fig. 6-10 After approximately three years, there is slight erosion of the tread, but no gullying is present on the Ocean Path (#3).

ROUTINE MAINTENANCE

Without cyclic maintenance, including the replacement of lost surface material, trail surface erosion will eventually make "terrace steps" out of a section of trail that has been checked. However, if they are installed properly as described above, the checks will continue to retain the subsurface infill and maintain the integrity of the tread. If checks are spaced correctly, the experience of walking a gently sloping path will still be maintained on the terraced slope, unlike a section of trail with a staircase.

Routine maintenance tasks include:

1. Make sure checks remain firmly set into the trail.
2. Prevent "terracing" of the trail by adding a top-dressing of tread material over the checks as they become exposed from erosion of tread.
3. If the tread is eroding too quickly, or checks are not holding subsurface fill, reevaluate whether the slope may be too steep for use of checks and implement other options, such as terracing or steps.

B. COPING STONES

DEFINITIONS

Coping stones are set along the edge of a treadway and protrude above the height of the tread surface. These stones may be laid on the top course of a wall or set partially into the ground. Coping stones are usually gapped, but sometimes abut. Coping defines the edge or edges of the tread, provides guidance to hikers, assists the integrity of retaining walls, and in some cases supports tread material, stone paving, or steps (Fig. 6-11).

Coping wall refers to any section of coping stones near or touching each other.

Piled coping is the same as scree (see Chapter 9, Section E).

Laid coping is a laid wall built along the trail above the level of the tread. Laid coping is similar to a stone fence (Fig. 6-12).

Acadia NP Archives

Fig. 6-11 Large and medium-sized coping stones defining the edges of the Stratheden Path (#24), circa 1920s.

Coping retaining wall refers to a coping wall that aids in the retention of the tread material, holding the tread higher than the ground on the other side of the coping. A coping retaining wall may retain gravel, stone pavement, or soil (Fig. 6-13).

Note: The term "coping stones" is not typically applied to hiking trail systems. However, at Acadia there is extensive coping on some of the highly crafted trails that closely resembles the coping stone work used on the island's carriage road system. In some locations, it is likely that the stonework was carried out by the same crews, particularly where the trail and carriage road systems connect.

Fig. 6-12 Laid coping wall on the Perpendicular Trail (#119).

Fig. 6-13 This section of coping retaining wall has larger coping stones atop a relatively small wall on the Asticou Trail (#49).

HISTORICAL USE OF COPING STONES AT ACADIA

Pre-VIA/VIS

Prior to the VIA/VIS path work, coping stones were used along roads to help guide horses and to keep breakaway carriages on the road. It is likely that its presence then served as the model for the use of coping on the trail system. However, there is no evidence that coping appeared on the trail system until the 1890s.

Village Improvement Associations/Societies

The VIA/VIS used coping stones for both guidance and retention. Early in the period, stones tended to be uncut, varied greatly in size, and were set at irregular intervals. With the creation of the memorial trails, trail work in general became more highly crafted and coping stones were more likely to be cut, uniform in size, and evenly spaced. However, there appears to be little consistency in the construction of these features and coping style often varied between VIA/VIS districts, builders, and differing terrain. Often a single stretch

Fig. 6-14 This coping along ledge on the Upper Ladder Trail (#334) was likely constructed by Bar Harbor VIA in the late 1800s.

of coping wall might change from coping stones for guidance only, to coping retaining wall, to piled coping (scree).

Many of the staircases built by the VIA/VIS contain remarkable use of coping retaining wall. On the Upper Ladder Trail (#334), built circa 1896, coping retaining wall, with stones as tall as 3 feet, are set on ledge to retain steps, which are small in comparison (Fig. 6-14). Some of the coping stones are cut blocks. These may have been added by the CCC when the trail was improved in the 1930s. Smaller, less crafted coping was used with stairs on many other trails, including the lower portion of the Penobscot Mountain Trail (#47), which was improved in 1919, and the Asticou Trail (#49), improved in the 1890s and thereafter.

However, many staircases of the era, including some which are otherwise highly crafted, were built without coping. For example, many trails built under the direction of Waldron Bates had steps but no coping, including the lower Eagles Crag Trail (#343), the Gorham/Cadillac Cliffs Trail (#5), and the Giant Slide Trail (#63) (Fig. 6-15). Similarly, trails built under the direction of Rudolph Brunnow in the 1910s on the east side of Champlain Mountain, such as the Precipice Trail (#11) and the Beehive Trail (#7), and several Northeast Harbor trails, such as the Maple Springs Trail (#58) and Hadlock Brook Trail (#57), do not use coping at all.

EXAMPLE OF STEPS—GIANT SLIDE TRAIL

Bar Harbor VIA Annual Report, Bates, 1906

Fig. 6-15 A 1906 image of steps constructed without sidewall or coping stones on the Giant Slide Trail (#63).

Nearly all the graveled paths were built with some coping. Stones pulled from the treadway to level the walking surface could be simply placed nearby in the coping wall. This technique was also used to create historical scree and on some paths, coping wall alternates with scree. On most trails the appearance of coping wall is directly correlated to the amount and type of stones in the landscape, such as on the Asticou Trail (#49), which travels through ledge and woods. Stones were used as coping retaining wall to retain the stone base and gravel surface. The effectiveness of these walls depends largely on the size and number of gaps between the stones; the more gaps, the less that is retained. A comparison of areas of coping retaining wall on the Jordan Pond Path (#39) bears this out. One of the most successful sections of coping retaining wall on a graveled path is on the Wild Gardens Path (#354), where continuous coping stones up to 5 feet long and 3 feet high retain a bench of crushed stone base and gravel paving.

The memorial trails constructed under the direction of George Dorr present the most remarkable use of coping with steps and stone pavement, though some contain no coping. The Kane Path (#17) and Kurt Diederich's Climb (#16), both begun in circa 1913, avoid coping even when the routes lead them through stone talus with suitable stones surrounding the treadway. The Homans Path (#349), also begun in 1913, and subsequent Beachcroft (#13), Emery (#15), and Schiff Paths (#15), used coping extensively (Figs. 6-16 & 6-17, also Fig. 6-1). There was also inconsistent use of coping on graveled paths built under the direction of Dorr in the Sieur de Monts area. The Stratheden Path uses coping extensively, while the Jesup Path has none. Similarly, the Gurnee Path (#352) and Andrew Murray Young Path (#25), both completed in the 1920s, use coping sporadically (Fig. 6-18). In the Seal Harbor VIS district, the Van Santvoord Trail (#450), completed in 1915, used coping only with its steps.

In general, the look of the coping reflects the look of the steps and walls on a particular trail. It is logical that the largest coping stones and most highly crafted coping walls in the system were constructed during the same era. The coping stones on the Emery Path (#15) and the Homans Path (#349), which used large, cut stones for steps, walls and culverts, are prime examples. The coping wall on these trails is constructed of large, rectilinear stones set at evenly spaced intervals. While the Beachcroft Path (#13) coping is generally medium-sized, the huge blocks at its base, up to 18 cubic feet, are also among the largest in the system, probably set there to discourage the cutting of switchbacks. Interestingly, the coping on this particular trail is set the most like a carriage road—deliberately and evenly spaced. Perhaps the 1926 date of this work, which was at the same time as much of the carriage road work, is a clue here. In keeping with the principle of similarity, the differently sized and shaped, uncut coping stones of the Gurnee Path (#352) are in keeping with walls built of the same type of stone.


Charlie Jacobi, Acadia NP, 4-99-53-5

Fig. 6-16 Large coping stones are used along the lower section of the Beachcroft Path (#13) to help define the trail sides.


Acadia Trails Crew, 2001

Fig. 6-17 Evenly spaced coping stones on the Beachcroft Path (#13).


Olmsted Center, 4-99-1-11

Fig. 6-18 Coping stones are used sparingly on the Andrew Murray Young Path (#25). Here they are used in conjunction with stone pavement.

Civilian Conservation Corps

As in the VIA/VIS period, the decision to use of coping by the CCC was determined on a site-specific basis. On CCC summit trails built in the 1930s, coping is used extensively with steps on the Perpendicular Trail (#119), but not on the Beech Cliff Ladder Trail (#106) (Figs. 6-19 & 6-20). Coping was also used on sections of the Valley Trail (#116) and the beginning of the Beech Mountain Loop Trail (#113) (Fig. 6-21). Of the

Fig. 6-19 The CCC regularly used coping stones along stairways on the Perpendicular Trail (#119). They serve several purposes, including adding structural stability to the staircase and providing a definitive boundary for the trail edges.

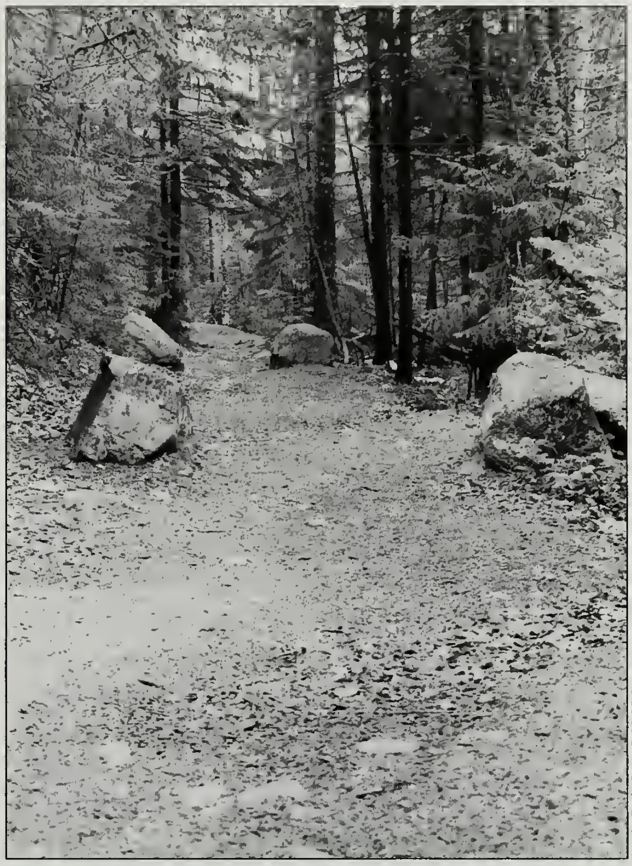


Fig. 6-21 Large coping stones marking a section of the Beech Mountain Loop Trail (#113).

Fig. 6-20 Coping stones define the edge of the this small CCC staircase on the Perpendicular Trail (#119), circa 1934.

graveled shoreline paths, the CCC work on the Ocean Path (#3) has the most extensive use of coping. Along different segments of the trail, coping stones were installed on the roadside as the trail parallels Ocean Drive, or on the ocean side of the trail (Figs. 6-22 & 6-23). In contrast, the Long Pond Trail (#118) has almost no coping on the mile and a half section of smooth gravel walkway along the pond. The CCC also added coping to earlier VIA trails. For example, they rebuilt the Ladder Trail (#64) and added coping.

The CCC likely used the memorial trail work as a model for their coping style. CCC coping closely resembles the stonework on these earlier trails. Cut regular stairs, wall, and walkway are paired with cut, regularly spaced coping, such as on the Perpendicular Trail (#119). Similarly, uncut, natural stonework is paired with natural, more irregularly spaced coping, such as on the Valley Trail (#116). The Perpendicular Trail (#119) also contains laid coping wall on its steep, switchback sections. This may be the only example of laid coping in the trail system.

NPS/Mission 66

Mission 66 crews used coping in places, mainly along the outside edges of bench cuts, but not in every such case. A segment of trail along the Ship Harbor Nature Trail (#127) has sporadic coping. Some of this is comprised of large, discrete stones; some of unattractive, low coping retaining wall that may have once held some gravel. A 6-foot-high retaining wall on the Anemone Cave Trail (#369) is topped with large, attractive, continuous coping.

National Park Service

Since the early 1970s, NPS crews have replaced toppled coping with original or similar stones on some trails, such as the Beachcroft Path (#13) and the Ocean

Fig. 6-22 Coping stones newly installed by the CCC and Rockefeller's road crew between Ocean Drive and the Ocean Path (#3), circa 1934.

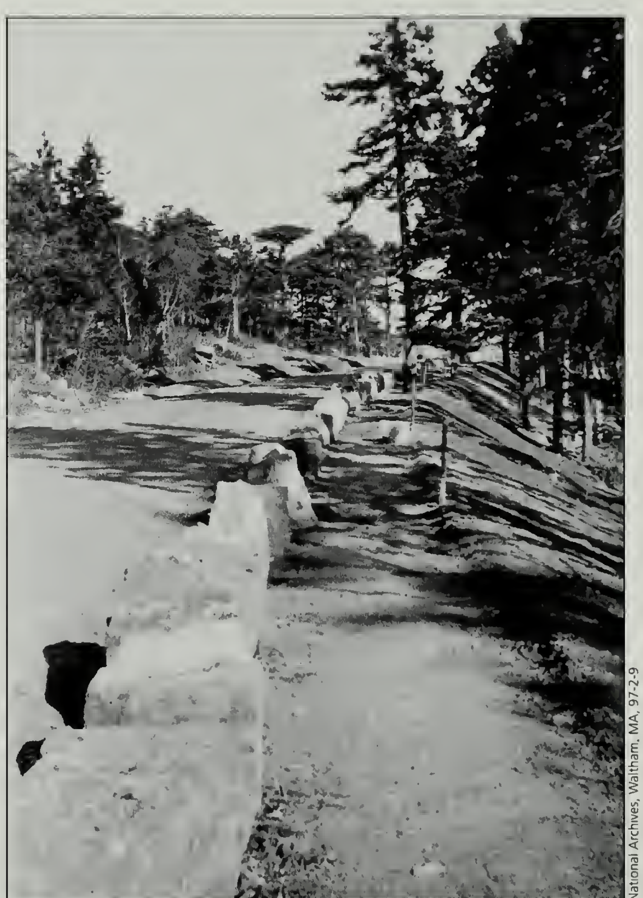


Fig. 6-23 Coping stones were also installed between the Ocean Path (#3) and the shoreline, photograph circa 1934.

Path (#3). They have also added coping to some trails, including those just named, on which coping was already present. Additionally, coping was added to nearly all new staircases, even where it did not exist historically, such as on the Precipice Trail (#11).

Scree was introduced by the AMC in the early and mid-1990s. Scree filled the role previously assigned to coping stones and many trails with and without historical coping were treated with scree (see Chapter 9, Section E).

HISTORICAL CHARACTERISTICS OF COPING STONES
Pre-VIA/VIS (pre-1890)
Coping stones were used occasionally on area roads.
VIA/VIS Period (1890–1937)
There was extensive, but inconsistent, use of coping. Coping was used along steps, gravel, and stone paving to guide and retain, but there were many examples of all these features without coping. Coping stones were typically similar to other stonework on the same trail in terms of being either cut or uncut, of regular or irregular size, shape, and spacing. The most spectacular coping in the system appeared on some of the memorial trails late in the period.
CCC Period (1933–42)
There was extensive, yet inconsistent, use of coping. Stones were nearly always used with steps, sometimes with gravel tread. Laid coping wall was first used on the Perpendicular Trail (#119). Coping stones were typically similar to other stonework on the same trail—i.e., cut or uncut, regular or irregular size and spacing.
NPS/Mission 66 Period (1943–66)
There was occasional use of coping along bench cuts with stones resembling other stonework on same trail.
NPS Period (1967–1997)
There was some repair of toppled coping stones, and some new coping constructed on suitable trails. Coping was incorporated into all new staircases, regardless of precedent. Scree was introduced and used instead of coping on several trails, including those originally constructed using coping.

TREATMENT FOR COPING STONES

1. Maintaining Character

Issue: The addition of coping stones to highly crafted trails may alter the trails' historic character if there is no precedent for coping stone use on those trails.

Treatment Guidelines: Coping will not be added to a highly crafted trail without historic precedent. Before the decision to add coping is made, other options should be considered for providing the needed guidance or retention for the trail.

2. Use of Coping Stones at Summits

Issue: On the summits, guidance measures like coping stone or scree are needed to prevent resource degradation. However, there is no historic precedent for the use of coping stones on Acadia's summits.

Treatment Guidelines: To provide guidance, individual coping stones may be placed in key summit areas along unconstructed, or minimally constructed treadway. Stones should appear as natural as possible. They should be spaced unevenly, with at least 10 feet between individual stones or groupings of three stones or less, and the stones should be uncut and resemble stone from the area.

3. Use of Coping Stones with Staircases

Issue: The use of coping along stone steps helps keep steps from slipping by providing weight and friction, and by holding blocking in place underneath steps. Smaller slab-laid steps can benefit greatly from well-laid coping wall. Also, stone steps are a common place for hiker wandering off trail, as many hikers prefer the graded ground nearby to the steps. Coping walls discourage this wandering. However, many historic trails did not have coping walls constructed in conjunction with steps.

Treatment Guidelines: Coping will not be added to historical staircases originally constructed without it. Other methods will be found to support vulnerable slab-laid steps, such as rebuilding the supporting wall. For steps set in the ground, wall similar to coping may be brought up to the sides to hold them in place, but may not protrude above the height of the steps. If such wall is out of character, it should be buried with soil. Concealed ironwork may be used to support steps or staircases that are susceptible to collapsing. This use should be carefully documented.

4. Coping Stones versus Scree

Issue: Hikers wandering off the trail route and the resulting resource damage are significant reasons to define treadway edges. Coping stones and scree are two options for this; however, unlike scree, coping stones were used extensively during the historic periods. Scree may be more effective in completely defining the trail edges, thereby keeping hikers on the path, yet it also alters the aesthetic character of the trail.

Treatment Guidelines: For areas where resource damage from trampling is likely, such as mountain summits, coping stones are the preferred alternative for defining the trail edges. However, scree may be considered in certain cases where coping or other options are not successful (see Chapter 9, Section E).

5. Trail Erosion

Issue: Because coping wall, by definition, is higher than the treadway, in many instances it can act as a barrier, keeping water from sheeting across the trail. This is a particular problem on bench cuts where the trail has a grade. A large volume of sheet water is trapped in the treadway and uses it as a drainage course, eroding the trail and creating a gully. This problem can be seen on many trails, including the Stratheden Path (#24), the Pond Trail (#20) and the Valley Trail (#116). Because there are no gaps at all to allow water through, continuous coping is the most problematic wall type.

Treatment Guidelines: In most cases, adequate drainage can be achieved without removing coping stones. Gaps between coping stones can be used as drains. Where coping wall is continuous, often drainage paths can still be constructed underneath coping stones. In many cases, the solution is to restore the height of the treadway, such that water sheets over lower stones in a coping wall. However, in those cases in which none of the above is possible, and drainage is needed to preserve the integrity of a treadway, individual coping stones can be moved or removed to provide drainage passages. In such cases, the same stone, or a different stone, should be set in its place such that its top is flush with the treadway. In most cases, removed portions of a wall should be no longer than a single stone.

SPECIFICATIONS FOR COPING STONES

There are four general requirements that all coping must meet.

1. Coping stones must rise above the level of the treadway in order to be coping. If the historical work being reconstructed or imitated does not fulfill this requirement, it is not coping and should not be repaired as such.
2. Coping stones must be at the border of the treadway, such that the inside edge of the stone corresponds to the outside edge of the treadway.
3. New or repaired coping must resemble the other coping of a given trail or trail section in regards to size of stone, shape of stone, whether stone is cut or uncut, type of stone, frequency of placement of individual stones, and type of coping wall. Because the character of coping is so trail-specific, crucial specifications for the construction of coping will be developed on a trail-by-trail basis in the individual trails section of this document.
4. Coping stones must be solid, so that they do not move when kicked, pushed, or stood upon.

ROUTINE MAINTENANCE

1. Check for gaps in coping walls and reset any tumbled coping stones. Replace missing coping stones according to specifications above.
2. In places crucial for the maintenance of trail drainage, keep gaps between coping stones open down to the level of the treadway or floor of the drainage leading to them.

C. RETAINING WALLS

DEFINITIONS

A **retaining wall** is any wall that holds one portion of ground higher than another. On a trail, a retaining wall may retain the treadway itself or the ground on the uphill side of the treadway. Retaining walls are used to retain a side slope that is too steep to be stable without retention. In general, retaining walls are found only on highly crafted trails on which they are used to maintain a specific grade or trail alignment.

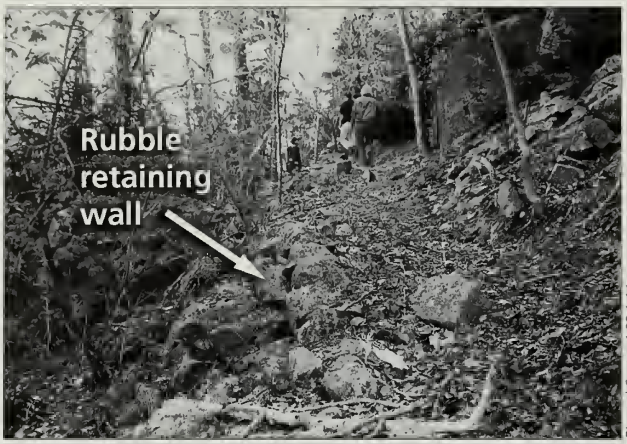
Stone retaining walls in which stones sit on top of each other may be laid, rubble, fitted, piled, or some combination of these. Retaining walls in which stones are laid in a single row are called "single-tier walls." A new technique in use at Acadia is a combination of retaining wall and sloped crushed rock, called "crush wall."

A **laid wall** contains stones set beside and on top of one another to create a vertical or substantially vertical face (Fig. 6-24). The construction of laid walls uses established dry-laid stonework methods like maintaining tight contacts between stones, breaking the joints, and filling the core of the wall. The face of a laid wall may be smooth or rough. A laid wall with the stones set in even, horizontal rows is called a **tiered wall**. Laid walls are the strongest and most durable retaining walls, but also the most difficult to build properly.

A **rubble wall** uses stones that are set less carefully than in a laid wall. The joints in a rubble wall are not always broken and the face is irregular and contains gaps. A rubble wall depends on large stones and shallow batter for durability (Figs. 6-25 & 6-26). **Batter** is the slope, or relationship of rise to run in the face of a wall. A wall that rises 2 feet tall and slopes back 1 foot from its foundation has a 2:1 batter. The steepest batter is vertical, whereas a very shallow-batter rubble wall

Fig. 6-24 A recently constructed laid retaining wall on the Ocean Path (#3) at Otter Point.

Fig. 6-25 An original rubble-laid retaining wall on the abandoned Gurnee Path (#352).



Olmsted Center, 4-98-1-14

Fig. 6-26 The remains of an early VIA/VIS stone rubble retaining wall on the lower Eagles Crag Trail (#343).

Maine Historic Preservation Commission

Fig. 6-27 This circa-1890 image of the Shore Path in Bar Harbor (#301) shows the early use of both sidewall and laid retaining walls.

Olmsted Center, 7-97-20-22

Fig. 6-28 CCC side wall on the Long/Great Pond Trail (#118).

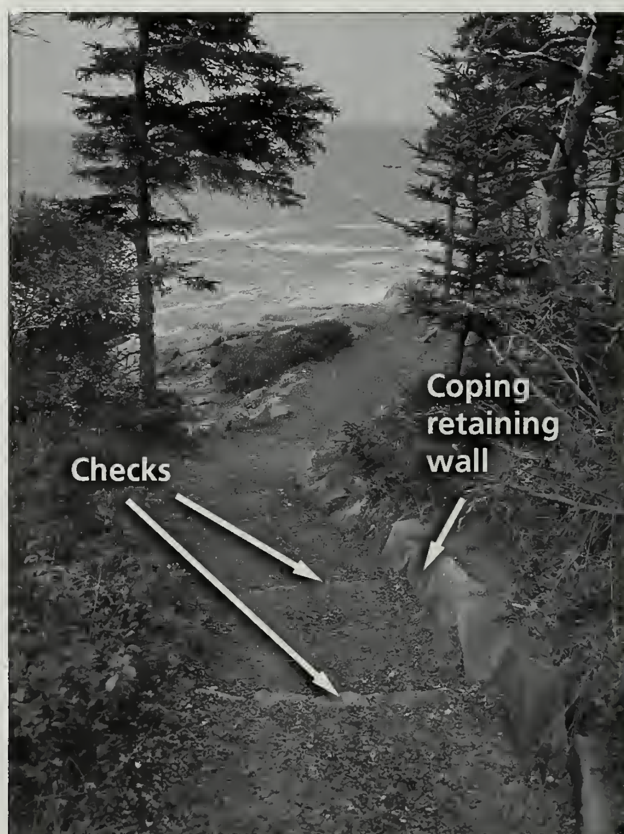
is 1:1, in which the face is a 45-degree angle from the vertical.

A **fitted wall** is a rubble wall constructed of stones that are simply fit into spaces left by existing stones in a talus slope.

A **piled wall** is the least structured retaining wall. It consists of a row or group of randomly piled stones that retain material. Piled walls depend on very shallow batter to maintain their position and are usually less than 3 feet tall to avoid collapse.

A stone retaining wall with a single tier of stones may be either a **sidewall** or a **coping retaining wall**; either of these may be referred to as **single-tier wall**.

A **sidewall** is a low, single-tier retaining wall that retains a gravel treadway. It is the type of wall used in conjunction with causeways (see Chapter 3, Section B) (Figs. 6-27 & 6-28).



Olmsted Center, 10-00-s

Fig. 6-29 A coping retaining wall and checks along a section of the Ocean Path (#3) that was rehabilitated by the Acadia trails crew in 1997.

A **coping retaining** wall is a low, single-tier wall that both retains the treadway or steps, and rises above it to act also as coping wall (see the previous section, "Coping Stones") (Fig. 6-29).

A **crush** wall is a retaining feature that combines a foundation similar to that of a retaining wall with a top course like the edge of a wall-less causeway, including a cover of vegetation. This hybrid style is also called "root wall" because it is a way of retaining trail without destroying all the roots in an area. Crush wall is not an historical technique; however, because crush wall usually restores material to an eroded area and because it is largely obscured with vegetation, it has the appearance of historic bench cuts (Fig. 6-30).

Any laid or rubble wall in which the stones are set so that they do not penetrate the core of the wall is called a **veneer** wall. Typically, veneer walls have limited strength and are not suitable for trail construction.

Note: Retaining walls that are constructed of logs are discussed under "Log Cribs" later in this chapter.

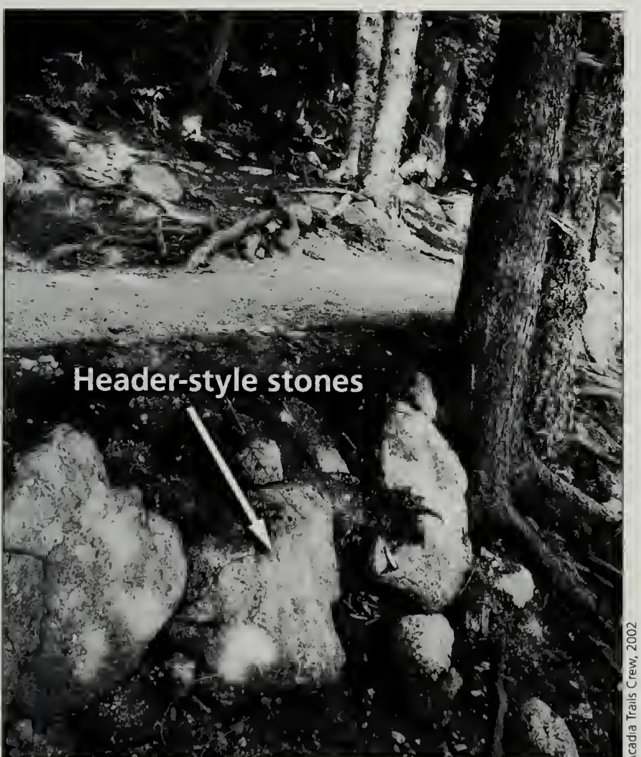


Fig. 6-30 New crush wall constructed by NPS in 2002 through heavily rooted area on the west side of the Jordan Pond Path (#39).

HISTORICAL USE OF RETAINING WALLS AT ACADIA

Pre-VIA/VIS

Prior to the VIA/VIS there is no physical evidence or documentation for the use of retaining walls on Acadia's trails.

Village Improvement Associations/Societies

Beginning in the early 1900s many rubble retaining walls and a few laid walls were built by the Bar Harbor VIA under the direction of Waldron Bates. Contemporaries of Bates noted his skill for laying out a route "which makes quite easy passage through the wonderful rock scenery that had offered in the past almost unsurmountable obstacles to ordinary walkers."[33] To achieve these routes, Bates used retaining walls as well as his famed steps, though much less often. Bates paths that were constructed with retaining walls include the lower Eagles Crag Path (#343) built in 1905 and the Cadillac Cliffs Path (#5) built in 1906. Following Bates's death in 1909, the BHVIA noted that the Cadillac Cliffs Path was the "best illustration of engineering skill in path making."[34] Most of Bates's walls were rubble-laid. However, substantial sections of the Eagles Crag Path are supported with well-built, laid retaining wall, perhaps the first in the trail system.

Multi-tiered retaining walls were seldom used by early VIA/VIS builders. Trail routes tended to follow the landscape rather than alter it and there was little need for constructed retaining walls. Low, single-tier walls were sufficient to hold the tread in place. The broad paths, such as Schooner Head Road Path (#362) and the Asticou Trail (#49), made extensive use of sidewall and coping retaining wall (Fig. 6-31). In some places, such as the Jordan Pond Seaside Path (#401), low piled retaining walls were built out of stones pulled from excavation for the treadway.

In the few cases where more substantial retaining walls were required to achieve a route, the early builders preferred the use of single, large stones set as coping retaining wall over the use of multi-tiered wall. On the Wild Gardens Path (#354) a bench is retained on the steeper sections using a row of boulders up to 6 feet

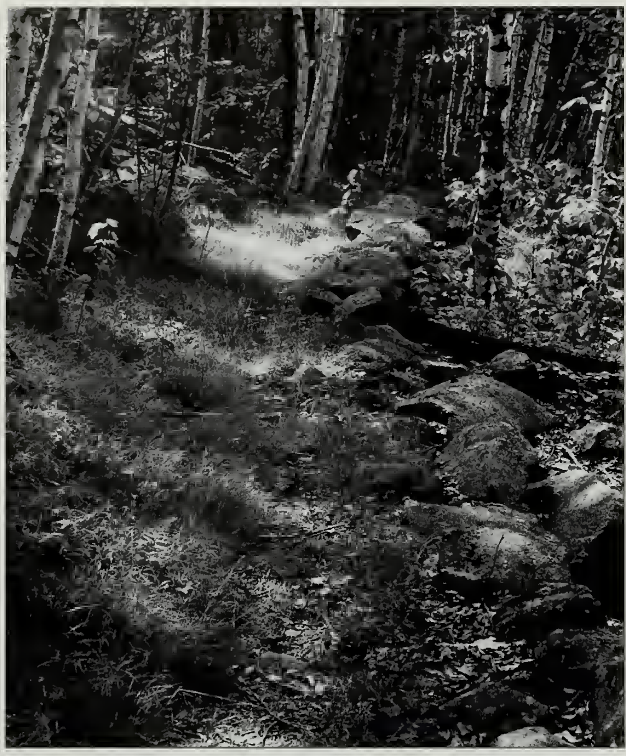


Fig. 6-31 A classic example of original coping retaining wall on the Wild Gardens Path (#354) using large single boulders for retention.

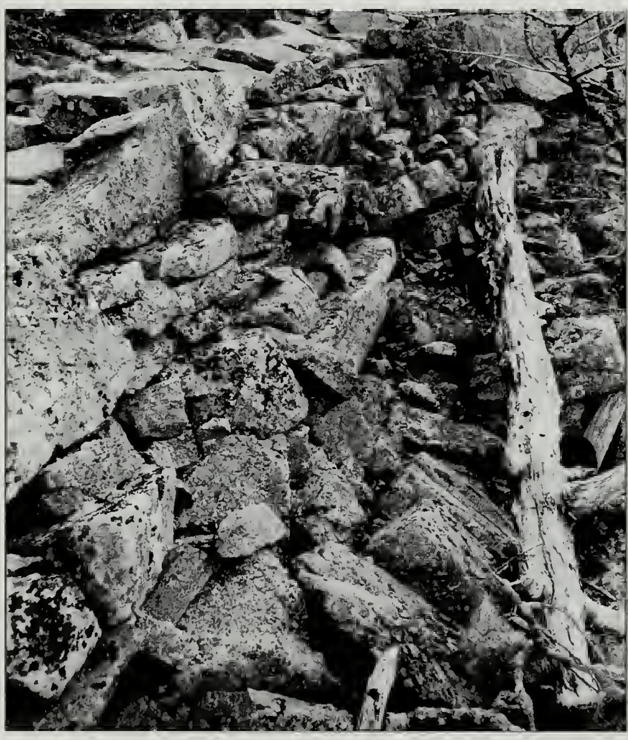


Fig. 6-32 VIA/VIS laid wall on the Beachcroft Path (#13). Stones have shifted due to "stack bonds" (unbroken, or "running joints") and areas of the wall in which three or more rocks are stacked on top of each other without overlapping the abutting stones. The weight of larger rocks on top as a coping layer is probably holding the wall together. The rough face, with some rocks jutting out, others inset, is a typical characteristic of walls on this trail as opposed to the Emery (#15) or Gurnee Path (#352) on which the walls have relatively smooth, uniform faces.

long and 3 feet tall. Other examples of this technique can be found on the Jordan Cliffs Trail (#48) and at the original northern end of the Bear Brook Trail. However, these trails contain sections of laid retaining wall as well, proving that the builders of these trails were familiar with the technique.

More extensive use of retaining walls and coping stones occurred on the highly crafted memorial and endowed trails built under the direction of George Dorr between 1914 and 1916. This work is still evident on the Beachcroft (#13), Emery (#15), and Schiff Paths (#15), which contain dry-laid retaining walls and large coping stones (Fig. 6-32), some of which are secured with iron pins.

During this period of VIA/VIS work, laid, rubble, piled, and coping retaining wall were all used. Dorr's endowed trails used the most laid retaining wall, but not the only tiered wall of the era. However, not all of Dorr's paths used laid wall. The Ladder Trail (#64) contained only single-tiered walls. The Homans Path (#349), the Beachcroft Path (#13), and the Emery Path (#15) have coping retaining, piled, rubble, and laid wall within a few hundred yards of each other. The Gurnee Path (#352) was constructed with hundreds of linear feet of laid retaining wall up to 20 feet high, and the Andrew Murray Young Path (#25) contained sporadic sections of low, laid wall. Both of these trails also made use of rubble wall, with the Gurnee Path (#352) containing examples of walls that are rubble at the bottom and laid at the top (Fig. 6-33). Brunnow trails used laid retaining walls mainly to support staircases and stone paving.

Of this era's laid walls, the style of construction was not consistent from trail to trail nor always within a trail. Emery Path (#15) retaining walls were constructed of cut blocks laid in tiers to create a smooth face and consistent batter between 3:1 and 4:1. Walls on the Gurnee Path (#352) and Beachcroft Path (#13) were laid walls consisting of mostly uncut stone laid into a rough face with no discernible tiers. Nearly all the laid walls of this period had a course of coping stones on the top tier rising above the tread surface.

These were gapped and regularly shaped, as on the Beachcroft Path (#13), or continuous and irregularly shaped, as on the Gurnee Path (#352) (see "Coping Stones").

Rubble walls, many of them fitted, were also widely used during this time. Generally, rubble walls accompanied other less highly crafted features on a trail. An exception is Kurt Diederich's Climb (#16), which is among the most highly crafted trails, and contains many rubble-laid walls with a shallow batter. The stonework at the northeastern end of the Jordan Pond Path (#39) is fitted and rubble laid wall built into a talus slope with no regard to batter or face. It is likely this work was done in the 1910s. Rudolf Brunnow's trails also used rubble walls for retention. Although he generally relied on iron rungs and rails for his cliff-side trails, he did use rubble and fitted retaining walls when retention was necessary. The horseshoe section on the Champlain Mountain East Face Trail (#12) is supported by mostly fitted wall, with a couple of small sections of laid wall (Fig. 6-34).

Piled retaining wall was used in the later VIA/VIS period only to retain tread crossing moderately sloping ledge against the fall line. This use of piled retaining wall occurred on the abandoned lower portion of the Champlain Mountain East Face Trail (#12) and the upper section of the Beachcroft Path (#13), where it was supported by iron pins (Fig. 6-35).

Coping retaining wall was used extensively in this era to hold steps and stone paving, though numerous examples of each were also constructed without coping. In the case of the Stratheden Path (#24), coping retaining wall was used in the same way as it was by the early VIA/VIS builders—to retain gravel tread. This may be the only example of this use of coping retaining wall during the later VIA/VIS period.

Civilian Conservation Corps

Very little CCC trail construction was done without the use of retaining walls. These features were often necessary because CCC trail design placed a premium on evenness of grade, wide bench cuts, and permanence of construction. Recommendations for the

Acadia Trails Crew, 2002

Fig. 6-34 Fitted retaining wall built into the talus slope on the Champlain Mountain East Face Trail (#12).

Charlie Jacobi, Acadia NP, 4-99-56-21

Fig. 6-33 This retaining wall on the Gurnee Path (#352) is rubble at the bottom and laid at the top.

Olmsted Center, 7-97-22-20

Fig. 6-35 Original VIA/VIS piled wall on the Beachcroft Path (#13).

construction of rubble walls were dictated in CCC construction standards: "Where necessary to retain material on steep slope, a dry random rubble wall may be built along the downhill side of the trail"[35] (Fig. 6-36).

In addition to rubble retaining walls, the CCC also used laid walls and sidewalls along much of their gravel treadway. They did not use piled retaining walls. The decision to build rubble or laid wall seems to have been made according to two criteria. First, the vertical component dictated whether the shallower batter of a rubble wall was possible, and second, the visibility of the wall influenced its constructed appearance. More visible walls, such as those on switchbacks, tended to be laid, while those walls not visible from the trail were usually rubble walls.

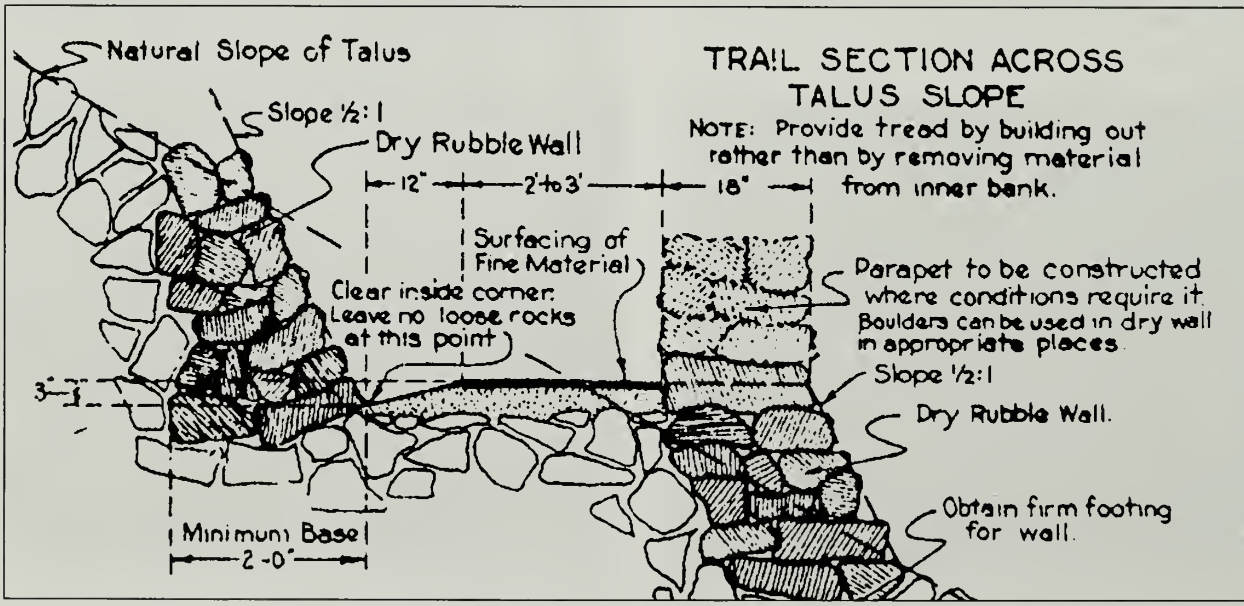
CCC rubble walls are virtually indistinguishable from those of the VIA/VIS. However, CCC laid walls are noticeably different. They have a shallower batter with an average slope of 3:1, are often multi-tiered walls built of cut blocks or naturally square stone, and have smooth faces. CCC laid walls are uniformly high in quality, while their rubble walls vary in quality. CCC laid walls use a higher percentage of small stones than other retaining walls, with faces of 8 inches square or less.

NPS/Mission 66

Retaining walls constructed during Mission 66 followed specifications for earlier CCC work. However, relatively few trails were added during the Mission 66 period that required retaining walls, and the walls that were constructed by Mission 66 crews are generally lower in quality than work from previous eras. Some work remains; however, it is typically in a poor state of repair. Extant work includes sidewall retaining walls on the Ship Harbor Nature Trail (#127) and rubble wall on the Beech Mountain Loop Trail (#113) (Figs. 6-37 & 6-38). On the Anemone Cave Trail (#369), a 20-foot-long by 6-foot-high section of laid wall sits atop a rubble wall, recalling the style of the walls on the Gurnee Path (#352). Though not well constructed, this Mission 66 work remains in good shape. It contains a top course of large coping stones, up to 6 cubic feet in size. The weight of these stones has probably kept the wall intact (Fig. 6-39).

National Park Service

By the 1970s, the NPS trails crew was faced with a backlog of repairs to collapsed retaining walls and washed-out, eroded trail sections. From the early 1970s until the 1990s, many sections of retaining wall were repaired; however, styles of construction used were generally utilitarian with little emphasis on



Arthur, Civilian Conservation Corps Construction of Trails, No. 7, 1937

Fig. 6-36 CCC specifications for rubble retaining walls on bench construction.

historical accuracy. Most repairs consisted of resetting or replacing toppled coping stones. Log cribbing and log retaining walls were introduced as an expedient alternative to stone retaining walls (Fig. 6-40). New stone wall construction and repairs used only near-vertical, tiered laid wall of varying quality, regardless of surrounding work or historical precedent. Untiered, rough-faced, laid wall on the Beachcroft Path (#13) was replaced with tiered, smooth-faced laid wall in 1995, while a 6-foot-high vertical, tiered wall was built on the otherwise unconstructed Great Head Trail (#2). The majority of the retaining walls in need of repair were neglected.

Beginning in the late 1990s, more care was taken to duplicate previous or historically similar retaining wall work. There was an emphasis on learning and practicing the techniques of wall-building used during the trail system's historic periods. In 2000, the Acadia trails crew hosted two instructors for week-long courses in wall building and traveled to several other work sites to trade knowledge and skills with other crews. To date, thousands of square feet of retaining wall have been constructed or rehabilitated in the appropriate style by the trails crew. The majority of these efforts have involved laid retaining wall, but work completed in 2001 included rehabilitating rubble and laid retaining walls on the Jordan Pond Path (#39) as well as constructing new crush walls (Figs. 6-41 to 6-44).


Acadia Trails Crew, 5-99-25-6

Fig. 6-38 Original Mission 66 rubble retaining wall on the Beech Mountain Loop Trail (#113).

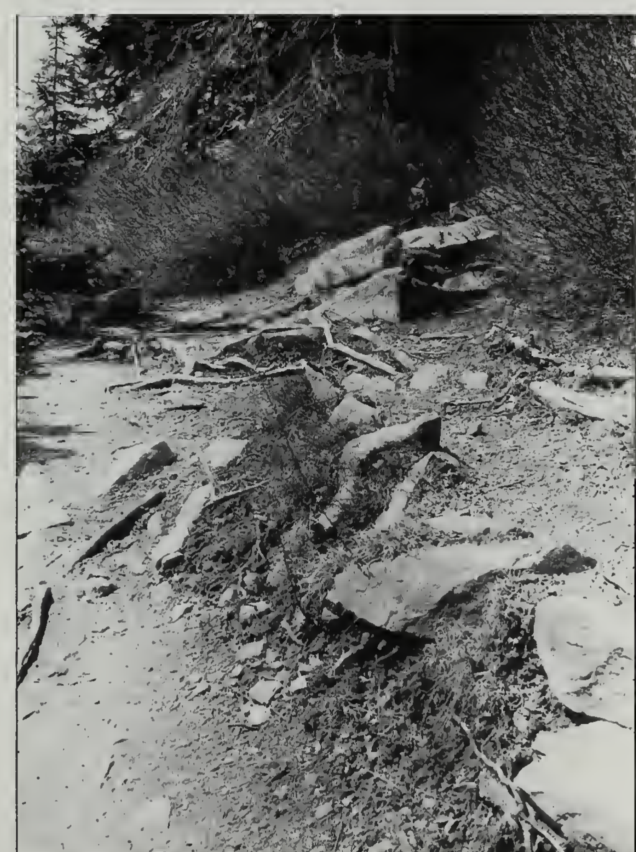

Acadia Trails Crew, 4-99-33-17

Fig. 6-37 Original Mission 66 sidewall on the Ship Harbor Trail (#127).


Olmsted Center, 5-01-5-24

Fig. 6-39 This Mission 66 retaining wall on the Anemone Cave Trail (#369) consists of laid wall upon a rubble wall base.

Olmsted Center, 7-97-20-25

Fig. 6-40 Log features, like this log retaining wall on the Long/Great Pond Trail (#118), have been introduced as a quick and cheap alternative to stone retaining walls, although they are not historically appropriate for the system.

Olmsted Center, 5-99-9-24

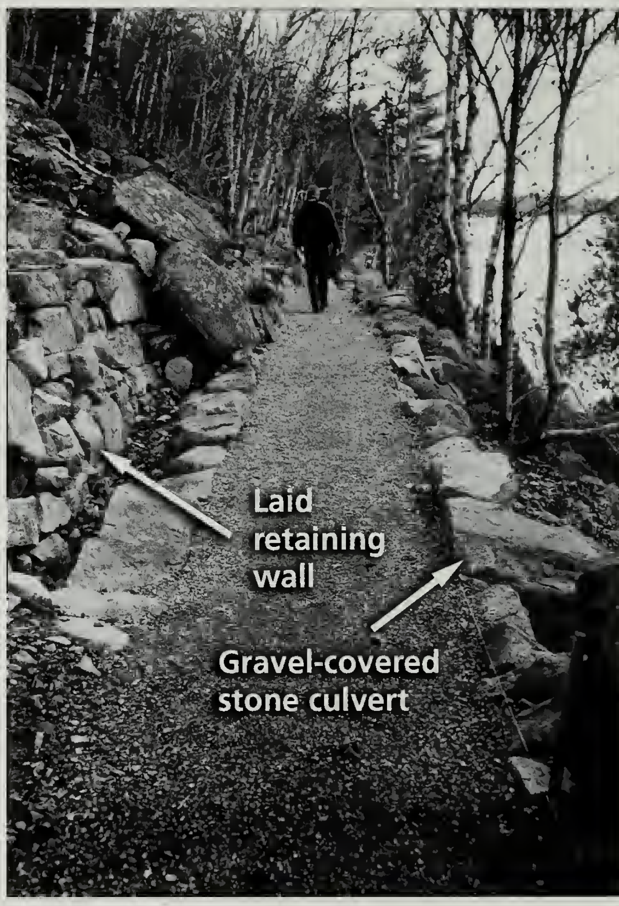
Fig. 6-41 This laid retaining wall on the Beachcroft Path (#13) was rehabilitated by the Acadia trails crew in 1999.

Acadia Trails Crew, 2001

Fig. 6-42 This rehabilitated laid stone retaining wall on a section of the Ocean Path (#3) was completed by the Acadia trails crew in 2000.

Acadia Trails Crew, 2002

Fig. 6-43 Stone retaining wall construction on Jordan Pond Path (#39). The top course of stones are sloped in and set header-style with high contact, and the core is properly blocked.



Acadia Trails Crew, 2001

Fig. 6-44 Stone retaining wall constructed in 2001 on the Jordan Pond Path (#39) to retain the uphill side of the trail which receives heavy water flow. The wall was built in conjunction with a gravel-covered stone culvert, side drain, and walled causeway.

HISTORICAL CHARACTERISTICS
Pre-VIA/VIS (pre-1890)
There is no evidence or documentation of the use of retaining walls prior to the VIA/VIS period.
VIA/VIS Period (1890–1937)
Laid, rubble, piled, sidewall, and coping retaining walls were used in conjunction with surfacing and step retention. There was little use of multi-tiered retaining walls early in the period when larger stones in single tiers were often used. Later trails used multi-tiered laid and rubble walls. Craftsmanship was consistent with other contemporary features with walls varying greatly in style and quality, but consistent to specific builders. Pile retaining walls were used to retain low benches and on ledgeside slopes.
CCC Period (1933–42)
Use of laid, rubble, and coping retaining walls reached its height of frequency and quality. Laid walls were generally tiered and smooth-faced. Laid walls were topped with a coping tier, either large single stones or a built wall above the treadway. The use of smaller stones increased, introducing weakness into otherwise well-built walls. Rubble walls were used for expediency, while laid walls were used for steep rises, or when the wall is highly visible.
NPS/Mission 66 Period (1943–66)
The use of laid, rubble, and sidewall retaining walls attempted to follow previous work. However, much of the constructed work was of low quality.
NPS Period (1967–1997)
Little retaining wall construction or repair was accomplished by the NPS. Work that was undertaken included replacing toppled coping, and the rehabilitation of walls with a single style of tiered, laid wall, regardless of historical precedent. The mid-1990s saw increased attention to the importance of maintaining historic character and work.

1. Maintaining Character

Issue: The addition of a retaining wall can solve problems of tread and embankment loss on sidehill construction. However, many of the trails that need this kind of work are trails for which there is no precedent for building retaining walls.

Treatment Guidelines: When the use of retaining walls would have an adverse impact on the trail's character, other options should be considered. Other retaining structures may appear less out of character than stone walls. For short blow-outs, single large stones can be used, rather than many smaller stones laid into a wall. For shallow blow-outs and retaining problems, berms can be created with soil, or, when more retention is necessary on unconstructed trails, log cribbing can be used in some instances, if certain criteria are met (see "Log Cribs"). If the addition of a wall is the only solution for a trail on which there is no precedent for the use of retaining walls, the structure should be obscured as much as possible. For example, a slope can be riprapped or walled, and then covered with debris and soil to minimize the visual impact of an added constructed feature to the trail. In areas in which the amount of retention needed is minimal, there is plenty of footing space outside the trail, and enough crushable rock is available, crush wall is an effective, natural-appearing solution.

In some cases the functional need to protect a trail and the surrounding resources may outweigh adverse impacts to the trail's historic character. For example, the 1992 wall on the Great Head Trail (#2) is out of character but was the most viable solution to retain a trail route over a 7-foot-deep gulch. The addition of the wall not only preserved the route of the trail, it also discourages hikers from leaving the trail and following the gulch to the beach. In similar situations, careful consideration should be given to the impacts of all options on trail character and resource protection.

2. Structural Integrity

Issue: In some places, the type of wall originally built has failed, particularly rubble and piled walls. Replacing failed rubble and piled walls with laid walls would increase their stability but would be an alteration of a trail's character. Additionally, some signature characteristics of laid walls are structurally weak. The vertical walls on the Beachcroft Path (#13) would be stronger if they had a batter. Shims used on the Emery Path (#15) walls and on CCC walls tend to wiggle out but are a part of the visual character. The small stones used to build entire sections of wall on CCC laid walls are easily pushed out by frost, or can fall out after only minute shifts in a talus slope.

Treatment Guidelines: The historically appropriate type of wall will be used when feasible, with slight modifications as necessary to improve strength and durability. In general, drainage can be added to the treadway to take water and ice pressure from the wall. Larger stones can be used, and crucial stones can be set so that they are sturdy. On sloping ledge, pins can be used to hold key stones in the wall's base, but these should be hidden from view (see Chapter 8 on Ironwork). Where possible, ledge should be modified to create a level or insloping bench, in which case pins would not be necessary. New and repaired rubble wall should be constructed using an adequate amount of headers, with long stones laid with their length into the wall, and with increased batter. Such walls should resemble the historical wall but be substantially stronger. Shims and stones that do not penetrate into the face of the wall at least 8 inches should not be used. However, the historic appearance of a wall with shims and small stones can be achieved by setting long, narrow stones with their lengths into the wall. Also, after a wall has been laid, small stones can be wedged into the openings of the wall face. These stones will provide the same visual appearance as shims, but not act as structural features in the wall.

3. Roots

Issue: In some areas, the amount of large roots that would have to be cut in order to establish a footing for a retaining wall would cause the death of large trees near the trail. This is especially the case in many lakeside and streamside areas, where a narrow corridor of trees lives between the trail and the water, exactly where a retaining wall needs to be placed.

Treatment Guidelines: Since log cribbing and crush wall can both be constructed in a way that leaves many large roots intact, these two options should be considered first. Due to the batter and material required, crush wall is usually only a tenable solution for retention needs of 3 vertical feet or less, where there is 3 or more feet beyond the edge of the trail in which to put a stable footing. Because it is tied in horizontally, log cribbing can be built when there is no room for a footing, or when no stable soil or rock can be found. Log cribbing can also be built in a vertical batter and as high as is needed. In some cases, a laid wall can be constructed with its foundation stones built between large roots, but such a structure is usually weaker, and far more vulnerable to disintegration as the roots grow or rot away.

SPECIFICATIONS FOR RETAINING WALLS

1. Laid Walls (Figs. 6-45 & 6-46)

Excavation: The entire length and width of the retaining wall should be excavated at least 6 inches deep, until solid ground, free of organic material, is reached. The width of the base, and therefore the excavation channel, of a retaining wall should be at least one-third the height of the completed wall. The ground at the bottom of the excavated area should be level or sloping slightly toward the interior of the wall, never sloping out. When building a wall in water, such as for a bridge abutment, the excavation and the foundation should extend to ledge. If this is not possible, then excavation should go as deep as is practical.

Foundation: The foundation is the first tier of the wall, which is partially or fully beneath the ground. It should project 4 inches or more beyond the face of the main wall. At least 50 percent of each front foundation stone should be directly beneath the main wall; these stones should be at least 12 inches long in the direction perpendicular to the wall. Foundation stones should provide a flat, or slightly in-sloping, top surface on which to lay the main wall. In appropriate areas where foundations are laid on out-sloping ledge, iron pins may be used to secure the foundation (see Chapter 8). However, if ledge can be modified to form a level or in-sloping bench for foundation stones, that is the preferable, more permanent solution. Another technique for

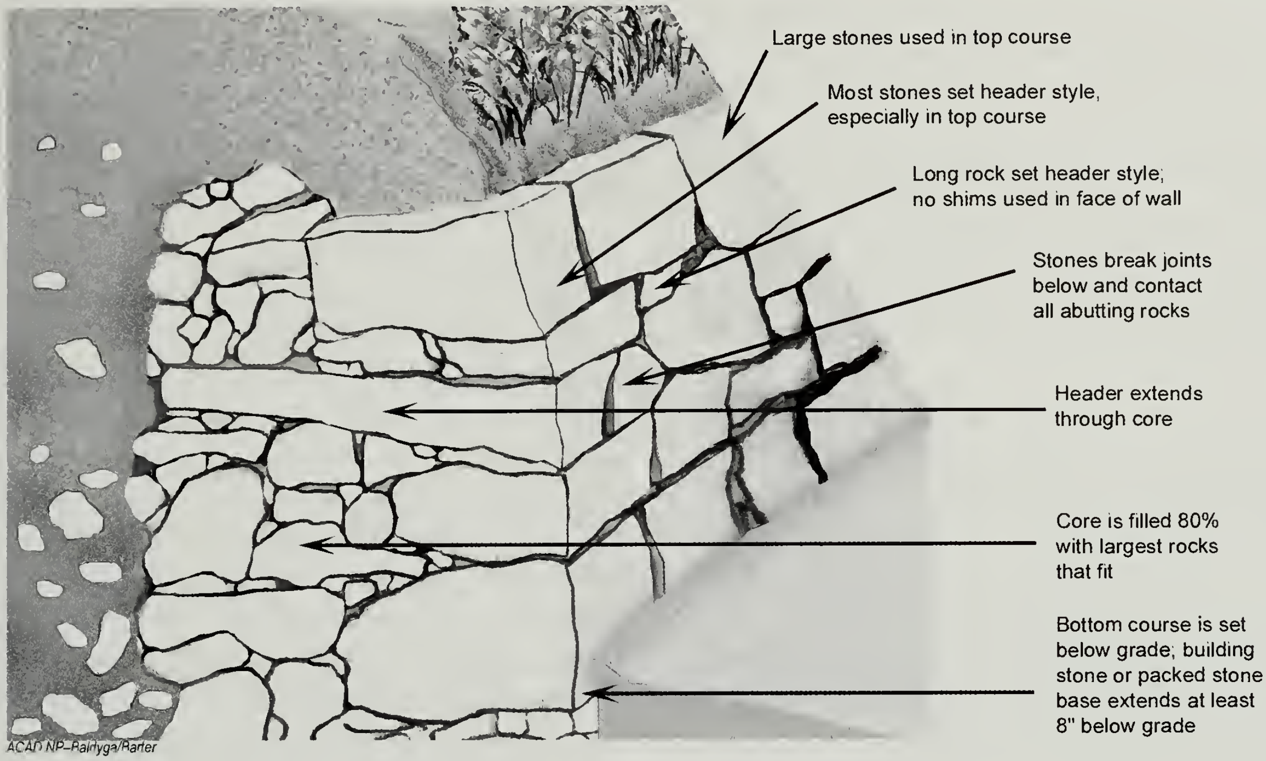


Fig. 6-45 Detail of a laid retaining wall.

laying stones on outsloping ledge is to lay a foundation course of all tapering headers and key them behind any lip available in the surface of the ledge.

Wall Face: Stones should be chosen and laid so that an appropriate face is showing. If the desired face of a finished wall is to be smooth, then flat, even faces should show on each stone, and be flush at the fronts. If the face is to be rough, then rounded, sloping, or jagged faces can be used, and must be used at least part of the time. When a wall is being laid in water, the face should curve, or "wing back," into the embankment to protect it from water getting behind.

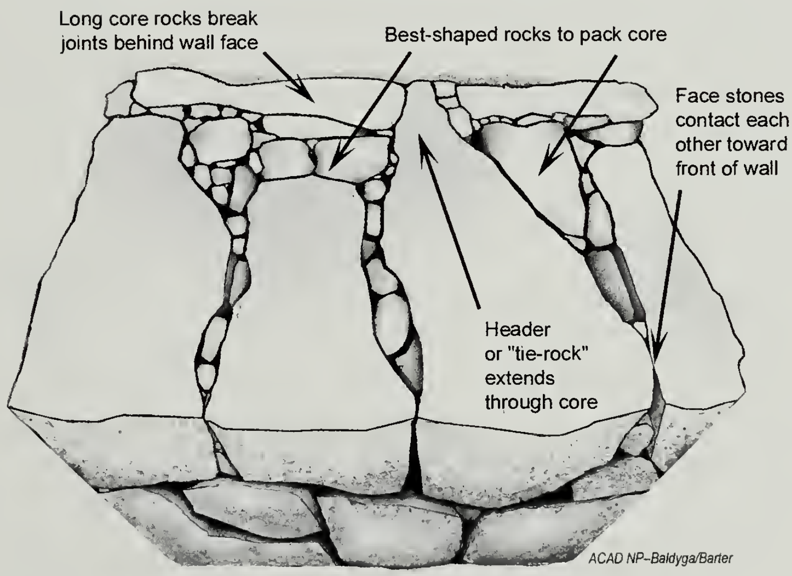


Fig. 6-46 Detail of a laid retaining wall in plan view.

Batter: The batter, or relationship of rise to run in the face of a retaining wall, should be determined in part according to the precedents of relevant historical work, as outlined, and in the specific requirements of individual trails. However, some general rules should be adhered to whenever possible.

- A 3:1 batter (rise:run) should be used for walls that retain active slopes, or soils which carry large amounts of running or freezing-and-thawing water. A 4:1 batter should be used for walls that retain soils which carry a moderate amount of water.

- A 6:1 batter may be used for walls that retain inactive, well-drained soils with no unusual weight stresses, such as heavy equipment, placed on them.

Laying the Stone: Lay stones with the length back into the wall (header style) as often as possible. Larger stones occasionally may be laid with their lengths running with the face of the wall (stretcher style), but only if they provide at least 8 to 10 inches of width in the face of the wall.

The tops of wall stones should provide level or generally backsloping surfaces on which to lay the next stones.

Lay stones so that they transfer their weight into the wall below and the material behind, rather than away from the wall, which can cause stones to tumble out of the wall or walls to lean away from their loads instead of back into them.

Every seam created by stones laid side by side should be broken or spanned by a single stone which covers the seam and has contact with each of the stones beneath it. Unbroken joints are called "running joints" or "stack bonds" and are usually the first areas to fail in a retaining wall.

Headers are stones laid with their lengths perpendicular to the direction of the wall; **tie rock**s are headers which span the entire width of the wall, including the core, and ideally penetrate the material behind the wall. They serve to tie the wall together, front to back. The number of headers and tie rocks needed in a given wall will vary according to the size of other stones in the wall, the availability of headers, the purpose of the wall, and so on, but two good rules of thumb are: (1) Have at least one tie rock in any 3-square-foot area on the face of the wall; and (2) Lay a header over any stones set "stretcher" style, with their lengths parallel to the wall's face.

Wall stones should contact all stones below and beside them at one point. More contact points are unnecessary, as the amount of friction transferred will be the same with additional contact points. Contact should be at or toward the face of the wall for stability and to better retain core material. This technique is known as making a stone "strong to the face." A stone should not tip forward when weight is put on it at the face.

Large stones should be used in the top course of the wall; all but the very largest (at least 3 cubic feet) should be set header style. The specific pressures on the wall must be considered. The weight of larger stones serves to pin down the wall below them. Top stones are more vulnerable because they are not pinned down, and larger, header-style stones will be dislodged less easily by back-pressure or hikers. In Acadia, use of large stones in the top course is the prevailing aesthetic; however, in cases where the look of walls is otherwise, care should be taken to imitate relevant work. If smaller stones are to be represented in the face of a wall, long stones can be set as deep headers.

The Core: The core is the area between the face of the wall and the material being retained by the wall. Though unseen, it is an essential part of the wall, providing internal drainage, mass, and structural cohesiveness to the wall. Poorly built core, with small stones just thrown in behind the wall, or lack of a core, are perhaps the most common causes of retaining wall failure.

The core should be built using the largest stones first and then increasingly smaller stones until at least 80 percent of the core is packed with stone. Larger core stones should be laid so they span joints between stones in front of them in the face of the wall and stones below them. The end result is two walls, one built of the face stones and the other of core stones, that are woven together.

The core should be tightly built behind face stones before additional face stones are laid on for the next tier. Usually, a row of face stones is set, and then the core is tightly packed behind the row.

2. Rubble Walls (Fig. 6-47)

In the construction of rubble walls, the same specifications as for "Laid Walls" apply, with the exception of wall face and batter.

Face: The face of a rubble wall should appear as though the stones were randomly placed. Individual courses should not be discernible. Stones should show jagged noses and rounded fronts, and should protrude or be inset in a random pattern. The face of a rubble wall will often have gaps. The size of these gaps will be in direct correlation to the size of the stones in the face and in the core. They should not be so large as to allow face stones to shift or core stones to escape.

Batter: For structural reasons, the batter of a rubble wall should be at least 2:1, and ideally 1 1/2 :1 or shallower. However, the batter need not be consistent across a section of rubble wall. It should vary with the landscape, the stone, or in whatever pattern is convenient to the builder. Increased batter and the use of more rounded stones allows for "cradling"—a technique in which stones are trapped behind and on top of the stones below and in front of them, or "locked in."

3. Piled Walls

An assortment of uncut, local stone of different sizes should be used. Stones are then piled one by one so that each stone is cradled by those below it. When possible, the length of the stone should be set into the wall. The pile should have a batter of 1:1 on the outside *and* on the inside, so that before backfilling the wall shape is pyramidal. Piled walls should not be built over 3 feet high.

4. Crush Walls (Figs. 6-48 & 6-49)

Crush walls are contemporary structures used to treat areas with many exposed roots, or where it is desirable to obscure the use of retaining wall (Fig 6-50). A crush wall is often easier to build than a retaining wall, especially at the top course, where a retaining wall requires uniform stones to satisfy height, width, and contact. However, as opposed to simply angled crush, crush walls use a retaining wall base to anchor the structure and gain the initial elevation vertically, reducing the need for additional width and material. The drawbacks of crush walls include the difficulty of constructing them over 3 feet tall, or where there is a need for a vertical structure, and the large amount of crushable rock required to build them.

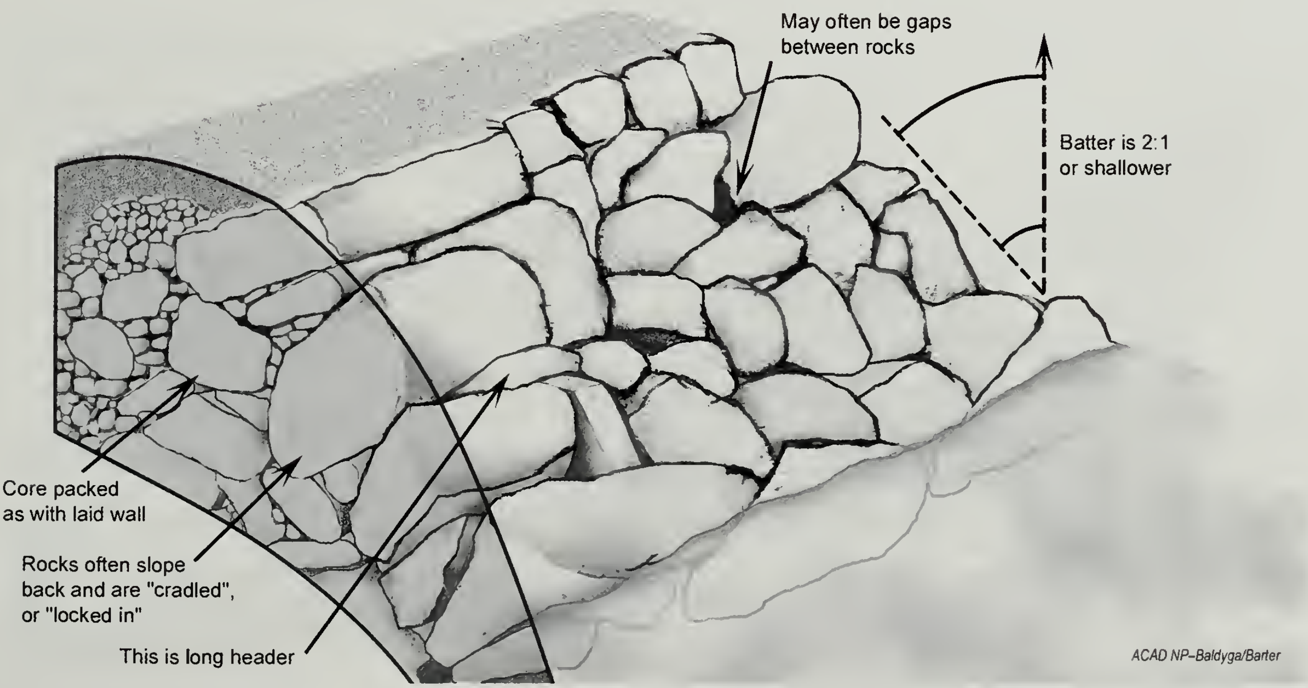


Fig. 6-47 Detail of a rubble retaining wall.

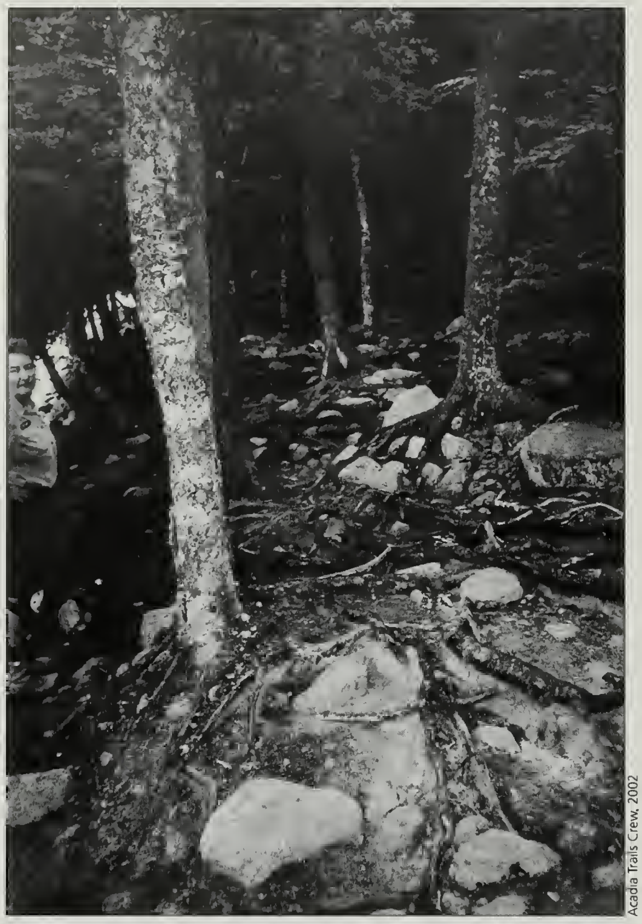


Fig. 6-48 Heavily rooted area on west side of the Jordan Pond Path (#39) before construction of crush wall.

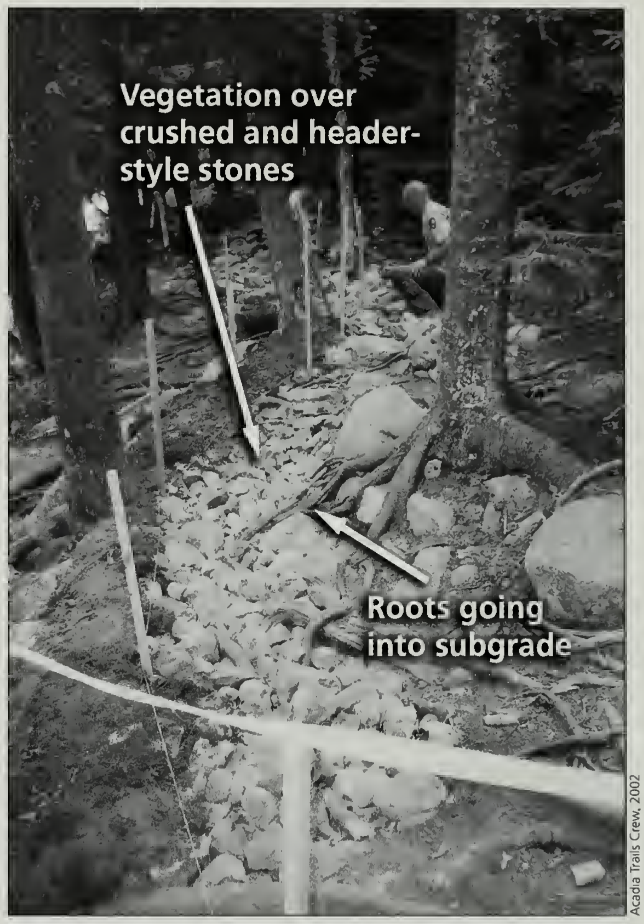


Fig. 6-49 A 2002 crush wall construction on the same section of the Jordan Pond Path (#39) pictured in Fig. 6-48 after vegetation of berm but before placement of gravel. Note roots going into subgrade.

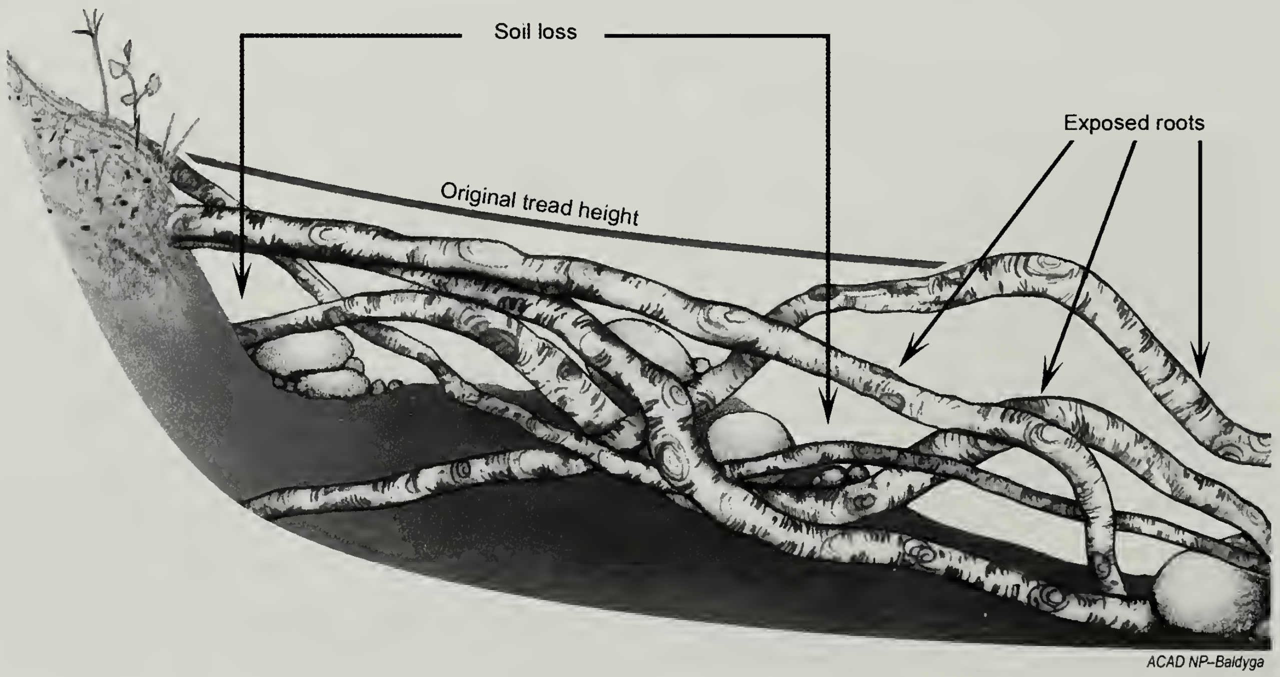


Fig. 6-50 Detail of heavily rooted area before application of crush wall construction technique.

Excavation: The trail corridor is excavated plus enough width on the downhill side for angled crush on top of the foundation stones. A 1:1 batter is the steepest recommended for crush material; therefore, every unit of height needed above the height of the foundation stones requires an equal distance from the trail edge. For instance, if 2 feet of height is required, and rocks are to be set that will stand 1 foot tall after being set in the ground, the edge will be excavated at least 1 foot for the crush, plus whatever is needed to properly set the stone header-style (a few inches at least).

Large roots need not be removed, but smaller roots may need to be cut to allow placement of larger stones. Insloping holes are excavated between the large roots to hold the foundation stones.

Setting the Foundation: (Fig. 6-51) Foundation stones are set header-style and in-sloping, at least several inches in the ground. They are set in the holes between large roots and they need not contact each other, though flared stones that contact each other over the roots between them are ideal. Non-contacting foundation stones should be locked in with stones set in from above and from the inside of the wall jammed between them. Because foundation stones are not as locked in as wall stones, they need be large (2 cubic feet is a good target) and set well, always header-style, with any gaps around them crushed in.

Laying the Crush: The crush is laid into the tread and onto the foundation stones as in a wall-less causeway, with higher crush rocks pounded into lower crush to fill all gaps and ensure that stones are locked together. The retaining edge of the crush base should be 1:1 or shallower. The crush fill is worked around the roots. Crush fill is brought up to 1 inch below line at the retaining edge, and cupped to 3 inches below the line in the tread way. Note that the crush portion of the wall is *not* a veneer wall, which will quickly disintegrate, but the outer edge of a crush-fill subgrade.

Vegetating the Sides (Fig. 6-52): Topsoil, mud, or organic material from the forest floor is worked into the retaining edge, and local vegetation (grasses and forest sods are best) is planted up to the mason's line. No organics are used inside the treadway, which is gravel-surfaced with the proper crown or outslope.

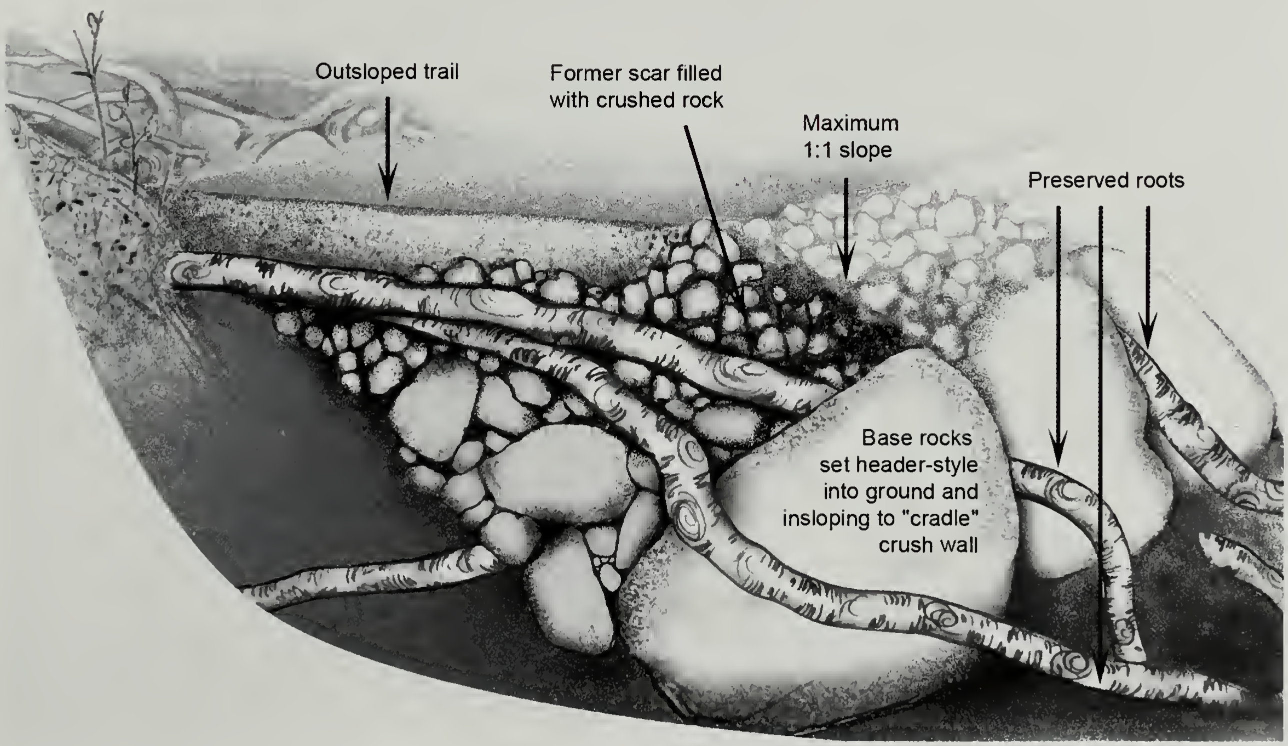


Fig. 6-51 Side view of crush wall construction.

ROUTINE MAINTENANCE

1. Maintain associated drainage structures and keep treadway above the wall draining properly.
2. Check face of wall for voids and fill them. Fill voids in the interior of the wall by stuffing small material through holes in the face.
3. Cut trees growing out of, directly in front of, or behind the wall. Generally, cut all trees three inches or less in diameter, cut all trees 4 to 6 inches in diameter if they are a threat to the wall, and avoid cutting trees greater than 6 inches in diameter, unless they are an extreme threat to a historic wall's integrity and their removal will not cause further damage to the wall.
4. Replace or reset missing or displaced coping stones.
5. Check for signs of wall failure: the wall leaning out at the top, or kicking out at the bottom, bulges, loose or missing stones, rusted or missing pins at the base of the wall. Repair and/or replace failed portions of a wall as necessary. These problems will worsen with time.

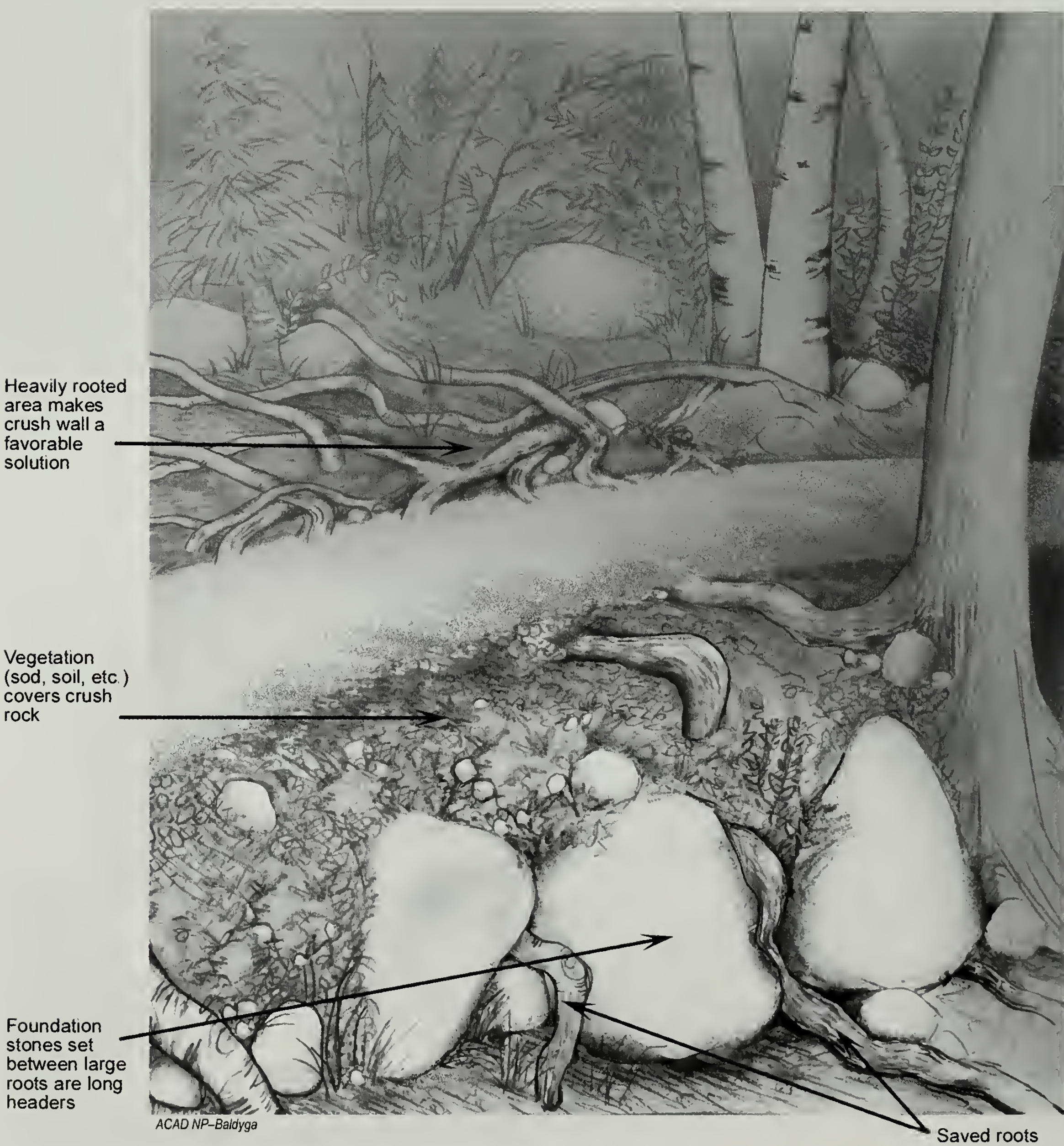


Fig. 6-52 Detail of finished crush wall.

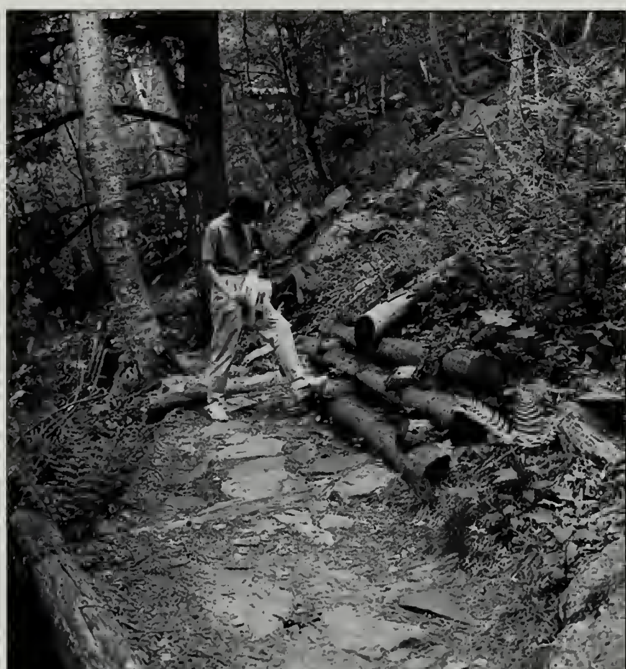
D. LOG CRIBS

DEFINITIONS

Log cribs are retaining structures consisting of interlocked logs. They may be **treadway cribs**, which are located in the trail's treadway itself, act as checks to retain the tread, and sometimes serve as sidewalls. They may also be **wall cribs**, which serve as retaining walls above or below the treadway (Figs. 6-53 & 6-54).

Log cribs are not historical features for Acadia's trail system. However, they may be used on a limited basis in certain circumstances. Log cribs should be considered as a treatment option if *all* of the following apply:

1. There was never historical stonework anywhere on the trail that would be an appropriate solution for the problem; this is most often a consideration in areas with large tree roots.
2. The area is not in close proximity to historical stonework on another trail.
3. The problem site is in a wooded area.
4. There is not enough usable stone in the immediate vicinity to construct an appropriate stone feature.



Olmsted Center, 6-97-13-2

Fig. 6-53 A wall crib on the Beech Cliff Ladder Trail (#106).

HISTORICAL USE OF LOG CRIBS AT ACADIA

There is no history of the use of log cribs in the system, although pinned logs were used by the VIA/VIS and the CCC recommended the use of log water bars. However, throughout the history of the system, many unconstructed woodland paths have developed erosion problems that were never anticipated in original construction. For most of these trails there is virtually no "appropriate" solution, as highly crafted stonework is often not compatible with the unconstructed character of the trail and/or there is usually not enough available stone nearby.

Log cribs were introduced to Acadia by trails foreman Gary Stellpflug in the early 1970s. Both treadway and wall log cribs were used to solve problems of trail gullying and bank erosion. Because of their ease of construction and the speed with which they could be built, log features were added to several trails. Many of these structures were built on inappropriate trails,

Acadia Trails Crew, 4-99-15-4

Fig. 6-54 Treadway cribs on the Bear Brook Trail (#10).

HISTORICAL CHARACTERISTICS OF LOG CRIBS
Pre-VIA/VIS (pre-1890)
There is no evidence or documentation of the use of logwork prior to the VIS/VIA period.
VIA/VIS Period (1890–1937)
Logwork was used for some limited features like pinned logs to retain tread, but log cribs were not used.
CCC Period (1933–42)
Logwork was used for some limited features like log water bars, but log cribs were not used.
NPS/Mission 66 Period (1943–66)
There is no evidence of the use of logwork.
NPS Period (1967–1997)
Widespread use of log cribs occurred in the early to mid-1970s, but cribs were used more sparingly in later years. Their use was discontinued from 1995 to 2001.


Acadia Trails Crew, 2002

Fig. 6-55 Wall crib on steepest west-side section of the Jordan Pond Path (#39) built in conjunction with stone retaining wall.

often with historic stonework within sight of the log cribwork. For example, extensive log treadway and wall cribs were constructed on the Beech Cliff Ladder Trail (#106) in 1982. This trail was historically defined by stone steps and ironwork, but at the time Stellpflug was in charge of a small, unskilled crew, and the easily installed log cribs quickly stabilized and made walkable a large section of badly eroded hillside. The cribs are still in place today and are in good condition. Other inappropriate, though useful, cribs were constructed on the Ocean Path (#3) and the Bear Brook Trail (#10). More appropriately cribbed areas, because of their wooded locations and lack of constructed features, include the North Bubble Trail (#41), the South Bubble Trail (#43), and the Bubbles-Pemetic Trail (#36).

The use of log cribs was discontinued in the late 1990s, on the largely held belief that because of the tradition of stonework at Acadia, logwork was inappropriate for the trail system. However, the use of logwork in certain circumstances is now considered an acceptable alternative for trail problems that cannot be easily addressed through the use of other features. For example, a wall crib built in 2002 was the most feasible treatment for one of the steepest sections on the west side of the Jordan Pond Path (#39) (Fig. 6-55). Care was taken to blend the crib into a continuing section of stone retaining wall.

TREATMENT FOR LOG CRIBS

1. Maintaining Character

Issue: While stonework is the preferred method of dealing with most trail problems, in many areas stonework is not possible, would be destructive to vegetation (such as tree roots), or would not be an historically appropriate treatment for unconstructed trails. However, since log cribs are not historical and are characteristically very different from other features on the trail system, widespread use of log cribs will alter the character and integrity of the trail system.

Treatment Guidelines: Log cribs should be used on a limited basis and only if the four criteria listed above (see "Definitions") are met. In these cases, logwork may be preferable to stonework and is an acceptable alternative.

To mitigate the effect of the characteristically different appearance of log work, it should be obscured as much as possible after construction. Sides of tread cribs should be buried and vegetated. Crib walls should be covered in soil and obscured by vegetation that will cover the logs permanently as it grows. Once slopes are stabilized and revegetated, or treadway becomes permanently rehabilitated, logwork should be allowed to rot, returning the area to its natural state and a trail to its original unconstructed character. At this point, the slope is naturally supported by the surrounding vegetation and constructed features should not be needed.

SPECIFICATIONS FOR LOG CRIBS

Northern white cedar logs are used. Logs should be structurally sound but need not be completely free of rot. Size can vary greatly; diameters less than 4 inches should not be used, as they will deteriorate too early.

All joints should be notched, using either flat or saddle notches (see Chapter 5 and Fig. 5-42), and spiked.

1. Tread Cribs (Figs. 6-56 & 6-57)

Tread cribs consist of side-pieces, laid along the edge of the treadway, and cross-pieces, or checks, laid across the treadway.

The top of the crib should be at or just above the level of the ground at either side of the trail at the edge of the gully. If the gully is deeper than the width of the crib logs, then it should be filled with stone rubble to the appropriate height. Side pieces are set at the edges of the desired treadway width. If the gully is wider than the desired treadway, the outsides of the crib should be filled with stone and soil and revegetated.

Cross-pieces may be set on top, underneath or flush with side-pieces. They are notched "Lincoln Log" style to fit with side pieces. A tread crib will have a cross-piece wherever it steps up to the next set of side-pieces, but it may also have side-pieces notched flush between individual cribs.

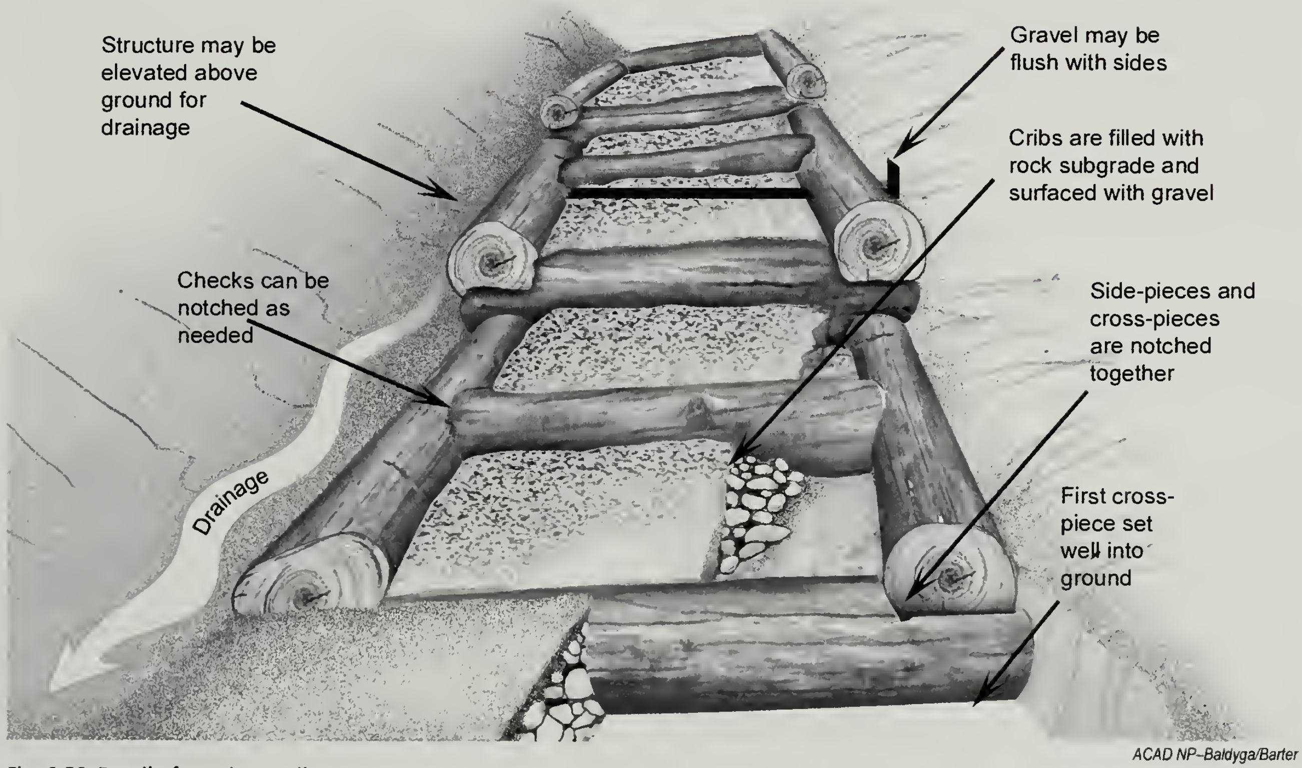


Fig. 6-56 Detail of treadway crib.

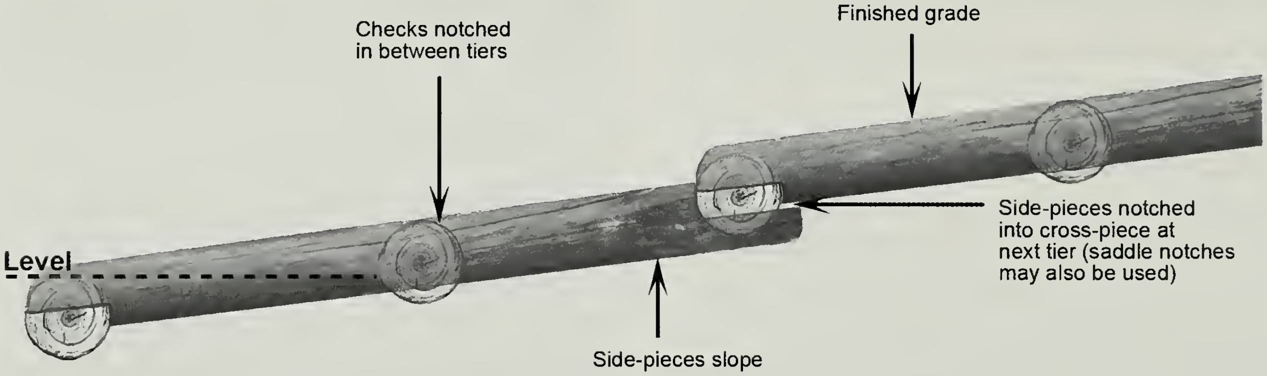


Fig. 6-57 Side view of detail of treadway crib.

The rise between cross-pieces should not exceed 1 foot. Cross-pieces should be backed with substantial stones that extend into the ground deeper than the height of the next cross-piece below them, so that if the tread erodes to the level of the step below, undermining will not occur.

The top surface of cross-pieces should be flattened with a chainsaw or ax to provide a stepping surface.

2. Wall Cribs (Fig. 6-58).
Wall cribs consist of wall or "rail" pieces, which make up the face of the wall, and "tie" pieces, which are perpendicular to the wall face and extend back into the slope, anchoring the structure. Rail pieces are set parallel to the trail and ties are notched into them, at least two ties per rail, and set back into the bank. Ties should be at least 36 inches long and extend into the bank at least 30 inches.

As with retaining wall, the bottom tier of the crib should be buried at least 8 inches below the natural level of the ground.

Unless the terrain dictates a more vertical structure, crib walls should have sufficient batter to allow the rails to be "stepped" and soil and vegetation planted between each of them, or at least every two or three rails. An ideal width for the horizontal gap is 1 foot. Trees and shrubs should be planted if possible, as they will obscure the wall and their root structures will provide the bank with integrity when the log wall has disintegrated.

Ideally, the entire area is excavated and the crib is filled as it is built. Cribs should be backfilled with a mixture of stones, for strength and drainage, and lower tiers topped with soil for vegetation. Substantial live roots should not be cut; logs can be notched if need be to go around them. If preservation of roots, stable stones, or other plant life prevents full excavation, ties must be driven into the bank rather than laid. In such cases, ties can be sharpened and driven into the bank with a sledgehammer. If crib wall is long enough to require multiple rails set end-to-end, joints between rails should be staggered, as in a retaining wall.

ROUTINE MAINTENANCE

Generally, there will be no routine maintenance needed, as the intent is to let the log structures decay naturally. However, tread cribs should be checked periodically to ensure that no logs have dislodged which may cause a hiker safety hazard. Such logs should be repaired or replaced as needed.

ENDNOTES

33 Bar Harbor VIA 19 09 *Annual Report*.

34 *Bar Harbor Record*, November 23, 1910, 3.

35 Frank Kittredge, *Standards for Trail Construction* (United States Department of the Interior, National Park Service, 1934).

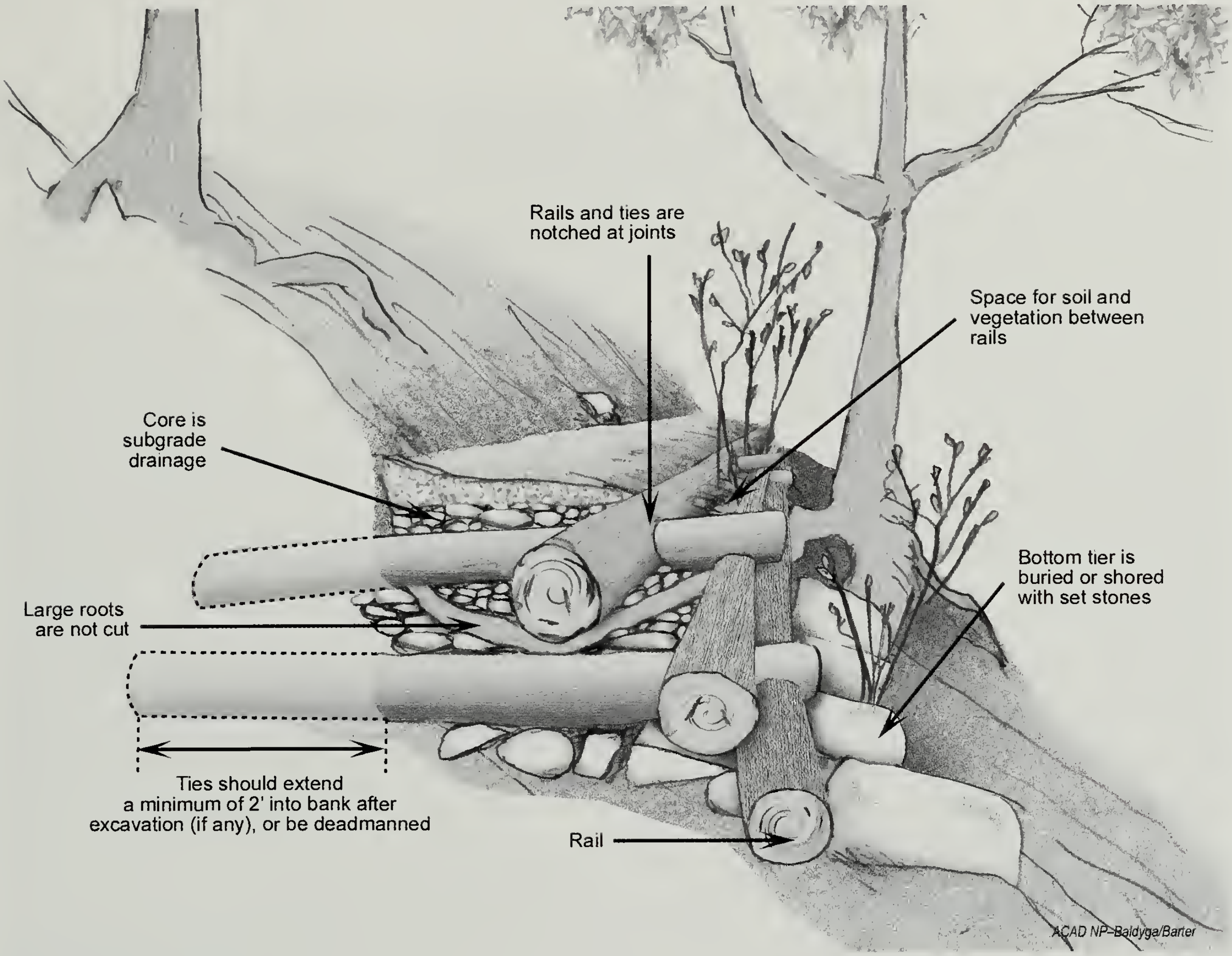


Fig. 6-58 Detail of a wall crib.

Fig. 7-1 This staircase at the trailhead of Kurt Diederich's Climb (#16), circa 1916, is one example of the highly crafted stone step work that exists on Acadia's trails.

CHAPTER 7:

STEPS

CHAPTER 7: STEPS

At Acadia, steps and staircases are primary character-defining features of the trail system. They contribute to trail diversity by allowing the trails to follow a variety of routes, from talus slopes to steep hillsides and ledges. Walking upon steps that are highly crafted and yet harmonize with the surrounding natural landscape is fundamental to the experience of hiking in Acadia.

Beginning in the 1890s, steps were built on steep slopes and ledges for ease of walking and guidance. From the 1910s through the 1930s, long sections of steps were added first by the VIA/VIS path committees and later by the CCC. Two types of stone steps are found on historic trails, slab-laid and set-behind, with the former most common. Although each step and staircase is individually built in response to topography and local stone, this section categorizes them by period of construction and characteristics including layout, stone type, average stone size, run, rise, width, and degree of uniformity. Additional categories include the presence of coping stones, support walls, iron pins, shims, and associated drainage.

An analysis of the history of step construction and the steps extant in the 1990s suggests four major classifications: Bates, Dorr, Brunnow, and CCC-style steps. As one of the most important historical features on the trail, care must be taken in rehabilitation work to understand the character and construction methods appropriate for each individual trail.

Most steps and staircases at Acadia were historically constructed of stone, and in keeping with this tradition, stone steps are preferred for continued use in the park (Fig. 7-1). Log steps, including log checks and log cribbing, may be used as short-term solutions, but are not recommended for long-term use. They deteriorate in Acadia's extreme climate, and they do not complement the historical building style of Acadia.

Note: Stone steps may be installed in conjunction with other trail features. For example, small runs of steps may be incorporated into stone pavement, drainage/culverts, coping and retaining walls, stream crossings, and ironwork. For information on these features, see Chapters 3, 4, 5, 6, and 8.

DEFINITIONS

A **step** is a constructed feature that is a vertical rise in grade onto a horizontal surface. A **staircase** is composed of a series of connected steps (**stairs**). Methods of step construction at Acadia include set-behind, slab-laid, or riprap.

Set-behind and slab-laid refer to steps in which each step is generally an individual stone, although in some cases two or more stones side-by-side may form a single step. In **set-behind steps**, each step is set directly behind the step immediately below it, so that the bottom of the upper step sits well below the top of the next lower step in the staircase. The stone below locks the stone above in place. In this way, the stone is "keyed" or wedged into place and can no longer slip unless the lower stone is moved. **Slab-laid steps** are set on top of each other, so that the bottom of the upper step sits on top of the back of the step immediately below it (Figs. 7-2 & 7-3).

Riprap steps are a series of tiers built of randomly laid, abutting stones. Each tier or step consists of many stones laid so their tops form a single smooth stepping surface (Fig. 7-4). While used in the western United States and in the New Hampshire White Mountains, this technique is not an historically appropriate style of step building at Acadia. However, use may be appropriate where a high-use trail has become excessively wide, or where a steep rocky slope needs to be stabilized.

Shims are small, flat stones placed underneath larger stones (steps, in this case) to eliminate wobble, to fill gaps, or to raise the overall height of a larger stone. In general, stones used for these purposes are called shims if they are exposed (see Fig. 7-4). If they are used in the interior of a structure, where they are locked in place, they are called **blocking** or **packing** (Fig. 7-4).

Patio refers to a wide section of stone pavement, often found between sections of steps (see Figs. 7-13, 7-43).

HISTORICAL USE OF STEPS AT ACADIA

Pre-VIA/VIS

There is no evidence or documentation of step use prior to the VIA/VIS period.

Village Improvement Associations/Societies

Beginning in the 1890s, the use of stone steps on the island's trails is an integral part of the history of the system as a whole. In fact, the trails on Mount Desert may be the country's first recreational trail system to incorporate the extensive use of stone staircases.

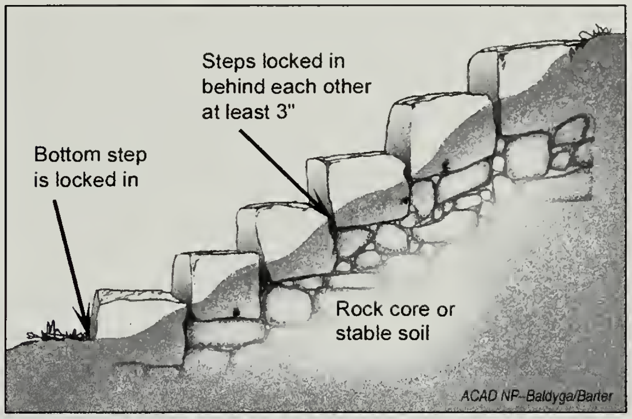


Fig. 7-2 Set-behind steps.

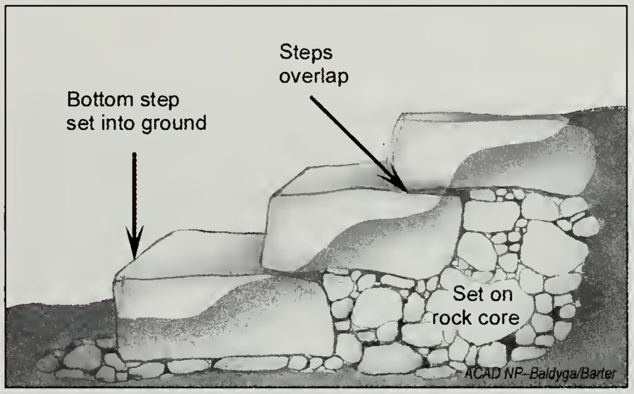


Fig. 7-3 Slab-laid steps.

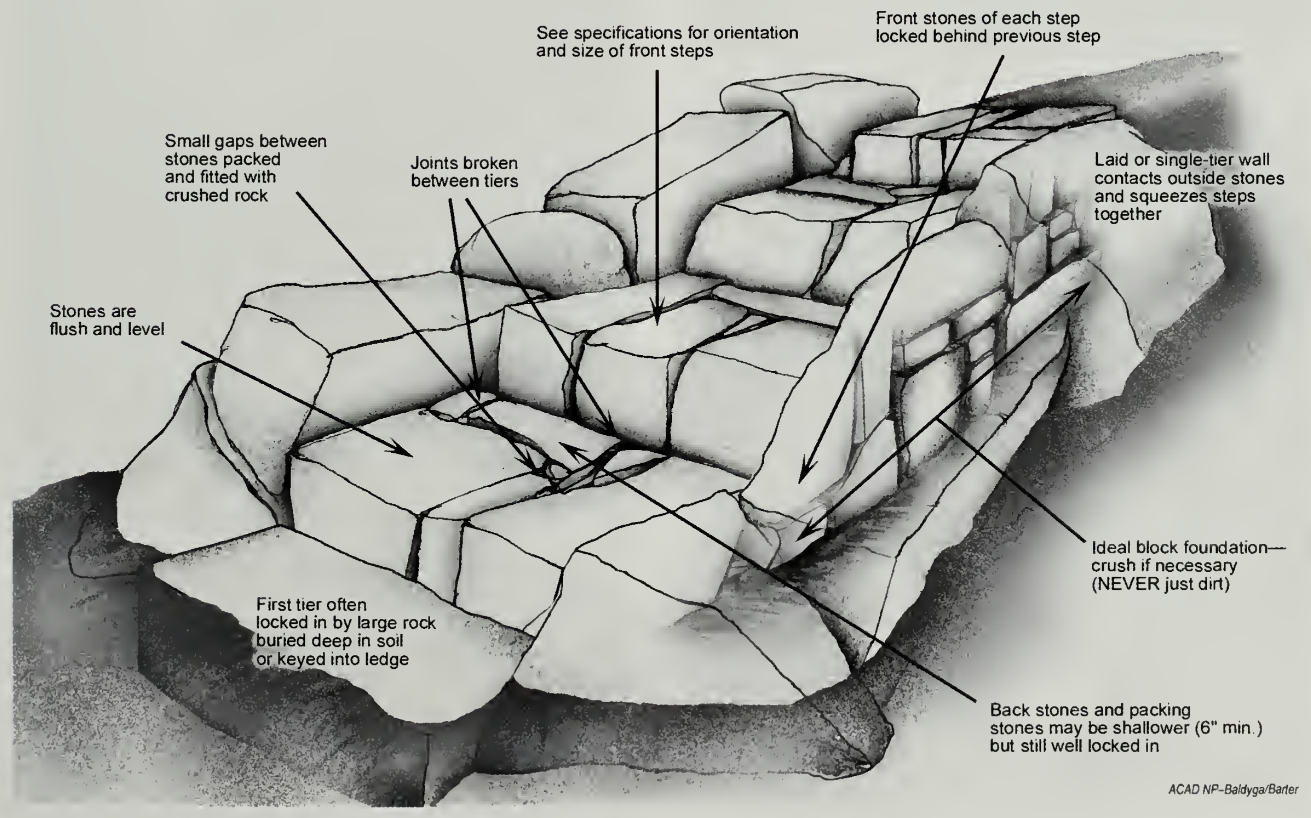


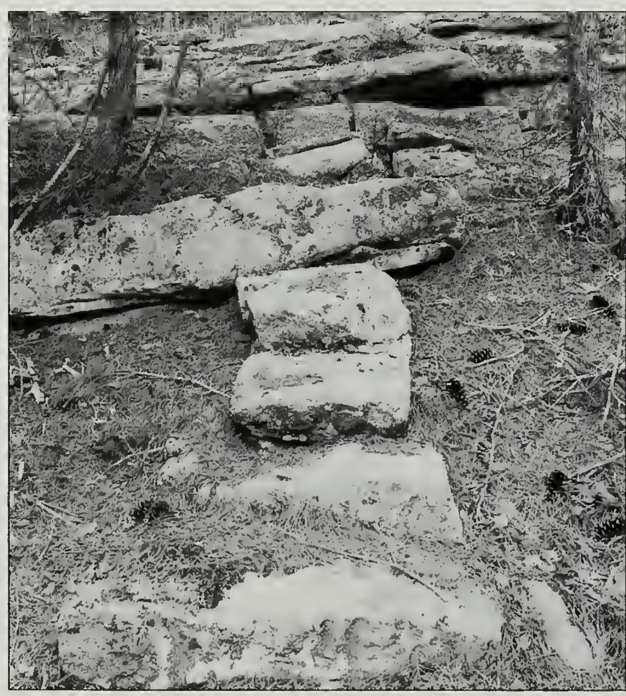
Fig. 7-4 Rip-rap steps.

Olmsted Center, 8-95-3-7A

Fig. 7-5 These steps on the Upper Ladder Trail (#334) contain exposed shims. Their use may have contributed to the deterioration of these Bates-style steps since shims are generally not locked in place and are often dislodged.

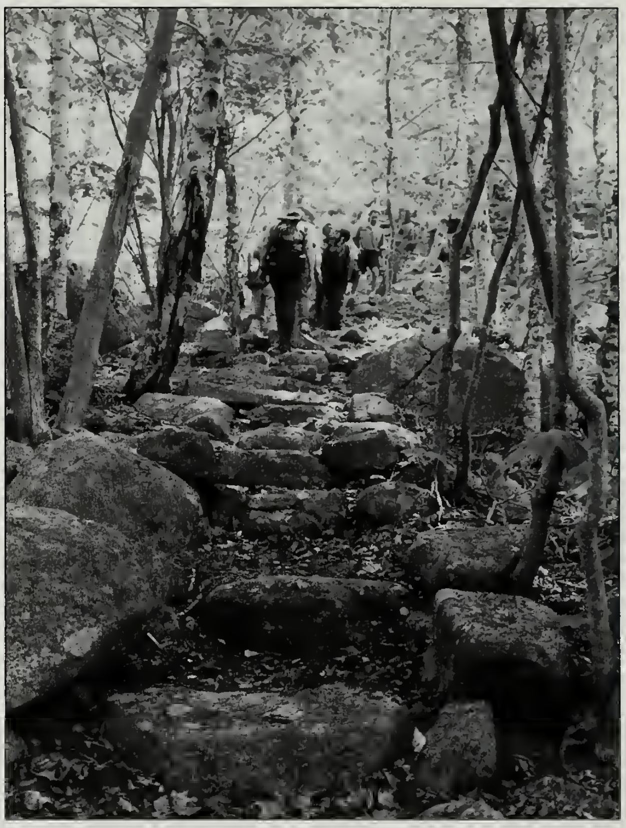
Acadia Trails Crew, 99-32-16

Fig. 7-6 Deteriorated steps on the Giant Slide Trail (#63).



Charlie Jacobi, Acadia NP, 5-99-59-1

Fig. 7-7 Bates-style steps on the Potholes to Eagles Crag Trail (#343).



Olmsted Center, 6-97-15-33

Fig. 7-8 Bates-style steps on the Goat Trail (#444).

Olmsted Center, 8-97-23-9

Fig. 7-9 Dorr-style stone staircase on the Emery Path (#15).

The first stone steps were most likely built in the 1890s either by or under the direction of Waldron Bates. Defined by economy and simplicity, these early steps were flat, uncut, slab-laid stones, constructed in short flights. The size of stones used was generally smaller than in later work. In some locations, especially over sections of ledgerock, the steps functioned more as guidance features (see Chapter 9) than as a way of providing a durable tread over changing topography. Examples of these early VIA/VIS "Bates-style" steps (Fig. 7-45) can be found on the Upper Ladder Trail (#334), Potholes to Eagles Crag Trail (#343), Cadillac Cliffs to Thunder Hole (#345), Goat Trail (#444), and Giant Slide Trail (#63) (Figs. 7-6 to 7-8).

While the majority of step-building took place in the Bar Harbor region throughout the VIA/VIS period, significant work also occurred in the Seal Harbor, Northeast Harbor and Southwest Harbor districts. Most of this step work, with a few important exceptions, can be classified as Bates-style, especially since Bates assisted crews in Seal Harbor and Northeast Harbor districts for a number of years. For instance, steps on the Pond Trail (#20), the Jordan South End Path (#409), and the Penobscot Mountain Trail (#47) are in the rougher Bates style. One exception is a set of staircases on the Northeast Harbor side of the Asticou Trail (#49) that uses a unique style of wide, multi-stone stairs with support wall and coping. Southwest Harbor steps are a variation of rough-laid steps that use no coping and are set into the earth. The few staircases in this region appear on otherwise unconstructed, woodland trails.

Interestingly, while Bar Harbor steps evolved into larger, more highly crafted features as the era proceeded, steps built in the other districts apparently did not. Though constructed in the 1910s, steps on the Maple Spring Trail (#58) and the Hadlock Brook Trails (#501, #502, #57) more closely resemble Bar Harbor work from the 1890s than that of the 1910s and 1920s. The one exception is the Van Santvoord Trail (#450), which is discussed below.

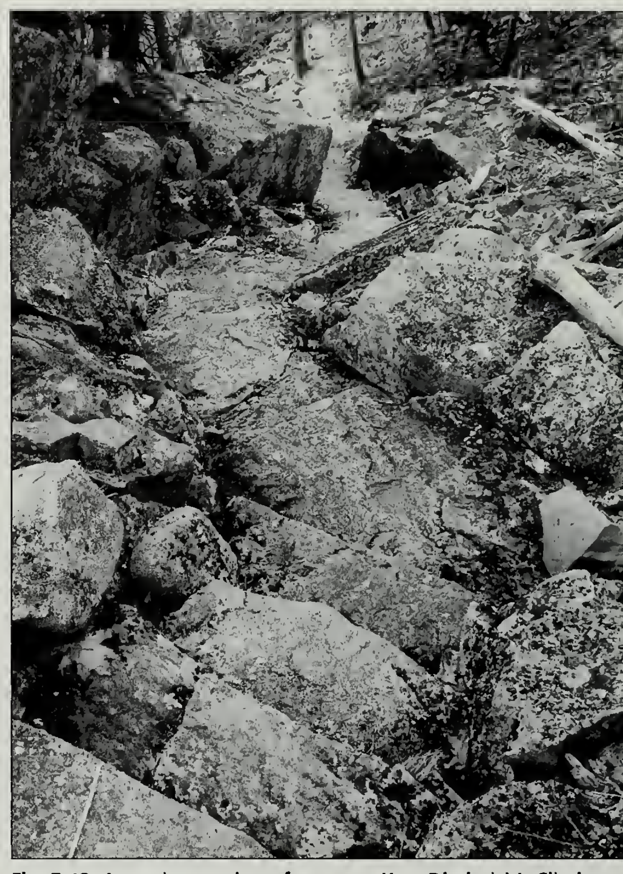
After the death of Waldron Bates in 1909, and throughout the extended tenure of Andrew Liscomb as Superintendent of Paths for the Bar Harbor VIA until 1931, stone steps continued to be a frequently constructed feature on the island's slope-traversing trails. As VIA/VIS trail-building skill increased, steps began to be integral to trail building and construction methods were modified, creating steps that became more refined and substantial trail features.

The memorial and endowed trails built under the direction of George Dorr in the 1910s represent some of the most ingenious stair building in the park. Many of these trails were engineered to provide walkers with a continuous stone tread, using large cut blocks set with even runs and risers (see Fig. 7-46). Added components of the "Dorr-style" stairs were coping stones, large boulders used as coping retaining walls, and iron pins. Dorr staircases exhibit straight runs and pleasing curves. They make use of both slab-laid and set-behind steps. Dorr was also the first to use drainage in conjunction with staircases, making steps the capstones of capstone culverts (used on the Emery Path, #15) and using subgrade drainage beneath his steps and side drains beside them. An interesting feature of some of Dorr's slab-laid steps is that they "belly" down, or rounded side down, behind the step on which they sit, locking in the stone and providing extra protection against slipping forward. Primary examples of steps in the Dorr style are extant on the Emery Path (#15), Kurt Diederich's Climb (#16), and the Homans Path (#349) (Figs. 7-9 to 7-15).

Later memorial paths, such as the Beachcroft Path (#13), Schiff Path (#15), and Andrew Murray Young Path (#25), had a tendency to use stairs that were smaller in overall scale and height of risers than the earlier paths, but often set in long runs of steps. Very few of the larger stairs on these later paths were as big as the stairs commonly used on their predecessors. The reason for this is unknown. Oddly, coping stones used on the Beachcroft Path (#13) are as large as any steps or paving stones on the early memorial paths, but the steps are smaller (Figs. 7-16 & 7-17).

Acadia NP Archives

Fig. 7-10 Coping is used with stairs on the Emery Path (#15), circa 1920. There is also an obscure culvert under this staircase.



Acadia Trails Crew, 5-99-17-7

Fig. 7-12 A curving section of steps on Kurt Diederich's Climb (#16).

Acadia NP Archives

Fig. 7-11 Dorr-style stone staircase on Schiff Path (#15), circa 1916.

Olmsted Center, 10-00-d

Fig. 7-13 Stone steps on the Homans Path (#349) are interspersed with sections of stone "patio."

Fig. 7-14 Dorr-style stone staircase on ledge rock on the upper section of the Homans Path (#349).

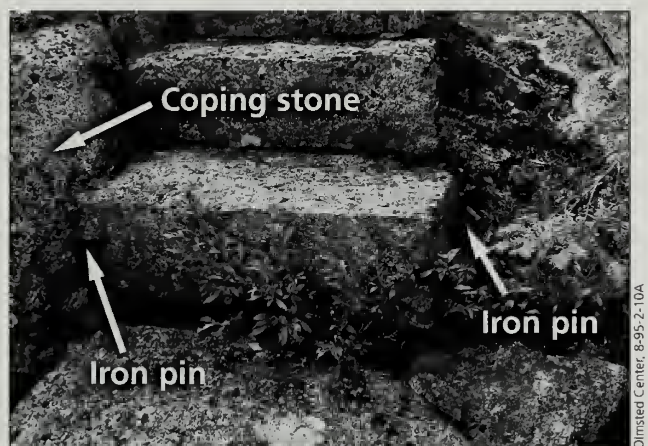


Fig. 7-15 Detail of stone steps on the Homans Path (#349).

Fig. 7-17 A narrow stone staircase between sections of stone pavement on the Beachcroft Path (#13).

Fig. 7-16 This curving staircase on the Beachcroft Path (#13) is typical of the smaller-sized steps generally found on this trail.

The sporadic, distinctively curved staircases of the Van Santvoord Trail (#450) represent another variation. Constructed between 1915 and 1917 under the direction of Joseph Allen, Seal Harbor VIS path committee chairman, the trail contains large stone steps on steep climbs, between long stretches of trail with no other built features. Some short staircases were constructed on open ledgerock, reminiscent of some of the earliest Bates-style step work (Figs. 7-18 & 7-19).

Fig. 7-18 This small curving stone staircase on the Van Santvoord Trail (#450) is typical of many of the steps on this trail.

Fig. 7-19 The stone steps on the Van Santvoord Trail (#450) were often located on ledgerock where there is no apparent need for a set of steps. These steps functioned more as a route guide than an aid to traversing the slope.

During the 1910s and 1920s, significant step work was being performed in every major area of the park. On the island's west side, the Southwest Harbor VIA added steps to the Bernard Mountain South Face Trail (#111) using typical VIA/VIS construction techniques including square, uncut stones, slab-laid construction with even runs and risers, and no coping. On the east side, Rudolph Brunnow's crew built numerous staircases on the Orange and Black Path (#348), the Precipice Trail (#11), and the Beehive Trail (#7) (Fig. 7-21). These staircases exhibit a unique style in which the steps are the top course of a retaining wall which is constructed completely under them of relatively small, carefully laid stones. The stairs do not use coping, and the blocking is exposed. The "Hanging Steps" on the Orange and Black Path (#348) are the most dramatic example of this Brunnow style (Fig. 7-22).

Civilian Conservation Corps

In the early years of park management from 1916 to 1932, the VIA/VIS continued to construct and maintain trails on land that would eventually become part of the national park. The park, under the direction of

Fig. 7-20 Historic view of classic SHVIA slab-laid steps on the Moss Trail, part of the Bernard Mountain South Face Trail (#111). Steps are square, uncut stones with even runs and risers, no coping, and shimmed under the first step. The staircase is now obliterated, perhaps due to a weak foundation.

Superintendent Dorr, focused on construction of visitor facilities, including associated trails. For example, when the Cadillac Summit Road was completed in 1932, the park constructed an associated interpretive loop trail on the summit (#33). Design drawings were prepared by the NPS Branch of Plans and Design in 1932 and implemented in 1933. This was probably the first asphalt-paved trail on the island (Fig. 7-24). (In the 1970s, the trail was resurfaced with concrete mixed with local pink granite in an effort to harmonize with the native summit setting.) Upon the arrival of the CCC, Dorr also laid out plans for expansion of the trail system, including several stepped trails on the less-developed western side of the island.

The CCC vigorously continued the art and craft of step construction on a scale similar to the VIA/VIS endowed paths, and often in a remarkably similar character. However, the CCC was even more methodical in their attention to detail, employing large numbers of engineers, foremen, and workmen at trail construction in the park. CCC steps had a consistent appearance, relying on cut or naturally occurring stone that was uniform in size and shape (Figs. 7-25 and 7-46). The treads and "risers" were consistent throughout a run of steps, creating stairs that were comfortable for the hiker. Also, CCC steps were often wider than VIA/VIS steps, some over 4 feet wide, to handle more use. And to make the stairs blend in with the natural surroundings, CCC crews would plant mosses, ferns, and other vegetation in the crevices of staircase after they were finished with construction.

This level of detail and attention to craftsmanship in the construction of CCC steps, as well as other contributing features like drainage and retention, remains especially evident on the Perpendicular Trail (#119). This trail was one of the few complete trails added to the park by the CCC, and much of the route consists of continuous staircases. On this trail, sections of a talus field were reconstructed and engineered in order to accommodate a series of even switchbacks of uniform steps (Figs. 7-26 & 7-27). While perhaps not as highly engineered, or as well constructed as the Perpendicular Trail (#119), the Valley Cove (#626) portion of the Flying Mountain Trail (#105) is the other major

Acadia Trails Crew, 5-99-14-25

Fig. 7-21 A partially reconstructed stone staircase on the Beehive Trail (#7). The rehab is misfitting, as the odd-shaped stones of random sizes on the lower part of the staircase do not resemble the historic, evenly laid rectangular stones on the upper part of the staircase.

Olmsted Center, 8-95-8-18A

Fig. 7-22 Brunnow's "Hanging Steps" on the Orange and Black Path (#348). Steps are pinned in the front and middle. Note the exposed retaining wall under the upper steps.


Olmsted Center, 6-97-16-9

Fig. 7-23 Brunnow-style stone steps on the Champlain East Face Trail (#12).


Acadia Trails Crew, 5-99-37-4

Fig. 7-25 These CCC steps on the Acadia Mountain Trail (#101) contain consistent sizes of stones. The AMC scree installed later along the trail edges has altered the historic character.


Olmsted Center, 5-98-s

Fig. 7-24 Stone steps and asphalt pavement on the Cadillac Summit Loop Trail (#33).


Acadia Trails Crew, 2002

Fig. 7-26 Highly engineered CCC switchbacks of uniform steps cutting through a talus slope on the Perpendicular Trail (#119).

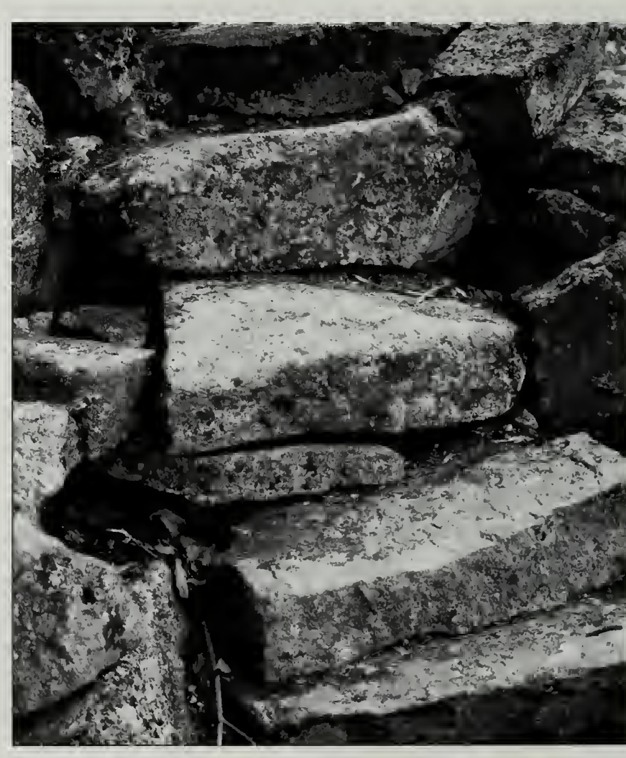

Olmsted Center, 5-98-4-20

Fig. 7-27 Details of CCC steps with shims on the Perpendicular Trail (#119).

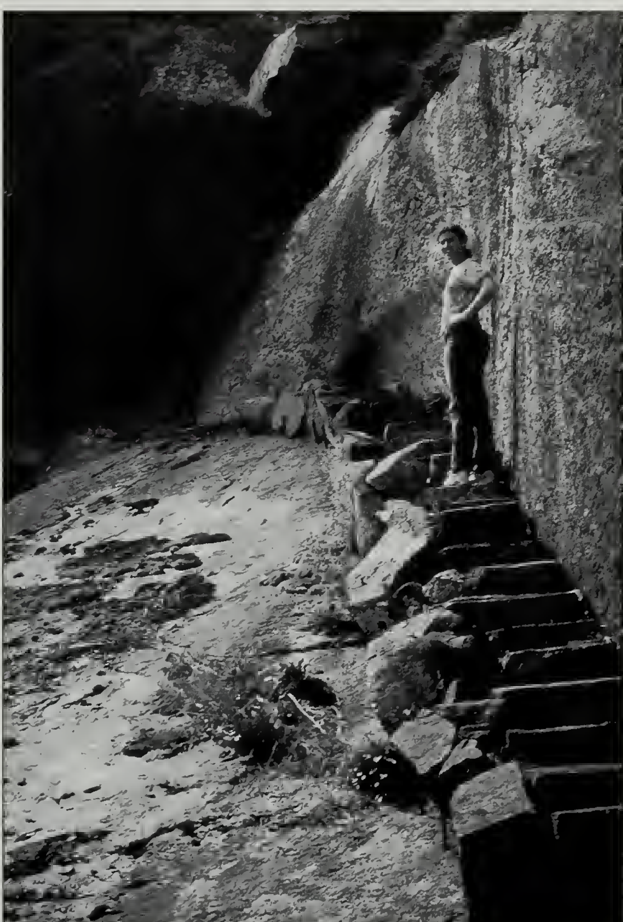
stepped trail built by the CCC. On this trail, hundreds of cut stone steps create a easily traversed route across ledgerock and through a talus slope (Fig. 7-28).

However, most CCC step construction was not as extensive as the work on the Perpendicular Trail (#119) or the Valley Cove portion of the Flying Mountain Trail (#105). Typical CCC work consisted of small runs of steps constructed in conjunction with the various visitor amenities added to the park during the 1930s. Several of these features were constructed to connect the CCC's newly renovated Ocean Path (#3) with parking facilities along the adjacent Ocean Drive (Figs. 7-29 to 7-31). Also, some steps were added to existing trails during CCC rehabilitation. For example, a run of steps at the start of the Beachcroft Path (#13) leads up the hill from Route 3 to the path itself. The original trailhead at Sieur de Monts was closed and the CCC added these stairs to access a new parking area across the road from the newly established trailhead (Fig. 7-32). Other trails where the CCC completed step work include the Beech Mountain South Ridge Trail (#109) and the Valley Trail (#116) (Figs. 7-33 & 7-34).

A comparison between the CCC style of step construction and the earlier VIA/VIS Bates style is most evident on the Ladder Trail (#64). The CCC completely rehabilitated the staircases on the lower portion of this trail, creating a series of steps with a more uniform and constructed appearance and adding appropriate drainage features. This style contrasts greatly with the less orderly VIA steps that were originally used and remained evident on the abandoned Upper Ladder Trail (#334) (Figs. 7-35 to 7-37).

NPS/Mission 66

Few examples of Mission 66 steps are extant. Generally Mission 66 trails were easily accessible trails near parking areas and park facilities and did not ascend steep slopes. They relied on a few short runs of stone steps, such as the two- and three-step staircases found on the Ship Harbor Nature Trail (#127) and the Anemone Cave Trail (#369). Like VIA/VIS and CCC steps, these tend to be square blocks set in even runs. However, the craftsmanship of the Mission 66 work was inferior to previous work, and much of it has since fallen into disrepair (Fig. 7-38).



David Goodrich

Fig. 7-28 CCC steps across ledgerock on the Valley Cove Trail (#626), shown in 1969.

National Archives, Waltham, MA, 97-1-9

Fig. 7-29 CCC steps connecting Ocean Path (#3) with a parking area along Ocean Drive, soon after construction, circa 1937.

Fig. 7-30 CCC steps at Thunder Hole parking along the Ocean Path (#3).

Olmsted Center, 5-98-s

Fig. 7-32 These stone steps were added by the CCC at the newly established trailhead for the Beachcroft Path (#13).

Charlie Jacobi, Acadia NP, 4-99-53-0

Fig. 7-31 CCC steps at Otter Cliffs on Ocean Path (#3) adjacent to motor road grade separation.

Olmsted Center, 5-98-s

Fig. 7-33 CCC stone wall and steps on the Beech Mountain South Ridge Trail (#109).

Acadia Trails Crew, 5-99-46-3

Fig. 7-34 A CCC stone staircase on the Valley Trail (#116).

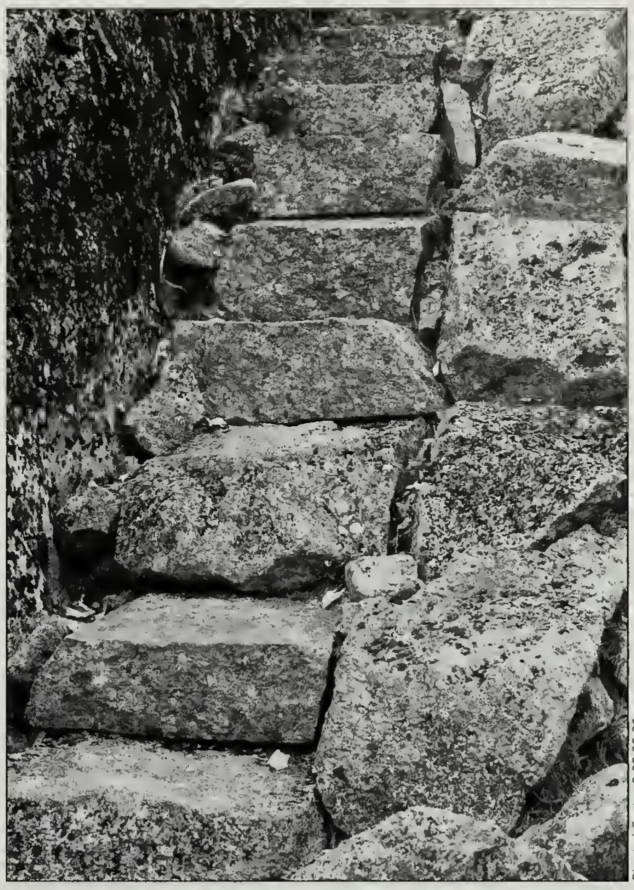
Acadia Trails Crew 5-99-27-10

Olmsted Center, 8-95-3-4A

Fig. 7-35 VIA/VIS Bates-style steps on the Upper Ladder Trail (#334).

Olmsted Center, 5-98-8-20

Fig. 7-36 CCC steps along cliff face on the lower section of the Ladder Trail (#64).



Olmsted Center, 8-97-25-20

Fig. 7-37 CCC steps on the lower section of the Ladder Trail (#64).

Acadia Trails Crew, 4-99-33-18

Fig. 7-38 The remains of a short run of Mission 66 steps on the Ship Harbor Nature Trail (#127).

National Park Service

Since the late 1960s, NPS crews have repaired historic staircases and have also added a number of staircases in places where previously there were none. While some of this work was in keeping with the trails' historic character, the majority of it was not. Historic steps were lost, and new incompatible features like riprap and wooden steps were added.

Since the 1970s, volunteer groups like the Appalachian Mountain Club (AMC) have also assisted with some step construction projects. This work has not only added additional styles of step construction to Acadia, it has also introduced a different attitude toward trail building, which is not always in keeping with Acadia's historic precedent. For example, in reference to step building, the AMC trail handbook says:

> For aesthetic reasons...it is best to avoid building perfectly straight staircases up a slope. Nature is unruly, so put some twists and bends in the staircase.... You can also break up the "staircase effect" through use of odd-shaped...rocks. Offset some steps rather than keep them in a direct line....[36]

This attitude is best shown in the AMC's style of step construction, which has been used on several trails at Acadia (Fig. 7-39). Only when the NPS began rehabilitation efforts in the 1990s, did it become evident that the early trail builders at Acadia espoused a different attitude toward trail construction. The steps themselves were often designed and meant to be emphasized as an important aesthetic feature of the trail. Depending on the individual trail, achieving a "staircase effect" is often a desirable goal to maintain historic character.

Some of the more extreme examples of harm done to Acadia's steps:

- The Spring Trail (#621) was closed in 1975 because a staircase could not be repaired due to a lack of information and/or skills by workers.
- During a 1975 "repair" of a CCC staircase at an overlook on the Acadia Mountain Trail (#101), loose steps were not reused, but simply heaved into the ocean.
- In 1992, CCC step work on Flying Mountain (#105) was dismantled and used as scree by a volunteer work group.

Even step work of integrity has not always been sympathetic to a trail's historic character. Round steps have been added to cut block staircases, as with the Beachcroft Path (#13) trailhead; steps of odd rise and run sizes have been added to staircases with uniform rises and runs; and cut and polished granite steps have been added to trails or visitor areas adjacent to trails, such as staircases constructed at the summit of Cadillac Mountain. Consequently, some of the work completed by the NPS since 1942 has compounded the problems caused by environmental conditions and increased usage of the trails.

However, recent work completed by NPS crews has been performed in a more informed manner. Histori-

Olmsted Center, 10-00-s

Fig. 7-39 These AMC-style steps on the Pond Trail (#20) were built according to AMC handbook. However, this style of step work, with uneven, slanted steps and the heavy use of scree, is not appropriate for the Acadia trail system.

cal precedents for step construction have been used in both the rehabilitation of old steps, as well as in the addition of new steps to the trail system. Some examples of recent step rehabilitation include work on the Pond Trail (#20) and the Ocean Path (#3) at Otter Point (Fig. 7-40).

HISTORICAL CHARACTERISTICS OF STEPS
Pre-VIA/VIS (pre-1890)
No evidence or documentation for step use has been found.
VIA/VIS Period (1890–1937)
The earliest, or Bates-style, steps were typically small, uncut, slab-laid steps of varying sizes constructed in short runs. As building skills improved with the advent of memorial trails, steps developed into longer engineered runs with uniform slab-laid and set-behind steps. These Dorr-style steps often used cut stones, coping walls, retaining walls, and/or ironwork. Brunnow-style steps were similar to earlier styles in their small size and lack of coping. They often used cut stones and exhibited a much higher level of craftsmanship, especially in the retaining walls built underneath the steps. Variations on these styles also occurred on many trails.
CCC Period (1933–42)
The consistency of the CCC work relied on uniform sizes of cut, slab-laid steps set in long, engineered runs. Staircases were usually used in conjunction with coping walls and/or retaining walls.
NPS/Mission 66 Period (1943–66)
Few steps were used during this period. The typical two- or three-step staircases were inferior in quality to previous historical work.
NPS Period (1967–1997)
Repairs were made to staircases of all eras, both in-character and out-of-character (Fig. 7-41). New work varied considerably. New styles were introduced, including AMC steps, wooden steps, riprap, and set-behind steps as a substitute for slab-laid steps. From the late 1990s on, close attention has been paid to rehabilitating and constructing steps in the proper style, such as in the 2002 rehabilitation of Bates-style steps on the Jordan Pond Path (#39) (Figs. 7-42 & 7-43).

1. Maintaining Character

Issue: Many historic steps and staircases are in serious need of repair or replacement resulting in a loss of historic fabric and character over the years as trails have not been adequately maintained. Some historic steps have been replaced with incompatible work, or new step styles have been added to the system. After water bars and dips, steps are the most common feature added to sections of trails where they previously did not exist. While the addition of steps can solve many problems related to steep grades, in some places

Olmsted Center, 10-00-s

Fig. 7-40 These stone steps at Otter Point on the Ocean Path (#3) were constructed in 2000.

Olmsted Center, 5-98-s

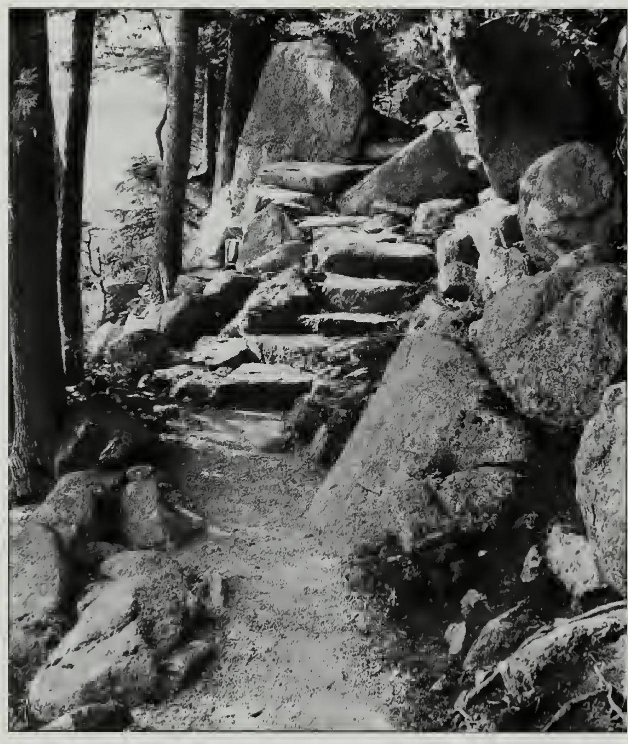
Fig. 7-41 These stairs from the Park Loop Road to Western Point, south of Blackwoods Campground, are too uniform and are out of place in the Acadia trail system.

they are detrimental to the trail's historical character. For example, steps would not be in character for the smooth, graveled, "broad" paths like the Stratheden Trail (#24). In other areas, the addition of steps may change a trail's unconstructed appearance, such as on upper Perpendicular Trail (#119) or the Deer Brook Trail (#51).

Treatment Guidelines: Existing historic stone steps should be rehabilitated as necessary in the appropriate historic style for the trail. Removal of historic stairs should only be considered as a last resort when stairs can no longer be repaired or reconstructed, or when maintaining these features is no longer a viable option due to resource or visitor protection. New stone steps may be added in-kind to existing staircases and may be considered for sections of trail when there is historic precedent of stone step use. New steps may be considered for areas with steep ascents (typically over 15 percent) on the forest floor, through talus fields, or across ledgerock. Steps are also an acceptable solution for lesser grades with erosion problems. New steps should be constructed to complement existing work on the trail or fit within the trail's period and style of construction. Steps should not be added to trails whose character would be changed or interrupted by the addition of steps. For example, steps should not be used on long sections of smooth graveled tread, such as the broad paths or the Ocean Path (#3), or on long sections of inclined stone pavement. The alternative for steps on inclined graveled paths will be checks and/or inside drainage. Wooden steps are not a recommended treatment option.

Acadia Trails Crew, 2002

Fig. 7-42 Dilapidated Bates-style steps on the Jordan Pond Path (#39) before NPS rehabilitation, see Fig. 7-43.



Olmsted Center, 4-98-1-14

Fig. 7-43 NPS rehabilitation of Bates-style steps on the same section of the Jordan Pond Path (#39) in 2002. Note varying sizes, flat "patio" above the fifth step, and use of both slab-laid (top step) and set-behind (front steps). Steps also conform to boulders in the landscape.

2. Step Style

Issue: Each step style has pros and cons. Slab-laid steps were the most commonly used historically, yet they often succumb to rear pressure, which can push the steps forward into a "stack," or topple them altogether. Particularly vulnerable are steps built in loose or poorly drained soil. Small slab-laid steps not "pinched" on the sides by coping or ledge can be dislodged by foot traffic. Slab-laid staircases also depend on the use of rectangular stones of uniform thickness which may not always be readily available. While set-behind steps are more durable in certain situations and allow the use of various stone shapes, they often appear out of place in Acadia and have their own problems. Flowing water can run directly behind set-behind steps, tread size is dictated by stone shape, and building on ledgerock is particularly difficult. In some cases, historic step styles are not wide enough to accommodate the volume of foot traffic, or the right stone is not available to build staircases of a sufficient step-size.

Treatment Guidelines: Slab-laid steps should be replaced in kind. In problem areas where failure is likely, larger steps (over 150 pounds) and/or well-built coping that "pinch" steps in place will be used to prevent slab-laid steps from shifting. If steps are being cut or shaped, Dorr's "bellying" technique may be used to help secure steps from sliding forward. The lower surface is shaped so that it locks in and will not slide over the step below. In new step construction with no historical precedent for slab-laid steps, or in areas where drainage problems or a lack of the appropriate stone prohibits the building of slab-laid steps, set-behind steps may be used. Set-behind steps should be built in a way that mimics the appearance of slab-laid steps as much as possible, including the use of square fronts to the steps and evenly spaced treads and risers. When building in an historic style, care should be taken to avoid a riprap look with multiple stones set as a single step.

Occasionally, non-historic step styles are necessary and may be used, although this is not a preferred treatment option and should only be considered as a last choice. Riprap steps may be used if the following conditions apply:

- There is no precedent of another style of step in that area of the trail.
- There is a need for a tread-width greater than the available stone, or than an historic style will allow.
- The trail grade is too steep or too vulnerable to treat with less conspicuous features, such as checks and fill, or causeway.

Like riprap, log crib steps may also be considered when there is no historical precedent. See Chapter 6 for further information on the use of log cribs.

3. Use of Pins

Issue: Unpinned steps and walls constructed directly on ledgerock have slid out of place over time, while work held by iron pins has generally lasted as long as the pins' useful life of over fifty years. However, iron pins are not historically accurate on all trails, including early VIA/VIS work like the deteriorating steps of the Upper Ladder Trail (#334).

Treatment Guidelines: The addition of pins is an acceptable remedy for steps and/or coping wall that is in danger of slippage. The options of either setting the base of the wall in a stable area, such as insloping ledge, or adding coping wall to steps to shore them up, should be considered before pins are added to trails where they are not historically accurate. If used, stainless steel pins are recommended as a compatible yet distinguishable feature and may last much longer than the traditional iron. Pins should be placed in inconspicuous locations (see Chapter 8).

4. Use of Shims

Issue: In slab-laid construction, shims are often used to level a step or keep it from rocking on the step below. The use of shims can save the labor of reshaping a stone, quarrying another, or extensively rebuilding a section of steps. However, shims can work themselves loose over time, often leaving an unstable and unsafe step.

Treatment Guidelines: The use of shims is not recommended since they cannot be permanently held in place. In cases where shims may have been used historically, new steps should be selected or the old steps reshaped in order to level and/or stabilize them. The use of shims as blocking underneath the sides or backs of steps may be considered, provided they are set tightly and held on all sides by other stonework.

5. Drainage

Issue: In some cases, old steps were built without drainage. Water and ice flowing into or over them has pushed the steps out of place or led to their total collapse.

Treatment Guidelines: Drainage systems built in conjunction with historic steps or steps constructed in an historic style should be in keeping with other drainage systems used in conjunction with similar steps. For Dorr-style and CCC steps this includes culverts underneath steps. For all other styles, such drains should be used only as a last resort and be kept as subtle as possible. In nearly all cases another drainage option may be more appropriate, such as subgrade drainage, side drainage, or cross drainage above the staircase.

6. Stabilization

Issue: Several historic trails at Acadia are no longer marked and maintained. There are many original steps and staircases on these trails which need stabilization to prevent further deterioration and loss of historic fabric.

Treatment Guidelines: Stabilization of steps on abandoned trails should be done in the least intrusive method possible. Small repairs, like on a piece of retaining wall or a single step in order to keep a staircase from collapsing, will be the first choice. Deteriorated pins and slipped shims should be replaced as needed. If the repair is extensive, new stainless steel pins and shims should be inconspicuously added to prevent further collapse. Drainage threats should be resolved using methods that do not sacrifice the integrity of the step or staircase, such as dips and ditching.

SPECIFICATIONS FOR STEPS (FIGS. 7-45 TO 7-47)

1. General Guidelines for Historic Stone Steps

- Steps and staircases should be constructed of stone either taken directly from the site, or stone that is indistinguishable from local stone.
- Rectangular stones, especially those with flat surfaces for the tread, are preferred over rounded stones.
- Slab-laid construction is preferred over set-behind, though both may be used if needed.
- When possible, staircases should be used in either straight or curving rows.
- Steps are as even as possible, given the construction technique, the surrounding landscape and the general terrain.
- Rise and run of steps are negotiable. Treads are deep enough to land on, and risers are within reach of the average stride.
- Steps are intended to stand out as constructed features, becoming objects of interest, even admiration, to the hiker.

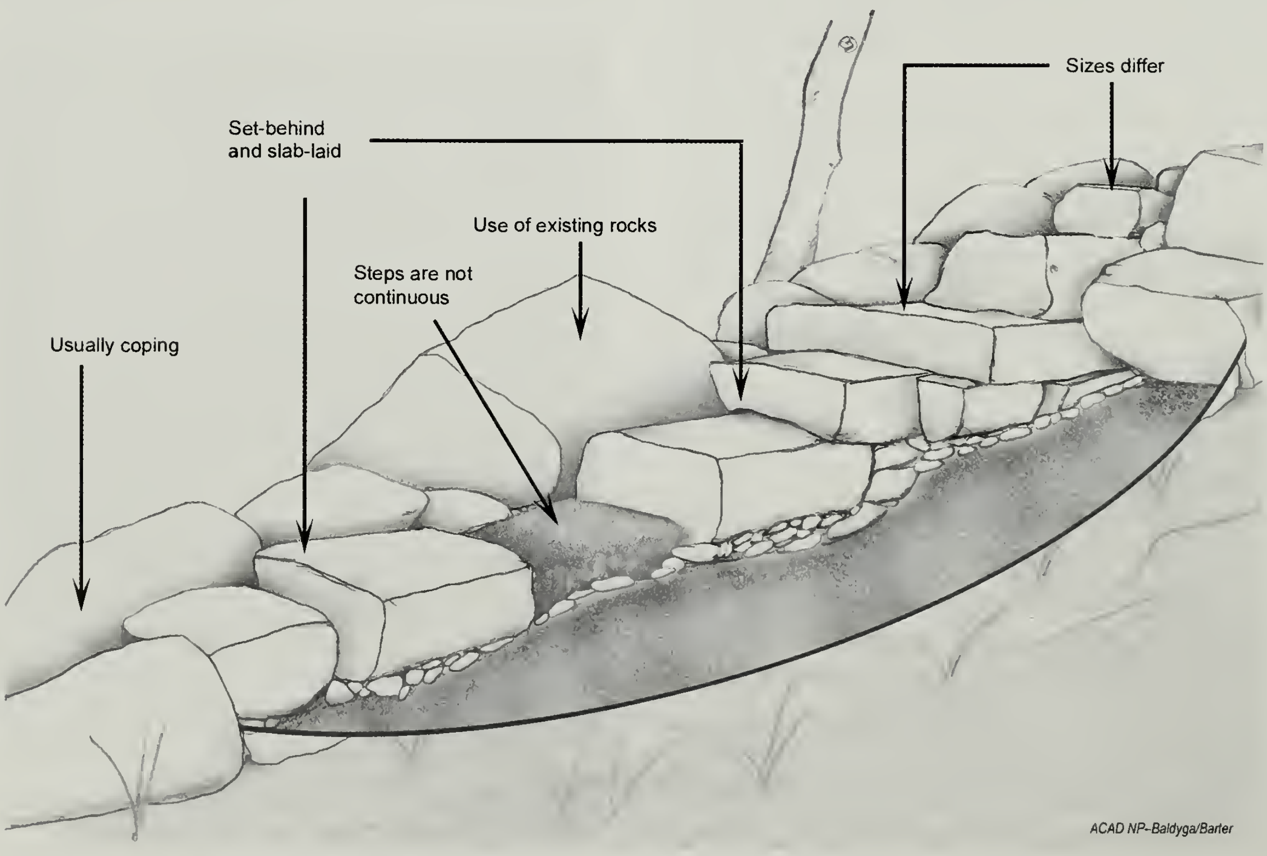


Fig. 7-45 Details for a typical VIA/VIS Bates-style staircase.

The degree to which a given staircase will meet the general step criteria depends on the particular construction model for that set of steps. For example, Bates-style steps rely on local uncut stone and will be as even and uniform as the material allows. CCC steps will be of cut stone laid on a reconfigured trail alignment to assure that each step is nearly identical in size and spacing to the other steps throughout the staircase.

The following historic styles of steps are to be used as guidelines when rehabilitating existing steps or adding new steps to the trail system.

- Bates-style VIA/VIS steps
- Dorr-style VIA/VIS steps
- Brunnow-style VIA/VIS steps
- CCC steps

Specifications for construction of each of these step types have been identified through field investigations and historic research. These are described below.

2. Construction Techniques for Historic Stone Steps
Adhering to the following chart (Fig. 7-47), specific needs for rise and run are calculated, and stone sizes and shapes are determined, then quarried or shaped, with the appropriate amount of variation for the style. The area around the step is excavated of organic soil and loose stone. The bottom step is set at least 6 inches below ground on inorganic soil, crushed stone, or bedrock, or it is keyed or pinned onto ledge so that it cannot slip forward.

> In slab-laid construction (Figs. 7-3 & 7-46), the area behind each step is packed as the core of a retaining wall (see Chapter 6). If coping or sidewall is not to be used, exposed core stones must be laid as a wall under the step, as with Brunnow-style construction.

Coping, sidewall, and/or retaining wall should be constructed as the steps are laid as one interwoven structure. If coping or sidewall is to be used, coping

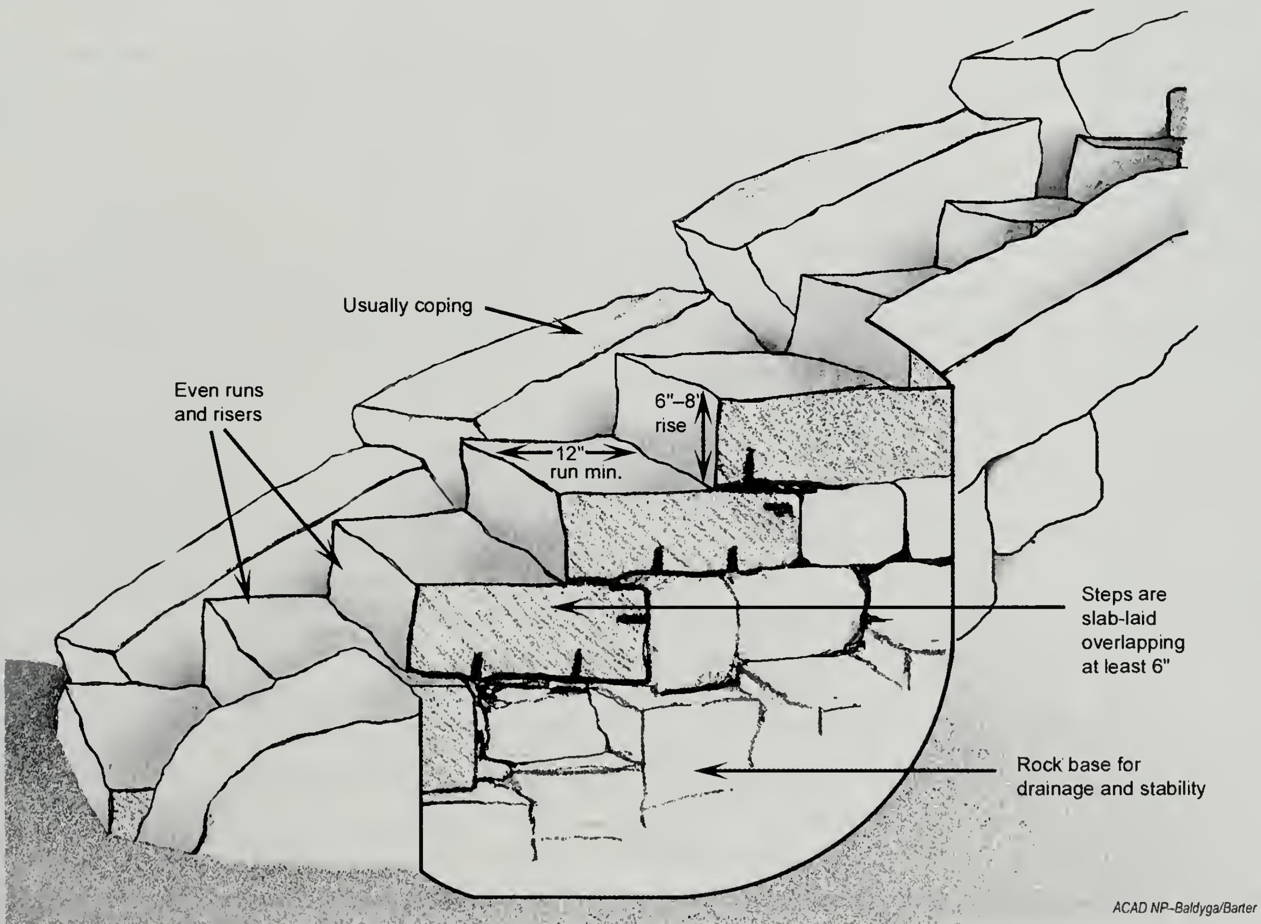


Fig. 7-46 Detail of a typical staircase from the CCC or VIA/VIS period.

	Bates-style VIA/VIS Steps	Dorr-style VIA/VIS Steps	Brunnow-style VIA/ VIS Steps	CCC Steps
Type of Construction	Slab-laid and set-behind; often both types in one staircase	Slab-laid and set-behind; often both types in one staircase	Slab-laid	Slab-laid
Layout of Staircases	Short, sporadic flights broken by sections of level tread; natural features like boulders are often incorporated into the staircase, or the steps go around them	Flights in straight lines or engineered curves; landscape often altered to accommodate regularity of staircase	Some staircases engineered, others dictated by the landscape	Staircases engineered and laid out to exacting standards and specifications
Stone Type	Uncut; shape varies; at least one flat surface	Primarily cut; some uncut; rectangular	Cut or uncut; rectangular	Primarily cut; some uncut; rectangular
Average Stone Size	Varies greatly	24" x 18" x 6"	18" x 18" x 6"	24" x 18" x 6"
Typical Run	10"-24"	12"-32"	10"-24"	8"-24"
Typical Rise	3"-18"	6"-12"	6"-18"	6"-14"
Typical Step Width	8"-48"; typically smaller than other styles	12"-60"	12"-60"	12"-60"; typically over 30" on well traveled paths
Step Uniformity	Irregular rises and runs, varying greatly from step to step	Regular rises and runs within staircases; varies between staircases	Rises and runs may or may not be consistent within a staircase and/or between staircases	Regular rises and runs within staircases; varies between staircases
Coping	Typically used; uncut single or piled stones no more than 12" above steps	Typically used; large cut or uncut single stones or retaining wall	Not used	Typically used; single cut or uncut stones of various sizes
Support Wall	None	Laid wall	Laid wall	Laid wall
Iron Pins	None	Steps, coping and retaining walls may be pinned	Steps may be pinned	Coping and retaining walls may be pinned
Shims	Yes	Yes	Yes	Yes
Associated Drainage Features	None	Capstone culverts	None	Graveled-over or capstone culverts and side drains

Fig. 7-47 Historic styles of steps and specifications.

will hold the core and it need only be packed solidly. Coping stones should span the joints between steps.

Each next step is set on the previous step and core so that it overlaps the step by at least 6 inches (1 foot is ideal). The step should contact the lower step at least once and should be stable without shims. If shims are appropriate to the area, exposed shim stones may be used. These should be part of the core and locked underneath and on the side by coping may be used.

In set-behind steps, the core is packed behind the step to a level that will lift the next step to the desired height (Fig. 7-2). The upper step sits on the core only, contacting the lower step along its face. To ensure that steps are locked in, each upper step should be set at least 3 inches below the top of the step below. Small gaps between steps are packed only after a number of steps are set, to prevent separation. The same techniques are appropriate for constructing accompanying coping or retaining wall.

3. Construction Techniques for Riprap Steps (Fig. 7-4)
Riprap steps should be considered as a treatment option if the following apply:

1. The trail is high-use trail that must have a corridor wider than most available stone.
2. There is no appropriate historical solution.
3. The area is not in close proximity to historic steps.

All building stones should contact abutting stones. The step's top surface should be relatively flat, and stones should be set so they are flush with each other. All gaps should be chinked so that the result is a flat and level surface free of gaps or impediments.

Rise and run should be consistent over a span of steps. Risers should be 4 to 10 inches (ideally 6 or 8 inches), but should be the same for each step. Width may vary from staircase to staircase depending upon the trail's use and other factors, but should be no narrower than 2 feet. Runs should be even throughout the structure, a minimum of 1 foot (ideally 16 inches or greater). Flat "patio" areas (see Fig. 7-13) may be incorporated between steps, but runs of evenly spaced steps should be as long as the terrain allows so that hiking will be more natural.

The core under the steps is constructed as with other steps, according to the principles of core building for retaining walls (see Chapter 6). Proper height is achieved by constructing the blocking under each stone so that it holds the stone to the correct height; sometimes the stone must be put in and taken out a number of times for correct adjustment. Blocking should span the breadth of the stone, rather than supporting the step stones under just one or two points. Friction with abutting stones should not be depended on to keep stones from sinking or tilting; "pinch sets," which are hollow underneath, should never be used.

Riprap is always built in conjunction with a wall on each side, or natural features contacting the steps on each side to keep individual stones in place. Single-tiered walls should contain stones of substantial size (generally 2 cubic feet or greater) and set header-style to withstand movement, unless they are very large. Multi-tiered retaining walls should be constructed according to wall specifications (see Chapter 6). The top tier, which holds the riprap together, should be constructed of large stones leaning into the structure (2 cubic feet is ideal). In all cases, wall stones should contact each other, and contact the steps toward the top of the step stones for greatest integrity. Wall stones should also span the joints between riprap steps.

When riprap is constructed against the side of a hill, the hill-side of the structure should still be supported with a row of stones dug into the earth, to apply maximum pressure to the structure; this is often called a "false wall" because the stones are trapped between earth and the structure, and are therefore not really a retaining wall.

The first tier should be one or more large stones set at least 1 foot deep in the ground so that the top of the stone is flush with the original ground level. Sometimes the bottom tier is keyed behind a substantial lip in the ledge, or locked in behind a large extant stone, or is held with iron pins. The set of the first tier is of crucial importance to the integrity of the structure.

The front stones of each step are keyed behind and in contact with the rear stones of the step below. Front stones of the upper step should span the joints of the lower step, as in a retaining wall. Header-set stones may be as small as ½ cubic foot, or 1 cubic foot if cake-set. Both must be set a minimum of 4 inches behind the step in front, deeper if they are at the small end of the acceptable sizes. Toast sets can be used as front steps only if two-thirds of their height is below the step in front. They should be stones at least 1 cubic foot in size. Contact between front stones of a step should be within 1 inch of their tops, and toward the front of these stones. The face of each step should be within 1 inch of vertical in either direction, with little overhang or back-slope.

Rear stones may be set in any orientation. Ideally, they should break the joints of front stones, but this isn't as crucial as in other areas. They should be set at least 6 inches deep in the step, deeper if they are small. Stones with a very small stepping surface may be used if they are set deep into the step as "pegs."

All gaps should be fitted with the largest and deepest stones that will fit and be flush at the top. Small rocks should be packed and crushed into the remaining gaps until the step is smooth at the top and one continuous structure with very few gaps in its core.

ROUTINE MAINTENANCE

1. Create or maintain any drainage that protects the steps (see Chapter 4).
2. Any erosion at the bottom of stairs should be dealt with to prevent slippage. Slipped steps on which other steps are laid, most commonly bottom steps, should be reset as soon as possible to prevent a domino effect in which the entire staircase collapses.
3. Remove invasive vegetation from coping walls, retaining walls, and between steps. Otherwise, roots may separate the stonework.

ENDNOTES

36 Carl Demrow and David Salisbury, *The Complete Guide to Trail Building and Maintenance* (Boston: Appalachian Mountain Club Books, 1998), 135.

Fig. 8-1 Iron pins hold an overhanging boulder at Sieur de Monts Crag on the Emery Path (#15).

CHAPTER 8:
IRONWORK

CHAPTER 8: IRONWORK

Ironwork consists of pins, rungs, railings, ladders, and bridges that are drilled into stone. Iron enables rigorous hiking on cliffside trails and supports some of the finest stonework on the island. Without iron, many of the steepest trails would not be feasible. An abundance of ironwork is one of the many distinguishing characteristics of Acadia's trail system.

Iron was possibly introduced to the trail system in the late 1800s. Its use increased dramatically in the 1910s for the construction of VIA/VIS cliffside trails, such as the Beehive Trail (#7) and Precipice Trail (#11), and for the construction of memorial trails, such as the Emery Path (#15) and the Van Santvoord Trail (#450) (Fig. 8-1). The CCC also installed iron, but to a lesser degree. Much of the original VIA/VIS ironwork is still extant, although it is now nearly ninety years old. This ironwork requires careful inspection and, when necessary, replacement to ensure safety. In some locations additional iron has been added to provide greater assistance to hikers. Such additions are limited, however, so as to prevent hikers from climbing to heights beyond their abilities and to preserve the character of these climbs. Replacement iron and additions are distinguishable only upon close inspection. In concealed locations stainless steel pins are now used, which are compatible yet distinguishable from original iron.

DEFINITIONS

Ironwork as identified at Acadia is a constructed iron or steel trail feature, affixed to stone, for the purpose of either supporting structures or aiding hikers. It generally consists of rolled steel, though often it is square steel stock, angle iron, or any assorted pieces of steel. Ironwork includes the following components (Figs. 8-2 to 8-6):

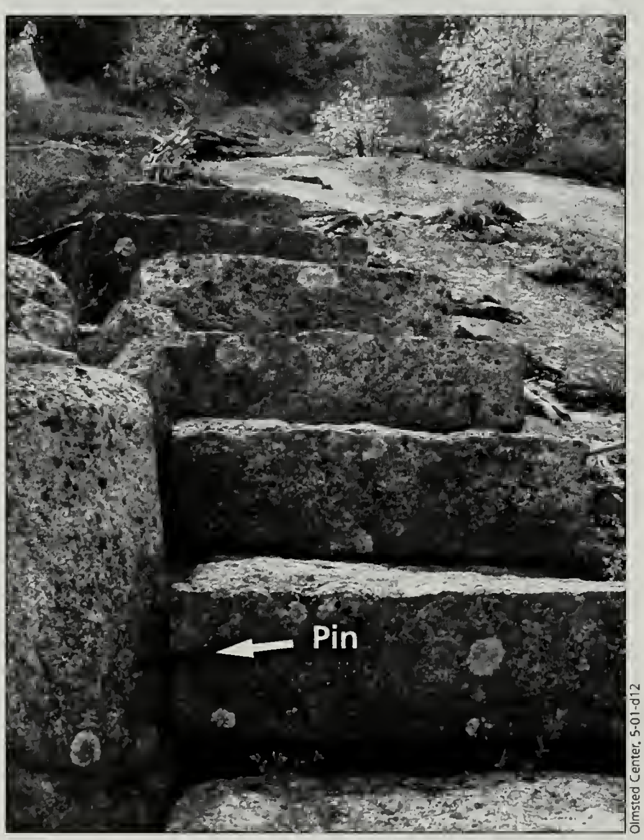


Fig. 8-2 Pin holding step on the Homans Path (#349).

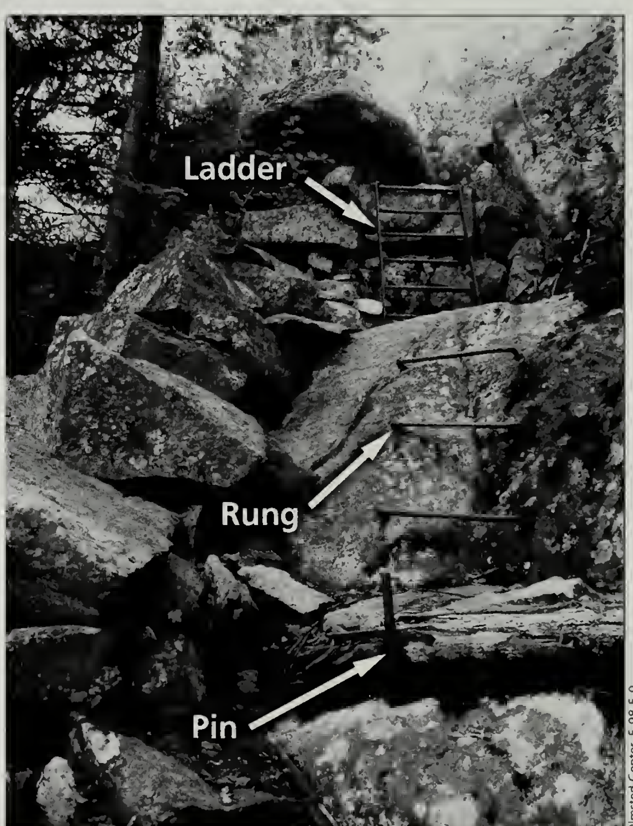


Fig. 8-3 Pinned log, rungs, and ladder on Perpendicular Trail (#119). A series of rungs as shown here may also be called a ladder.

A **pin** is any piece of solid iron or stainless steel used for fastening, holding, or supporting steps, wall, coping, overhanging boulders, bridge stringers, or any other constructed feature.

A **rung** is a foot perch, crosspiece of a ladder, or a handhold.

A **rail**, or **railing**, is generally rolled steel, extending from one point or support to another, that serves as a guard, barrier, handrail, or support. Some railings are supported on iron stanchions, which serve as posts. Railings are also constructed with galvanized pipe.

A **ladder** is a structure for climbing that consists of two sidepieces joined at intervals by crosspieces on which a hiker may step or hold. A series of ascending or descending rungs, without sidepieces, is also often described as a ladder.

An **iron bridge** is a series of bars, perpendicular to the tread and supported by angle iron, used to span gaps between ledges.

Olmsted Center. 8-97-25-17

Fig. 8-5 Rung handrails and ladder on the Ladder Trail (#64).

Olmsted Center. 8-95-8-15

Fig. 8-4 Railing supported on stanchions on the Orange and Black Path (#348).

Acadia Trails Crew. 4-99-50-7

Fig. 8-6 An iron bridge on the Beehive Trail (#7).

Iron pins are the most prevalent yet least visible ironwork on the trail system. Most pins are concealed below large coping stones, retaining walls, culvert headwalls, and on the sides of stone steps. Some are concealed above the trail where they hold overhanging boulders together, acting like iron staples. Other pins are visible where they anchor slab-laid steps onto ledges. Pins support signs, bridges, and iron and wooden railings. Some pins were probably used to anchor construction equipment. There are a various pins in the park marking pre-park boundaries. Instances of pins with absolutely no discernible purpose are also scattered throughout the park.

Iron rungs, rails, ladders, bridges, and pinned steps are used to aid hikers on steep rock ledges. In a few locations, including the Beehive Trail (#6), Cliff Path to Great Cave (#347), and the South and North Bubble Cliff Trail, (#451 & 459), iron bridges are used to span gaps between ledges. Ironwork on its own or in combination with stone or wood construction allows hikers to climb with relative security in areas that would otherwise require technical rock climbing gear, or sheer madness.

HISTORICAL USE OF IRON AT ACADIA

Pre-VIA/VIS

Iron was used across Mount Desert in the late 1800s. Ships tied to eyebolts or to piers of pinned granite blocks. Logs sluiced and drove through gauntlets of iron-pinned side dams, roll dams, and coffer dams. In 1883 the Green Mountain Railway climbed Cadillac on tracks anchored with hundreds of iron pins. Cyrus Hall's quarry employed hundreds of workers during the late 1800s, all of whom could have easily applied the skills of their trade to the growing trail system on Acadia. No documentation of ironwork on trails exists, however, until 1908.

Village Improvement Associations/Societies

Using iron on trails would have furthered the VIA/VIS purpose to enable "the public to climb with ease and delight in the steeps of Green Mountain, of Dry [Dorr] Mountain, of Newport, of Sargent's, of Kebo and several others." Although several trails dating to the 1890s do contain ironwork, it is undocumented as to when the ironwork was initially installed.

The Ladder Trail (#64), which was described as a new route in 1896, shown on the 1896 path map, and labeled on the 1901 path map, may be the first trail to use ironwork: "This latter [*sic*] path down the eastern slope of Dry is quite steep and needs to be followed with caution" (Fig. 8-7). It is possible its name was derived from the iron ladders used on the trail. The Goat Trail (#444) on Pemetic Mountain has a small amount of ironwork of varying types. It is mostly round iron, with a few square pieces, and primarily consists of rungs and step pinning (Figs. 8-8 & 8-9). The Shore Path (#427) along ledges near Seal Harbor (#427) and the Ingraham Rocks Path (#445), both shown on the 1896 path map, traversed the cliff tops and their initial construction likely included iron stanchions, iron railings, or iron bridges. Remnants of this ironwork, including a rod-and-turnbuckle anchor, are visible and definitively dated in a 1908 photo of a bridge along the path. Portions of these paths and their iron are still present today (Fig. 8-10).

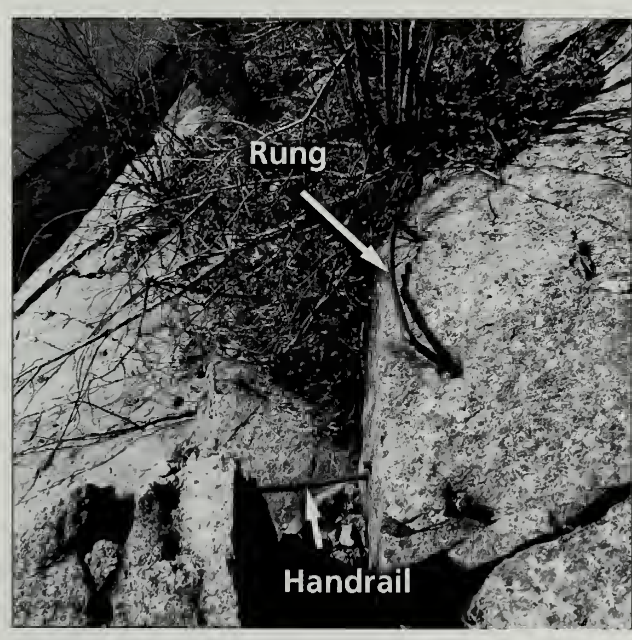
The installation of iron became more common in the early 1900s beginning with the supervision of Bar Harbor VIA Path Committee Chairman Rudolph Brunnow. Landscape Designer and Superintendent of Paths Andrew Liscomb, local masons, and laborers most likely carried out the actual work. Brunnow laid out some of the most challenging trails on the eastern side of the island, along the cliffs of Champlain Mountain, selecting routes that would be nearly impossible to ascend without the use of iron. Between 1913 and 1916, along the eastern cliffs of Champlain Mountain, the VIA/VIS installed extensive iron for pins, rungs, railings, ladders and bridges on the Precipice Trail (#11), the Beehive Trail (#7), the Cliff Path (#347), and the Orange and Black Path (#348). Ironwork was also used in the Brigham Trail (#366) when it was built in 1924–1925. On the Precipice Trail (#11), ironwork offered a novel climbing adventure up the cliff by rungs, rails, and ladders as described in the 1915 Path Guide

(Figs. 8-11 & 8-12). The 1928 Path Guide refers to a sign at the base of the trail: "Precipice Trail, which is steep and dizzy: for experienced climbers only." Long sections of iron handrails were installed along the most exposed sections of the trail. These were built in combination with a wooden bridge connecting two ledges (Fig. 8-13). The Beehive Trail (#7) contains extensive pins, rungs, rails, and a small iron bridge that spans two ledges (Figs. 8-14 & 8-15, also Fig. 8-6). On the Cliff Path (#347) iron supports stone paving over a ravine (Fig. 8-16). On the Orange and Black Path (#348) iron pins were set in the front center of each step to hold together a staircase (see Chapter 7, Fig. 7-22).

In the Sieur de Monts Spring area, on several memorial trails built under the direction of George Dorr, iron was used to achieve a different purpose: to create a highly crafted and easy-to-walk trail across rugged

Olmsted Center, 5-98-9-4

Fig. 8-7 Ladder on the Ladder Trail (#64).



Charlie Jacobi, Acadia NP, 5-99-57-1

Fig. 8-8 Rungs and handrail on Goat Trail (#444).

Charlie Jacobi, Acadia NP, 5-99-58-5

Fig. 8-9 Pipe railing along steps on Goat Trail (#444).

Olmsted Center, 6-97-15-33

Fig. 8-10 Iron railing with stanchions on Shore Path (#427) in 1999.

Herbert Gleason, Acadia NP Archives

Fig. 8-11 Rungs and handrails on Precipice Trail (#11), circa 1920.

Herbert Gleason, Acadia NP Archives

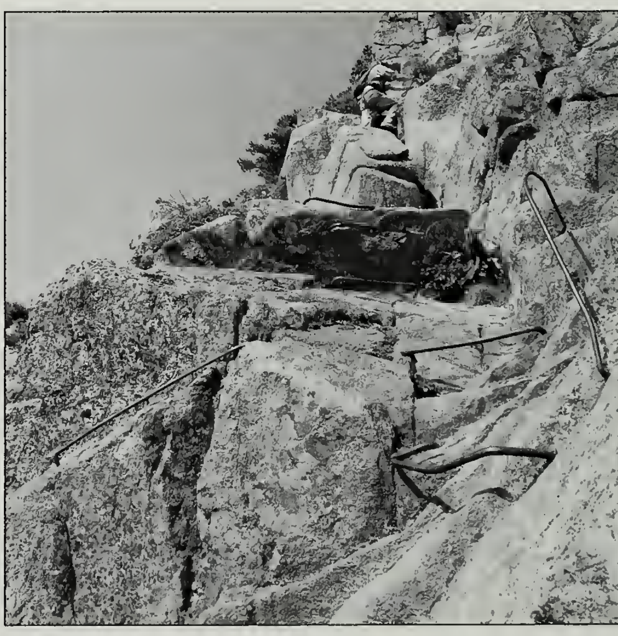
Fig. 8-12 Climbers ascend the Precipice Trail (#11) with the assistance of iron rungs, circa 1920.

David Goodrich

Fig. 8-13 A view in 1958 of the wooden bridge and iron handrail along the Precipice Trail (#11) ledges. The bridge was later destroyed by a rockslide.

Acadia Trails Crew, 4-99-50-18

Fig. 8-14 These pins on the Beehive Path (#7) are too long and can be seen by hikers on the trail.

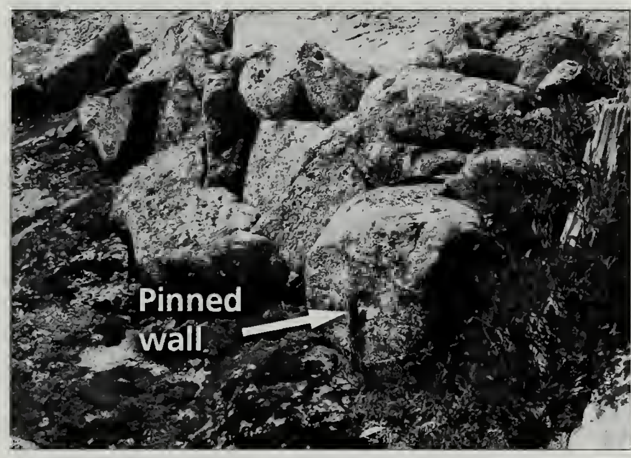


NPS HABS/HAER Photo. # ME 11-15

Fig. 8-15 Rungs and rails on the Beehive Trail (#7).

Acadia Trails Crew, 2001

Fig. 8-16 Side view of iron bridge surfaced with flat stones on the Cliff Path (#347).



Olmsted Center, 7-97-22-21

Fig. 8-17 The Beachcroft Path (#13) showing a low pinned retaining wall originally designed to hold gravel tread, which has been lost.

Olmsted Center, 5-99-9-25

Fig. 8-18 Pin supporting coping stone, not visible from the trail, on the Beachcroft Path (#13).

terrain. On the Beachcroft Path (#13), along steep sections and across ledges, iron pins hold many base and key rocks of laid and piled retaining walls, as well as many coping stones. This use of iron for walls is not found on earlier trails. Most of these pins are obscured from the hiker's view (Figs. 8-17 & 8-18). On the Homans Path (#349), completed in 1915, iron was used in only four locations to hold steps and coping sidewall (Fig. 8-19, also Fig. 8-2). (It is possible some of these pins are a later repair or alteration.) The Emery Path (#15), completed in 1916, contains extensive, concealed iron pins to support coping stones and walls, which are some of the highest trail walls at Acadia (Figs. 8-20 & 8-21). Pins were also used to hold retaining walls built with logs, which formed pinned log walkways (Fig. 8-22). A less common use of ironwork was to stabilize a large boulder above the path (see Fig. 8-1). It is interesting to note that in areas where iron was not used, the actions of gravity, erosion, and ice over the past one hundred years have altered the initial placement of many steps, wall rocks, and coping stones.

While the most extensive ironwork was carried out under the direction of Brunnow and Dorr, ironwork was also used by the Seal Harbor VIS for the memorial Van Santvoord Trail (#450), completed in 1915 under the direction of Path Committee Chairman Joseph Allen. Here, iron was used in a manner that anchors steps to ledge from behind as opposed to pinning them in front (Figs. 8-23 & 8-24). On the present NPS trail system, the Penobscot Mountain Trail (#47) had wooden steps over a short section of open ledge and pinned handrails in an area that is relatively safe and easy to traverse without these aids. Other examples of Seal Harbor VIS ironwork appear on the Jordan Cliffs Trail (#48), the Shore Path (#427), and the Goat Trail (#444).

When America entered World War I there was a lull in new feats of ironwork until circa 1926 when the Gurnee Path (#352) was built along Eden Street in Bar Harbor. Iron pins were used to support both wooden railings and many sections of laid retaining wall. In 1928, the South Bubble Cliff Trail (#451) was built by the Bar Harbor VIA or Seal Harbor VIS using log steps

Olmsted Center, 5-01-d13

Fig. 8-19 Pin supporting steps on the Homans Path (#349).

Acadia NP Archives

Fig. 8-20 Trail builders used iron pins to hold many coping stones along ledges and steep slopes, such as seen here on the Emery Path (#15) in a 1920 photo.

Olmsted Center, 8-97-23-12

Fig. 8-21 Contemporary view of Emery Path (#15) pins holding coping stones. In the foreground a stone has toppled over the ledge, leaving the pin exposed.

Acadia NP Archives

Fig. 8-22 A pinned retaining log on the Ladder Trail (#64) shown in the 1920s.

pinned to ledge. Comparable pinned log construction was used on the North Bubble Cliff Trail (#459) in 1929. Despite the addition of iron steps and rails in 1931, the dramatic South Bubble Cliff Trail was considered too dangerous by some hikers. The trail was not maintained during the 1940s and was eliminated by the NPS in the 1950s by removing some but not all of the iron. Skeletal traces of this marvelous example of the bygone trail system remain rusting and broken (Figs. 8-25 to 8-28).

Additional interesting ironwork from this same time period occurs on the southern portion of the Jordan Cliffs Trail (#48). This trail contains a few pinned logs and steps, one pinned wooden rail at a bridge, and less than a dozen hand rungs. There is also pre-1900 work on the nearby Bluff Path (#457) across the top of Jordan Bluff. Comparison in the field and research on maps and guidebooks implies that the work and the iron on Jordan Cliffs is part of a 1932 connection to the Sargent East Cliff Trail (northern end of Jordan Cliffs Trail, #48). It is quite different in style from the rudimentary steps and patio, and lack of iron, on the 1896 Bluff Path (#457).

Notably, there are highly crafted VIA/VIS routes that contain little or no ironwork. The Andrew Murray Young Path (#25) and Gorge Path (#28) have only a few pins that anchor stone pavement and wall. In the trail districts of both the Northeast Harbor VIS and Southwest Harbor VIA, there is no evidence of ironwork until the CCC era.

The VIA/VIS materials and methods for installing iron were essentially the same as the present methods (see "Specifications for Ironwork"). It is interesting to note that any material available was employed. Many pins were broken drill steels, old bolts, eyebolts in places where the "eye" was unnecessary, and of more than one diameter in the same general area. There are even instances of a square pins in use. It appears that the path builders were comfortable using whatever iron was available.

Ironwork was inspected annually by the VIA/VIS path committees. According to Frederic Weekes, path committee chairman for the Bar Harbor VIA from 1918 to 1923, each autumn iron railings and ladders on the cliff trails were given two coats of paint to prevent deterioration and rust during the winter.

Fig. 8-23 An unusual placement of pins holding steps on the Van Santvoord Trail (#450).

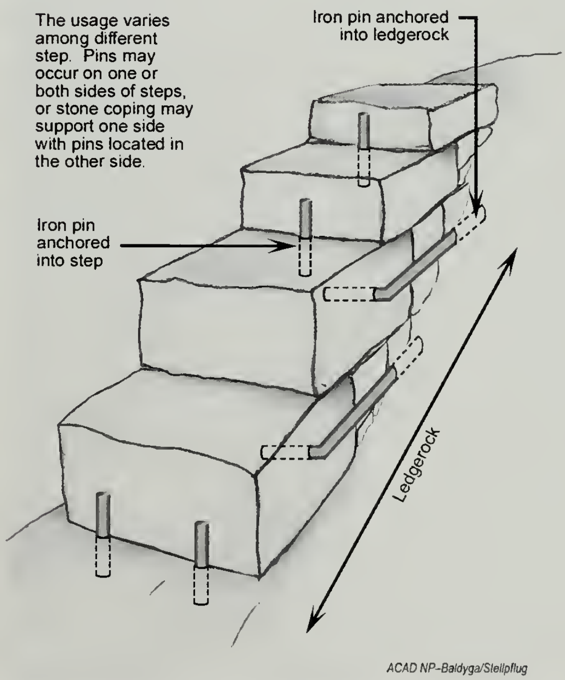


Fig. 8-24 Detail of various pin placements for stone steps.

Fig. 8-25 Climber using hand and foot rails on the South Bubble Cliff Trail (#451) in 1955.

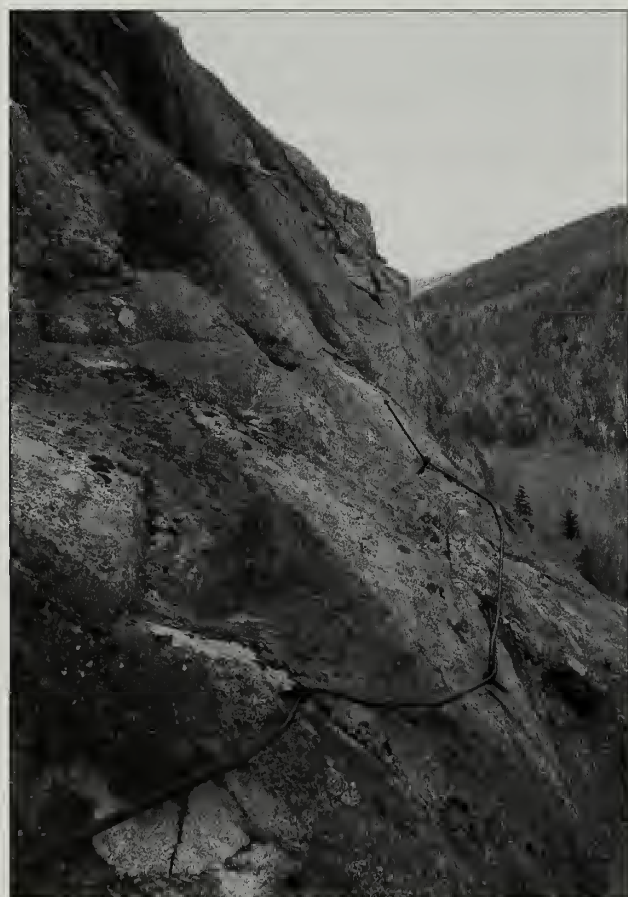


Fig. 8-26 Remnant railings on the South Bubble Cliff Trail (#451) in 1999.

Civilian Conservation Corps

Iron pins, rungs, and ladders were used extensively in some sections of trail built by the CCC in ways similar to the VIA/VIS. When the CCC installed ironwork, it was most often used in the areas of difficult terrain, such as steep grade or exposed ledge, in order to support structures and assist hikers. Written and photographic documentation of CCC ironwork has not yet been found, though ample physical evidence remains.

The CCC installed iron ladders on the Beech Cliff Ladder Trail (#106) in the 1930s. One rung and four different ladders guided hikers up the cliff face. For comparison, on the Brunnow trails of Champlain Mountain, ladders usually consisted of individual rungs in series. The Beech Cliff ladders, however, incorporated rolled steel crosspieces fitted and welded to angle iron sidepieces with 110 feet of ½-inch wire rope cable providing safety railing for hikers. This type of railing, with 2-inch square metal stanchions and eyebolts for support, is unique among Acadia's trails (Figs. 8-29 to 8-32).

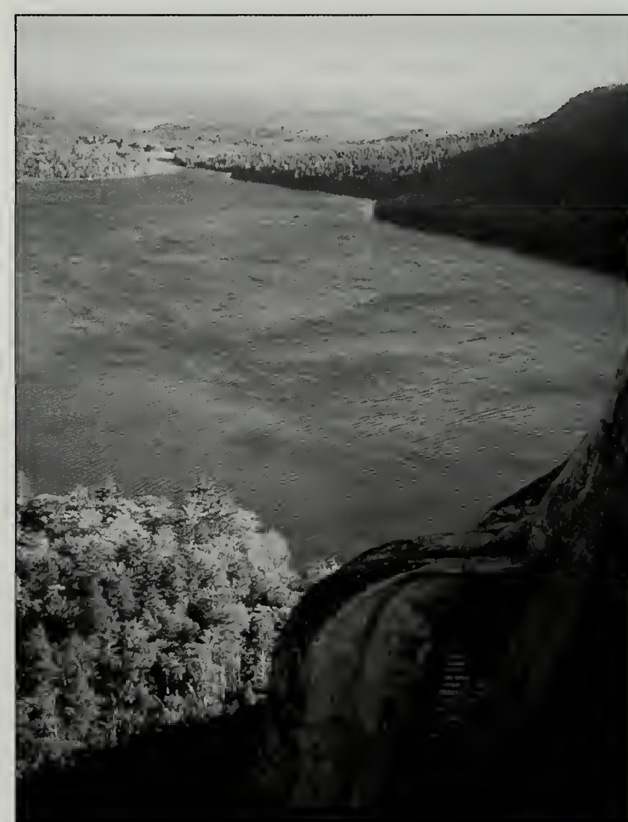


Fig. 8-27 Iron bridge across ledges on the South Bubble Cliff Trail (#451) in 1963.

It is interesting to note that the Ladder Trail (#64), which was heavily reworked by the CCC, incorporates two of the crosspiece/welded rung–style ladders as seen on Beech Cliff (Fig. 8-33). Likewise, the Perpendicular Trail (#119) climbs a short 4-foot ladder (see Fig. 8-3). This is an apparent CCC approach to ladders, as opposed to typical VIA/VIS rung ladders.

Charlie Jacobi, Acadia NP, 5-99-58-9

Fig. 8-28 Remnant iron bridge on the South Bubble Cliff Trail (#451) in 1999.

Olmsted Center, 6-97-13-30

Fig. 8-29 Ladder on the Beech Cliff Ladder Trail (#106).

Olmsted Center, 6-97-13-32

Fig. 8-30 End of rope cable on Beech Cliff Ladder Trail (#106).

Olmsted Center, 6-97-13-30

Fig. 8-31 Cable on stanchions on the Beech Cliff Ladder Trail (#106).

Olmsted Center, 6-97-13-33

Fig. 8-32 Fastener for ladder on the Beech Cliff Ladder Trail (#106).

On the Perpendicular Trail (#119), 160 feet of walled tread and switchback is secured with pins. Most of these are ½ inch diameter, and only 2 to 3 inches tall. They are barely discernible, with no detrimental effect on the overall view of the intricate stonework (Fig. 8-34). There are also pins throughout the Valley Cove section of Flying Mountain Trail (#105). One section, though, reveals a most remarkable use of iron in the form of a pinned rock walkway. This tread runs 60 feet across open ledge. Two dozen steps are secured in place with eighteen pins, with evidence of five to seven other pins rusted away. Perhaps these pins were not as visible when first installed. Possibly, vegetation in the area concealed these pins. With subsequent vegetation loss over the years, they are now highly visible (Fig. 8-35). In contrast to the extensive use of iron on some CCC trails, the highly crafted Valley Trail (#116) contains extensive walls and stonework steps with no ironwork.

Olmsted Center, 5-98-8-24

Fig. 8-33 Ladder on Ladder Trail (#64), a VIA trail, similar to the CCC type.

Two areas deserve special note as curious anomalies. First, along the Long Pond Trail (#118), a pinned log walkway exists, creating tread approximately 24 inches wide. It is so out of character with the 4-foot width of over 2 miles of this trail that this may be a later repair or alteration of a pinned retaining wall. Second, on the Perpendicular Trail (#119), a highly crafted trail

Olmsted Center, 5-98-4-23

Fig. 8-34 This section of coping and retaining wall along a staircase on the Perpendicular Trail (#119) is held in place with iron pins that are expertly hidden among the stone. It is typical of the type of ironwork used by the CCC on this trail.

Acadia Trails Crew, 5-99-23-14

Fig. 8-35 Increased pin visibility resulting from vegetation loss on the Flying Mountain Trail (#105).

with extensive stonework, there are very few rungs, a pinned log, and a short ladder (Fig. 8-36, also Fig. 8-3). Careful examination of this area suggests that steps may have been used, or at least planned for, since there are step-shaped blocks immediately to the side of the trail, stacked and indeed usable as steps. The ladder differs slightly from the original Beech Cliff ladders. The limited use of rungs on this trail, the possibility of steps set aside, and the difference in character from other CCC work suggest this iron was a later addition.

NPS/Mission 66

There is no record or evidence of Mission 66 using ironwork. However, improvements to the Lower Mountain Road in the early 1960s included the addition of galvanized pipe hand railings and iron rungs near the Park Loop Road.

National Park Service

NPS has continued to install and maintain ironwork. Most work involves the replacement of broken or rusted rungs or rails. New rungs are occasionally installed in areas that cannot be climbed without iron and where hiker safety is a concern. In some instance in the early 1980s, rungs were replaced with pre-made rungs of differing lengths. This accounts for some of the Precipice Trail (#11) rung ladders which contain various-length hand/footholds. Also, many rung placements show visible drill holes within a few inches of their present location. This serves as evidence of replacements, as drill holes normally cannot be reused. Again, on The Precipice, the safety rails near the wood bridge exhibit up to three holes, suggesting as many replacements over the years. In spite of replacements, many of the original rungs remain in the system.

The current iron ladders on the Beech Cliff Ladder Trail (#106) are replacements of the CCC originals. One ladder was replaced in 1976, the other three in 1984. The bracing is different from the original, and the second ladder up was lengthened due to erosion at its base, but in general the spirit and intent of the original trail has been followed.

In the 1980s, to cope with increasing sign vandalism, NPS crew began pinning both standard and log sign posts to ledge areas. A ¾-inch pin is run alongside the post, with a bolt through both pin and post (Fig. 8-37).

During the 1990s, new materials and methods of installation have been used by NPS crews. Stainless

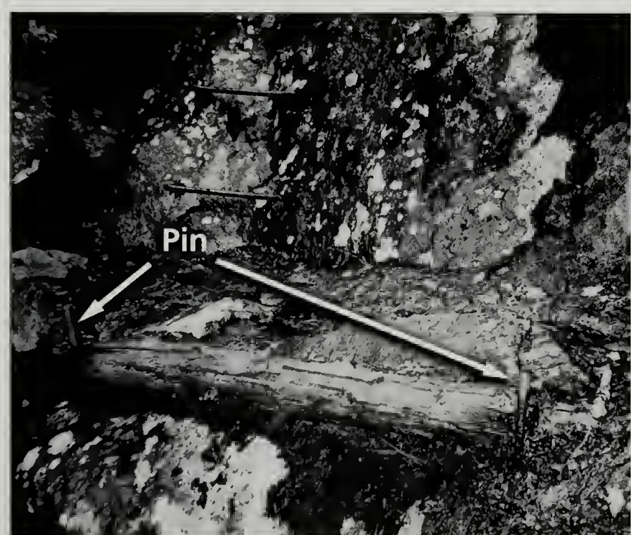


Fig. 8-36 Pinned log on the Perpendicular Trail (#119) (refer also to Fig. 8-3).

Fig. 8-37 Pinning technique used to deter sign vandalism on signpost at the Bear Brook Trail trailhead (#10).

steel pins were introduced on the Beachcroft Path (#13) to secure a wall foundation. These were used to differentiate new work from original pins and in hopes they would last longer. Ironwork was added to some traditionally iron-free areas. One rung was installed on the Parkman Mountain Trail (#59) and one on the Acadia Mountain Trail (#101), which was later removed. Several foot and hand rungs have been added to the Precipice Trail (#11). In some cases this has been in response to genuine concerns. Erosion may have altered conditions in such a way that rungs are a necessity. Additionally, the death of a hiker on the Beehive Trail (#7) in 2000 necessitated the addition of more rungs in one area to address visitor safety; this may happen elsewhere throughout the system. New methods of installation were developed, including the use of chemical cement to anchor ironwork, and bending the pin prior to insertion, with the pressure on the crimped pin providing the friction to hold it in place.

HISTORICAL CHARACTERISTICS OF IRONWORK
Pre-VIA/VIS (pre-1890)
There is no record of the use of ironwork prior to the VIA/VIS period.
VIA/VIS Period (1890–1937)
There was extensive use of iron pins, rungs, rails, ladders, and bridges on many, but not all highly crafted trails, particularly cliff trails. The iron was generally painted.
CCC Period (1933–42)
Iron pins, rungs, and ladders were used on sections of cliffside and pondside trails.
NPS/Mission 66 Period (1943–66)
There was no use of ironwork during this period.
NPS Period (1967–1997)
Rusted iron rungs and ladders were replaced. Additional ironwork included pins for wall repairs, pinning signposts to ledge, and new rungs and ladders for hiker safety and convenience. Stainless steel pins and chemical cements were introduced.

TREATMENT OF IRONWORK

1. Durability

Issue: Rust, rockfall, and areas of constant use affect the longevity of ironwork, particularly of rails, rungs, and stanchions. Historic records indicate the VIA/VIS painted iron to inhibit rust.

Treatment Guidelines: Some iron will require more frequent replacement due to rust, rockfalls, or high use. If a section of iron is damaged or destroyed by a rockfall, replacement ironwork should be placed outside of the rock fall line when possible, to reduce the likelihood of future damage. Changes in location should be documented. In certain areas, railing stanchions occasionally break due to stress or rockfall. Replacement of these stanchions should be considered part of the long-term maintenance program if alterations would greatly affect the appearance or experience of a given trail or trail section. Ironwork should not be painted. Many unpainted rungs have lasted over eighty years, suggesting the gain from painting is negligible. Deterioration is more prevalent in areas subject to seasonal water flow and moisture. If possible, ironwork should be placed in areas that remain relatively dry.

2. Size of Materials

Issue: Most extant ironwork is ¾-inch-diameter steel for rungs or rails; however, some historic iron used a smaller diameter.

Treatment Guidelines: For safety and longevity, replacement iron rungs and rails should be a minimum of ¾ inch diameter, which is sufficient to withstand stress.

3. Use of Stainless Steel

Issue: Stainless steel was not used historically on the trail system, but it offers a new solution to prevent deterioration by rust.

Treatment Guidelines: Because of its lack of historic authenticity, and its smooth surface that provides little friction for a grip, stainless is not presently recommended for use on highly visible and used features like ladders, rungs, and rails. Stainless steel pins may be used to support rock wall or coping where they are not visible and are not intended to be used directly by a hiker.

Additionally, stainless steel is slightly more brittle than iron, and may not hold up to the stresses of constant use on frequently used features. However, as it generally corrodes at a slower rate, stainless steel may indeed last longer than iron. Test applications of stainless should be implemented to document and study the long-term endurance and reliability of stainless steel.

4. Adding Rungs or Rails

Issue: The ease in which iron can be used to solve tread problems may preclude the use of less-intensive solutions, or cause overuse. Adding new iron rungs or rails for hiker convenience may affect the character of a trail or trail sections. Additions may also affect physical visitor experience. That is, a trail may become more easily traversed, and some of the thrill of a difficult section may be lost. Some of the feeling of climbing on natural surfaces may be compromised.

Treatment Guidelines: Iron should not be used as a panacea. Its use should be tied to what is appropriate to the individual trail, rather than simply adding rungs, rails, or pins where they were not used historically. For example, rungs should not be added to an eroded area of a woodland trail. Ironwork should not be installed under misguided attempts to make trails easier to traverse. This would include areas where there is only a slight drop-off along the tread, where tread width is safe and sufficient, or where there are several handhold options.

There are instances where a limited number of iron additions are necessary due to changes in terrain that result from a rockfall, where accidents have occurred, or there is a safety concern, such as a precipitous drop, limited tread width, or insufficient foot or handholds. Additions should be accomplished in a manner appropriate to the trail and the area so the visual character of the trail will not be affected.

5. Adding Pins

Issue: Pins are often used as a quick and easy solution for supporting structures such as retaining walls and wooden railings.

Treatment Guidelines: Pins may be added for the purpose of supporting structures such as retaining walls or wooden railings. Added pins should be hidden or disguised so as not to alter the appearance of the trail. In particular, added stainless steel pins should be well concealed. Additions should be documented.

6. Documentation

Issue: New ironwork is often difficult to distinguish from historical work. This may affect maintenance or inspection procedures, or future historical research.

Treatment Guidelines: The use of stainless steel pins distinguishes new work. In lieu of stainless steel, maintaining comprehensive documentation will suffice for differentiation between new and historical work. Historic pins should not be removed unless absolutely necessary.

SPECIFICATIONS FOR IRONWORK

1. Hole Depth

Ladders: Ladder supports, either for VIA/VIS trails or the CCC ladders, require a minimum 4-inch depth.

Pins: Pins supporting stonework require a minimum 2-inch depth.

Railing: Railing stanchions require a minimum 3-inch depth.

Rungs: Vertical or horizontal hand and foot rungs require a minimum 3-inch depth; 4 inches is suggested.

2. Hole Diameter

Bolts: For expansion bolts, follow the manufacturer's recommendation.

Cement: For chemical cements, allow at least ¼ inch larger diameter than metal to be used, and/or follow the manufacturer's recommendation.

Pins: For wedged or crimped pins, hole diameter is the same size as the metal to be used.

3. Materials

Ladders: Use 2-inch by 2-inch by ¼-inch side-pieces. An exception is on the Ladder Trail (#64), which uses 2-inch by ⅜-inch flat steel.

Pins: Default to ¾ inch diameter. Exceptions include areas where visible pin size and appearance should match surrounding work. Use cold-rolled steel where visible. Where not visible, stainless steel may be substituted for support of rock coping or wall.

Railings: Use ¾-inch-diameter cold-rolled steel. Exceptions include areas such as the Precipice rails where ¾-inch galvanized pipe is used, and Beech Cliffs where ½-inch-diameter cable is installed.

Rungs: Use ¾-inch-diameter cold-rolled steel in all instances.

Stanchions: Use ¾-inch cold-rolled steel, except on the Beech Cliff Ladder Trail (#106) which uses 2-inch-square steel stock.

4. Protruding Distance

Pins: Pins should protrude at a distance to match surrounding work. New pins should protrude as little as possible to perform their supporting function. Pin height for pinning stones should not exceed 6 inches unless this matches work in surrounding areas. Pin height to support wooden railings should be 6 inches minimum. Signpost supports require pins to protrude 12 to 14 inches above the surface. These pins are heated and flattened on their top 3 to 6 inches, and drilled to accept a ⅜-inch bolt for attachment to the signpost.

Rungs: Rungs should protrude at a distance to match surrounding work. This distance must be such that the rung safely and effectively works. Hikers must be able to grasp or stand on the rung.

Stanchions: Stanchions should range from approximately 30 inches high (Beech Cliff Ladder Trail, #106) to approximately 36 inches high (Precipice Trail, #11).

5. Method of Attachment (Figs. 8-38 to 8-41)

Cements: A hydraulic cement, such as brand name Waterplug, is now used successfully for sign pins. Further research and/or the test of time is necessary to establish the practicality of this method, especially for rungs or rails. Installation is in accordance with the manufacturer's instructions. Cement should not be used where visible. Small indentations or nicks should be filed or sawn into pin along the length that will be inserted in the hole. This will allow the cement to grip the pin.

Crimping: A pin is bent or crimped slightly, at approximately one-half the distance it will be inserted in the hole base. When inserted, this crimp causes enough pressure on the sides of the drilled hole to keep a pin in place. Crimping alone is unreliable for rungs and rails but may be used for pins. Rungs and rails should be installed with the traditional wedge method plus a slight crimp.

Expansion Bolts: Expansion bolts have not been used on trails. These may be used for anchoring non-historic features such as new ladder supports, hidden pins, or sign pins. Installation is in accordance with the manufacturer's instructions. Expansion bolts should not be used where visible.

Wedging: Using a hacksaw, a slit is cut 1½ inches up from the base of the rung along its axis. A small metal handle wedge is placed in this slit and inserted in the drilled hole. The rung is forcefully hammered into place. As the rung is hammered, the wedge is driven against the bottom of the hole. This forces the wedge to spread the base of the pin against the sides of the hole, causing friction to hold in the rung or pin.

Lead Wool: Lead wool is a matted gathering of thin strands of lead. It is similar in appearance to common steel wool. When packed tightly, the strands form an effective barrier against the intrusion of water. Small pinches of lead wool are wrapped around the inserted pin. Using a pin punch, the lead wool is packed into the gap between pin and rock. There is a sufficient amount when the wool is hard packed to approximately 1/8 inch above the rock surface. The final surface should be tamped smooth to form a watertight seal. Always use gloves during this operation, as lead is a toxic substance.

ROUTINE MAINTENANCE

1. Careful documentation of location of all ironwork is critical.
2. Inspect all coping stones, retaining walls, steps, and overhanging boulders that are supported by pins for shifting, rotating, or possibility of falling. Make sure rocks are stable and not loose.
3. Inspect all ironwork for corrosion and replace when it appears the work may fail.

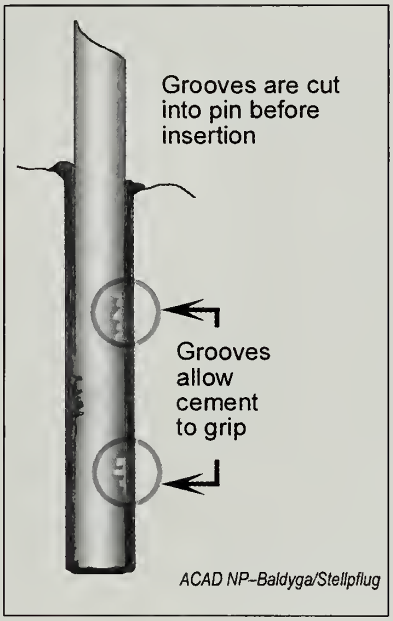


Fig. 8-38 Detail of iron attachment using chemical adhesive or hydraulic cement.

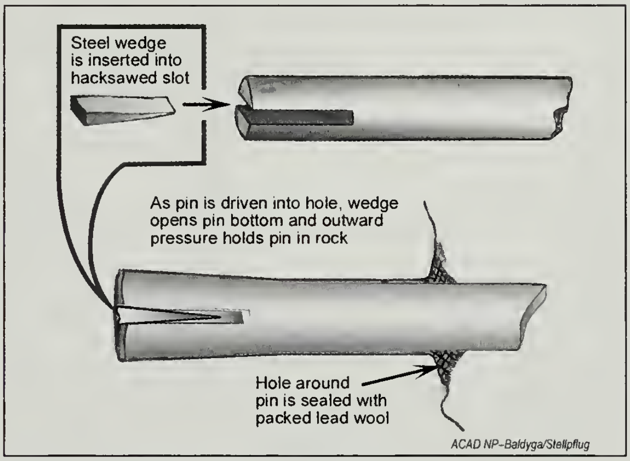


Fig. 8-40 Detail of iron attachment using wedges.

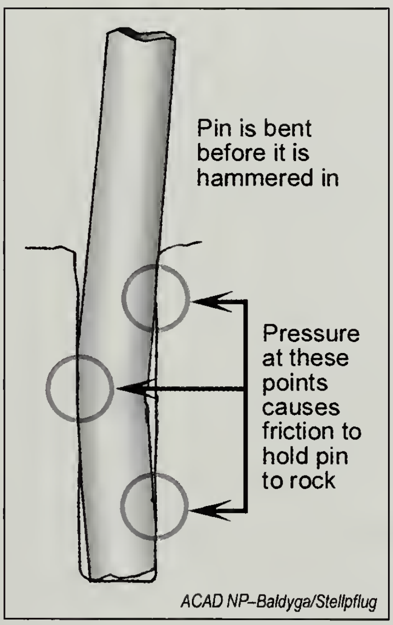


Fig. 8-39 Detail of iron attachment using bending or crimping.

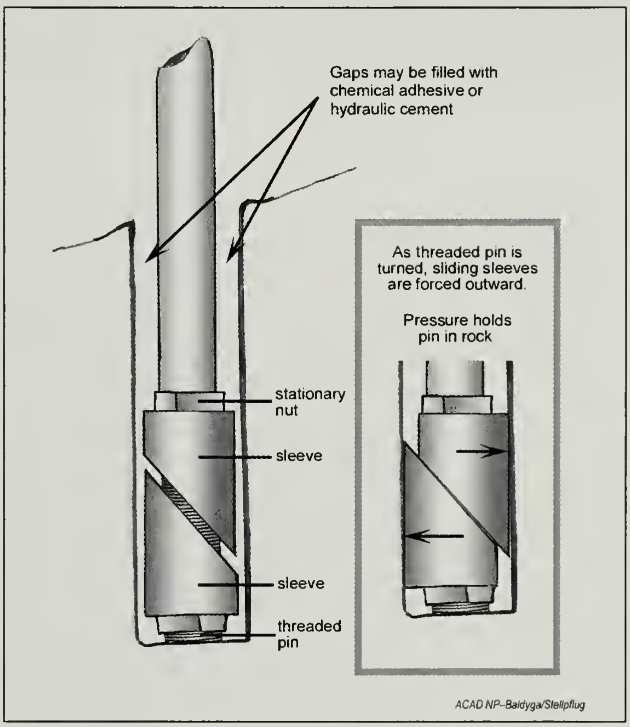


Fig. 8-41 Detail of iron attachment using expansion bolts.

4. Check yearly all rungs and rails. Ensure that the work will support body weight without bending. Tap with small hammer and listen for a clear ring. If a clear ring is not present, this may indicate deterioration of the iron. Find the cause and correct, or replace rungs.
5. Repack the lead wool as necessary.

Fig. 9-1 Directional signs, like these CCC signs shown in the 1930s possibly near Gilley Field, have always been major guidance features on the trail system at Acadia.

CHAPTER 9:
GUIDANCE

CHAPTER 9: GUIDANCE

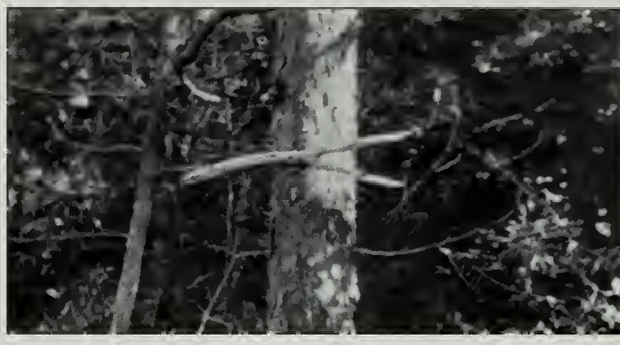
Guidance encompasses all markers, signs, symbols, constructed features, and information provided to direct hikers along the trail and to their destination. While a number of constructed features serve a secondary function of making the trail visible on the landscape, such as steps and stone pavement, this chapter deals only with features specifically designed to provide guidance. Six categories of guidance features are used at Acadia.

A. Blazes
B. Cairns
C. Directional Signs
D. Informational Signs
E. Scree
F. Wooden Railings and Fences
G. Trail Names

For Acadia's trails, guidance features were described as early as 1855, though it was not until the 1890s that the VIA/VIS developed an island-wide system for marking trails. The VIA/VIS Joint Path Committee issued standards for the four districts, which were followed until the 1930s when the CCC took over responsibility for trail signs within the park (Fig. 9-1). Since that time, the CCC signs have been continually replaced and updated, first during the NPS Mission 66 period and again by the NPS Trails Program.

Remnant Bates-style cairns within the park and signs posted on the Northeast Harbor VIS trails outside the park retain the characteristics of the VIA/VIS era. Short runs of steps constructed to help guide the hiker still remain (see Chapter 7, Historical Use). Most historical guidance features, however, have long since disappeared. Many features were removed as Acadia management made incremental style changes to signage. As signs deteriorated, they were often replaced with a new style. Bates-style cairns were removed and/or not maintained by trails crews and hikers alike. Blazes have weathered beyond recognition, and vandalism to signs, cairns, and blazes has continued to be a problem since the 1890s.

Loss of signs and change of trail names have created confusion over the years. These treatment guidelines provide standards for blazing, cairns, signage, and trail names.



Peabody & Grandgent, Path Guide, 1928

Fig. 9-2 VIA/VIS pointer on tree indicating trail route, illustrated in the 1928 path guide.

Peabody & Grandgent, Path Guide, 1928

Fig. 9-3 These wooden signs and pointers were early forms of trail guidance recommended by Waldron Bates.

Olmsted Center, 8-95-9-13

Fig. 9-4 VIA/VIS metal marker, approximately 4 inches square, painted red, on the Green and Black Path (#358), origin unknown.

A. BLAZES

DEFINITION

A **blaze** is a mark used to identify a trail and reassure hikers that they are following the route. Blazes may be markers nailed onto trees or marks painted onto ledgerock and/or trees. At Acadia, the most recent style of blazing is the use of blue painted rectangular marks, approximately 1½ by 4 inches in size.

HISTORICAL USE OF BLAZES AT ACADIA

Pre-VIA/VIS

In the 1880s, Clara B. Martin's guidebooks suggest that most hikers simply followed the "beaten" paths. However, in 1885 she describes three trails radiating from Northeast Harbor, up Sargent Mountain, up Asticou Hill, and to Jordan Pond, that were marked with red arrows and blazes.

Village Improvement Associations/Societies

Beginning in the 1890s the Bar Harbor VIA used arrows and pointers to mark the trail route. Painted blazes were used only on the colored path system on Champlain and Gorham Mountains.


Olmsted Center, 8-95-9-9

Fig. 9-5 VIA/VIS metal marker, approximately 4 inches square, painted half green and half black, on the Green and Black Path (#358), origin unknown.

> The paths and trails are marked at their entrances and crossings by signs suitably inscribed; by cairns, i.e., piles of stones along the open rocks and ledges; by rustic arrows and pointers in the woods, or by colors painted on trees and rocks as around Newport [Champlain] Mountain.[37]

Arrows were straight branches, with tapered ends, nailed to trees to indicate trail direction (Figs. 9-2 & 9-3). Specifications for pointers were described in 1906 by Waldron Bates, BHVIA path committee chairman from 1900 to 1909:

> Cut the pointers from hard-wood trees, maple by preference, large, with blunt ends back and front, and with the back part forked, and so place them that no part of a pointer shall be nearer the ground than 6 ft. 6 in....
>
> Before putting up a sign or a pointer, consider the situation from all sides.
>
> Where there is a sharp turn in a path, put up two pointers on the same tree or build three cairns.
>
> Where paths meet or cross in the woods, put up a pointer or a sign for each diverging path, usually all on the same tree, and another pointer on each path on nearby trees....
>
> Where the [BHVIA] Association paths cross or meet wood roads or paths not shown on the Path Map, define the Association paths very clearly and put up extra pointers.[38]

Blazing the colored path system at Champlain and Gorham Mountains was the work of Herbert Jaques, BHVIA path committee chairman between 1893 and 1900. Colored arrows and rings on the trees corresponded to the name of the trail, such as the Black Path (currently the Bear Brook Trail, #10). The colored paths on Champlain Mountain were also marked with small metal blazes fastened to trees (Figs. 9-4 & 9-5). It is not known when these were initially used, but there are still metal blazes on the abandoned Green and Black Path (#358). They are 3 inches square and are striped green and black to correspond with the trail name. During the historic period, maps mounted on trees at trailheads provided a diagram of the colored path routes and destinations.

Civilian Conservation Corps

No documentation has been found for the use of blazing by the CCC.

NPS/Mission 66

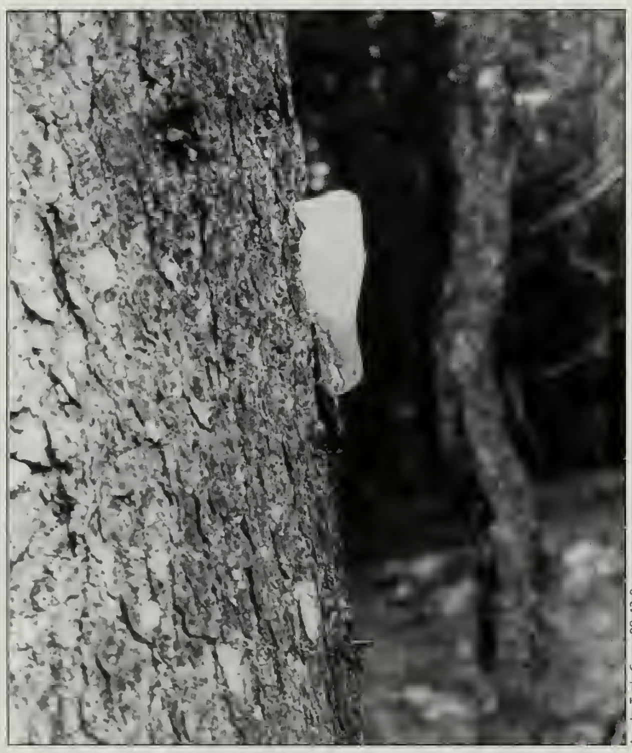
No documentation has been found for the use of blazing during the Mission 66 era.

National Park Service

In the late 1960s and early 1970s, most wooded areas were marked with 3-inch-square metal blazes, all deep reddish orange in color. Ledge areas were marked with cairns. Remnants of an earlier marking system of large orange painted arrows was still evident in a few areas of the park. (It is unknown when these were first introduced.) There were perhaps a dozen arrows, of varying length and size, scattered and extremely faded. For example, on the Bear Brook Trail (#10) a large arrow pointed east with painted text "to the White Path."

During the mid-1970s, new orange paint blazes were introduced and blazing with metal tags was discontinued. By the late 1970s, metal blazes were completely removed from the marked trails (except for a few overlooked examples). In the mid-1970s, however, some trails were marked with bird-shaped metal blazes, approximately 4 inches long (Fig. 9-6). These blazes were difficult and time consuming to cut, and their use was discontinued in 1977, though a few still remain in the trail system. Within the Acadia National Park land on Schoodic Peninsula, some bird-shaped blazes also remain on open trails.

In the 1970s there were increasing numbers of hikers, subsequently increasing the need for trail guidance. Since the size of the park trails crew was insufficient to maintain a comprehensive system of cairns, standardized painted blazes were introduced. A few orange painted blazes still remained, so orange was chosen as the color for new blazes. In 1974 and 1975, 4-inch-long orange arrows were applied at various locations in the park. These included summits, intersections, and confusing areas. Application of the stenciled arrows was labor intensive, so the 1½- by 4-inch rectangular blaze was adopted. By the mid-1980s the entire NPS system



Acadia Trails Crew, 99-42-9

Fig. 9-6 Bird-shaped metal marker on the Ledge Trail (#103).

Acadia Trails Crew, 5-99-42-10

Fig. 9-7 This blue painted blaze on the Ledge Trail (#103) is curved to indicate a turn in the trail. Most trail blazes are rectangular.

on Mount Desert Island was marked with orange rectangular blazes. Cairns were only used on a few trails.

The orange blazes, however, were considered too intrusive by some, so in the early 1990s an AMC study group recommended a change in blaze color. Acadia trails foreman Don Beal painted a stone with several test colors, and a committee chose sky blue as the blaze color that was most pleasing to the eye, the least intrusive, and was still easily spotted from a distance. Throughout the 1990s, the system of orange rectangular paint blazes was replaced with blue blazes (Fig. 9-7).

The 1990s also saw a reintroduction of the square metal blazes for a short time. The original metal blazes had been nailed to trees, but the new blazes were installed in trees by cleaving a slot with an axe and inserting the blaze. To date, these blazes are extant on quite a few trails, though their maintenance and use has been discontinued.

HISTORICAL CHARACTERISTICS OF BLAZES
Pre-VIA/VIS (pre-1890)
Some trails were marked with red arrows and blazes.
VIA/VIS Period (1890–1937)
Colored paths on Champlain and Gorham Mountains were marked with painted arrows, tree rings, and painted metal blazes.
CCC Period (1933–42)
No documentation for the use of blazes has been found.
NPS/Mission 66 Period (1943–66)
No documentation for the use of blazes has been found.
NPS Period (1967–1997)
Sporadic remnant orange arrow blazes, then rectangular paint blazes were used throughout the system. The use of metal blazes was discontinued, reinstated, then discontinued again. Eventually, blue paint blazes became standard for all trails.

TREATMENT

1. Excessive Blazing

Issue: Excessive paint blazes have been applied to some trails. Additionally, blazing has been used on steps, stone paving, rungs, and coping stones.

Treatment Guidelines: Paint should be applied according to the specifications outlined in this document. Paint should never be used on trail sections with steps, stone paving, rungs, coping stones, or otherwise clearly delineated tread, particularly on the memorial and endowed VIA/VIS trails. In such sections, blazing is not needed and detracts from trail character.

2. Metal Blazes

Issue: Metal blazes nailed to trees may be hazardous to hikers and potentially damaging to trees. Metal blazes in the shape of birds are difficult to produce.

Treatment Guidelines: The practice of using metal blazes, including bird-shaped tags, should not be reinstated.

3. Natural Resource Protection

Issue: Some hikers are troubled with the aesthetics of blazes, the visual intrusion of unnatural markers into the landscape, and the introduction of chemicals (paint) into the environment.

Treatment Guidelines: Due to the large number of hikers at Acadia, the average hiker's skill level, and the challenge of some trails, the trails need to be clearly marked. Cairns are often difficult to maintain, especially in wooded areas. Many hikers also object to the aesthetic appearance and the resultant resource damage of cairn building. Blazes have historic precedent at the park, can be relatively unobtrusive if used sparingly, and are considered an acceptable and appropriate method for marking trail routes at Acadia. Chemical intrusion in the environment can be minimized through careful training of trail blazers and following recommended application techniques developed in consultation with natural resource staff.

4. Colored Path System

Issue: Reinstating the historical use of various colored blazes for the colored path system on Champlain and Gorham Mountains, devised by Herbert Jaques in the 1890s, is inconsistent with the current system-wide approach of uniform blue blazes.

Treatment Guidelines: Due to the high volume of use of trails across the island, consistency and clear guidance are essential. Thus, one system and standard of blazing is recommended. However, as stated above, blazes should be used with restraint. The history of the colored path system should be interpreted through trail naming and signage (information is provided later in this chapter).

5. Ineffective Blazes

Issue: Blazes are often difficult to see, or are covered with snow. Their function is not apparent to some new hikers.

Treatment Guidelines: In wooded areas, blazes should be placed on trees. On ledges, blazes should be supplemented with cairns. Information on trail blazing at Acadia should be provided to hikers at trailhead signs and on park maps.

SPECIFICATIONS FOR BLAZES

Following are general specifications for the location and installation of paint blazes at Acadia. For further information on blazing in general, it is strongly recommended that trail workers read through, understand, and follow the guidelines established in *The AMC Complete Guide to Trail Building and Trail Maintenance,* 1998, pages 77–85. It provides an excellent summary of blazing.

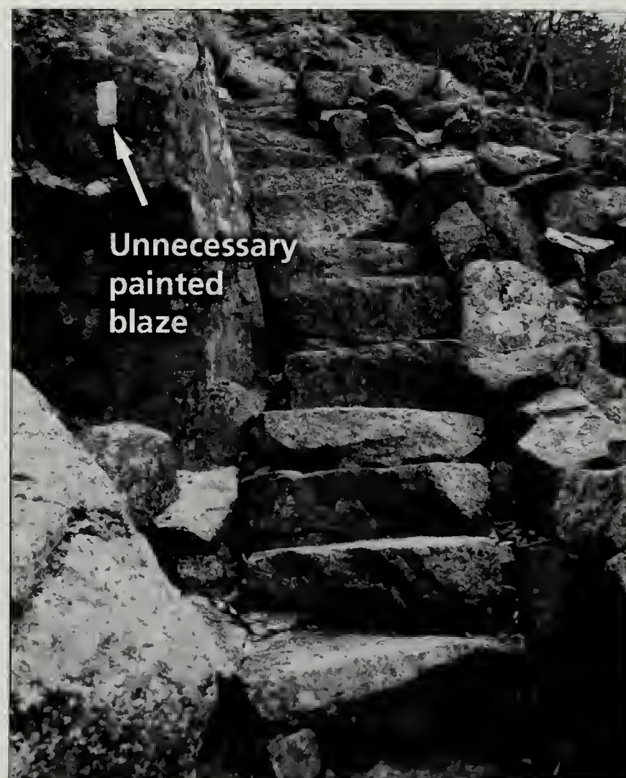
1. Paint Color

A uniform sky blue color should be used within park boundaries. The paint currently used is Interlux Brightside Polyurethane, Medium Blue #4353. This paint, or a comparable mixture, should continue to be used for blazing.

2. General Location

As a general rule, trail sections with historic construction features that adequately mark the route, such as steps, stairs, stone paving, or rungs, should not be blazed (Fig. 9-8). There are some exceptions to this rule. In certain areas, such as the tumbledown on The Precipice, constructed tread is almost indistinguishable from the surrounding area, and this presents many options for hikers to stray from the trail. Areas such as these should be paint blazed, using extreme care not to over-blaze. In other instances, constructed tread is in such a state of disrepair so as to make it difficult to follow the correct path. These areas, too, can be carefully blazed until rehabilitation efforts more correctly define the corridor. All trails with unconstructed tread should be blazed to direct and reassure hikers, and to uniformly mark the trail system.

The character of the trail is a deciding factor in determining blaze frequency. In general, the frequency of blazes increases in area where the tread is hard to discern or follow. This would include sections cross-



Olmsted Center, 5-98-4-21

Fig. 9-8 This paint blaze located adjacent to a stone staircase on the Perpendicular Trail (#119) is unnecessary since steps and coping stones clearly delineate the trail route.

ing old wood roads, social trails, sharp turns, and areas where natural conditions create false trails. Care should be taken to avoid excessive blazing.

The best rule of thumb is that a hiker should never walk out of sight of a blaze either behind or ahead. Depending on the terrain, this could be as far as a few hundred feet to as little as 20 feet. From *The AMC Complete Guide to Trail Building and Trail Maintenance,* 1998: "Do not fail to mark a trail because you think no one could possibly get lost in that area.... Trail marking is for the benefit of one who is unfamiliar with the trail...hikers, many with little experience...will rely on your blazes."

3. Application

Blazes should be applied in one direction at a time. Finish a trail in one direction, then mark the trail in the other direction. This ensures the best placement of blazes.

Use a wire brush to prepare stone surfaces and trees. Trees shall be wirebrushed, wiped with a dry rag (especially white birch), or scraped. Do not scrape through the bark on any tree.

Blazes shall be rectangular marks 1 to 2 inches wide by 4 inches long. The length should run parallel to the treadway. No other types of marks should be used.

Apply the paint with a small brush 1 to 2 inches wide.

ROUTINE MAINTENANCE

1. Paint blazes should be inspected yearly and/or when hikers complain about trail legibility.
2. Whenever blazes have faded or deteriorated to the point of being difficult to identify, the entire trail should be reblazed. "Spot" blazing should be avoided, as this would present a non-uniform marking system on any given trail.
3. Vegetation that is obscuring blazes should be trimmed, or the blaze completely removed and relocated, if possible.

B. CAIRNS

DEFINITIONS

A **cairn** is a stone or a stone structure used as a trail marker. Cairns are used extensively on trails crossing the mountain summits, where the exposed ledgerock often leaves no location for sign placement, and painted blazes are easily missed or obscured. Additionally, cairns are especially important in locations such as summits where fog or snow can interfere with a hiker's ability to follow a trail; cairns are often easier to locate than blazes.

Piled cairns are a historic Acadia style of cairns that consist of randomly constructed stone piles used to mark the trail.

Bates-style cairns are a historic Acadia style of cairn dating from Waldron Bates's chairmanship of the Bar Harbor VIA. They are constructed of two base stones set apart with a lintel across them, creating an opening in the direction of the trail, and topped by a pointer stone (Figs. 9-13 & 9-23) . Some Bates-style cairns consist of two or more tiers constructed in this manner (Fig. 9-9).

Stacked cairns are a historic Acadia style of cairn consisting of stacked stones of diminishing size, from largest on bottom to smallest on top (Figs. 9-10 & 9-18).

Olmsted Center, 4-99-s

Fig. 9-9 Bates-style cairn at the summit of Eliot Mountain, on the Asticou Ridge Trail (#520).

Conical cairns consist of tiers of circular, battered (in-sloped) walls that form a "cone" (Fig. 9-24) This type of cairn is the most substantial and solid of the cairn types, and is the standard used by the AMC. However, there is no evidence of its early historical use at Acadia. Use of conical cairns likely began in the 1970s and continued through the 1990s.

Upright single stones are large individual stones or boulders standing on end and acting as cairns (Fig. 9-12). They were used historically at Acadia.

HISTORICAL USE AT ACADIA

Pre-VIA/VIS

The first description of a stone trail marker dates to 1855 when Charles Tracy noted a "sat up" boulder (an upright single stone) and pile of stones on the summit of Sargent Mountain (Figs. 9-11 & 9-12). Benjamin F. DeCosta's 1871 guidebook indicates that the Bear Brook Trail (#10) (originally called the Path up Newport Mountain) was marked with piles of stones.

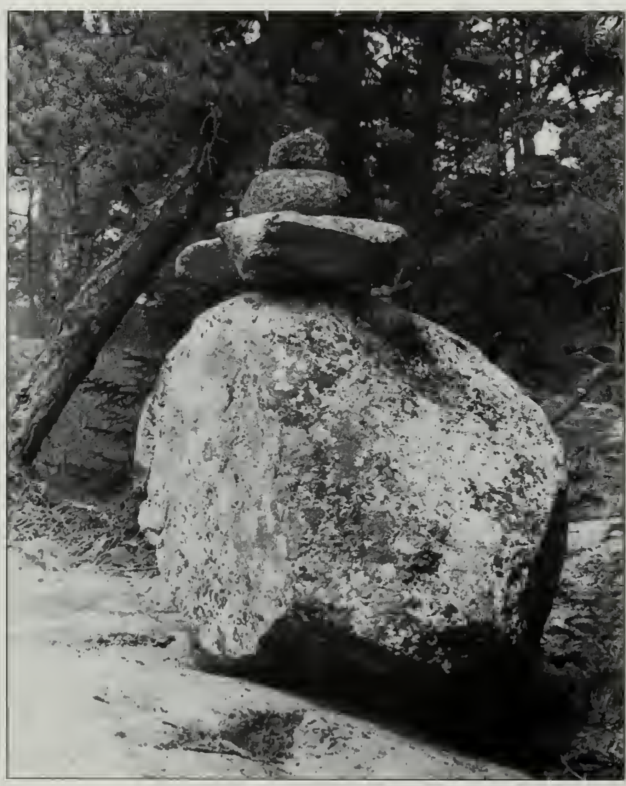


Fig. 9-10 Stacked cairn on the Ledge Trail (#103) with a large boulder used as the base.

Village Improvement Associations/Societies

Beginning in 1890 the Bar Harbor VIA marked trails with signs, arrows, pointers, cairns, maps, and regulatory signs. Cairns were used along the open ledgerock. Specifications for cairns were described in 1906 by Waldron Bates, Bar Harbor VIA path committee chairman from 1900 to 1909 (Figs. 9-13 & 9-23).

> Build the cairns as shown in the accompanying diagram pictures: two large stones with an opening between in line with the direction of the path, across one flat stone, and on top of this one long stone in line with the direction of the path. Use large stones and set them firmly in place....
>
> Where there is a sharp turn in a path, put up two pointers on the same tree or build three cairns....
>
> Where paths meet or cross on ledges, build a large pile of stones at the intersection and place a cairn on each diverging path about ten feet from the pile of stones....[39]

Cairns were used extensively on some ledge trails; however, construction varied. Many cairns constructed under Bates are still extant. On the mountain summits, piles of stones, first described in 1855, have continued to grow to large mounds (Figs. 9-15 to 9-22).

Fig. 9-11 This 1907 view, possibly located near Jordan Bluffs, shows two early cairn styles. The large upright stone may be the first style of cairn to mark recreational walking routes. In 1855, Charles Tracy described a "sat-up" boulder on the summit of Sargent. The smaller Bates-style cairn represents an early VIA/VIS style of cairn building.

Olmsted Center, 5-98-9-17

Fig. 9-12 A "sat-up" or upright stone marking the trail across exposed ledge rock on the Dorr Mountain East Face Trail (Emery Path/Schiff Path, #15).

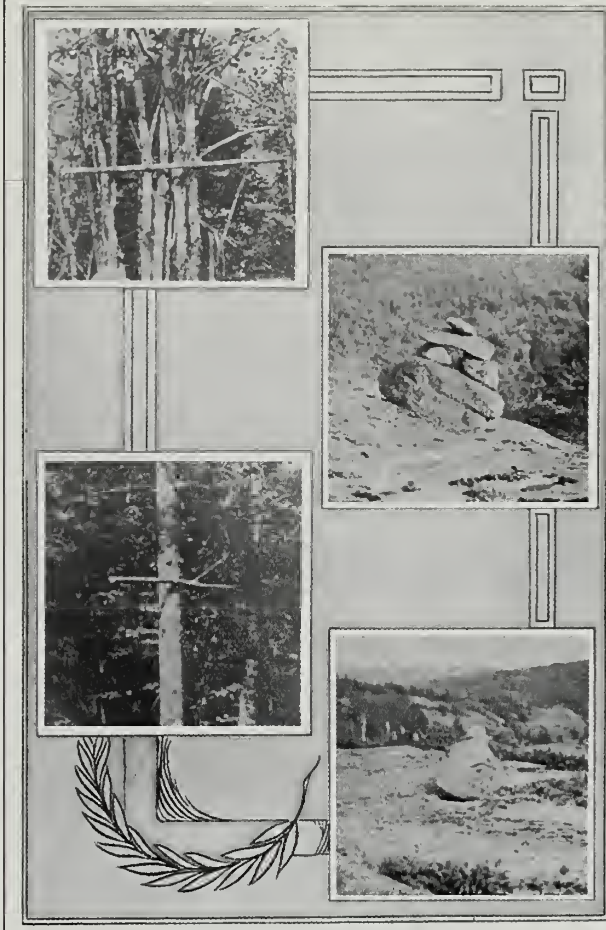
EXAMPLE OF CAIRNS IN THE WOODS
CADILLAC CLIFFS PATH

Bar Harbor VIA Annual Report, 1906

Fig. 9-13 Cairn included in Waldron Bates 1906 General Instructions for Work on Paths in the 1906 Bar Harbor VIA Annual Report.

Maine Historic Preservation Commission, Dana Family Collection

Fig. 9-14 Stone cairn with large upright stone on the Seaside Path, circa 1910.



RUSTIC ARROWS AND CAIRNS

VIS Path Guide, 1915

Fig. 9-15 Early images of trail markers and cairns illustrated in the 1915 path guide.

Olmsted Center, 8-95-6-20A

Fig. 9-16 Large cairn on the Potholes Path (#342) photographed in 1995.

Maine Historic Preservation Commission, Dana Family Collection, 97-10-12

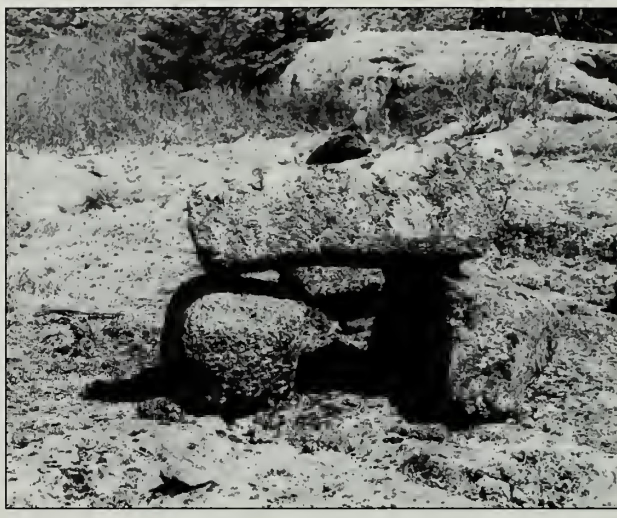
Fig. 9-17 A 1906 photo of a small Bates-style cairn, exact location unknown, but most likely near Seal Harbor.

Charlie Jacobi, Acadia NP, 5-99-60-7

Fig. 9-18 VIA/VIS stacked cairn on the Van Santvoord Trail (#450).

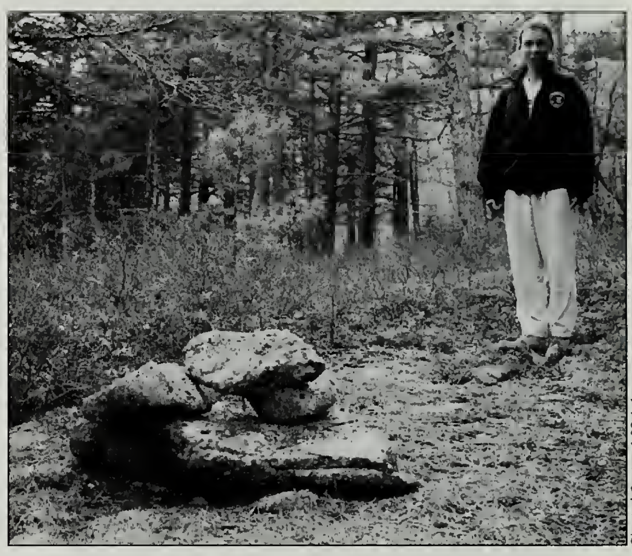
Acadia Trails Crew, 5-99-39-23

Fig. 9-19 This Bates-style cairn on the Sargent Mountain South Ridge Trail (#52) in 1999 may have survived in this open location because of its extra large lintel stone.



Charlie Jacobi, Acadia NP, 5-99-60-5

Fig. 9-20 Bates-style cairn on the Van Santvoord Trail (#450).



Olmsted Center, 4-98-1-4

Fig. 9-21 Bates-style cairn on the Potholes to Eagles Crag Trail (#343).

Acadia Trails Crew, 5-99-43-17

Fig. 9-22 A large pile of stones marking the summit of Dorr Mountain.

Civilian Conservation Corps
No documentation has been found relating to cairn use by the CCC.

NPS/Mission 66
No documentation has been found relating to cairn use by the NPS during the Mission 66 era.

National Park Service
Although initially the NPS repaired and installed cairns on mountain ridges, ledges, and in some wooded areas, over the years cairn use was altered. Many historical cairns were dismantled on abandoned trails to discourage hikers from using those routes. The Bates-style cairn was considered too vulnerable to vandalism, leading the trails crew to discontinue its use in the 1970s, when they began building conical cairns. By the early 1980s, disheartened by the speed with which cairns were being vandalized, Gary Stellpflug discontinued cairn building altogether in favor of blazes. Blazing became the primary mode of marking ledge trails. In the early 1990s, the trails crew began using the conical cairn and it became the standard type of cairn used in the park. Beginning in 2000, in response to rapid degradation of summit ecosystems by wandering hikers, a substantial program of cairn building that focused on mountain ridges was begun by Acadia Resource Management. The Acadia Ridge Runners began constructing new cairns to direct traffic over sensitive summit areas. In 2002 the Ridge Runners began building new Bates-style cairns. At the time of this document, the overall success of the program, as well as the relative success of the two cairn types, has not been determined.

HISTORICAL CHARACTERISTICS OF CAIRNS
Pre-VIA/VIS (pre-1890)
Two types of cairns were used: piles of stones and upright single stones.
VIA/VIS Period (1890–1937)
Four types of cairns were used: Bates-style cairns, stacked cairns, piled cairns (typically on summits), and upright single stones.
CCC Period (1933–42)
No documentation has been found for the style of cairns used.
NPS/Mission 66 Period (1943–66)
No documentation has been found for the style of cairns used.
NPS Period (1967–1997)
Paint blazing was introduced to mark ledge areas. Conical cairns were introduced and used to replace Bates-style cairns. Many Bates-style cairns were dismantled on abandoned trails. Bates-style cairns were reintroduced in 2002.

TREATMENT

1. Bates-Style Cairns versus Conical Cairns
Issue: Historically, the Bates-style cairn was the most widely used kind of trail marker, at least on trails on the eastern side of Mount Desert Island. These cairns are also the easiest to build, provided an adequate number of suitably sized and shaped stones can be found (see "Specifications for Cairns"). However, there is a concern that Bates-style cairns may be more easily knocked over than conical cairns and they may be more likely to encourage "copycat" cairns (see below) due to their ease of construction and pleasing appearance.

Treatment Guidelines: The park is currently in an experimental phase to determine whether Bates-style or conical cairns are preferred for use on the trail system, given the construction difficulties, ease of visibility, and life span of each cairn style. Currently, the preferred treatment recommends constructing Bates-style cairns on the eastern side of the island if they can be shown to meet these criteria reasonably well. However, if conical cairns are shown to be much more durable, encourage less copycatting, and/or are substantially easier to construct, they may be used instead of Bates-style cairns.

2. Vandalism and Copycatting

Issue: Cairns of any type are consistently toppled, and nearly every summit in Acadia has a number of copycat cairns built both on and off-trail. The building of copycat cairns not only misleads hikers, it disturbs the character of trails and endangers local habitats since stones for these cairns are often pulled from soil pockets, destabilizing the plant life and subjecting the soil to erosion.

Treatment Guidelines: Cairns will be built and maintained by park staff as needed. Resource management will continue, and increase if possible, efforts to educate visitors concerning vandalism and copycatting. Such education efforts might include model cairns, information in park publications and on maps, signs, and direct education on the trails by park staff.

3. Documentation

Issue: The historic cairns still extant in the park are not adequately documented.

Treatment Guidelines: Every effort should be made to identify and preserve historic cairns that are extant on both open and abandoned trails. The age of the cairn can be approximated by examining the lichen growth on the outer surfaces and comparing it to the concealed surfaces on which the stones are stacked. In general, the lesser the amount of lichen inside the cairn, relative to that outside the cairn, the older it is. When identified, historic cairns should be documented with black-and-white photographs.

SPECIFICATIONS FOR CAIRNS

Cairn spacing will vary depending on visibility and the number of turns a trail makes, but a general guideline is that cairns should be spaced 50 to 100 feet apart. Hikers should always have in sight at least the cairn in front and the cairn behind the one at which thy are standing. Cairns should not be built in locations where they will intrude on the landscape, such as on a ridge where they will be silhouetted against the sky to ascending hikers.

Stones for cairns may be gathered or quarried from the surrounding area, following the guidelines set forth in Acadia's *Hiking Trails Management Plan.*[40] When gathering material, best management practices should be followed to avoid resource damage. According to Demrow and Salisbury, trail workers should "Take care to avoid damaging areas with fragile soils and vegetation while you are quarrying rock. Find a rock pile near the site that you can reach without trampling plants (i.e. walk on rocks). Carry the rock to the cairn site, or use a rock basket or a skyline...to move large quantities of rock." [41]

1. Bates-Style Cairn (Fig. 9-23)

Four stones are needed: two base stones, a lintel, and a pointing stone. The sizes of historic cairns vary greatly, but following are the ideal dimensions for a cairn built in a place where it needs to be seen from a distance and may be subjected to toppling. Smaller versions may be appropriate for trails with little use or woodland trails. Base stones should be rectilinear stones averaging 16 inches to 2 feet long, 10 inches high, and 10 inches wide. The lintel stone should be an elongated plate and need not be rectilinear. Ideally it should be between 2 and 3 feet long and at least 1 foot across. The pointer should be an elongated stone no longer than the width of the lintel on which it is to be placed. It may be rounded.

The base stones are set in the ground or on ledge with their length in the direction of the trail. They should be gapped so that the lintel stone will just reach their outside edges when it is laid across them lengthwise. If the stones wobble, or if the ground is sloped, solid shims may be used, if they are locked in (see Chapter 7), or a stone base built under them.

Some cairns have two stones stacked on top of each other acting as a single base stone. This is seen only occasionally in historic cairns, and the technique should be used sparingly. If two stones are to be used as a single base stone, both should be sufficiently wide and flat so that the top stone fits solidly on the lower stone without shimming.

The lintel is laid across the base stones with its length perpendicular to the trail. If possible, base stones should be adjusted so that the lintel is solid, but shims may be used under the lintel if necessary.

The pointer stone is set on top of the lintel so that it points in the direction of the trail. No shims should be used to secure this stone, as it is not of sufficient weight to keep them in place.

The height of the finished cairn should be at least 16 inches.

2. Conical Cairn (Fig. 9-24)

Conical cairns should be built in layers. The base layer should be built of large, flat stones; for subsequent layers, flat stones should be arranged to slope toward the center of the cairn. Each stone should have three contact points for stability. Stones should span joints in previous layers, as in the construction of stone retaining walls. Small stones should not be used as wedges or stabilizers between layers; these will eventually loosen, resulting in an unstable cairn. A stable and strong cairn relies on good contact between adjoining stones.[42]

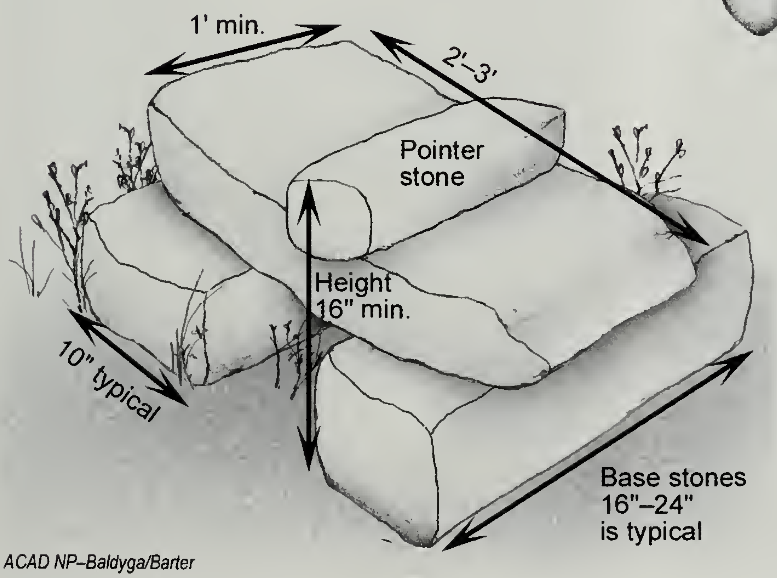


Fig. 9-23 Detail of a Bates-style cairn.

ROUTINE MAINTENANCE

1. Toppled or fallen cairns should be rebuilt. If possible, the original stones should be located and reused to avoid disturbing more of the area.
2. Copycat cairns and other stone structures should be dismantled, and the stones scattered or used in needed cairns.
3. If cairns are constantly toppled in a given area, a new guidance solution, such as paint blazes, should be considered.
4. In areas where it is evident that hikers are wandering, new cairns should be considered, or other guidance features added, such as coping stones.

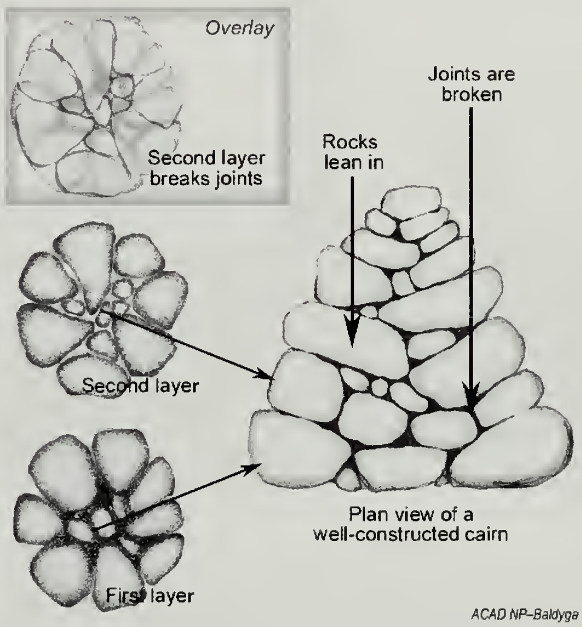


Fig. 9-24 Detail of a conical cairn.

C. DIRECTIONAL SIGNS

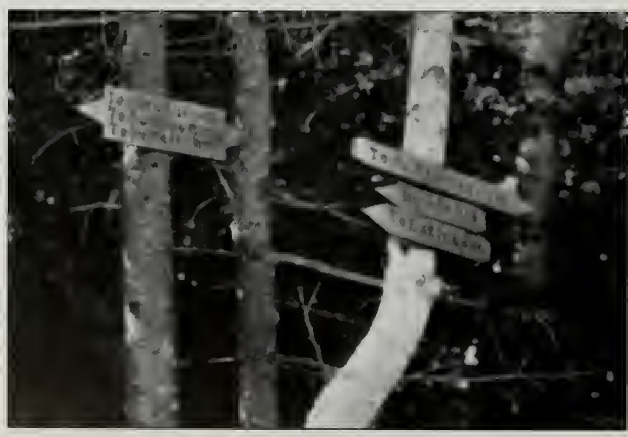
DEFINITIONS

Directional signs contain information to direct hikers. These signs are usually located at trail heads, road crossings, trail intersections, summits, and points of interest.

Trailhead or **log signs** are signs crafted from a single log which has had a flat face cut on one or both sides for the top portion of the log. Information routed into this flat face includes trail and destination names and directional arrows (Fig. 9-35, also 9-42 & 9-43). Gary Stellpflug developed this style of signage for Acadia in 1980.

Maine Historic Preservation Commission, Dana Family Collection, 95-10-28

Fig. 9-25 On this signpost at the summit of Sargent Mountain, the sign in the center is the oldest of the three and directs walkers to "Somes Sound." The upper and lower signs were likely installed under the direction of Waldron Bates, who recommended "burned-in" lettering. Both the Giant Slide Trail and Chasm Brook Trail were laid out by Bates in 1903, thus the signs were relatively new in this 1907 photograph. Note the point on one end and the slight taper on the "cut-off" end.



Peabody & Grandgent, Path Guide, 1928

Fig. 9-26 Signs shown in the 1928 path guide built in the Waldron Bates style.

Flat signs are planed wood pieces containing limited information, such as a trail or summit name. The lettering is usually routed or chiseled into the wood. Flat signs may be pointer signs, which are cut to a point on one end, indicating the direction of the sign's named location. Flat signs may also be rectangular signs, which are cut square on each end and indicate the location where the sign is placed, such as a summit, spring, or the trail the hiker is on. Flat signs are mounted, usually in groups, on posts (Figs. 9-33 & 9-34, also Figs. 9-40 & 9-41). Posts may be milled square posts, milled round posts, or natural logs. Some original VIA/VIS signs were mounted on trees, but this practice is no longer used at Acadia.

HISTORICAL USE OF SIGNS AT ACADIA

Pre-VIA/VIS

There is no documentation for sign use on the Mount Desert Island trails prior to the VIA/VIS period.

Maine Historic Preservation Commission, Dana Family Collection, 95-10-14

Fig. 9-27 This 1906 image shows several early VIA/VIS signs near Seal Harbor. The individual signs were mounted on a tree at a height of approximately 6 feet.

Village Improvement Associations/Societies

Beginning in 1890 the Bar Harbor VIA marked trails with signs, arrows, pointers, cairns, maps, and regulatory signs. The group marked "paths and trails…at their entrances and crossings by signs suitably inscribed."[43] Specifications were described in 1906 by Waldron Bates (Figs. 9-25 to 9-27, also Fig. 9-3):

> Make the signs with both ends pointed and with the lettering burned in. When the position of a sign is determined, cut off one end so that the other end shall point in the desired direction.
>
> Before putting up a sign or a pointer, consider the situation from all sides.
>
> Where paths meet or cross in the woods, put up a pointer or a sign for each diverging path, usually all on the same tree, and another pointer on each path on nearby trees.
>
> Where the [BHVIA] Association paths cross or meet wood roads or paths not shown on the Path Map, define the Association paths very clearly and put up extra pointer....
>
> See that the waterproofed and varnished Path Maps mounted on cloth, placed at a few important points on the paths, are renewed from year to year. Place signs, at a few important points on the paths worded as follows: B. H. V. I. A. The land-owner has a right to close this path. Do not injure trees or shrubs.[44]

David Goodrich

Fig. 9-28 This steel post with signs, shown here in 1965, was located on the Sargent Mountain North Ridge Trail (#53) and dated to the VIA/VIS period. The signs read: Aunt Bettys Pond, Chasm Brook, Sargent Mt., and Giant Slide. They were removed circa 1970, but the spot where the angle iron support was cemented into the rock is still visible.

On the colored path system maps were mounted on trees at trailheads and provided a diagram of the colored path routes and destinations. In 1900, cross-island uniformity of trail marking standards was achieved by the Joint Path Committee of the Bar Harbor VIA, Seal Harbor VIS, and Northeast Harbor VIS. The committee was expanding in 1914 to include Southwest Harbor VIA. Resolutions adopted in 1914 included:

- The use of standardized signs—wooden varnished signs with letters cut in and painted red, referred to as "Bates" signs—at most locations (excepting summits).
- The placement of steel signs on summit and ridge trails to eliminate the need for their annual replacement (Fig. 9-28).
- A numbering system for trails to be marked on trail signs, maps, and guides.

David Goodrich

Fig. 9-29 One of the last remaining early VIA/VIS signs pictured in 1961 with lower-case letters at the top of post. Later VIA/VIS signs with upper-case letters on lower post located on the Jordan Cliffs Trail (#48).

Olmsted Center, 8-97-25-25

Fig. 9-30 CCC-style carriage road trail markers in the NPS sign shop.

David Goodrich

Fig. 9-31 A 1958 photo of a 1930s CCC trail sign at Lookout Point on the Mansell Mountain Trail (#115). The sign is nailed to a notched post that was stained brown and cut with a conical top. The sign had tapered ends and was also stained brown with chiseled letters painted yellow.

David Goodrich

Fig. 9-32 Two different styles of CCC signs are shown in this 1958 photograph. The sign on the left was stained brown with yellow painted letters. The sign in the center was left natural, weathered wood with painted letters. Although different colors, these signs all contained one pointed and one beveled end, and were mounted on round posts with conical tops, though blunter than those in the Bar Harbor district.

David Goodrich

Fig. 9-33 This CCC sign, photographed in 1964, was one of the last remaining CCC signs. It was located at the intersection of the Green and White Path (#327) with the Black Path (Gorham Mountain Trail, #4) on Champlain Mountain near the outlet of The Bowl. The signs read from top to bottom: Black Path to Champlain Mountain; Otter Creek Road at Canon Brook Path (pointing to the Green and Black Path, #358, which forked off a little up the ridge); Ocean Drive; Beehive Mt.; Otter Creek Road at Canon Brook Path (may have been reattached and not an original sign on this post). CCC-type signs such as this were used in the Bar Harbor district, and were slightly different than signs on the west side of the island. Bar Harbor district posts were taller, had pointed tops, and could accommodate more signs. The use of a second line in smaller letters only occurred in the Bar Harbor area. This type of sign became extremely rare, as most burned during the 1947 fire. Note the very pointed conical post top.

Olmsted Center, 99-6-15

Fig. 9-34 NPS signpost on the South Bubble Trail (#43), in the saddle between the North and South Bubble Trails.

Olmsted Center, 99-43-23

Fig. 9-35 Trailhead sign on the Kane Path/Tarn Trail (#17) marking the way to Sieur de Monts Spring.

Olmsted Center, 4-98-1-2

Fig. 9-36 Within the former Bar Harbor VIA district are contemporary signs of unknown origin (i.e., by a phantom), located within the park on unmarked trails. These signs mimic the VIA/VIS style (pointed on one end, tapered on the other) but with alterations (beveled edge, routed rather than chiseled letters.) The center sign "To CANYON BROOK TRAIL" was installed in about 1997.

Acadia Trails Crew, 5-99-49-5

Fig. 9-37 Within the park, near Northeast Harbor, are signs made by the current Northeast Harbor VIS that retain the VIA/VIS style (pointed on one end, tapered on the other, chiseled letters) but are slightly more crafted (edges are slightly beveled, thus not "cut off" in the field. These signs are on the Norumbega Lower Hadlock to Goat Trail (#69).

Olmsted Center, 10-98-15-2

Fig. 9-38 Detail of sign in the current Northeast Harbor VIS district with square post, pointed at the top, located near the entrance to the Asticou Brook Trail, or "Path," near the Asticou Gardens (#514).

Olmsted Center, 4-99-s

Fig. 9-39 Signpost on the Little Harbor Brook Trail (#55) at the Route 3 trailhead. The sign is stained gray with red painted letters, in the Northeast Harbor VIS style.

Acadia superintendent George Dorr changed the names of many of the mountain peaks in about 1918. This in turn required name changes for many of the trails and required the replacement of many signs. Local resistance to name changes, particularly by the Northeast Harbor VIS, resulted in a mix of signs with old and new names, a situation that still persists in a few locations.

During the early period of park ownership, the VIA/VIS path committees continued to maintain all markings. When the park began producing signs in the 1930s through the CCC, the path committees continued to maintain trail signs outside the park and also within the park in their respective districts, but with less uniformity than had been done previously (Fig. 9-29).

Civilian Conservation Corps

A 1935 NPS Master Plan for the trail system, coupled with CCC manpower, resulted in an overhaul of trail signage within the park. CCC records indicated that new signs were needed in conjunction with recent trail construction, as replacements for signs in bad repair, or where makeshift shingle signs had been used. Approximately 700 trail signs were installed on the eastern half of the island and 80 on the western half of the island. Where adaptable to the site, signs on tall posts were used. Where views of the surrounding landscape were important, a waist-high signpost was used. Signs were mounted on notched posts with cut, conical tops (Figs. 9-30 to 9-33, also Fig. 9-1). Two color schemes were used: (1) stained brown signs and posts with chiseled, yellow-paint letters, and (2) natural weathered signs and posts with chiseled, red-paint letters. (Further research is needed to determine whether brown and yellow signs adhered to nationwide CCC specifications, and if natural and red signs were intended to harmonize with the existing VIA/VIS signs.)

NPS/Mission 66

CCC signs persisted into the 1950s, but by 1959 NPS/Mission 66 crews removed all extant signs and installed approximately 400 signs, probably similar in style to the flat signs currently used at Acadia. However, signs no longer indicated trail names, but instead described destinations and distances. For example, rather than "Giant Slide Trail" and "Sargent Mountain Trail," the signs read "Sargent Mountain, 2.0." Without individual trail names on the new signs, it was often difficult to know which trail one was following. On trails that were to be abandoned, signs were removed and not replaced. This sign change was coincident with a renaming of the trails in which many historic names were changed.

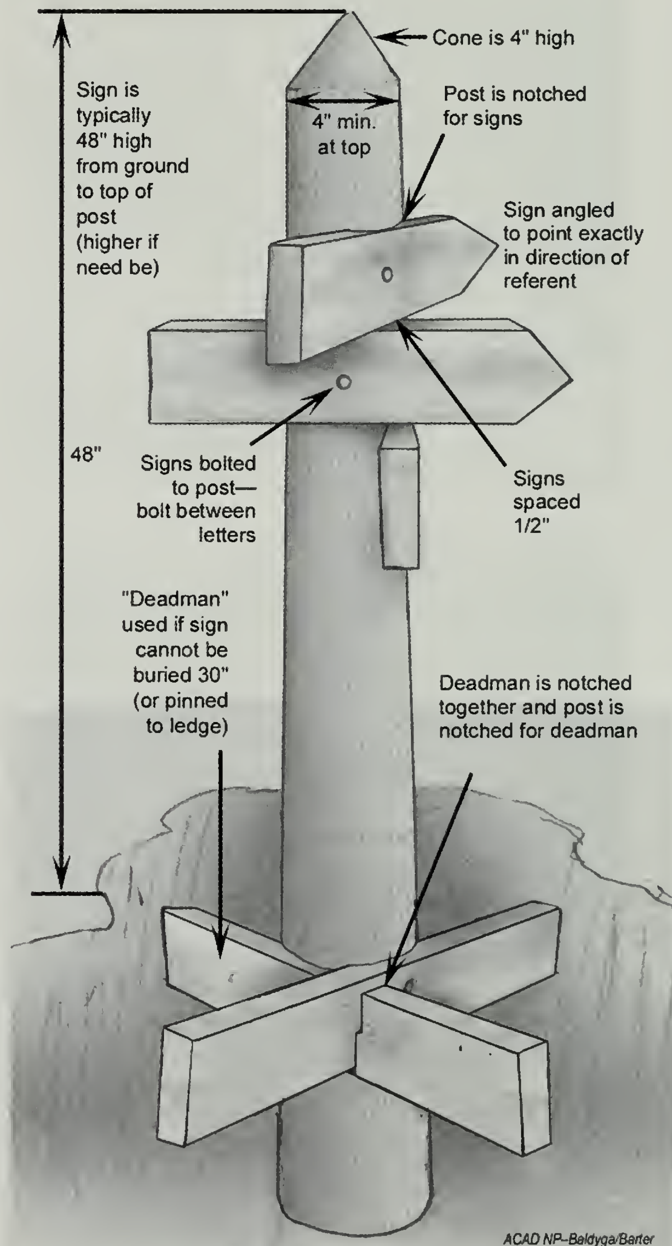


Fig. 9-40 Detail of a typical signpost for flat signs.

National Park Service

In the 1970s Acadia trails foreman Gary Stellpflug altered sign specifications to reduce vandalism and use local materials. Signs were bolted rather than nailed to posts. Cedar was introduced along with redwood. Distances were given in both miles and kilometers. Stellpflug continued to use the size, shape, and font style of the earlier flat signs, a style that may have been developed during the Mission 66 era (Fig. 9-34, also Figs. 9-40 & 9-41).

In 1980, Stellpflug introduced the log sign as an alternative to the easily vandalized or stolen flat signs, mainly at trailheads along motor roads. The original design was routed letters on the face of a 4-inch-round by 8-foot-long post. One such sign was installed at the southern Gorham Mountain Trail (#4) trailhead. Within a year, Stellpflug developed the current log sign design, which became the standard sign for entrances to the trail system and trail crossings with motor roads or carriage roads (Fig. 9-35, also Figs. 9-42 & 9-43).

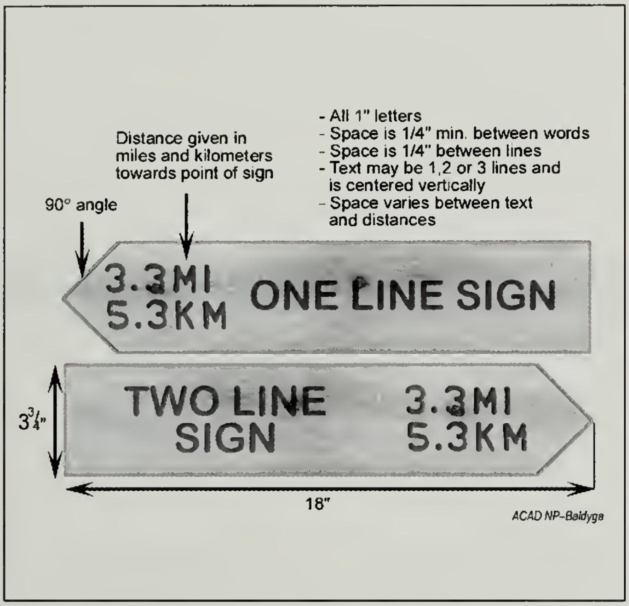


Fig. 9-41 Detail of lettering layout for flat signs.

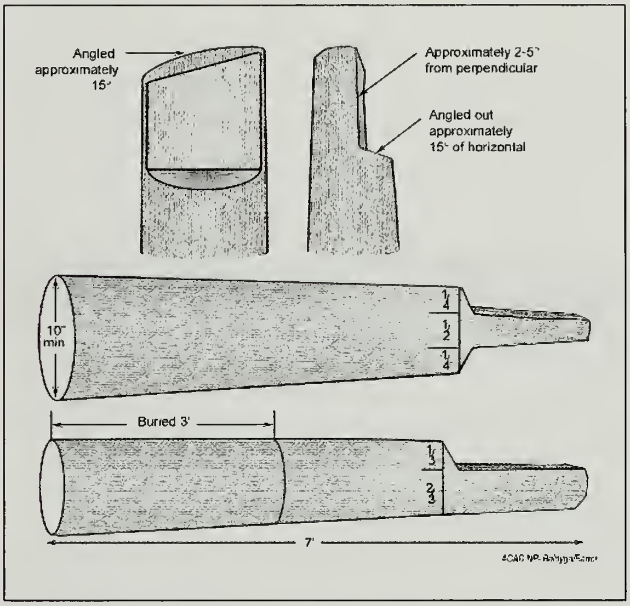


Fig. 9-42 Detail of log signs.

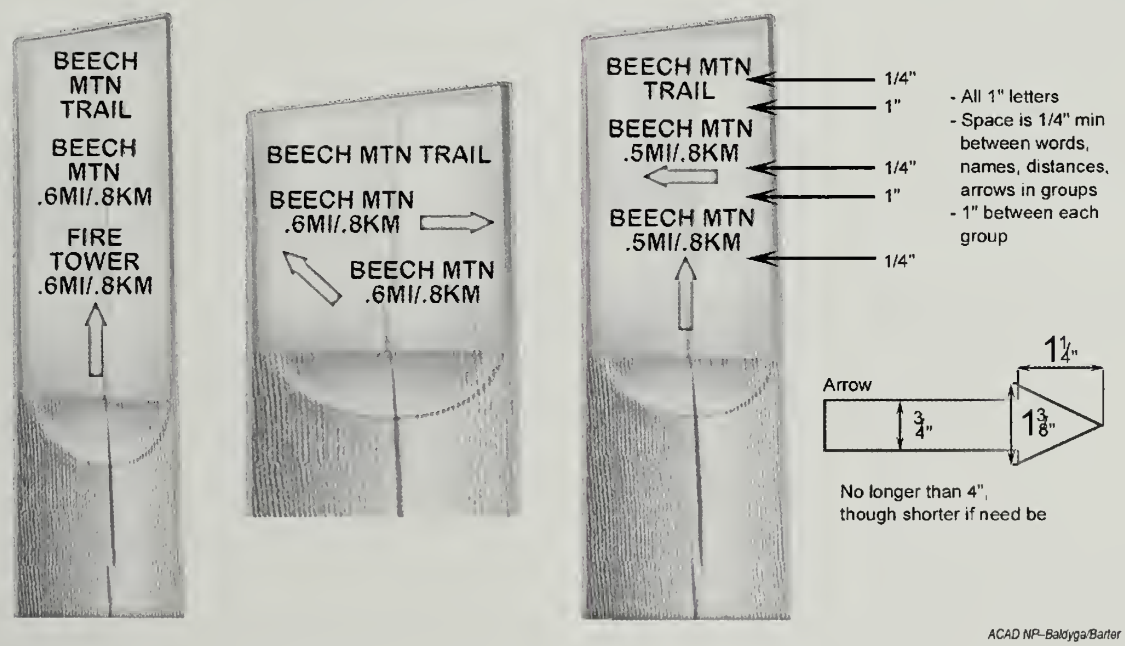


Fig. 9-43 Detail of lettering for log signs.

Some log signs were also placed off-road at intersections and summits where flat signs were commonly vandalized or stolen, such as the Beehive Trail (#7) or the summit of Dorr Mountain).

In the 1990s, foreman Don Beal began installing log signs at any intersection at which maps showed a trail with a different name beginning or ending. Each trail terminus was given its own log sign, so that many intersections had two or even three log signs. An example is the intersection of the Bear Brook Trail (#10), Bowl Trail (#6), and Beehive Trail (#7). This intersection at The Bowl currently has three log signs. Adequate records were not kept of the sign exchanges, but possibly hundreds of flat signs were removed and discarded during this time.

Throughout the years, some characteristics of VIA/VIS signage have persisted. As of 2002, VIA/VIS-style signs are used by the Seal Harbor VIS (tapered ends, painted letters), Northeast Harbor VIS (tapered ends, chiseled letters, similar dimensions, and in some locations red-painted letters), and a phantom signmaker in the Bar Harbor VIA district (tapered ends) (Figs. 9-36 to 9-39).

HISTORICAL CHARACTERISTICS OF DIRECTIONAL SIGNS

The chart below identifies characteristics of flat signs for the different periods.

HISTORICAL CHARACTERISTICS OF DIRECTIONAL SIGNS

	VIA/VIS	CCC	Mission 66	NPS
Post	Natural post, some with coned tops, some with square tops, trees occasionally used	Natural, smooth posts with coned tops, notched for each sign	Unknown, probably similar to current NPS flat signs.	4" x 4"cedar or pressure-treated posts, notched only for non-right-angle signs
Sign Size	Length and width varied with wording	Length varied with wording, 6" standard width		18" length, 3¾" and 5 ¾" standard width
Sign Surface Treatment	Probably varnished or stained	Stained		Mostly natural, some stained
Sign Beveling	Face probably beveled, some butt-ends beveled	Face beveled butt-ends beveled		No beveling
Lettering	Chiseled or cut, basic font, capital and lower-case letters, one groove, painted red and yellow	Chiseled or cut, rectilinear font, all capital letters with initial large letter, double groove, painted yellow and possibly red		Routed, basic font, all same size capital letters, single groove, most unpainted
Information Provided	Destinations, current trail name, adjacent trail names	Destinations, current trail name, adjacent trail names		Destinations, trailheads, current trail name

TREATMENT FOR DIRECTIONAL SIGNS

1. Maintaining Character

Issues: The flat signs currently used at Acadia are unlike those used in either of the two historical periods, VIA/VIS and CCC. The adoption of historically accurate signage from the VIA/VIS or CCC period raises several issues, including:

- The more attractive signs of both historic periods may invite vandalism.
- Historic letters were cut or chiseled; currently, letters are routed. Chiseled or cut letters take longer to make and require more skill. Routed letters are more uniform in appearance and allow less variation between different signmakers. Router bits are available that can approximate the look of chiseled or cut letters. Hand-cutting the double-bordered letters of the CCC style would be labor-intensive.
- Historically, letters were painted and sign faces stained or painted; currently, letters are not painted, and sign faces are not treated. Paint in the grooves and stain or paint on the face tends to disintegrate faster than the sign and create a ragged appearance or require the added work of regularly repainting signs.
- Historic signs used either capital/lowercase letters, or all capitals with larger initial capitals; currently, lettering is all capitals of a single size. Laying out signs is easier if all the letters are uniform.
- Historic signs were usually beveled on the butt end and on the sign face; currently, signs are cut square on the butt ends and the faces are not beveled.
- Historic signs used rounded posts, usually coned at the top; current posts are 4-inch by 4-inch milled timbers.

Treatment Guidelines: The current flat sign style is compatible with the two historic periods yet it is distinguishable as a modern addition to the trail system. This style should continue to be used with one alteration: pointed router bits will be used to approximate chiseled or cut letters. A maintenance schedule should be developed to replace square posts with round, coned posts in the historic style. For interpretive purposes, in order to represent the VIA/VIS- and CCC-style signs, at least one major intersection on a popular route should be marked with signs reconstructed in the appropriate style of each period.

Signs currently used by the VIA/VIS groups on trails outside the park are still being crafted in pre-Mission 66 styles. The park has no jurisdiction over signs installed outside the park; however, this practice will be encouraged by park management, as it continues a tradition, and also provides a distinction between trail intersections inside and outside the park.

2. Log Signs to Deter Vandalism

Issue: Certain sign types and signs in certain locations are often vandalized or stolen. Log signs, although not historic, are not easily vandalized and cannot be easily stolen. For this reason, log signs are currently used at all trailheads and trail crossings located at roads, at many summits, and at many interior trail intersections. This increased use of log signs has led to the removal by NPS of many flat signs, even in locations where log signs may not be needed like remote trail intersections. A consistent policy is needed for the use of log signs at Acadia.

Treatment Guidelines: In agreement with the *Hiking Trails Management Plan*, it is recommended that log signs be installed in places where vandalism requires the constant replacement of flat signs, at trailheads, and at carriage road crossings. However, flat signs will be returned to all interior trail intersections, mountain summits, and other locations where vandalism does not pose a threat.[45]

SPECIFICATIONS FOR DIRECTIONAL SIGNS

See Figures 9-40 to 9-43 for sign specifications.

ROUTINE MAINTENANCE

1. All signs should be inspected yearly for needed maintenance or replacement.
2. Broken or stolen flat signs will be replaced; intersections where frequent vandalism occurs may be signed with log signs.
3. Signs and posts should be replaced when they become illegible or deteriorate to the point where they are no longer aesthetically pleasing.

Olmsted Center, 5-98-3-19

Fig. 9-44 A trailhead exhibit at the Cadillac Mountain North Ridge Trail (#34) located on the summit of Cadillac Mountain.

Olmsted Center, 5-98-3-18

Fig. 9-45 Interpretive signs on the Cadillac Summit Loop Trail (#33) discuss the surrounding viewsheds.

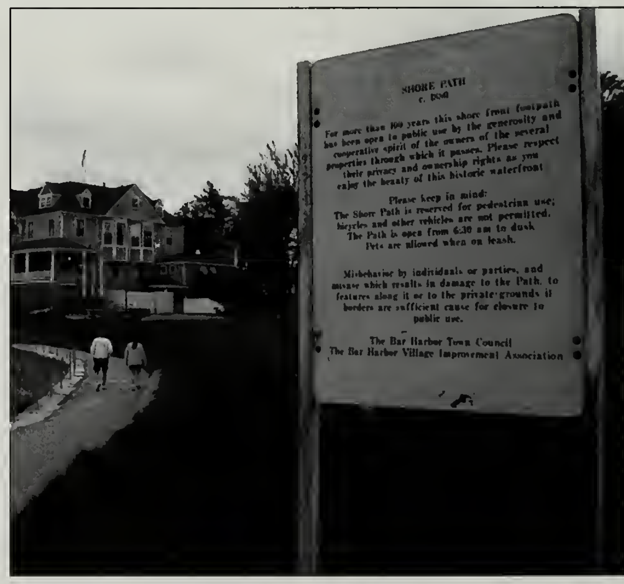
D. INFORMATIONAL SIGNS

DEFINITIONS

Informational signs convey information about trail routes, conditions, and safety and educate trail users about cultural and natural history, resource protection, and associated rules and regulations. Informational signs may include text, illustrations, maps, and regulatory symbols. The island's trail system, both within and outside of the park, currently contains a spectrum of informational signage.

In this report, informational signs are distinguished from signs used for guidance, including trailhead name and intersection signs. These are addressed under the previous section, "Directional Signs." Commemorative plaques and engraved stones are also addressed separately in Chapter 10, Section A. Types of informational signs include:

Trailhead exhibits are located near popular trails. Each consists of two embedded fiberglass panels that provide the trail name, a map, "Leave No Trace" and/or other resource protection messages, and safety information. An example of a trailhead exhibit is located at the summit of Cadillac Mountain (Fig. 9-44).



Olmsted Center, 5-98-16-0A

Fig. 9-46 This interpretive sign on the Shore Path (#301) gives an overview of the history of the trail.

Interpretive signs are located at scenic overlooks, such as Cadillac Summit; at cultural features, such as Bass Harbor Head Light; at natural features, such as Thunder Hole; and at the several trailheads, such as the Ship Harbor Nature Trail (#127) or the Shore Path (#301) in Bar Harbor. Numbered posts along nature trails corresponding to self-guided trail brochures are also considered interpretive signs (Figs. 9-45 to 9-48).

Rules and **regulatory signs** with wording and/or symbols are also posted where necessary. Examples include signs explaining trail closures due to nesting peregrines or signs prohibiting certain practices, such as “No Camping” or “No Fires” (Figs. 9-49 & 9-50).

Acadia Trails Crew, 4-99-33-1

Fig. 9-47 An interpretive sign at the start of the Ship Harbor Nature Trail (#127).

Olmsted Center, 7-97-24-20

Fig. 9-48 Numbered markers such as this one on the Ship Harbor Nature Trail (#127) are often used with self-guiding trail brochures.

Safety signs are closely related to rules signs and are posted in areas with unsafe conditions. Examples include the trailheads of the ladder trails, near shoreline caves that are flooded at high tide, and by the sandbar to Bar Island, which is accessible only at low tide.

Finally, **map signs** are posted both as part of the trailhead exhibits and in the one map house, located on Eliot Mountain, near Northeast Harbor (Fig. 9-51). Historically, more map signs were posted in the park than are currently present.

HISTORICAL USE AT ACADIA

Village Improvement Associations/Societies

Beginning in the 1880s, rules were posted on the Shore Path (#301) in Bar Harbor to keep walkers on the path and off private property. A similar message was included on path maps and guides:

Since the paths and trails cross private properties the owners of which may at any time exercise their legal right to close them to the public, the law in regard to setting fires should be strictly observed.

Olmsted Center, 00-10-s

Fig. 9-49 This regulatory sign reminds hikers to stay off a newly vegetated area on the Ocean Path (#3).

Olmsted Center, 5-98-s

Fig. 9-50 The trailhead to the Precipice Trail (#11) contains both interpretive signs and regulatory signs informing hikers of trail closure during peregrine falcon nesting season.

Acadia Trails Crew, 5-99-38-3

Fig. 9-51 Eliot Mountain map hut on the Asticou Trail (#49).

Olmsted Center, 5-98-5-17

Fig. 9-52 This interpretive sign was installed during the Mission 66 era at the Hulls Cove Visitor Center.

When the first path map was published by the VIA/VIS in 1896, it was mounted and lacquered onto boards. These map signs were posted at major trail intersections. At an undetermined time, a map house was built on Eliot Mountain, which offered both a mounted map sign and a small shelter for hikers in the Northeast Harbor VIS district.

The self-guided Jordan Pond Nature Trail (#463), developed by the Seal Harbor VIS in 1929, was the first of its kind in the park. It was located near the Jordan Pond House and extended to the western side of Jordan Stream to the Asticou Trail (#49). The trail included over seventy-five plant labels. There is still a self-guiding nature trail in the vicinity today, but it is located east of the Jordan Pond House, not on the original trail route. The dates of closure of the original nature trail and the creation of the current nature trail are unknown.

Civilian Conservation Corps

By 1933, the park staff included ranger-naturalists who led tours on several of the most popular loops, including the newly built Cadillac Summit Loop Trail (#33). Interpretive signs were added to provide information along the extremely popular trail. The park also developed three interpretive gardens, containing native wildflowers labeled with plant names and brief information. These were located at Sieur de Monts Spring (Wild Gardens of Acadia), the Cadillac Mountain summit, and the park's campground at Bear Brook, which is no longer present. No documentation has been found regarding the CCC production of interpretive signs.

NPS/Mission 66

In the early 1950s, interpretation was concentrated in the park's headquarters and at road waysides. Ranger-led hiking tours provided interpretation on the trails, but there were no self-guided trails (except possibly the Seal Harbor VIS Jordan Pond Nature Trail). As part of the park's Mission 66 plan, interpretive self-guiding trails were proposed on both the east and west sides of the island. The park built the Ship Harbor Nature Trail (#127) in 1957 and produced a self-guided brochure for the trail circa 1959, which corresponded with fourteen numbered posts along the trail route. The walk and brochure are still actively used. Mission 66 may have also built a similar trail near the Jordan Pond House (#45). Mission 66 crews also paved the trail to Anemone Cave (#369), and a photograph taken in 1961 shows an informational sign at the end of the trail. The park's visitor center at Hulls Cove was also constructed during this period. This new facility offered interpretive information, though it was detached from the trail system (Fig. 9-52).

National Park Service

There is limited information for informational signage installed by the NPS from the 1960s to the 1990s, but generally the style used followed generic NPS standards.

The most recent sign was a new design for trailhead exhibits developed in the late 1990s. Composed of three cedar posts, a small roof, and two display panels, the kiosks display maps, trail mileage, rules, and safety considerations (see Fig. 9-44). The maps are generated through the park's Geographic Information System database. Information about the terrain is provided only for the ladder trails. Additionally, the self-guided trails at Jordan Pond and Ship Harbor are actively used by individuals and ranger-led tours. A self-guided nature area is also maintained within the Wild Gardens at Sieur de Monts Spring.

At present the various informative signs located in the park do not reflect a unified style and there are no sign standards, other than general NPS regulations, that are unique to Acadia.

HISTORICAL CHARACTERISTICS
During the VIA/VIS period, interpretive signs were somewhat standardized, but this did not last through other historic periods. Currently there is little consistency in the style or usage of interpretive signs throughout the trail system.
Pre-VIA/VIS (pre-1890)
There is no documentation for use of informational signage.
VIA/VIS Period (1890–1937)
Trailhead signs were installed on popular trails such as the Shore Path (#301) in Bar Harbor. Map signs were used at major path intersections and at the map house. All signs were developed by the VIA/VIS organizations, which through the Joint Path Committee developed sign standards.
CCC Period (1933–42)
No new trailhead signs were developed. Interpretive signs were added to high use areas; however, there was no standard for informative signage, and a mix of VIA/VIS and CCC styles were used.
NPS/Mission 66 Period (1943–66)
No new trailhead signs were developed. Self-guided nature trails were developed on the east and west sides of island. No sign standards were followed.
NPS Period (1967–1997)
New trailhead exhibits for popular trails such as the Cadillac North Ridge Trail (#34) were designed and installed. Self-guided trails remain at Jordan Pond, Ship Harbor, and Wild Gardens of Acadia. However, no sign standards are in use.

TREATMENT

1. Sign Standards

Issues: There are no unified standards for informational signage on the trail system. Signs are placed in an ad hoc manner, and there are examples of many different styles throughout the park.

Treatment Guidelines: According to Albert Good,

> Nothing in parks, unless it be the entranceway, offers wider legitimate scope for individuality in conveying the characteristics or background of the particular area than the signs and markers. These can be the embodiment of those rare and distinguishing features that have dictated the establishment of the park—park motifs-in-miniature.[46]

Signage provides an important aspect of the character of the park and its trail system. Therefore, unified standards for informational signs should be developed for

Acadia that are complementary to the system's directional signage (as discussed in the previous section of this chapter) and other park signage (motor roads, carriage roads, etc.). Items to be addressed include style, location, and number of signs. While adequate signage is important, the overuse of signs should be avoided, as too many signs detract from the natural setting. Signs should be informative but not overwhelming with excessive information, and their placement should not obscure views or interesting features. Signs should be built in a rustic style with local wood and stone, avoiding metal, recycled plastic, pressure-treated wood, laminated paper or card stock, or other materials manufactured with character that is not compatible with the historic trail system. However, these materials may be used for structural stability, and/or to deter vandalism, if they are concealed and not readily apparent to the casual observer. Signs should be of the proper scale. For example, signs constructed of large timbers are not appropriate for a location with predominantly small second-growth trees. Signs should not be painted on stones or nailed into trees. Slight variations in placement and construction may be made to suit the topography, vegetation, ledges, or other natural features in the vicinity of the sign.

2. Adequate Information

Issue: First-time hikers may be unprepared for the rigor of Acadia's trails. Only hikers with guidebooks or using trailhead exhibits for orientation have sufficient information on conditions and what to expect.

Treatment Guidelines: Informational signs can provide hikers with various details about their destination, trip length, anticipated terrain, public transportation options, "Leave No Trace" principles, history of the trail, notable natural and cultural features, park regulations, appropriate gear and supplies, and safety issues and concerns. It is not necessary for every informational sign to convey all this information. For example, a safety notice on the upper Precipice may mention safety issues and appropriate gear, and nothing else. A public transportation sign near a trailhead could simply state transportation options and no information about the trail.

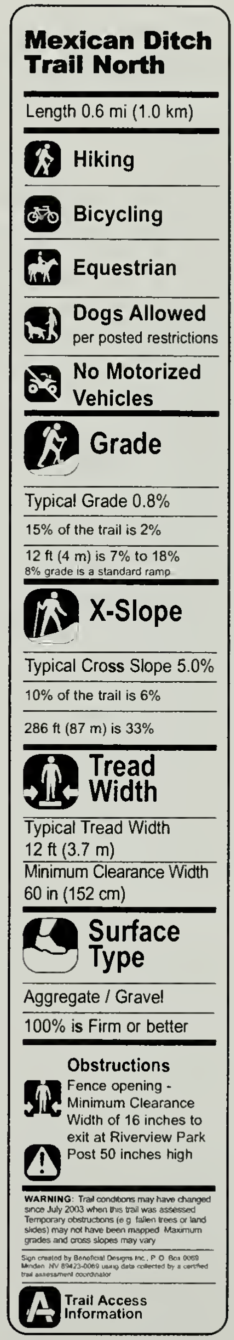
3. Accessibility

Issue: There are currently no informational signs pertaining to hikers with disabilities.

Treatment Guidelines: It is recommended that Acadia develop informational signage that provides accessibility information for the trail system.

The U.S. Access Board is currently developing Accessibility Guidelines for trails as described in the Report of the Regulatory Negotiation Committee on Accessibility Guidelines for Outdoor Developed Areas (www.Access-board.gov). These guidelines describe the ideal provisions for surface, width, openings, protruding objects, obstacles, passing space, running slope, cross slope, rest intervals, edge protection, and signs. The report provides exceptions that address necessary departures from these provisions. For historic trails, exceptions are allowed where compliance would cause substantial harm to cultural, historic, religious, or significant natural features or characteristics. Exceptions are also allowed where the provisions are not feasible due to terrain or the prevailing construction practices.

A key component of accessibility, which is not fully addressed in the proposed accessibility guidelines, is providing information to hikers so they can make decisions about whether a trail is too difficult. A recent sign program, advocated by a



Beneficial Designs

Fig. 9-53 Trailhead signage using the Universal Trail Assessment Process developed by Beneficial Designs.

private consultant group, Beneficial Designs Inc., offers parameters for information needed by all hikers, but particularly disabled hikers. Beneficial Designs Inc. identifies trail characteristics that would allow hikers of all abilities decide whether to hike a particular trail. These characteristics include trail grade, cross slope, width, surface firmness, and the presence of obstacles. Obstacles identified include tree roots, boulders, water crossings, ruts, vertical obstructions, steps, dangerous plants, and drop-offs. Information is collected through their Universal Trail Assessment Process (UTAP) and conveyed through an Internet database for trails across the country, in guidebooks, and by signs posted at individual trailheads. The trailhead sign format is referred to as Trail Access Information (Fig. 9-53).

SPECIFICATIONS FOR INFORMATIONAL SIGNS

As there is such a wide range of informational sign styles, and there may or may not be any historical precedent for any given sign, there are no exacting specifications for their construction. However, there are some general guidelines that can be followed., as discussed in Treatment Issue 1, "Sign Standards," above. Informational signs, lacking historic precedent, need not necessarily be built in historic or even rustic styles. Indeed, a safety sign or ADA-related sign may need to "stand out" and be highly visible to the public. General specifications include visibility and installation in areas safe for the visitor to view the sign. Signs should be of sturdy, long-lasting, and weatherproof construction. Professional quality is of extreme importance, and signs should not have a shoddy, makeshift, or temporary appearance.

ROUTINE MAINTENANCE

1. All signs should be inspected yearly for needed replacement or repair.
2. Safety signs should be updated as needed during peak hiking seasons so that hikers do not inadvertently end up in an unsafe situation.

E. SCREE

DEFINITION

Scree refers to stones, logs, or other natural materials piled along the sides of a trail to define the treadway, direct and restrict hikers, and protect trailside vegetation and soil. Scree performs no structural function. Other stone and log features that aid in guidance such as steps, stepping stones, and bridges are not discussed in the Guidance chapter.

Although scree can be similar in appearance to coping stones, there are some distinct differences. Scree is often placed in random piles, has a more haphazard appearance, and forms a continuous line along the trail edge. Coping stones are usually placed at regular intervals along a straight or evenly curving line at the trail's edge and often contribute structurally to the retention of the treadway (see Chapter 6, Section B). Though coping stones sometimes abut, forming a solid line, they are still a single row, are set well in the ground, and are overall much more orderly in appearance than scree.

Occasionally coping and historic scree are used together, when even runs of single coping stones are interspersed with rows of piled stones, as on the Asticou Trail (#49).

HISTORICAL USE AT ACADIA

Pre-VIA/VIS

There is no documentation for the use of scree prior to the VIA/VIS period.

Village Improvement Associations/Societies

During the early period of VIA/VIS trail construction, stones and roots were removed from trails to create a smooth walking path. The result was often a path lined with stones acting as scree (Fig. 9-54). This technique was used on the most heavily traveled graveled paths, such as the Seaside Path (#401), a popular walk from three large hotels in Seal Harbor to the Jordan Pond House. Annual reports describing maintenance on the Seaside Path suggest that this practice exacerbated trail erosion, and the trail eventually had to be entirely rebuilt. More often, stones removed from the treadway were set in orderly rows of coping.

During the memorial part of the VIA/VIS period, coping stones generally increased in size, frequency, and regularity; at the same time, the use of scree became obsolete.

Civilian Conservation Corps

There is no documentation for the use of scree by the CCC. Typically, if stones were used by the CCC along the trail, they were coping stones.

NPS/Mission 66

There is no documentation for the use of scree during the Mission 66 period.

National Park Service

The AMC has used scree in the White Mountains to define the trail and direct hikers since the 1970s. It is typically used for steep sections of woodland trail where large and medium stones, fallen trees, and large limbs are set in a random fashion along the edges of stone staircases to stabilize soil, direct foot traffic, and prevent shortcutting at switchbacks. For alpine areas, stones are piled into walls along the trail to define the treadway and keep hikers off fragile vegetation. Well-maintained stone cairns, paint blazes, and informational signs accompany the scree and careful judgement is used in the selection of stones in alpine areas to form scree walls so as not to incur damage.

In the western United States, Student Conservation Association crews also use scree in both woodland and alpine situations. Stones are placed along the trail in a seemingly haphazard pattern so that the trail is the easiest and most attractive route to follow.

Despite its widespread use on other trail systems, Acadia trail crews have chosen to refrain from installing large amounts of rock scree because of its impact on trail aesthetics. This is especially true on summits, where scree-lined trails appear road-like and detract from the natural appearance of the surrounding environment. However, some rock scree has been used recently at Acadia, primarily on woodland trails (Fig. 9-55). Typically, this scree is out of keeping with historical scree used in the park. Recent scree has a haphazard quality, is usually higher (a foot or greater), and has been used on trails where historic builders would not have used scree, like woodland paths. Little rock scree has been placed on Acadia's summit trails. Log scree has been introduced on woodland paths to define the treadway.

Maine Historic Preservation Commission, Dana Family Collection, 97-11-10

Fig. 9-54 A 1907 photograph showing the early Seal Harbor VIS trail construction of the Seaside Path (#401). Stones and roots were removed from the treadway and stacked along the trail, acting as scree. However, this technique contributed to increased trail erosion, and widening of the path.

Acadia Trails Crew; Olmsted Center, 99-41-22

Fig. 9-55 Scree installed on the South Bubble Trail (#43).

HISTORICAL CHARACTERISTICS OF SCREE
Pre-VIA/VIS (pre-1890)
There is no documentation for scree use.
VIA/VIS Period (1890–1937)
Scree was used on some early paths where stones extracted from tread were piled along path edges.
CCC Period (1933–42)
There is no documentation for scree use.
NPS/Mission 66 Period (1943–66)
There is no documentation for scree use.
NPS Period (1967–1997)
Some scree was used, but generally its was avoided, particularly on summit trails. Log scree was introduced and used on woodland paths to define the treadway.

TREATMENT FOR SCREE

1. Maintaining Character

Issue: Small amounts of scree have been used historically in the park, but modern usage has typically been in a different style. Although scree may be an appropriate feature for limited use, continued use of haphazard scree will negatively impact trail aesthetics and historic integrity of the trail system.

Treatment Guidelines: For areas in which use of scree is appropriate, properly constructed scree compatible with historic scree may be added or rebuilt in-kind. Log scree should be the first consideration. It can be blended with the natural environment, is easily removed, and will rot away as the preferred treadway becomes more established through increased use. Random scree will not be used under any circumstances.

For areas where scree is not an appropriate feature, or where historic scree will not properly deter wandering, other methods may be employed to guide hikers. Revegetation of wide areas and social trails is effective, especially if thorny bushes or woody plants are used. In some cases, especially those in which trail work is needed for some other reason, a more appropriate option would be to construct an attractive treadway by using checks, stairs, bogwalks, coping stones, or other appropriate features. Additional options include placement of individual stones in an impacted area, signage, temporary rope fences, enhanced trail marking, patrols, educational programs, and/or reroutes.

Note: The use of stone scree to protect fragile summit vegetation from wandering hikers has not been determined effective to date. Sample sections need to be installed to verify if this would be the most appropriate solution to this problem.

SPECIFICATIONS FOR SCREE

Stone scree will be used only on those trails on which scree is an historically appropriate feature and should be constructed of local stones. Stones should be piled no higher than 8 inches, and no wider than 2 feet. The scree row should conform exactly to the trail edge, outlining a pleasing contour. Openings should be left in the scree to allow for trail drainage.

Log scree can be used to treat any trail on which guidance is an issue that cannot be solved by other means. Logs and brush should be piled along the trail edge in a way that looks natural and imitates the look of fallen trees in the surrounding area. Care should be taken to hide chainsaw marks or cut edges. The minimal amount of material needed to deter hikers should be used. However, if hiker removal of brush and smaller material is a problem, large trees may be placed at the trail edge with a hoist. At the completion of a log scree project, leaves and other organic material should be spread along the edge of the trail to better delineate it and cover scars left in the adjacent landscape by the construction work.

Although log scree is considered a temporary measure, it can be left in place for many years, or even until it rots. Ideally, its use should be limited and the trail corridor should be defined by natural barriers, an attractive treadway, and/or historically appropriate construction.

ROUTINE MAINTENANCE

1. Scattered scree should be re-piled as necessary.
2. Occasional openings should be maintained in sections of scree to allow for trail drainage.

F. WOODEN RAILINGS AND FENCES

DEFINITION

Wooden railings and fences are used in several locations on the trail system to provide guidance, ensure hiker safety, or add an aesthetically pleasing feature to a particular location. The style of railing is similar to railings and handrails used in conjunction with trail bridges, although the features described here are freestanding and are not generally associated with bridges.

HISTORICAL USE AT ACADIA

Pre-VIA/VIS

It is evident from early photographs that many of the late-1800s roads, such as Sargent Drive and the old Ocean Drive, were lined with wooden railings. Pin remains suggest that some sections of the old Cadillac Mountain road were lined with wooden railings also.

Village Improvement Associations/Societies

Wooden railings were used along cliffs and waterfalls in the Catskills resorts in the late 1800s, and perhaps the early Acadia trail builders were influenced by these styles. The rails certainly do provide a degree of physical safety as well as a psychological safety net. Nevertheless, many of the railed areas were not difficult to traverse, nor were they in dangerously exposed areas. This indicates that these rails were often installed for aesthetic reasons in addition to safety concerns.

Olmsted Center, 99-56-16

Fig. 9-56 Extant VIA/VIS railings on the abandoned Gurnee Path (#352).

Examples of VIA/VIS railings were present on the ledges of the Penobscot Mountain Trail (#47, formerly the Spring Trail, #621, from 1911), the connection from the Maple Spring Trail (#58) to the Hadlock Brook Trail (#57), the Northeast Harbor Skidoo Trail (#509) and Steep Trail (#508), and the Thuya Lodge trails (including #519). Examples of historic railings can still be found on the abandoned Gurnee Path (#352) (Fig. 9-56)

Civilian Conservation Corps

The CCC used wooden railings in conjunction with some of their constructed features, including railings along the Pretty Marsh Picnic Area staircases.

NPS/Mission 66

It is unknown whether wooden railings or fences were installed during the Mission 66 era.

National Park Service

From the 1980s to the present, the focus for railings has changed. Rails along the Beech Cliff Trail (#106) were established purely to direct and guide hikers off badly eroded hillsides. Fences were installed for the same purpose on the Echo Lake Ledges and near The Tarn. With the increase in hiker numbers, and the decrease in trailside vegetation related to trail widening, the 2003 trails crew is considering adding fences as guidance structures to a few eroded trailside areas.

HISTORICAL CHARACTERISTICS
Pre-VIA/VIS (pre-1890)
Wooden railings were used along some early roads.
VIA/VIS Period (1890–1937)
Wooden railings and fences were used occasionally, for safety as well as aesthetic reasons.
CCC Period (1933–42)
Evidence shows that wooden railings were used with some staircases.
NPS/Mission 66 Period (1943–66)
It is unknown whether Mission 66 crews used wooden railings or fences.
NPS Period (1967–1997)
Wooden railings and fences were used primarily for hiker safety and to prevent trail widening and erosion in susceptible areas.

TREATMENT

1. Maintaining Character

Issue: Wooden railings and fences were not used consistently during the historic periods, and their overuse is not in character with the historic trail system.

Treatment Guidelines: If other guidance features are more compatible and seem to be functioning, wooden railings or fences should not be added to the trail system. However, these features can be an effective, easily installed, and temporary solution to guidance problems when there is no acceptable alternative that is historically appropriate. They may be used on a temporary basis until more permanent measures can be applied. In some instances, vegetation growth and hiker patterns may change enough during the life span of railings or fences so that their use can be discontinued.

SPECIFICATIONS FOR WOODEN RAILINGS AND FENCES

Specifications for wooden railings and fences are the same as specifications for bridge railings described in Chapter 5, Section B.

ROUTINE MAINTENANCE

Inspect wooden railings and fences regularly for decay, structural integrity, splinters, and raised nails, and repair or replace members as necessary.

G. TRAIL NAMES

DEFINITION

A trail name is ascribed to each trail from its origin to its destination or the point where it intersects another trail. The name is used on trail signs, maps, in guidebooks, and associated documents. Having one designated name reduces confusion related to use and management of the trails.

HISTORICAL USE AT ACADIA

Pre-VIA/VIS

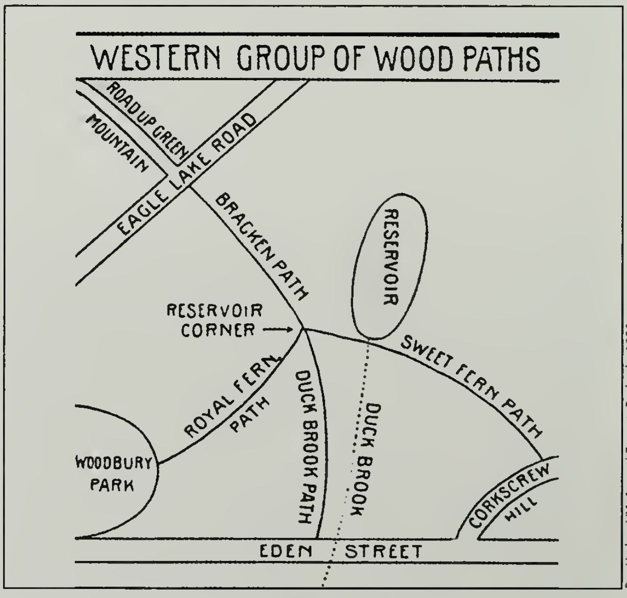
The terminology for trails has changed over the past century. In the late 1800s, prior to automobiles, most roads accommodated livestock and carts as well as pedestrians and were referred to as roads, lanes, paths, or passes. Routes through the woods were called "wood paths." Naming paths on Mount Desert Island became important in the 1870s and 1880s when several guidebooks were printed. Most names were described as destinations such as the Path to Jordan Pond or the Path up Newport Mountain.

Village Improvement Associations/Societies

When the Bar Harbor VIA began marking recreational walks in the 1890s, routes were naturally referred to as paths. With the production of maps and guidebooks, general names such as the Path up Newport Mountain evolved into definitive path names, i.e., the Newport Mountain Path. The names of some new trails added to the system did not describe the destination but rather features along the route, such as the Sweet Fern Path (#360) and the Hemlock Path (#23) (Fig. 9-57). Beginning in 1893, Bar Harbor VIA Path Committee chairman, Herbert Jaques, developed a colored path system for trails in the Newport Mountain area, such as the Green and Black Path (#358). This nomenclature survived until 1959, when those colored paths that had not fallen into disuse were renamed.

The path map printed in 1901 was the first to identify path names. Of the approximately forty trails named on the map, several were associated with the current landowners, including the Hadlock Ponds Paths (#501 and #502) and the McFarland Path (#524). Many called out geological features such as the Giant Slide Path (#63) and Chasm Path (#525) (Fig. 9-58). A few trail names implied the strenuous quality of the trail, such as the Ladder Path (#64 and #334) and the Goat Path (#444). With the formation of the Hancock County Trustees of Public Reservations (HCTPR) in 1901 and subsequent gifts of land for protection, names were added to the system to commemorate individuals. This began with the path to the Champlain Monument (#453), marked in 1906, followed in 1910 by the Waldron Bates Memorial Path (#525), which was previously built and named the Chasm Path in 1903 by Bates himself.

One of the founders as well as an active member of the HCTPR, George Dorr envisioned the Sieur de Monts Spring area as the nucleus of the reservation, and subsequently the national park. He guided the development of a network of memorial trails. The Kane Path (#17), Beachcroft Path (#13), Kurt Diederich's Climb (#16), Emery Path (#15), Homans Path (#349), Schiff Path (#15), Stratheden Path (#24), and Jesup Path (#14)



Bar Harbor VIA Annual Report, Peabody, 1890

Fig. 9-57 This 1890 map prepared for the Bar Harbor VIA by Francis H. Peabody shows trails named for vegetation along the route, like the Sweet Fern Path (#360).

evolved from Dorr's vision of a network of paths leading to and radiating from the spring (Fig. 9-59).

The term "trail" became popular in the twentieth century. Early use of the term on Mount Desert Island is associated with some of the steeper routes, such as the Precipice Trail (#11), constructed and named in 1915. When the reservation became part of the national park system, it appears that the term was applied to many of the existing routes. However, the VIA/VIS groups continued to use the word "path." Similarly in about 1918, shortly after the park was established, Superintendent George Dorr changed the names of many of the mountain peaks. This in turn resulted in name changes for many of the trails and required the replacement of many signs, as described earlier in this chapter in the "Directional Signs" section. Local resistance to name changes, particularly by the Northeast Harbor VIS, resulted in a mix of signs with old and new names, a situation that persists in a few locations. Signs for "Brown Mountain," the earlier name of Norumbega Mountain, still exist.

Civilian Conservation Corps

During the 1930s the CCC constructed new routes that were called trails, including the Long Pond Trail (#118) and the Anemone Cave Trail (#369). Under NPS management, most "paths" were renamed "trails." In the 1930s new sign standards were developed by the CCC and approximately 780 signs were replaced. These signs applied the new mountain names assigned by Dorr in 1918 (see Fig. 9-1).

NPS/Mission 66

As part of the Mission 66 program, trail signs were again replaced. Many of the original names of the trails were changed or misspelled. The Emery Path (#15) and Kane Path (#17) were respectively called the Dorr Mountain Trail and the Tarn Trail. The colored trails were renamed. For example, the northern end of the Black Path became the Bear Brook Trail (#10). Mission 66 records, maps and inventories misspelled Jesup (#14) as "Jessup" and Gurnee (#352) as "Gurney." These spellings permeated NPS documents and have been retained to the present.

National Park Service

The use of "trail" has continued until the present for most of the system. However, with the research and planning for the trail system currently underway, there has been interest in returning some of the historic trails to their original designation as "paths," and/or to correct names to historic spellings.

In 2002, the *Hiking Trails Management Plan* addressed the trail name issue. Under the preferred alternative, the park service would develop a standardized list of

Maine Historic Preservation Commission, Dana Family Collection, 95-10-28

Fig. 9-58 These signs on the summit of Sargent Mountain, shown in 1907, marked trails by the natural features found on the route, like the Giant Slide, Chasm Brook, and Somes Sound (enlargement of Fig. 9-25).

Acadia Trails Crew, 5-99-49-0

Fig. 9-59 Carved stones, like this one marking the Stratheden Path (#24), were used to identify Dorr's trails radiating from Sieur de Monts. Many are still extant in the park.

trail names, reverting to historic names "when practical." Additionally, they would encourage private guidebook and map publishers to use this official list of trail names to reduce confusion.[47] For example, the CCC Great Pond Trail is now referred to as the Long Pond Trail, since most maps refer to the adjacent water body as Long Pond.

HISTORICAL CHARACTERISTICS OF TRAIL NAMES
Pre-VIA/VIS (pre-1890)
Names were destination oriented, such as the Path up Newport Mountain.
VIA/VIS Period (1890–1937)
The use of "path" rather than "trail" predominated. Path names were associated with destinations, features along route, landowners, commemoration of individuals, and terrain.
CCC Period (1933–42)
The use of "trail" and newly established mountain names predominated.
NPS/Mission 66 Period (1943–66)
Many names were misspelled and memorial paths were renamed.
NPS Period (1967–1997)
There was continued use of Mission 66 era names until the recent planning for the trail system, which raised the issue of returning to historic precedents.

TREATMENT

1. Reestablishment of Historic Names

Issue: Many of the historic trail names have been altered over time. However, simply reestablishing all historic names is not a feasible option, since this would present a variety of concerns. Some of the interrelated issues regarding trail naming include:

- Hikers are confused, and sometimes misled by trails that have two or more names, or that contradict the names or spellings on maps or guides.
- Some name changes took place during the VIA/VIS or CCC historic period. For example, the VIA/VIS path committees referred to the Canon Brook Path (#19) as the *Cañon (Spanish for canyon)* Path (1901) and Canyon Brook Path. Many routes that were referred to as paths by the VIA/VIS were referred to as trails by the CCC.
- None of the colored path names have persisted. Some colored paths have been renamed, such as the Black Path, which is now the Gorham Mountain Trail (#4), Bowl Trail (#8), and Bear Brook Trail (#10). Many are no longer marked such as the White Path (#329), Yellow Path (#338), and Yellow and White Path (#336). Even during the historic period, some considered the colored path names confusing.
- On some historic paths the route has been altered or a portion is no longer marked, which may cause confusion if the historic name is used. Examples include the Orange and Black Path (#12 and #348), Black Path (#4, #8, #10, and #346), and Jordan South End Path (#47 and #409).
- Some historic trails have assumed new sections, such as the upper section of the Beachcroft Path beyond Huguenot Head, which is actually upper section of the Black and White Path (#326).

Treatment Guidelines: The significance of the various types of historical trail names is a key component of the island's trail system. The original names contribute to the character and history of the trails, and their reintroduction will promote greater awareness and educational opportunities for the park.

It is recommended that historic trail names be used when feasible, as stated in the *Hiking Trails Management Plan:*

> When practical, the NPS may revert to historic trail names. Trail names will be determined on a trail by trail basis, considering the historic importance of the name, whether the historic name would confuse visitors, and other considerations. An official list of park trail names will be developed, and publishers of hiking-related information will be encouraged to use official trail

names to reduce confusion. Changing trail names will be carefully planned and coordinated with publishers of information about the trail system to minimize visitor confusion, costs associated with the new signs, and effects on local communities.[48]

SPECIFICATIONS FOR TRAIL NAMING

The following recommendations are made for changes to specific trail names. These recommendations were developed by Acadia's Trail Naming Committee in February 2002. A thorough explanation of trail naming at Acadia and the reasoning behind each of the recommended changes is included at the end of this report in Appendix C.

RECOMMENDATIONS FOR TRAIL NAMES

Trail names listed below are those that currently differ from VIA/VIS or CCC historic names and those for which altered routes (different trailheads) are suggested. This chart does not list trail names that have been changed to be consistent with the current names of mountains or other natural features.

Trail Number and Current Name	Historic Name/Names	Suggested Name	Route
#4 Gorham Mountain Trail	Black Path	Gorham Mountain Trail	Current route
#5 Gorham/Cadillac Cliffs Trail	Cadillac Cliffs Path Black Path	Cadillac Cliffs Path	Current route
#9 Sand Beach–Great Head Access Trail	Ocean Drive	Satterlee Trail	Current route
#10 Bear Brook Trail	Black Path	Champlain North Ridge Trail	Current route from the summit north to the Loop Road
	Black Path	Champlain South Ridge Trail	Current route from the summit south to the Bowl Trail
#12 Champlain Mountain East Face Trail	Orange and Black Path	Orange and Black Path	Current route of Champlain Mountain East Face Trail
#13 Beachcroft Trail	Beachcroft Path (section), Black and White Path (section)	Beachcroft Path	Current route
#15 Dorr Mountain East Face Trail	Emery Path	Emery Path	Sieur de Monts to Sieur de Monts Crag intersection
	Schiff Path	Schiff Path	Sieur de Monts Crag intersection to Dorr summit
#17 Tarn Trail	Kane Path	Kane Path	Current route
#18 Sieur de Monts–Tarn Trail	Wild Gardens Path	Wild Gardens Path	Current route
#19 Canon Brook Trail	Canón, Cañon, Canyon, or Canon	Canon Brook Path	From the trail's original entrance on Route 3, past Featherbed, to intersection with Bubble and Jordan Pond Path
#20 Pond Trail	Bubble and Jordan Ponds Path	Bubble and Jordan Ponds Path	From Jordan Pond, past intersection with historic route of Canyon Brook, along historic corridor, tying in with carriage road near Bubble Pond

RECOMMENDATIONS FOR TRAIL NAMES (CONTINUED)			
Current Name	**Historic Name/Names**	**Suggested Name**	**Route**
#21 Dorr Mountain North and South Ridge Trails	Kebo Mountain Path	Kebo Mountain Trail	Loop Road, over Kebo, to Hemlock Trail
	Dry Mountain Path	Dorr North Ridge Trail	From intersection w/Kebo Mountain Path north to summit
	Dry Mountain Path	Dorr South Ridge Trail	Current route
#23 Hemlock Trail	Hemlock Path	Hemlock Trail	Current route
#24 Stratheden Trail	Harden Farm Path, Stratheden Path	Stratheden Path	Current route, eventually extended across loop road to connector
#25 A. Murray Young Trail	A.Murray Young Path	A. Murray Young Path	Current route
#28 Gorge Trail	Gorge Path	Gorge Path	Current route, eventually to extend to connector
#29 Triad Pass Trail	Triad Pass	Triad Pass	Current route
#30 Pemetic West Cliff Trail	Part of Pemetic Trail	Pemetic South Ridge Trail	Summit of Pemetic south to Jordan and Bubble Ponds Path
#31 Pemetic Mountain Trail, East/Southeast	Pemetic Trail, Old Trail	Pemetic North Ridge	Bubble Pond north to Pemetic summit
	East Cliff Trail	Pemetic East Cliff Trail	From intersection with Pemetic South Ridge Trail southeast to intersection with Jordan and Bubble Ponds Path
	Part of Van Santvoord Trail, unnamed connector	Triad Trail	From Day Mountain Bridge north over summit of Triad to intersection with Jordan and Bubble Ponds Path
#32 Cadillac West Face Trail	Near route of abandoned Steep Trail	Cadillac West Face Trail	Current route
#35 Hunters Brook Trail	Hunter's Brook Trail (section), Van Santvoord Trail (section)	Hunters Brook Trail	Current Route
#36 Bubbles–Pemetic Trail	Northwest Trail	Pemetic Northwest Trail	Current route
#38 Jordan Pond Carry Trail	Eagle Lake Carry, Jordan Pond Carry, Carry Trail, Carry Path	Jordan Pond Carry	Current route
#39 Jordan Pond Loop Trail	Jordan Pond Path (1928 sign and 1928 guidebook), East Jordan Path (1903), West Jordan Path(1903) East Side (1906), West Side(1906), Jordan Path, Jordan Pond Path (1937)	Jordan Pond Path	Current route
#41, #43 North/South Bubble Trails	Bubble Mountain Trail	Bubbles Trail	From JP Carry intersection at JP, over South Bubble, over North Bubble, Connors Nubble, to Eagle Lake Trail
	Bubbles Divide Trail	Bubbles Divide	From Bubbles parking up through notch and down to Jordan Pond

RECOMMENDATIONS FOR TRAIL NAMES (CONTINUED)			
Current Name	**Historic Name/Names**	**Suggested Name**	**Route**
#47 Penobscot Mountain Trail	Spring Trail	Spring Trail	Jordan Stream to ridge of Penobscot
	Jordan South End Path	Penobscot Mountain Trail	Summit of Penobscot south along ridge to Asticou and Jordan Pond Path
#48 Jordan Cliffs Trail	Jordan Bluffs Path, Jordan Cliffs Trail	Jordan Cliffs Trail	From intersection with Spring Trail north to Deer Brook Trail
	East Cliffs Trail	Sargent East Cliffs Trail	From intersection with Deer Brook Trail north, then west to summit of Sargent Mountain
#49 Asticou Trail	Asticou and Jordan Pond Path	Asticou and Jordan Pond Path	Current route
#52 Sargent Mountain South Ridge Trail	Sargent Mountain Ridge Trail	Sargent South Ridge Trail	Current route
#53 Sargent Mountain North Ridge Trail	Pieces of Aunt Bettys Pond Trail, perhaps Sargent Mountain Ridge Trail, and an unnamed connector to Giant Slide	Sargent Northwest Trail	From the summit of Sargent, north and then down to the west and connecting to Giant Slide Trail
#57 Hadlock Brook Trail	Waterfall Trail Hadlock Brook Trail	Hadlock Brook Trail	Current route
#60 Norumbega Mountain Trail	Goat Trail	Goat Trail	Parkman parking to summit
	Browns Mountain Path	Norumbega Mountain Trail	Lower Hadlock Pond to summit
#65 Jordan Stream Trail	Jordan Stream Path	Jordan Stream Path	Current route
#69 to #502, unnamed connector to Hadlock Ponds	Hadlock Ponds Trail	Hadlock Ponds Trail	Lower Hadlock pump house to Hadlock Brook Trail
#105 Flying Mountain Trail	Flying Mountain Trail	Flying Mountain Trail	Fernald Point parking, over summit, to head of Valley cove
	Valley Cove Trail	Valley Cove Trail	Head of Valley Cove across CCC trail along cove to intersection at end of Man O'War Brook Road
#110 Sluiceway Trail	Sluiceway Trail Little Notch Trail	Sluiceway Trail	Current route
#111 Bernard Mountain South Face Trail	South Face Trail Kaighn Trail Moss Trail	Bernard Mountain Trail	Current route of Bernard South Face Trail

RECOMMENDATIONS FOR TRAIL NAMES (CONTINUED)			
Current Name	**Historic Name/Names**	**Suggested Name**	**Route**
#112 Razorback Trail	Razorback Trail	Razorback Trail	From intersection with Gilley Trail to intersection with the spur to Mansell Mtn. Trail, then west to Great Notch; includes spur to Mansell Mountain
#115 Mansell Mountain Trail	East Peak Trail	Mansell Mountain Trail	From Gilley Field to intersection Razorback spur, continuing to summit
#117 Cold Brook Trail	Cold Brook Trail, Gilley Trail	Cold Brook Trail	Current route
#118 Long Pond Trail	Great Brook Trail, Great Pond Trail	Long Pond Trail	Current route
#120 Western Mountain Trail	Western Trail, Center Road	Great Notch Trail (section)	See below
#122 Great Notch Trail	Great Notch Trail	Great Notch Trail	Beginning at intersection with Gilley Trail, through notch, over route of current Western Mountain Trail, to Long Pond Fire Road
#401 Seaside Path	Jordan Pond Path (Seaside)	Seaside Path	Current route

ENDNOTES

37 Harold Peabody and Charles Grandgent, *Walks on Mount Desert Island* (1928), 4.

38 Bar Harbor VIA 1906 *Annual Report.*

39 Bar Harbor VIA 1906 *Annual Report.*

40 *Hiking Trails Management Plan*, 23.

41 Carl Demrow and David Salisbury, *The Complete Guide to Trail Building and Maintenance* (Boston: Appalachian Mountain Club Books, 1998), 94.

42 Demrow and Salisbury, 95–96.

43 Peabody and Grandgent, 4.

44 Bar Harbor VIA 1906 *Annual Report.*

45 *Hiking Trails Management Plan*, 28.

46 Albert H. Good, *Park and Recreation Structures* (National Park Service, 1938), Vol. 1, 39.

47 *Hiking Trails Management Plan*, 29.

48 *Hiking Trails Management Plan*, 29.

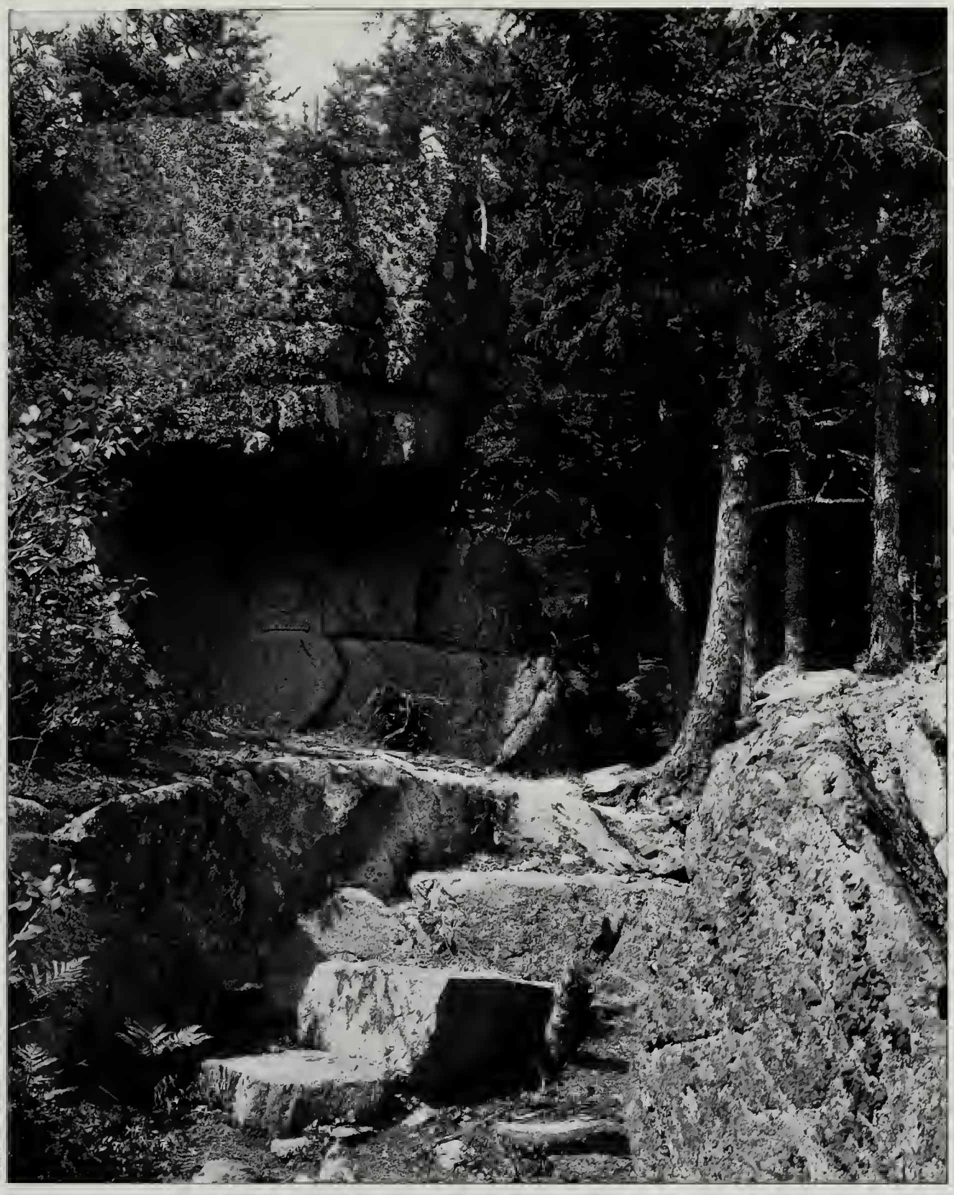


Fig. 10-1 Commemorative plaque honoring Waldron Bates in the cliffs of the Gorham Mountain/ Cadillac Cliffs Trail (#5), circa 1916.

CHAPTER 10:

MONUMENTS AND ASSOCIATED STRUCTURES

A. MONUMENTS

B. ASSOCIATED STRUCTURES

CHAPTER 10: MONUMENTS AND ASSOCIATED STRUCTURES

The trail system contains many associated features that fall outside the boundaries of constructed trail features. Although these items are not integral to the trails' construction, they still enrich the hiking experience at Acadia. In this section, treatment guidelines are provided for two of these features.

A. Monuments
B. Associated Structures

Monuments include commemorative plaques and engraved stones used to commemorate trail builders, explorers, and other individuals significant to the history of Acadia (Fig. 10-1). Structures associated with the trail system include a variety of trail amenities such as benches, shelters, comfort stations, and observation towers (Fig. 10-2).

Comfort, safety, and appreciation of the natural beauty and cultural history of the island have been an integral part of the trail system since the formation of the VIA/VIS path committees in the 1890s and early 1900s. The commitment of the VIA/VIS groups to the trail system was manifested in the careful selection of trail routes and the placement of signs, benches, shelters, and commemorative features. With the creation of the park in 1916, a broader range of hikers required additional associated features, developed in accordance with park system standards.

Maine Historic Preservation Comm., Dana Family Collection

Fig. 10-3 The Champlain Monument, along Route 3, soon after its installation and dedication in 1906. Trails to the monument connected to Seal Harbor and Day Mountain.

A. MONUMENTS

DEFINITIONS

A number of monuments at Acadia commemorate trail builders, philanthropists, and individuals associated with the cultural history of the island. Two types of monuments are associated with the trails and described in this document.

A **commemorative plaque** is a plaque cast in bronze or other metal which is mounted on the face of a cliff, into a large boulder, or in one case, into a stone bench; all of these commemorate individuals.

An **engraved stone** is a boulder, step, or cut stone into which text has been engraved. Generally, engraved stones associated with trails name the trails themselves and were located at one or both entrances to the trail.

Maine Historic Preservation Commission, 97-9-16

Fig. 10-2 This 19th-century gazebo with a bench nearby, photographed in the 1870s, was built as part of a Bar Harbor summer estate in the vicinity of some of the earliest Bar Harbor recreational paths.

HISTORICAL USE AT ACADIA

Pre-VIA/VIS

There is no documentation or evidence of monument construction prior to the VIA/VIS period.

Village Improvement Associations/Societies

In 1906, the first two commemorative plaques were added to the park. A large stone with descriptive plaques on both sides was erected on the southeastern side of Day Mountain (currently located near the trailhead for the Day Mountain Trail, #37) to honor Samuel de Champlain (Fig. 10-3), and the Bar Harbor VIA installed a smaller plaque on the edge of Fawn Pond to commemorate Charles T. How's gift of the pond and forty acres of land to the park. Over twenty additional commemorative plaques and inscribed stones were added between 1910 and 1945.[49] As members of the Mount Desert Island community, mostly summer residents in Bar Harbor, Seal Harbor and Northeast Harbor, either contributed land or died, a fitting tribute was to establish a memorial path or place a commemorative plaque at a favored spot. For example, when Waldron Bates, Bar Harbor VIA Path Committee chairman (1900–1909), died suddenly in 1909, the Chasm Path (#525) was renamed the Waldron Bates Memorial Path. A sign was posted at the upper end of the trail. In addition, many people contributed funds for a commemorative plaque to be placed on a ledge at the southern end of the Cadillac Cliffs Walk (#5) laid out by Bates, which the Bar Harbor VIA considered the "best illustration of engineering skill in path making"[50] (Figs. 10-1 & 10-4).

Beginning in 1913, George Dorr guided the development of a network of memorial trails radiating from the Sieur de Monts Spring area, which he envisioned as the nucleus of Hancock County Trustees' reservation and proposed National Park. Six trails, each marked with an engraved stone and most with a bronze commemorative plaque, were built between 1913 and 1918, including the Kane Path (#17), Kurt Diederich's Climb (#16), Beachcroft Path (#13), Emery Path (#15), Jesup Path (#14), Homans Path (#349), and Stratheden Path (#24) (Figs. 10-5 to 10-12).

Fig. 10-4 Detail of the Waldron Bates plaque, photographed in 1995.

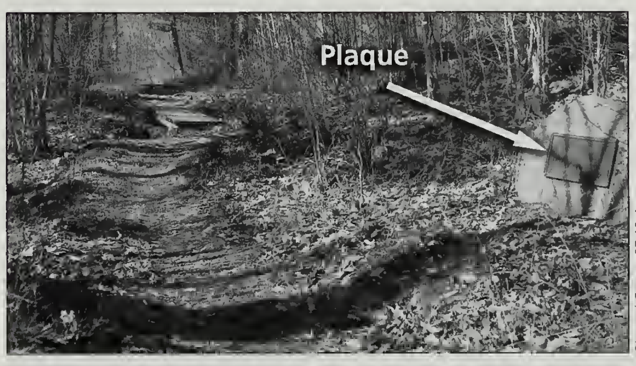
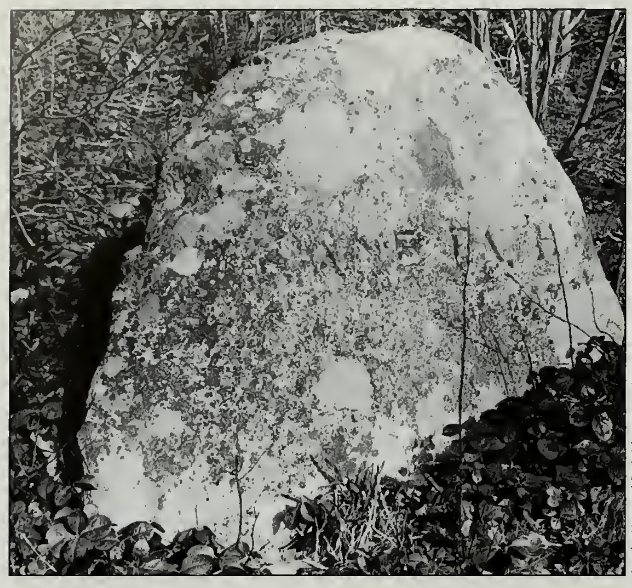


Fig. 10-5 Commemorative plaque honoring John Innes Kane on the Kane Path (#17).

Fig. 10-6 Detail of John Innes Kane plaque.



Acadia National Park Monument Inventory

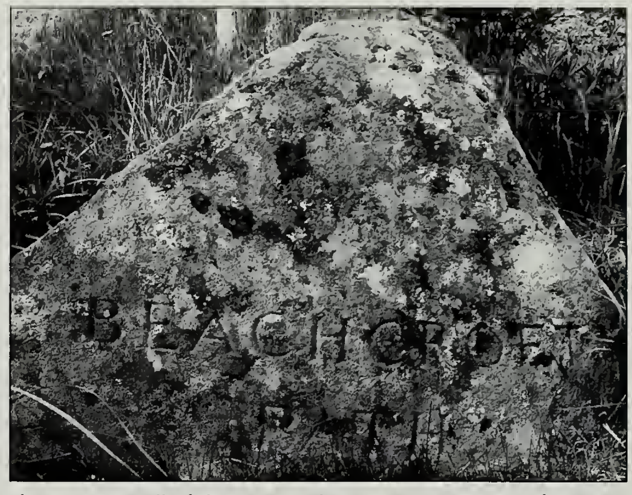
Fig. 10-7 Engraved stone marking the Kane Path (#17).

Olmsted Center, 5-99-16-3

Fig. 10-8 Detail of the engraved stone step marking the entrance to Kurt Diederich's Climb (#16).

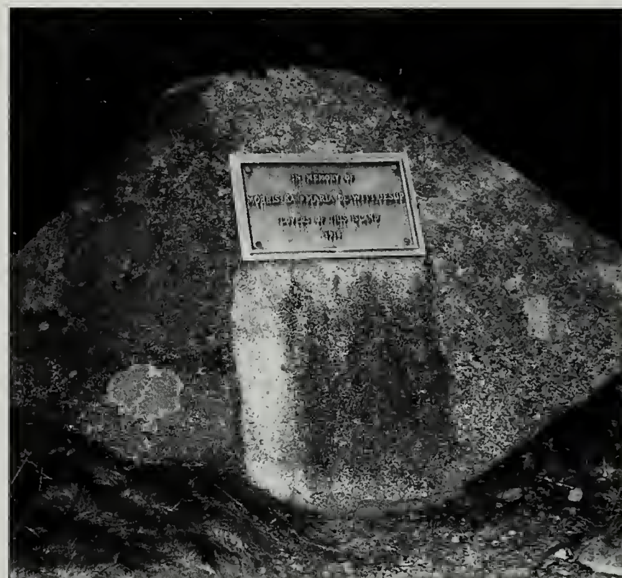
Olmsted Center, 5-99-5-4

Fig. 10-9 Beachcroft Path trailhead with and engraved stone to the right of the trail.



Olmsted Center, 5-99-5-5

Fig. 10-10 Detail of the engraved stone on the Beachcroft Path (#13).



Olmsted Center, 8-97-23-15

Fig. 10-11 1918 commemorative plaque honoring Morris K. and Maria DeWitt Jesup on the Jesup Path (#14).

Acadia Trails Crew, 2002

Fig. 10-12 "Sweet Waters of Acadia" engraved stone off the Park Loop Road near Sieur de Monts. This stone is probably not in its original location.

In the Seal Harbor VIS district, similar commemorative activities took place, but to a lesser degree. A circuit path was built in memory of John Van Santvoord (#450), path committee chairman from 1907 until his death in 1913. A simple commemorative plaque was placed at the summit of the East Triad in 1915 (Fig. 10-13). About this time a granite bench and commemorative plaque honoring Sarah Cushing was placed on the shore of Jordan Pond, not far from the Jordan Pond House. No documentation has been found about this commemorative bench. In association with gifts of land, a plaque was also placed on Acadia Mountain circa 1918 to recognize Reverend Cornelius Smith and Mary Wheeler.

After a post-World War I lull, work on memorial paths resumed in the mid-1920s. In Seal Harbor, the VIS placed a commemorative plaque on a large boulder along the Seaside Path (#401) circa 1925 in memory of Edward Rand, who was responsible for the VIA/VIS path maps and a former path committee chairman (Fig. 10-14). In the Bar Harbor VIA district several memorial paths were added to the system, while some existing trails were endowed with maintenance funds. Commemorative plaques were set on existing large boulders on the newly built Andrew Murray Young Path (#25) and the already established Gorge Path (#28). A stone bridge and associated engraved stone were placed at the outlet of Lakewood (#309) in recognition of the land gift of Annie Kane and Fanny Bridgham (Figs. 10-15 to 10-17). Two additional memorial trails were established, the newly built Gurnee Path (#352) and the already established Canon Brook Path (#19), but these did not receive monuments. In Northeast Harbor, a commemorative plaque was placed on Eliot Mountain circa 1929 in memory of Charles W. Eliot, founder of

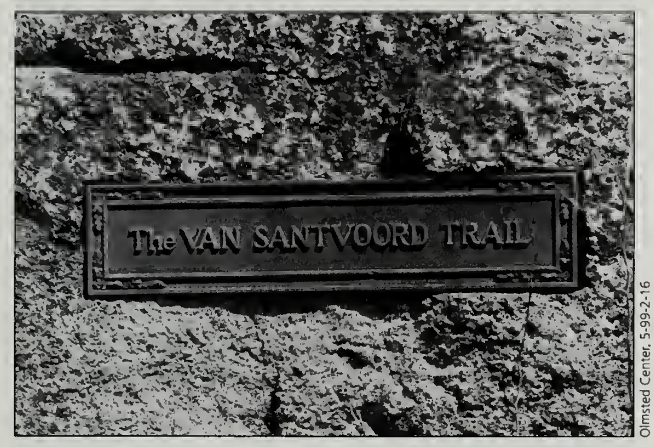


Fig. 10-13 Commemorative plaque on the Van Santvoord Trail (#450).

Fig. 10-14 Commemorative plaque honoring Edward Lothrop Rand on the Jordon Pond Seaside Path (#401).

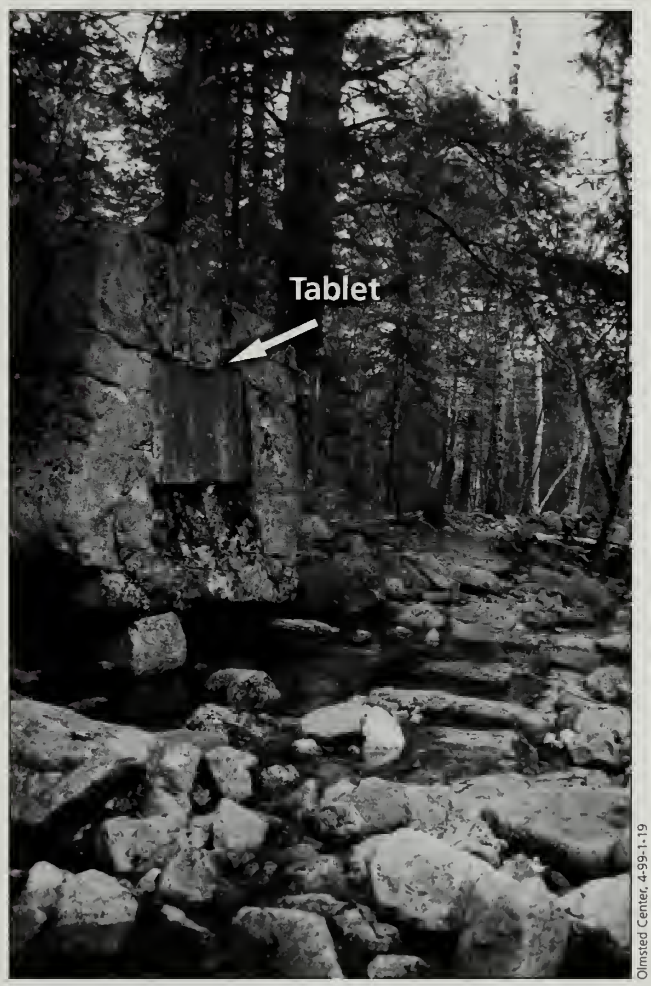


Fig. 10-15 Commemorative plaque honoring Andrew Murray Young on the Andrew Murray Young Path (#25).

the Hancock County Trustees (Fig. 10-18). Nearby, a rough-cut engraved stone was placed on the Asticou Terraces in memory of Joseph Curtis.

Civilian Conservation Corps

Fewer monuments were added to the trail system as the VIS/VIS role in the construction and maintenance of paths diminished. The CCC did not initiate the addition of monuments to the system and the NPS tended to discourage the placement of monuments on park land, with a few exceptions. However, one significant monument was added during the 1930s. A commemorative plaque honoring Stephen Mather, the first director of the Park Service, was placed at the entrance to the Cadillac Mountain Summit Loop Trail (#33) (Fig. 10-19). Similar plaques were placed at all national parks across the United States.

NPS/Mission 66

Two monuments were added to the trail system during the Mission 66 era. In the early part of the period, the Seal Harbor VIS installed the last commemorative plaque honoring a VIA/VIS member. This plaque was installed on the Jordan Pond Path (#39) circa 1945 in memory of Joseph Allen, Seal Harbor VIS Path Committee chairman from 1914 to 1945 (Fig. 10-20). During the 1960s, the NPS honored John D. Rockefeller, Jr. with a commemorative plaque. The plaque was located along the Ocean Path (#3) at Otter Point and described Rockefeller's contributions to the creation of Acadia National Park (Fig. 10-21).

Olmsted Center, 5-99-20-7

Fig. 10-16 Lilian Endicott Francklyn commemorative plaque on the Gorge Path (#28).

Olmsted Center, 2003

Fig. 10-17 Engraved stone near the Kane & Bridgham Memorial Bridge along the path around Lakewood (#309).

Olmsted Center, 2003

Fig. 10-18 Eliot Mountain commemorative plaque.

Olmsted Center, 5-98-3-16

Fig. 10-19 Stephen Mather commemorative plaque on the Cadillac Summit Loop Trail (#33).

National Park Service

No monuments have been added within the park in association with the path system since the 1960s. One commemorative plaque was added in the 1980s outside park boundaries in Northeast Harbor to honor Gordon H. Falt, who worked on trails around the village (Fig. 10-22). In 1990, park volunteers Charles and Virginia Edwards conducted a park-wide inventory of monuments. They located thirty-two monuments (not all associated with the trail system), including four monuments associated with the park but not on park land. Since this time the park has assumed ownership of one of these four, the Charles T. How commemorative plaque, located on the shore of Fawn Pond. In 1993, the NPS documented the monuments as part of the List of Classified Structures (LCS).

HISTORICAL CHARACTERISTICS OF MONUMENTS

The earliest monuments under the VIA/VIS were engraved stones. Later monuments consisted of bronze commemorative plaques mounted on stones. Although each monument is slightly different, the general usage did not vary much during the historic period. Later periods saw little addition to the trail monuments.

Pre-VIA/VIS (pre-1890)

No monuments were associated with trails.

VIA/VIS Period (1890–1937)

Some twenty monuments were added to the trail system. Most were engraved stones or commemorative plaque on boulders and ledges.

CCC Period (1933–42)

One monument was added to the trail system.

NPS/Mission 66 Period (1943–66)

Two monuments were added to the trail system.

NPS Period (1967–1997)

No new monuments were added.

Olmsted Center, 6-97-16-6

Fig. 10-20 Joseph Allen commemorative plaque on the Jordan Pond Trail (#39).

Acadia Trails Crew, 2001

Fig. 10-21 Rockefeller commemorative plaque at Otter Point on the Ocean Path (#3).

Acadia Trails Crew, 2001

Fig. 10-22 Gordon H. Falt commemorative plaque.

MONUMENTS ASSOCIATED WITH THE TRAIL SYSTEM		
Name and Date Installed Trail Name and Location Description	**Inscription**	**History**
Champlain Monument, 1906 Day Mountain Trail (#37), 70 feet north of Route 3 and 75 feet east of trail, formerly at the end of the Champlain Monument Path (#453) Two bronze commemorative plaques on relocated boulder	*Front Side:* "In honor of Samuel de Champlain Born in France 1567 Died at Quebec 1635 A soldier sailor explorer And administrator Who gave this island its name." *Rear Side:* "The same day we passed also near an island about four or five leagues long...it is very high, notched in places so as to appear from the sea like a range of seven or eight mountains close together. The summits of most of them are bare of trees for they are nothing but rock. I named it The Island of the Desert Mountains, Champlain's Journal, 5 September, 1604."	Placed by the Hancock County Trustees of Public Reservations. Originally placed on their first parcel of donated land, west of Ox Hill overlooking the Cranberry Isles, the monument was later moved to its present location along Route 3.
Charles T. How, 1906 Fawn Pond (#309), ledge on northwest side of pond, facing south Bronze commemorative plaque	"This plaque Commemorates the gift by Charles T. How Of the Fawn Pond And forty acres of land To the Bar Harbor Village Improvement Association 1906"	Placed by the Bar Harbor VIA in recognition of one of the first land gifts for preservation. The land was sold to the National Park Service in the 1990s.
Waldron Bates, 1910 Gorham Mountain Trail (#4), southern end at junction with Cadillac Cliffs Trail Bronze commemorative plaque on ledge	"1856-1909 Waldron Bates In Memoriam MCMX Pathmaker"	Placed by the Bar Harbor VIA in memory of Waldron Bates, who laid out over 25 miles of trails, helped map the trail system in the 1890s, developed standards for trail construction and maintenance, and served as Bar Harbor VIA Path Committee chairman. Bates laid out the Cadillac Cliffs Path. The plaque was designed by New York sculptor and summer resident, William Ordway Partridge.
Waldron Bates, 1910 Waldron Bates Memorial Path/ Chasm Path (#525), at upper end of path—exact location unknown Unknown	Unknown	Described by Mitchell in the Bar Harbor VIA 1910 Path Committee Annual Report
John Innes Kane, 1913 Kane Path (#17), northern end of path Bronze commemorative plaque on boulder	"In memory of John Innes Kane A man of kindness who Found his happiness in Giving others pleasure 1913"	Memorial trail funded by Mrs. John I. Kane in 1913. Described by Rudolph Brunnow in his 1914 Bar Harbor VIA Path Committee report. Completed in 1915 and attributed to George Dorr.

John Innes Kane, ca. 1913 Kane Path (#17), northern end of trail, exact location unknown Engraved stone	Kane Path	See above, placement attributed to George Dorr.
Kurt Diederich, 1913 Kurt Diederich's Climb (#16), currently located in park sign shop Bronze commemorative plaque	"In memory Of Kurt Diederich Who loved these mountains 1913"	Trail construction funded by Mrs. Hunt Slater in memory of her nephew, described by Rudolph Brunnow in his 1915 Bar Harbor VIA path committee report and attributed to George Dorr.
Kurt Diederich, ca. 1913 Kurt Diederich's Climb (#16), lower end of path near The Tarn Engraved stone step	"Kurt Diederich's Climb"	See above, installation attributed to George Dorr.
Beachcroft Path, ca. 1915 Beachcroft Path (#13), lower end of path near Route 3 Engraved stone	"Beachcroft Path"	Mrs. C. Morton Smith funded construction of the path, and later, in 1926, funded improvements and a maintenance endowment. Installation attributed to George Dorr.
Sweet Waters of Acadia, ca. 1916 Emery Path (#15), lower end at Sieur de Monts Spring Engraved stone	"Sweet Waters of Acadia"	Located at Sieur de Monts Spring, the hub of the network of the memorial trails, installation attributed to George Dorr.
Morris K. and Maria DeWitt Jesup, 1918 Jesup Path (#14), southern end of path Bronze commemorative plaque on boulder	"In Memory of Morris K. and Maria DeWitt Jesup Lovers of this island 1918"	Morris Jesup was a railroad investor and banker and president of the Chamber of Commerce of New York, the Audubon Society, one of the incorporators of the American Museum of American History, and a leader in efforts to protect the Adirondacks. On Mount Desert Island, he was active in the Bar Harbor VIA and helped establish the Jesup Memorial Library. George Dorr named a path for the Jesups in 1916 and directed placement of the plaque.
Jesup Path, ca. 1918 *Former Jesup Path at Cromwell Harbor Road (#375), at intersection with Harden Farm Road Engraved stone	"Jesup P ath"	Entrance marker for memorial path dedicated to Morris K. and Maria DeWitt Jesup. Installation by George Dorr. See above.
Stratheden Path, ca. 1916 In the woods north of Sieur de Monts Spring House Engraved stone	"Stratheden Path"	See next entry.

Stratheden Path, ca. 1916 Stratheden Path (#24), west side of Sieur de Monts Fire Road at junction with Hemlock Road Engraved stone	"Stratheden Path"	Formerly known as the Harden Farm Path, no documentation has been found on when and why the trail name was changed, or the rationale for choosing the name. Installation attributed to George Dorr.
Stratheden Path, ca. 1916 * Former Stratheden Path (#24) trailhead on Cromwell Harbor Road, south of road in the golf course, approximately 30 feet south of roadbed, at a small pull-off, approximately 1850 feet east of the Rte. 233 intersection at the Kebo Valley Club. Engraved stone	"Stratheden Path"	See previous entry
Van Santvoord Trail, 1916 Pemetic Mountain Trail (#31), on ledge at summit, facing west Bronze commemorative plaque	"The Van Santvoord Trail"	Installed by Seal Harbor VIS and named for John Van Santvoord, who was Seal Harbor VIS Path Committee chairman from 1907 until his death in 1913. His successor, Joseph Allen, led the effort to construct and name the trail.
Sarah Eliza Sigourney Cushing, Date Installed Unknown Jordan Pond Nature Trail (#45), south end of trail, 50 feet south of boat launch Bronze commemorative plaque and granite bench	"In grateful loving memory of Sarah Eliza Sigourney Cushing Wife of Edward Tuckerman 1832–1915 She dearly loved this spot"	This is the only commemorative plaque associated with a bench.
Edward L. Rand, ca. 1925 *Seaside Path (#401), southern end of path near private road Bronze commemorative plaque on large boulder	"To the memory of Edward Lothrop Rand 1859–1924 In grateful recognition of His pioneer service and labor of love In making known The flora of Mount Desert And compiling maps of Its woodland and mountain paths"	Installed by Seal Harbor VIS in memory of Edward Rand who was a member of the Champlain Society, coathored *Flora of Mt. Desert*, path maps, and guidebooks, and served as Seal Harbor VIS Path Committee chairman. Rand was active in the early marking of the Seal Harbor VIS path network, including the Seaside Path.
Andrew Murray Young, ca. 1924 Andrew Murray Young Path (#25), lower end of trail, 800 feet north of Canon Brook Trail junction, near brook. Metallic commemorative plaque (white metal) on large boulder	"In memory of Andrew Murray Young, Who loved this island Where god has given Of his beauty with a Lavish hand 1861–1924"	Funded and endowed by his wife, Marie Hunt Young. Described by Harold Peabody in his Bar Harbor VIA Path Committee reports in 1924–26. Installation attributed to George Dorr and the Bar Harbor VIA.

Lillian Endicott Francklyn, ca. 1929 Gorge Path (#28), 3/4 mile south of Loop Road, on ledge just below waterfall and pool Bronze commemorative plaque	"In loving memory of Lilian Endicott Francklyn 1891–1928 This trail is endowed by Her friends"	Funded by several summer residents who endowed the trail with a maintenance fund. Installation attributed to George Dorr and the Bar Harbor VIA.
Kane & Bridgham, ca. 1929 Fawn Pond Path (#309), at outlet of Lake Wood Engraved stone	"In memory of Annie Cottenet Kane & Fanny Schermerhorn Bridgham Who gave the lake & Surrounding land to Acadia National Park"	Unknown history. Located near the Kane & Bridgham Bridge, designed by Beatrix Farrand and built between 1926 and 1929. Pieces of the bridge are still visible. Installation attributed to George Dorr and the Bar Harbor VIA.
Stephen Tyng Mather, 1930s Cadillac Summit Loop Trail (#33), at trailhead, near parking lot Bronze commemorative plaque	"Stephen Tyng Mather July 4, 1867–Jan 22, 1930 He laid the foundation of the National Park Service defining and establishing the policies Under which its areas shall be developed and Conserved unim- paired for future generations. There will never come an end to the good that He has done."	A similar plaque is located in all national parks—not directly associated with the development of the trail system.
Charles William Eliot, date unknown *Eliot Mountain Trail to Map House (#516), along trail on ledge facing south Bronze commemorative plaque	"Eliot Mountain Named for Charles William Eliot 1834–1926 One of the first to cruise these Island-dotted down-east waters 1872–82 He bought this land and built the first summer Cottage on this shore 1882 Founder of the Hancock County Trustees of Public Reservations 1903, Through which the lands were assembled, And the Lafayette National Monument, Now Acadia National Park, was established."	History unknown.
Joseph Henry Curtis, 1932 Elliot Mountain Trail to Asticou Terrace Path (#519)*, patio area halfway up path Engraved stone with bronze commemorative plaque insert	"1841–1928, Joseph Henry Curtis Landscape architect Vigilant protector Of these hills The Asticou Terraces are his gift For the quiet recreation of the people Of this town and their summer guests."	The plaque was cast by Roman Bronze Works in New York.

Joseph Allen, ca. 1945 Jordan Pond Path (#39), at water's edge, near intersection with Jordan Pond Carry Path (#38), facing northeast Bronze commemorative plaque	"Lover of rocks and high places Builder of trails Conserver of natural beauty Joseph Allen Chairman Seal Harbor Path Committee 1914–1945."	Placed by the Seal Harbor VIS after Allen's death in 1945.
John D. Rockefeller, Jr., 1960s Ocean Path (#3), approximately 770 feet north of Otter Point Bronze commemorative plaque on ledge	"John D. Rockefeller, Jr., 1874–1960 These groves of spruce and fir, these granite ledges, this magnificent window on the sea, were given to the United States by John D. Rockefeller, Jr. He was among the first To sense the need to preserve America's natural beauty and, To set standards of environmental quality. This quiet, dedicated conservationist gave generously of his time, wisdom and resources to help establish this park and others, For the physical, cultural and spiritual benefit of the American people."	Rockefeller, Jr. donated large tracts of land to the park and funded much of the construction of the carriage road and motor road system. Rockefeller was involved in the construction of Ocean Drive, Otter Cliffs overlook, and the associated Ocean Path construction carried out by the CCC in the 1930s.

* outside of park boundary

TREATMENT

1. Location of Monuments

Issue: One engraved stone and at least two commemorative plaques have been removed, and some of the trails or trail segments to which markers refer have been abandoned.

Treatment Guidelines: Monuments should not be moved from their historic locations. According to NPS *Management Policies*:

> Many commemorative works have existed in the parks long enough to qualify as historic features. A key aspect of their historical interest is that they reflect the knowledge, attitudes, and tastes of the persons who designed and placed them. These works and their inscriptions will not be altered, relocated, obscured, or removed, even when they are deemed inaccurate or incompatible with prevailing present-day values. Any exceptions require specific approval by the Director.[51]

If the original location of a removed monument can be determined, the monument will returned to this location. If not, it should be erected in a suitable location on the trail it commemorates. For example, the Kurt Diederich commemorative plaque should be reinstalled on Kurt Diederich's Climb (#16) at its original location if known; otherwise, it should be placed in a suitable place on the trail.

As stated in the *Hiking Trails Management Plan*, decisions to reopen abandoned trails will be made independent of the existence of monuments. However, if an abandoned trail or trail segment is reopened, every effort should be made to follow the historic route to access associated monuments.

2. Agreement of Trail Names and Monument Inscriptions

Issue: Currently some trail names no longer correspond to their associated monuments.

Treatment Guidelines: Maintained trails associated with monuments are to be restored to their historic names, thereby bringing them into agreement with monument text (see Chapter 9, Section G).

An exception to this guideline is the Van Santvoord Trail (#450). Most of this route is abandoned and the section that contains the commemorative plaque is now maintained as part of the Pemetic Mountain Trail (#31). To avoid hiker confusion, the trail will retain its current name and the plaque will not be removed. An interpretive marker should be added to the trail to inform hikers of the trail's history and the reason for the name inconsistency.

3. Documentation

Issue: Other than photographs, the park has no physical record of the individual design of the commemorative plaques and carved stones. If one were stolen, it would be extremely difficult to accurately replace.

Treatment Guidelines: Commemorative plaques and engraved stones associated with the trail system should be thoroughly documented. A project should be developed to update the existing documentation with additional information such as rubbings of the bronze plaques and/or measured drawings of the monuments. A monument specialist should be consulted to scope the project and determine what documentation would be adequate to replace these features if they were lost.

4. Addition of Monuments

Issue: Although the *Hiking Trails Management Plan* allows for the possible addition of monuments to the trail system through "careful consideration" and adherence to applicable NPS management policies, the addition of incompatible new monuments could adversely affect the historic trail system.[52]

Treatment Guidelines: The standard for the addition of new monuments to national parks is high. NPS management policies state:

Outside the District of Columbia and its environs commemorative works will not be established unless authorized by Congress or approved by the Director (36 CFR 2.62). The consultation process required by Section 106 of National Historic Preservation Act must be completed before the Director will make a decision to approve a commemorative work.[53]

If the addition of new monuments is approved, they should be either commemorative plaques or engraved stones. Their placement, scale, and text should be compatible with existing monuments. A new style of monument should not be added to the system. New monuments should only be placed at appropriate locations along the trail, such as trailheads or prominent natural features. Documentation of existing monuments will identify the historic patterns of monument placement throughout the system and should be used as a general guideline for determining the placement of new monuments.

SPECIFICATIONS FOR MONUMENTS

Specifications for the fabrication of new monuments will be developed on a case-by-case basis. The size of the monuments, as well as the layout, font, and sizing of text should be compatible with the existing collection of commemorative plaques and engraved stones. Appropriate specifications should be developed as part of a system-wide monument documentation project.

ROUTINE MAINTENANCE

1. Commemorative Plaques

Bronze plaques should be cleaned and waxed annually to protect them from oxidation. The best time is in July or August because the plaque must be warm to absorb the wax; otherwise a torch must be used to warm the plaque. The plaque is cleaned with Orvis Paste (University Products, Inc. cat. #963-1000, tel. 800–628–1912). Then wash with Stoddard's Solvent, using 100-percent-cotton diapers, not rags. All environmental and personal safety precautions must be followed. It is important to remove salts, bird droppings, and tree saps that promote and accelerate corrosion. Use plastic or natural brushes, not wire. Rinse well with clear water. The plaque must dry completely so moisture is not locked in. The plaque is waxed with Butcher's Bowling Alley Clear Wax, buffed, rewaxed and buffed again. The Butcher's wax must be the Clear variety, not the Orange variety. The plaque should be professionally cleaned on a ten-year schedule using Incralex, a powerful solvent, after which the annual cleaning and waxing can be resumed by trails personnel. Acid rain or excessive touching can cause the wax to break down and oxidation or "greening" to occur at an accelerated rate, in which case professional cleaning may be needed at an earlier date than scheduled.

Note: Consult a bronze or monument specialist to find acceptable alternatives to the products listed above if these are not available.

2. Engraved Stones

Periodically, lichen should be removed from the faces of engraved stones with a wire brush. Engraved stone can also be washed with the Orvis Paste (see above). Lichens can be scrubbed with a vegetable brush. Sometimes they are seated deep within in the stone and can crumble the stone as they grow, so do not be too aggressive on compromised stone. As above, follow environmental and safety precautions.

Note: These instructions are sufficient for routine maintenance. Fungicidal preparations or pressure-washing may be required for seriously infected stones, but should be done only by trained conservators.

B. ASSOCIATED STRUCTURES

DEFINITION

An **associated structure** includes any constructed feature that provides the hiker comfort, rest, or an opportunity to appreciate the surrounding landscape. Examples include benches, shelters, picnic facilities, and observation towers.

HISTORICAL USE AT ACADIA

Note: Research to date has uncovered limited information on the location, design, and construction of associated structures. Thus, this history is based on fragments of information from annual reports, historic photographs, and historical precedents from comparable sites. For example, the construction of gazebos and towers was undertaken throughout the Catskills resort areas in eastern New York State during the same historical period as the early work at Acadia. Therefore, it is likely that the early rusticators on Mount Desert would have followed this example.

Pre-VIA/VIS

Comfortable seating has been a part of the hiking experience on Mount Desert Island as early as the 1870s when rustic structures with shade roofs and seats were built on the island and benches placed in the landscape. Private landowners constructed these structures in the "picturesque" style, a style promoted by landscape gardener, Andrew Jackson Downing (1815–52), who wrote the widely read *Treatise on the Theory and Practice of Landscape Gardening*. Downing advocated the use of native materials, particularly woodwork. He believed that manmade rustic features, such as bridges, steps, seats, and shelters, enhanced one's comfort and enjoyment in natural surroundings, while adding to the picturesque scene. Unfortunately, such delicate wooden structures could not withstand Maine's harsh climate and were soon gone (Fig. 10-23, also Fig. 10-1).

Village Improvement Associations/Societies

The first annual report of the Bar Harbor VIA describes a proposal to add benches or "seats" to the Duck Brook Path (#311) "where the pedestrian might sit and rest himself." As the path system expanded, seating areas were proposed throughout. However, it is not clear how many benches were added to the trails, and photographic documentation is scant. Photographs of the Jesup Path (#14) in 1916 show a bench in the background (Figs. 10-24 & 10-25). "Seats" were also placed along paths in the Seal Harbor district as described by the path committee chairman in 1939 on the Seaside Path (#401) and in 1941 along Hunters Brook Trail (#35 and #455) and Jordan Stream Path (#65). In 1942 the Seal Harbor VIS also placed benches on Little Hunters Brook Path (#438), at Champlain Monument (then located at the southern end of #453), Barr Hill Lookout (summit of #403 and #404), and on the Jordan Pond Path (#39). A 1907 photograph shows a Seal Harbor hiking group *possibly* sitting on a bench on an undetermined trail (Fig. 10-26). No other photographs have been found to further document this. The Northeast Harbor VIS also constructed benches along the trails, and continues to do so (Fig. 10-27). The majority of historic photographs portray hikers sitting on the existing boulders and ledges rather than constructed

Maine Historic Preservation Commission, 97-9-15

Fig. 10-23 Rustic bench near Bar Harbor no longer present, photographed in circa 1870s.

Acadia NP Archives

Fig. 10-24 George Dorr and Mr. and Mrs. Drury on Jesup Path bench near Sieur de Monts Spring.

Acadia NP Archives

Fig. 10-25 Bench on the Jesup Path (#14), circa 1916.

Maine Historic Preservation Comm., Dana Family Collection, 97-10-28

Fig. 10-26 Ladies resting, possibly on a bench, on an unknown trail in Seal Harbor in 1907.

benches, suggesting that benches were probably never widespread throughout the trail system.

None of the early wooden benches are extant in the park. Along with their natural tendency to deteriorate, vandalism of benches was also an issue. In 1938 the co-chair of the path committee reported,

> On the Gurnee Path last year, you may remember that three dainty little seats placed on the path through the kindness of Miss Gurnee, were carried off bodily by some of our light-fingered "tripper visitors." Instructions were given to Mr. Dunbar, our worker, to make a very heavy substantial bench for this path. This was done, a heavy rustic bench built, which was heavily protected by large stones. I am happy to be able to report that this bench is still there! [54]

Two existing stone benches may date to the VIA/VIS period. The first is a memorial bench located on the shore of Jordan Pond on the Jordan Pond Nature Trail (#45), approximately 50 feet south of the boat launching area (Fig. 10-28). While the commemorative plaque on the bench is typical of those placed by the VIA/VIS, no documentation has been found in the annual reports of the Bar Harbor VIA or Seal Harbor VIS to document the bench's construction. The second bench sits along the Penobsot Mountain Trail (#47) on the first bluffs west of and overlooking Jordan Pond. The location and orientation of this large rectangular block suggest it was more than likely arranged as a stone bench.

Other benches were likely present on other VIA/VIS trails, although documentation is circumstantial. Evidence of a stone bench has been discovered on the Champlain Mountain East Face Trail (#12). The Acadia

Fig. 10-27 This log bench on the Lower Hadlock Trail (#502), was constructed in the 1980s by the Northeast Harbor VIS.

Fig. 10-28 This stone memorial bench located on the Jordan Pond Nature Trail (#45) is dedicated to Sarah Cushing.

Fig. 10-29 Historic view of the Sieur de Monts Spring House near the Emery Path (#15) trailhead, circa 1920.

Trail Inventory documents that on section two of the trail, at 852 feet, in the "widest area of walkway, there used to be a stone bench (top is still there)." However, the historic bench is missing, and a new bench has been added as a replacement. Additionally, there are two curious spots on the Emery Path (#15) where benches may have been located. They are constructed flat areas approximately 200 and 400 square feet in size adjacent to the main trail. They provide excellent locations for scenic overlooks and it would be difficult to conceive benches had not been placed at these spots by the trail builders.

In addition to benches, many buildings and shelters offering seating, cover, and refreshments were scattered throughout the trail system during the VIA/VIS period. Examples included the Sieur de Monts Spring House, the Kebo Golf Club, the Building of the Arts, the Green Mountain House, the Jordan Pond House, the Russian Tea House, Satterlee's Tea House, the Seaside Inn, and the Asticou Inn (Figs. 10-29 to 10-31). Other, more rustic shelters were also constructed, including a map house at the western end of the Asticou Trail (#49) (see Chapter 9, Fig. 9-51) , shelters along the trail to the Thuja Lodge overlooking Northeast Harbor (Fig. 10-32), and a "rustic summer-house built by Mr. Kaighn" on the Bernard Mountain Trail (#111).[55] This summer house built by a family that frequented Southwest Harbor was mentioned in both the 1915 and 1928 Path Guides, and currently five iron pins remain in the ledge just south of the Bernard Mountain summit where it likely stood. The VIA/VIS did not construct any towers in association with the trail system.

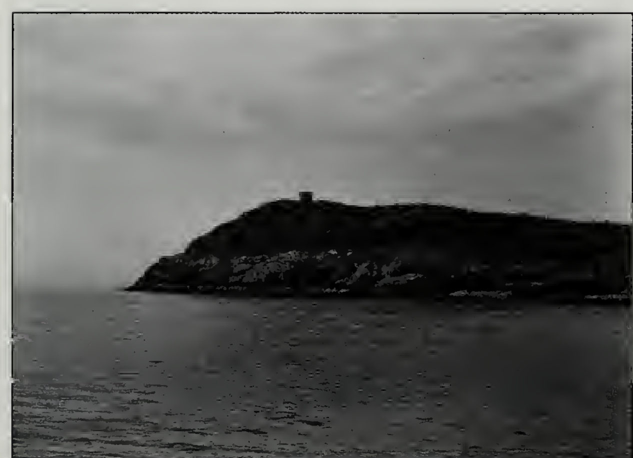

NPS, Harpers Ferry, #JB-808

Fig. 10-30 Satterlee's Tea House on Great Head, 1961.

Bar Harbor Historical Society Postcard Collection, 03-d

Fig. 10-31 Detail view of Satterlee's Tea House on Great Head, circa 1920.

Civilian Conservation Corps

During the CCC period of construction, there is no documentation for the addition of individual benches to the trail system. Instead, CCC documentation recounts the construction of recreation and picnic areas such as the Bear Brook, Pretty Marsh, Pine Hill, and Oak Hill picnic areas and the Echo Lake swimming area. These areas included outlook structures, picnic tables, and fire pits. Trails were built to connect these areas with the existing trail system.

The CCC did issue generic specifications for bench construction, although it is unknown if they were used at Acadia. The specifications are documented in the second volume of Albert Good's *Park and Recreation Structures* (1938), which includes a chapter on "Trailside Seats, Shelters, and Overlooks." Good writes:

> Seats along trails affording hikers a place to rest after a particularly difficult climb or to contemplate a fine view or an object of interest are very properly of much more informal character than the seating provided where use is more concentrated. If it is to be effectively naturalized, it must appear casual and unforced, free of the appearance of being too cumbersome and elaborately devised. Natural objects or formations may be utilized, within the limits of reason, as resting places along the trail. Ledges of stone, boulders, or down logs, with slight

adaptations, provide trailside seating without the introduction of foreign elements.[56]

Although no CCC benches are extant in the park, a bench installed by the NPS in the 1990s is similar in style to CCC benches described in *Park and Recreation Structures*. It is located on the Penobscot East Trail (#50) at Sargent Mountain Pond (Figs. 10-33 & 10-34).

In the second volume of *Park and Recreation Structures*, Good describes the desired characteristics of trailside shelters and overlook structures as having "an ingratiating lack of pretentiousness."[57] Of the CCC outlook shelters built on Mount Desert Island, only those at Pretty Marsh remain, though the viewshed and the associated trail are now overgrown. At Oak Hill, only the foundation of the shelter remains (Fig. 10-35). The CCC also constructed ranger cabins with trails on Bernard Mountain, McFarland Hill, and Youngs Mountain, but none of these structures are extant (Figs. 10-36 & 10-37). However, there are still a few rotted logs, boards, and shingles at the Bernard Mountain site.

Good describes favorable characteristics for both fire and observation towers. Regarding fire towers, he writes:

> Adequate protection against lightning, high winds, and winter storms, and the factor of live load due to a concentration of visitors must be taken into account in designing the lookout. High towers must be provided with railings along the steps, platforms, and landings. It is possible by employing native rock or logs in the construction to achieve a certain harmony with the sur-

Olmsted Center, 5-01-9-34

Fig. 10-32 A rustic shelter at the Asticou Terraces in Northeast Harbor on the trail to the Thuja Lodge.

Olmsted Center, 5-99-40-5

Fig. 10-34 This log bench, installed by the NPS in the 1990s at the water's edge on the Penobscot East Trail (#50), is similar in construction to CCC-style benches.

Good, Park and Recreation Structures, 1938

Fig. 10-33 This CCC log bench, with log supports on a stone base located in Camden State Park, Minnesota, is typical of the standard CCC bench style built at many sites across the country in the 1930s.

Acadia NP Archives, 2328 #44

Fig. 10-35 The picnic shelter shown in this 1937 photograph was constructed by the CCC at the Oak Hill picnic area. A trail led visitors from the parking area the site overlooking the marsh. Only the foundation of the structure remains.

roundings, especially if, when located on a rocky summit, the structure is blended to it and made to appear to grow out of it.[58]

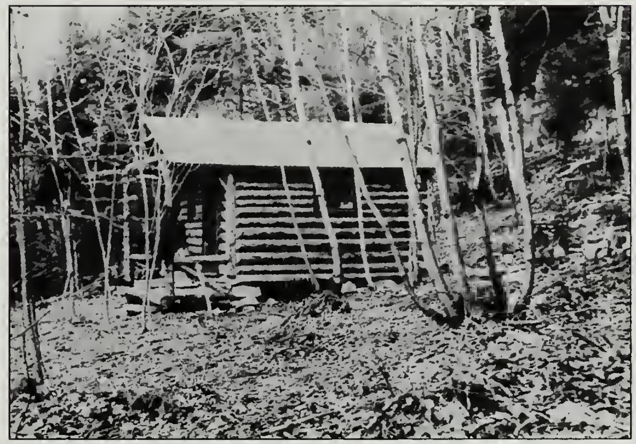
The CCC constructed a fire tower in this style on the summit of Bernard (Western) Mountain, which was used as a public observation tower (Fig. 10-38). A small fire tower was also constructed in 1941 approximately 200 yards northeast of the Sargent Mountain summit. This structure is no longer extant, but there are remnants of wooden walls, shingles, a line of utility poles, and telephone cable on the site.

NPS/Mission 66

There is no documentation for bench or shelter construction during the Mission 66 period. Mission 66 crews did replace the wooden fire tower on Beech Mountain with a modern steel tower sometime between 1960 and 1962. The western half of the Beech Mountain Loop Trail (#113) was constructed by Mission 66 crews as an access route for the construction of this tower (Fig. 10-39). (The towers and trail are documented in Acadia's interpretive guide, "Beech Mountain Hike.")

National Archives, Waltham, MA, 97-4-17

Fig. 10-36 Construction of a ranger cabin on McFarland Hill by the CCC in the 1930s.



National Archives, Waltham, MA, 97-5-13

Fig. 10-37 A ranger cabin on Youngs Mountain shown in the 1930s after construction by the CCC.

Acadia NP Archives

Fig. 10-38 This CCC fire tower on Bernard Mountain, photographed in 1936, was also used by many hikers as an observation tower.

Olmsted Center, 5-01-8-22

Fig. 10-39 Located on the summit of Beech Mountain along the Beech Mountain Loop Trail (#113), this steel fire tower was constructed during the Mission 66 Program and is still extant.

National Park Service

Relatively few associated structures have been added to the trail system during the NPS period. In the 1960s, the NPS installed benches in the Wild Gardens of Acadia at Sieur de Monts Spring (Fig. 10-40). A more recent addition, added by the Northeast Harbor VIS, is a garden bench on the Asticou Brook Trail (#514) in Northeast Harbor, outside of the park (Fig. 10-41). Due to a lack of documentation, it is difficult to assess whether these garden-style benches are out of character with VIA/VIS-era benches.

Examples of other associated structures added by the NPS include a privy on Beech Mountain Loop Trail (#113), and an observation platform and steps on the Bass Harbor Head Light Trail (#129). The construction of features like these provides both visitor comfort and safety. However, they generally do not complement the historic character of the trail system. These types of features have typically been generic in style and construction and are often not representative of the historical precedents at Acadia (Figs. 10-42 & 10-43).

Olmsted Center, 4-99-66-6

Fig. 10-41 This wooden, garden-style bench is located on the Asticou Brook Trail (#514) and was installed in the 1990s by the Northeast Harbor VIS.

Olmsted Center, 5-99-25-18

Fig. 10-42 Privy on the Beech Mountain Loop Trail (#113).

NPS, Harpers Ferry

Fig. 10-40 Wooden benches like this were used in the Wild Gardens of Acadia during the 1960s.

Olmsted Center, 5-99-29-7

Fig. 10-43 Observation deck on the Bass Harbor Head Light Trail (#129) built in the 1990s.

HISTORICAL CHARACTERISTICS
Based on the limited documentation available, it appears the historical character of associated structures has never been consistent but has changed during each of the historic periods. The result has been myriad styles ranging from the early picturesque benches, bridges, and shelters, to CCC features constructed to standardized specifications.
Pre-VIA/VIS (pre-1890)
Rustic wooden gazebos, bridges, and benches in the picturesque style, similar to those espoused by Andrew Jackson Downing, and erected in the Catskills resort areas, were used on several of the early trails.
VIA/VIS Period (1890–1937)
Varying styles of benches were used throughout the system including round logs (Jesup Path), granite (Jordan Pond), and split cedar log (Lower Hadlock Brook). Other structures remotely associated with the trail system were added, including the Jordan Pond House and the Sieur de Monts Spring House.
CCC Period (1933–42)
Some rustic wood and stone structures were added, primarily at new recreation areas like the various picnic grounds. Fire towers were also constructed.
NPS/Mission 66 Period (1943–66)
Benches were likely used on the trails, as there were old and rotted benches replaced at Great Notch and Bernard Mountain overlook in the early 1970s. However, the only documented addition was a steel fire tower on Beech Mountain.
NPS Period (1967–1997)
An assortment of bench styles were used, including wooden garden style in developed areas. A few other associated structures, like observation decks, were added, typically in a generic style of construction.

TREATMENT

1. Maintaining Character

Issue: There is poor documentation for many of the structures associated with the trail system. For example, specifications for the design and location of historic benches are often speculative. In places where the trail widens and there is an exceptional view, placement of a bench might be appropriate, but typically there is no documented evidence to verify if a bench was used historically by the VIA/VIS or CCC. This lack of information has resulted in the random placement of various bench styles throughout the trail system without unifying design standards. This haphazard approach had also applied to other features added to the system like observation decks and small structures.

Treatment Guidelines: Given the lack of information, prudence is required when dealing with associated structures.

For benches, a comprehensive inventory of existing benches should be undertaken to identify any extant historic benches and aid in establishing design guidelines for bench style and placement. The inventory should include VIA/VIS trails outside of the park as an additional source for information. Existing benches should not be removed until it can be determined whether they date to the historic period. Existing benches should be inspected to ensure they are structurally sound, and replaced in-kind if deteriorated beyond repair. If new benches are added to the trail system, they should be built in a rustic style with logs and/or stone, avoiding materials such as metal, recycled plastic, or pressure-treated wood in visible locations. Benches are easily removable and have less of a permanent impact on trail character. Therefore, new benches may be installed in locations where it is speculated a bench was placed historically. If evidence is later found to contradict this assumption, the bench can easily be removed. However, benches should not be installed in areas where there is no presumption of historical use.

Other associated structures dating from the historic period should be maintained as contributing features to the integrity of the trail system. Examples include, but are not limited to, the map house on Eliot Mountain and the CCC shelters at Pretty Marsh, including maintenance of the viewshed and rehabilitation of the associated trail. Physical remnants of other structures should be documented and preserved.

2. Vandalism
Issue: Overlook spots, where hiking groups are likely to stop, are the most likely locations for rock throwing, bench tossing, or other acts of vandalism which threaten both visitor safety and resource protection.

Treatment Guidelines: The threat of vandalism should not be a deterrent to installing and maintaining associated structures. However, careful consideration should be given to the placement of features. For example, benches should not be located in remote locations, where there is increased risk of vandalism, and not every overlook is in need of a bench. To decrease the threat of removal by vandals, ways to anchor the bench to the ledgerock that are relatively inconspicuous should be explored, such as pinning or using chemical adhesives.

3. Security of the Beech Mountain Fire Tower
Issue: The Beech Mountain fire tower currently remains locked and unavailable for public use. This restricts the public's enjoyment of one of the larger structures historically associated with the trail system and also limits interpretive opportunities for the Beech Mountain Loop Trail (#113).

Treatment Guidelines: It is recommended that the Beech Mountain fire tower be opened for public use. To determine the feasibility of implementing this recommendation, the park should to commission a study of the tower's structural integrity and identify the liability concerns involved with allowing public access.

SPECIFICATIONS FOR ASSOCIATED STRUCTURES

Specifications will vary for individual associated structures according to type and should be developed on a case-by-case basis by appropriate park staff. Visitor safety and resource protection are primary considerations to examine when developing specifications for an associated structures. Local building codes may also need to be addressed for buildings and/or larger structures.

ROUTINE MAINTENANCE

1. Regularly check all associated structures for decay and/or deterioration, and repair or replace pieces in-kind as needed. Wooden features should be routinely checked for splinters.
2. The fire tower and other larger structures should be inspected regularly for safety. Major repairs may need consultation with structural engineers to develop appropriate specifications for work.

ENDNOTES

49 Monuments associated with the path system, with the exception of the Jesup engraved stone monument, are documented in the 1990 Monument Inventory completed by park volunteers Charles and Virginia Edwards. Additional monuments are described in the inventory that are not part of the path system, including those for George Dorr, Atwater Kent Field, Satterlee Field, David McKinney, Gertrude and Fritz Engel, and John Moore, the Fabbri Monument, for Sargent Drive, and on Bar Island.

50 *Bar Harbor Record,* November 23, 1910, 3.

51 National Park Service, *Management Policies 2001* (United States Department of the Interior), section 9.6.4, 115.

52 *Hiking Trails Management Plan,* 14.

53 *Management Policies, 2001,* section 9.6.1, 114.

54 Bar Harbor VIA 1938 *Annual Report.*

55 Harold Peabody and Charles Grandgent, *Walks on Mount Desert Island,* 1928.

56 Albert H. Good, *Park and Recreation Structures* (National Park Service, 1938), Vol. 2, 87.

57 Good, Vol. 2, 8.

58 Good, Vol. 2, 156.

Friends of Acadia

Acadia Youth Conservation Corps using a highline above the Jordan Pond Path (#39).

SECTION 2:

INDIVIDUAL TRAIL SPECIFICATIONS

SCHIFF PATH (#15)

JORDAN POND PATH (#39)

JORDAN CLIFFS TRAIL (#48)

SHIP HARBOR NATURE TRAIL (#127)

HOMANS PATH (#349)

SECTION 2: INDIVIDUAL TRAIL SPECIFICATIONS

Section 2 provides treatment guidelines for individual trails, building on specific feature information presented in Section 1. Included are recommendations for five trails—the Schiff Path (#15), the Jordan Pond Path (#39), the Jordan Cliffs Trail (#48), the Ship Harbor Nature Trail (#127), and the Homans Path (#349).

As this document was under development, rehabilitation work was already in process or planned for these five trails. The Jordan Pond Path (#39) in particular underwent extensive rehabilitation concurrent with the development of this report. Field work provided an opportunity to test the guidelines and make necessary modifications to address trail conditions, staff availability, budget concerns, and other pertinent issues. Since rehabilitation remains underway on these five trails, it is anticipated the process of refining the guidelines will continue as each trail is addressed.

Deadlines for completion of this report preceded completion of trail rehabilitation. As rehabilitation of each trail is completed, actual trail conditions and guidelines used may be altered somewhat from the information currently presented in Section 2. As a result, Section 2 as written is general in nature and is not presented as the definitive prescription for each trail. It is included primarily to illustrate the complete planning process for trail rehabilitation at Acadia, showing how the feature information from Section 1 can be applied to individual trail scenarios. Ideally, as trail work is completed and guidelines are refined, the written documentation should be updated to reflect any changes in trail planning or implementation.

In Section 2, the following information is provided for each of the five included trails:

History: The historical development of the trail is discussed, including the original builders and any documented modifications to the trail during later eras.

Character: The specific character of the trail is analyzed, including how this trail fits into the overall character of the entire system.

Features: Specific treatment guidelines are provided for each of the feature types that are present on this particular trail or may be appropriate for addition to the trail. This section relies heavily on the information provided in Section 1. For example, if a certain trail historically contained VIA/VIS bridges, the treatment guidelines for bridges will likely say any new bridge work must be compatible with the VIA/VIS style. For a description of the VIA/VIS style and specifications for building compatible bridges, the reader should refer back to Section 1, Chapter 5, where VIS/VIS bridges are discussed in greater detail.

Routine Maintenance: Information is provided here only for specific maintenance concerns for the individual trail that must be addressed to preserve its historic character. This information will not be provided for all of Acadia's trails, as general maintenance for each feature type is addressed in Section 1.


Acadia NP Archives

Fig.15-1 Circa 1920s view of the Schiff Path.

SCHIFF PATH
(#15)

SCHIFF PATH (#15)

The Schiff Path has withstood nearly eighty years of heavy use with relatively little maintenance. The trail traverses the upper slope of Dorr Mountain to the summit, acting as an extension of the Emery Path (#15). Currently, both the Schiff Path and the Emery Path are marked as the Dorr Mountain East Face Trail (#15) (Figs. 15-1 & 15-2).

Most of the tread is highly constructed with stone paving, steps, and capstone culverts. Some sections are eroded and steps are slipping. Built features need to be reset or repaired to ensure that extensive damage does not occur.

REHABILITATION PRIORITIES

- Reopen closed culverts.
- Repair drainage on sections where no longer functional.
- Repair eroded sections, particularly where steps are loose or slipping.
- Inspect and replace ironwork as needed.

HISTORY

Beginning in 1913, George Dorr directed the development of a network of memorial paths radiating from Sieur de Monts Spring. Dorr envisioned the Sieur de Monts area as the center of a reservation of protected lands, with paths connecting to Bar Harbor and the surrounding mountains. Dorr was able to raise funds for trail construction as an active member of the Bar Harbor VIA Path Committee, the Hancock County Trustees of Public Reservations, as well as the founder of his own philanthropic organization, the Wild Gardens of Acadia Corporation. By the time the reservation was designated Sieur de Monts National Monument in 1916, with Dorr as Superintendent, most of the memorial trails were partially or fully completed, including the Kane Path (#17), Beachcroft Path (#13), Kurt Diederich's Climb (#16), Homans Path (#349), Emery Path (#15), and Jesup Path (#14). The Schiff Path was the last addition to the Sieur de Monts memorial paths and, like the others, was highly crafted with extensive stonework and ironwork.

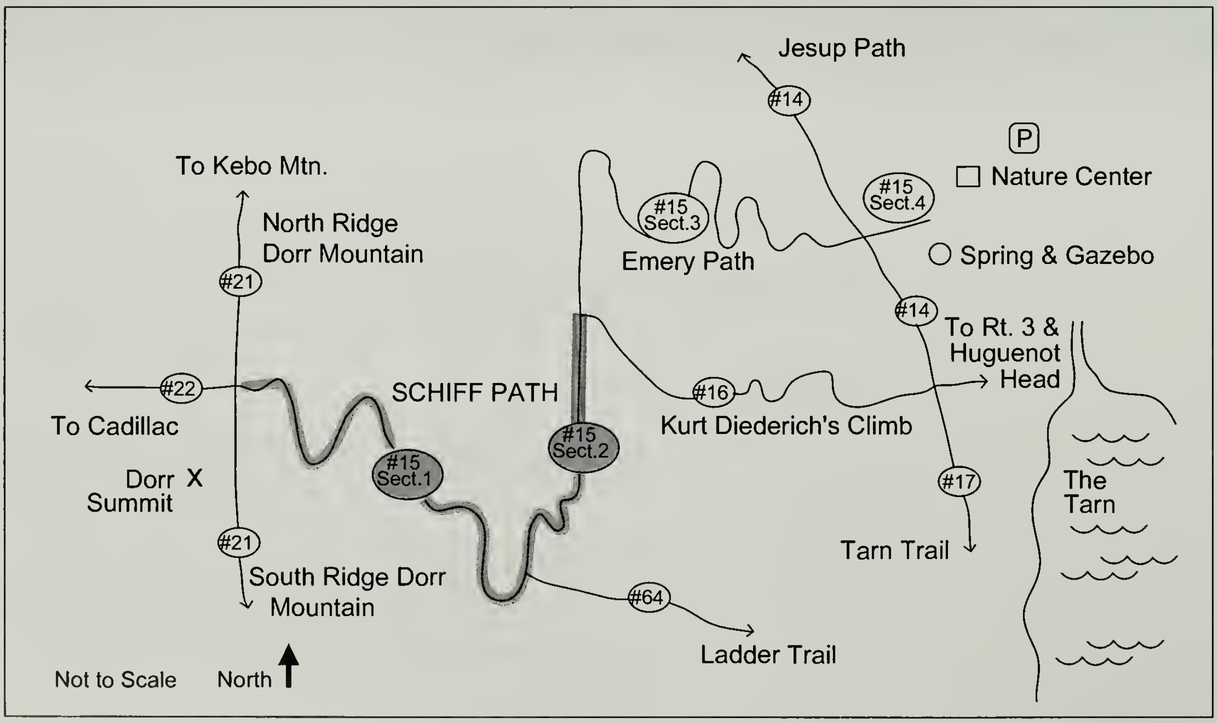


Fig. 15-2 Sections #1 and #2 of the Schiff Path (#15).

As early as 1915, a path from Sieur de Monts Crag to the summit of Dry [Dorr] Mountain was anticipated; however, construction had been delayed for several years. Circa 1921, Superintendent Dorr negotiated with the Bar Harbor VIA to take over care of the trails on Champlain and Dry [Dorr] Mountains. Construction of the Schiff Path is not mentioned in Bar Harbor VIA annual reports, thus it may have been carried out by the NPS in the early 1920s rather than by the VIA. The Schiff Path first appears on the 1926 path map. The path is drawn fairly inaccurately, as it does not show its close proximity and connection to the Ladder Trail (#64). The 1928 path guide described the Schiff Path and the connector to the Ladder Trail (#64), with special mention of the views to The Tarn, Otter Creek Gorge, and the steep, wooded west slope of Picket Mountain [Huguenot Head]. The connection between the two trails is shown on NPS maps prepared in the 1940s.

The path is named for Jacob Schiff (1847-1920), a businessman and philanthropist who contributed generously to the Bar Harbor VIA Path Committee. He joined the Bar Harbor VIA in about 1902 became a life member in 1908, and donated funds annually towards the upkeep of the path system. His wife was listed as a contributor in the VIA records through 1925.

In the 1930s the CCC rehabilitated some of the Dorr Mountain trails. While only the Emery Path (#15) and the Ladder Trail (#64) were mentioned specifically in CCC records, work on the "system" of Dorr Mountain trails was mentioned and it is likely this included the Schiff Path. Work documented in the area included adding stone pavement, stepping stones, steps, guardrails, and some rerouting of paths.

At this time the Emery Path/Schiff Path was one of the most popular hikes in the park and was commonly used for ranger-led walks. This continues to the present, since the steps allow for hikers of varying abilities.

In the early 1950s, many park trails were closed if they paralleled another route, led to private land, were seldom used, or were costly to maintain. The Upper Ladder Trail (#334) was both parallel to the Schiff Path and costly to maintain, and was closed around 1952. During this period, the total 1.6 miles of the Schiff and Emery Paths was renamed the Schiff-Emery Trail. By the late 1950s the trail was called the Dorr Mountain Trail, and later renamed the Dorr Mountain East Face Trail (#15).

In 1981, 3.5 miles of Acadia's trails, including the Dorr Mountain Trail East Face Trail (#15), were designated National Recreation Trails under the National Trails System Act. This designation has been given to approximately 800 trails across the country.

Olmsted Center, 5-01-3-1

Fig. 15-3 Lower end of Schiff Path (right) at intersection with Kurt Diederich's Climb (#16) to the left and Emery Path (#15) in the foreground.

Olmsted Center, 5-01-3-20

Fig. 15-4 The trail winds across ledges and past several large boulders. Squeezing hikers through narrow passageways, like this one, was a common design feature used on similar Dorr trails including the Homans Path (#349) and Ladder Trail (#64).

Olmsted Center, 5-01-3-16

Fig. 15-5 Gravel surface has washed away, exposing rubble base.

Olmsted Center, 5-01-3-2

Fig. 15-6 The same view in 2001 as Fig. 5-1 in the 1920s, but with gravel surface washed away.

Olmsted Center, 5-01-4-6a

Fig. 15-7 Stone paved trail in good condition.

Olmsted Center, 5-01-4-12a

Fig. 15-8 Stone paved path with some erosion.

CHARACTER

The Schiff Path connects four trails on the east face of Dorr Mountain to the summit, including the Ladder Trail (#64), Kurt Diederich's Climb (#16), the Emery Path (#15), and the Homans Path (#349) (Fig. 15-3). The trail was constructed as part of the memorial path system radiating from Sieur de Monts Spring. Named in memory of Jacob Schiff, there is little documentation about the naming and no record of an associated endowment as with other memorial trails from the same period. The trail has extensive built features including steps, iron-pinned retaining walls, stone pavement, and capstone culverts. Though well-armored by its durable construction, the trail is heavily used and is eroded in sections. Most of the gravel surface has been lost, exposing the rock rubble base. Many closed culverts are either partially collapsed, filled, or no longer effective. The trail requires thorough rehabilitation to ensure that built features are not damaged.

FEATURES

For detailed treatment guidelines and specifications for each feature, refer to Section 1, Chapters 1 through 10.

1. Route

The Schiff Path begins at the intersection of the Emery Path (#15) and Kurt Diederich's Climb (#16) at Sieur de Monts Crag. It travels southward along the side of Dorr Mountain to intersect with the Ladder Trail (#64), then turns westward, and ascends over ledge to the summit by a series of long, winding switchbacks along ledges and through boulders. This route is the original design of the trail and should be maintained (Fig. 15-4).

2. Vegetation

The Schiff Path travels through sparse upland woods, pines, and dense alpine shrubs. The area was burned in the 1947 fire; thus most trees are young, and birch and maple trees dominate. On the upper half of the trail, vegetation is low, allowing for exceptional views of the valley and surrounding mountains. Minimal management of vegetation is needed. The trail should be brushed every three to five years.

3. Treadway

A. **Bench Cut:** The lower half of the trail travels along the natural bench formed by Sieur de Monts Crag. It is likely that bench cuts were made at the time of construction. The tread was then armored with stone wall and pavement or gravel over rubble. In most cases these bench cuts do not require further maintenance, except to maintain the closed culverts under the path.

B. **Causeway:** None.

C. **Gravel Tread:** Many sections of trail were once surfaced with soil and gravel over rock rubble. Most of this gravel has washed away (Figs. 15-5 & Fig. 15-6, compare with Fig. 15-1). Because this is a highly crafted memorial trail, imported crushed stone and gravel would diminish the historical character of the trail. Borrowing enough gravel and soil to resurface all sections may be difficult and not sustainable. Thus, rock rubble may continue to be the surface for many sections. These sections can be repaired with stone pavement similar in appearance to other sections of trail. In places where gravel surface remains, drainage should be repaired or maintained to prevent erosion of remaining material.

D. **Stone Pavement:** The trail contains long sections of stone pavement that provide durable and comfortable walking tread (Figs. 15-7 to 15-10). In some locations erosion and/or loss of stone pavement has occurred, possibly because of a broken or clogged culvert nearby. Culverts associated with stone pavement should be repaired and stepstones reset. Compatible new stone pavement may be added to highly eroded sections of trail.

E. **Unconstructed Tread:** There is very little unconstructed tread along the trail. Near the summit there are fewer built features and the trail travels along open ledge. Where there is erosion, built

Fig. 15-9 Stone paved trail with capstone culvert in good condition.

Fig. 15-10 Stone paved trail and steps in good condition.

Fig. 15-11 Massive capstone culvert.

features should be added in character with the trail. Sections across ledge should be clearly marked to keep hikers from wandering off the trail.

4. Drainage

A. **Culverts:** The trail contains extensive culverts. These include capstone culverts and graveled-over culverts that have lost their gravel. Many culverts need to be rebuilt or cleaned out. Culverts should be rebuilt with the same stones if possible and in the style of historic closed culverts on the trail (Fig. 15-11).

B. **Subsurface Drains:** None.

C. **Side Drains:** There is some evidence of side drains. Extant side drains should be rehabilitated in conjunction with closed culverts, but installation of new side drains should be avoided.

D. **Water Bars:** None. Bars should not be added.

E. **Water Dips:** None. Dips may be added as needed.

5. Crossings

None.

6. Retaining Structures

A. **Checks:** Erosion is a problem in several sections of trail. Checks may be added to fill gullied sections and redirect water off of the treadway. Since the Schiff Path is a highly crafted memorial trail, stones used for checks should be gathered locally, as well as rubble and gravel fill. Use of checks should be limited so as not to detract from historical character. Some eroded sections are better repaired with the addition of steps, particularly if remnants of steps are apparent (Figs. 15-12 & 15-13).

B. **Coping Stones:** There are extensive sections of coping wall along the trail, built in association with retaining walls and steps. Some coping wall may have originally been sidewall, but a loss of surface material has exposed the stones. In some places, coping stones are holding water on the tread. Some coping stones have slipped and need to be reset (Figs. 15-14 & 15-15). Extant coping should be retained. Where coping is slipping along ledge, concealed pins may be added. Compatible new coping may be added as needed.

C. **Retaining Walls:** The Schiff Path contains almost 2,000 linear feet of retaining wall. Wall height ranges from 1 to 6 feet. Most of the wall is in good condition (Fig. 15-16). Damaged sections should be repaired or reset and compatible new sections may be added as needed.

7. Steps

Like other memorial trails, the Schiff Path ascends the mountainside with staircases of stone. There are about 350 steps of various styles. Some are placed through boulder fields. Most are built in association with retaining walls and stone pavement (Fig. 15-18). And, most are slab laid and cut (Fig. 15-19). Some are set behind, but in some cases this may be a result of slipping. Some are placed with drill marks visible. Many sections alternate between stone steps and stone paving. One step is cut out of ledge (Fig. 15-20). In several places, extensive erosion is undermining the bottom step of a staircase, thus jeopardizing the structural stability of the entire run. All steps that have slipped should be reset and secured with extant coping stones. Sources of erosion should be corrected by the construction of closed culverts or other appropriate drainage solutions. Eroded sections (see Fig. 15-13) should be repaired using steps, stone pavement, or checks.

8. Ironwork

There are two trail sections with iron. Iron is used to pin rubble retaining walls along the first 600 feet of trail (lower end). About 600 feet beyond is another section of iron used to anchor wall and steps (Fig. 15-21). Extant ironwork should be replaced as needed. Additional iron may be added to sections of the trail where it is currently extant, but excessive use of new iron should be avoided.

Fig. 15-12 Eroded upper trail.

Fig. 15-13 Eroded section with collapsed steps that need to be rebuilt.

Fig. 15-14 Low coping wall holding water on tread.

Fig. 15-15 Very large coping stones are used along this area of exposed ledge rock to retain the tread. Some of the stones have slipped.

Olmsted Center, 5-01-3-3

Fig. 15-16 Retaining wall at lower end of trail.

Friends of Acadia

Fig. 15-17 Stone steps with coping, some steps and coping stones have slipped.

Olmsted Center, 5-01-3-9

Fig. 15-18 Stone steps with coping stones and retaining wall behind.

Olmsted Center, 5-01-4-3a

Fig. 15-19 Slab-laid steps.

Olmsted Center, 5-01-3-21

Fig. 15-20 Step cut out of ledge.

Olmsted Center, 5-01-3-5

Fig. 15-21 Iron pins securing stone in retaining wall.

9. Guidance

A. **Blazes:** For most of the trail, steps and walls serve as guidance, a technique employed by the VIA/VIS path committees from the 1890s onward. Blazes should only be used in the upper section of the trail, where it travels over open ledge.

B. **Cairns:** Like blazes, Bates-style or stacked cairns should only be used in the last upper section of the trail over open ledge to keep hikers on the route.

C. **Directional Signs:** Intersection signs are needed at both ends of the trail and in the middle, at the intersection with the Ladder Trail (#64).

D. **Informational Signs:** None.

E. **Scree:** None. Scree is not appropriate for this historic highly crafted memorial trail.

F. **Trail Name**: The Schiff Path and Emery Path are currently referred to as the Dorr Mountain East Face Trail (#15). As historically significant memorial trails, the trail names should revert to the Schiff Path and Emery Path. Ideally the Schiff Path would also be assigned a different trail number, to reduce confusion when documenting features and work performed on each trail.

10. Monuments and Associated Structures

As a memorial path, the Schiff Path is one of the few that has no associated monument or commemorative plaque. It is also one of the least documented memorial trails. Further research in local newspapers from the late 1910s and early 1920s or the writings of George Dorr may reveal more information. No additional monuments or associated structures should be added to this trail.

Fig. 39-1 Corduroy bridge built in 2004 on the Jordan Pond Path near the Jordan Pond Carry Path.

JORDAN POND PATH
(#39)

JORDAN POND PATH (#39)

For over 100 years, the Jordan Pond Path has been one of the most heavily traveled walking paths on Mount Desert Island. Located in the pristine interior, along the reflective shores of Jordan Pond and leading to the Jordan Pond House, the trail offers a leisurely stroll for all generations (Figs. 39-1 & 39-2). The trail has suffered, however, from this heavy use. Erosion, compaction, widening, and exposed roots have created an unattractive and undesirable trail. Rehabilitation work must preserve the character of this late-nineteenth-century trail but also provide a durable tread.

REHABILITATION PRIORITIES

- Restore the tradition of an easy, mildly graded hike around Jordan Pond.
- Protect all adjacent natural resources.
- Restore the historic surface of gravel tread or stone paving.
- Rehabilitate extant features or construct new historically accurate features to ensure the durability of the trail surface. These include stone sidewalls, stone checks, side drains, culverts, coping, and bridges.
- Restore the trail to its original route, width, height, and grade.
- Revegetate scars caused by trail braiding and widening.
- Determine the trail's official name.

HISTORY

The Jordan Pond Path extends from the Jordan Pond House around the pond along the shore. The trail consists of several sections dating to the late 1800s. The oldest documented section is on the western side of the pond. Constructed circa 1890, it is first documented in the 1896 Bar Harbor VIA annual report as "the old path on the west side of Eagle Lake and Jordan Pond." The path on the eastern side of the pond may have been cut in 1896 as part of a path to connect Bar Harbor with the Jordan Pond House:

> ...a particularly good path having been run from the Jordan Pond House on the east side of Jordan Pond, through the old carry, and on the south end of Eagle Lake and west slope of Green Mountain, coming out at the toll gate on the Green Mountain carriage road. This path as been especially protected and cut under the direction of the map committee.[11]

The north section was cut two years later.

> Since the date of the last report, a new path has been made under the Bubbles, along the northern edge of Jordan Pond, and connecting the paths on the eastern and western sides of the pond.[12]

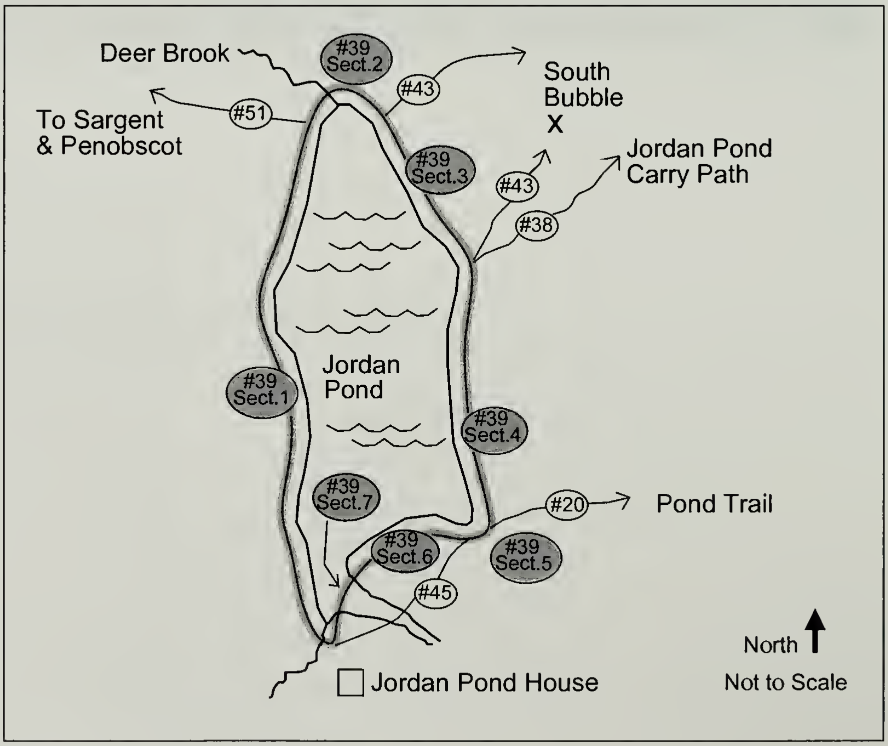


Fig. 39-2 Jordan Pond Path (#39).

At the outlet of the pond by the Jordan Pond House, a bridge was built by the Seal Harbor VIS Path committee, possibly with assistance from the Bar Harbor VIA and Waldron Bates. The trail was also shown on the 1896 path map (Fig. 39-3).

In the early 1920s the east and west sides were rebuilt and surfaced with fine gravel as recorded by Joseph Allen, Path Committee Chairman for Seal Harbor:

> The Committee is glad to report that with the cordial assistance of Mr. Dorr, Curator of the National Park, this path has been largely rebuilt, and made into one of the easiest and most delightful on the Island, especially for visitors who are unable to climb.[13]
>
> With the cooperation of Acadia National Park, work begun last season on the west side of Jordan Pond has been continued. The circuit of the pond can now be made with reasonable easy footing all the way.[14]

A circa 1920s photograph shows stepping stones, or a stone causeway, across the southeastern inlet to the pond (Fig. 39-4). Another 1920s photograph shows the 3-foot-wide trail located adjacent to the pond shoreline, newly surfaced with fine gravel tread (Fig. 39-5).

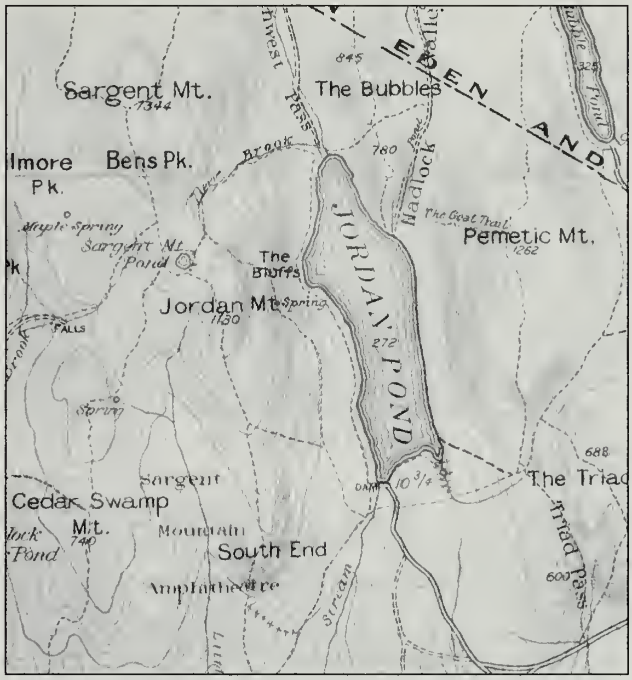
In 1937 the west side was improved by the CCC as described by the park's landscape architect B. L. Breeze: "Jordan Pond Trail...reconstruction of minor bridges, removal of rock slides, construction of shore sections of realigned trail."[15] By the 1940s there was an extensive network of trails connecting to the Jordan Pond Path as shown on the 1941 path map (Fig. 39-6).

The 1950 Seal Harbor Annual Report mentions the erection of "a memorial tablet to Joseph Allen for thirty-one years chairman of this Committee. To him we owe a lasting debt for the building of several of our finest trails and for his devoted and effective concern in the preservation of the natural beauty of Mount Desert Island." The commemorative plaque is located on a granite boulder at the water's edge at the intersection of the Jordan Pond Trail and the Jordan Pond Carry Path (#38), facing northeast (Fig. 39-7). The inscription reads,

> Lover of rocks and high places, builder of trails, conserve of natural beauty, Joseph Allen, Chairman, Seal Harbor Path Committee, 1914–945.

Another memorial along the trail, that most likely predates the Allen memorial, is a granite bench and commemorative plaque with the following inscription (Fig. 39-8):

> In grateful loving memory of Sarah Eliza Sigourney Cushing, Wife of Edward Tuckerman, 1832–1915, She dearly loved this spot.



Northeast Harbor Library

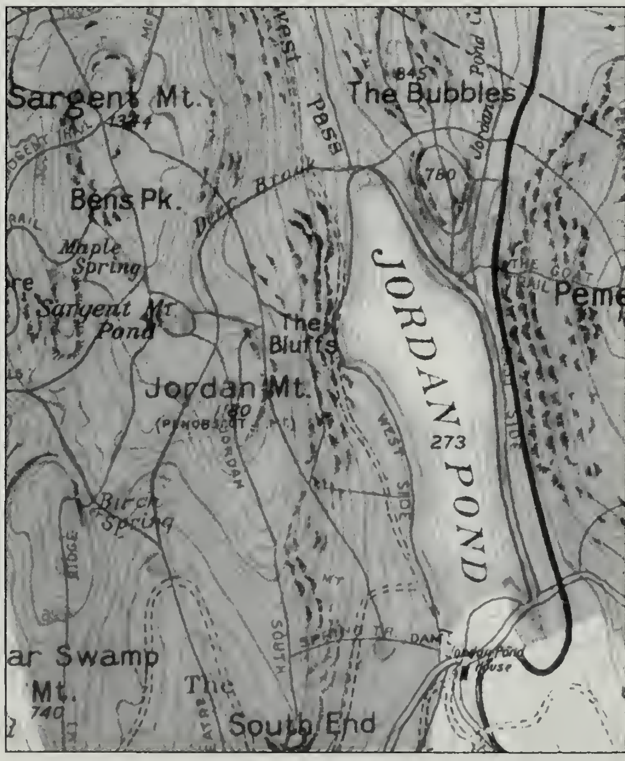
Fig. 39-3 Portion of the 1896 path map by the VIA/VIS showing the trails on the south, east and west sides of the pond (north is up).

Maine Historic Preservation Commission

Fig 39-3 An early photograph of the stone causeway, ca. 1920.

Maine Historic Preservation Commission

Fig. 39-5 An early photograph showing the recently rehabilitated gravel tread, circa 1920.



Bar Harbor Historical Society

Fig. 39-6 Portion of the 1941 path map by the VIA/VIS showing trails leading to, from, and around Jordan Pond (north is up).

Olmsted Center, 6-97-16-5

Fig. 39-7 Joseph Allen monument.

Olmsted Center, 5-01-7-8

Fig. 39-8 Sarah Cushing bench.

Olmsted Center, 7-97-21-14

Fig. 39-9 This wooden bridge was constructed in 1983 and reinstalled on wooden crib piers in 1987.

The Seal Harbor VIS continued to maintain the trail to some extent. In the early 1950s, the trail was cleared all around the pond and three new bridges were constructed.[16] By the 1970s, NPS took over maintenance of the trail. Youth Conservation Corps crews built wooden walkways that were unsuccessful and dismantled in the 1980s. NPS crews rebuilt bridges on the east and west sides in the 1970s and again in the 1980s. A bridge at the western end of the pond had washed away a couple of times, so in 1987 it was reconstructed on wooden crib piers. The bridge currently remains intact (Fig. 39-9). In 1988 bogwalk was introduced to the trail, with further additions in the early 1990s. Despite these repairs, the tread continued to erode due to high use, insufficient drainage, and little maintenance (Fig. 39-10). In 1991, various signs were installed for visitor safety, including some warning "Caution: Trail Becomes Difficult." Even with a massive rehabilitation of the western side in 1993, the tread was heavily eroded and unpleasantly difficult (Figs. 39-11 to 39-13). In 1997, a rehabilitation of greater magnitude began as the kickoff for the Acadia Trails Forever campaign. Work continues to return the trail to its historic condition of "one of the easiest and most delightful on the Island."

CHARACTER

The 3.2-mile Jordan Pond Path circles around the entire pond within 10 to 40 feet of the water's edge. It is a level route providing attractive views of the water and surrounding mountain cliffs. The primary trailhead is the Jordan Pond House, with two less-frequented trailheads along the park motor road. The trail intersects with five other marked trails as it loops around the pond. By the Jordan Pond House, the trail passes through an open meadow, cleared to allow views from the restaurant to the pond. The trail crosses streams, wetlands, and talus slopes and contains many built features including bridges, bog walks, causeways, stepping stones, talus pavement, and two memorial tablets. The trail receives very high use, resulting in a worn tread, standing water, excessive widening, and exposed roots on some sections of the trail (Fig. 39-14).

Prior to current rehabilitation efforts, most of the trail was in need of extensive maintenance, with only one section trail remaining in good condition as the bottom of a talus slope (Fig. 39-15). As of 2004, has been rehabilitated (Fig. 39-16, also see Fig. 39-1).

FEATURES

For detailed treatment guidelines and specifications for each feature, refer to Section 1, Chapters 1 through 10.

1. Route

Easy walking is hard to find on Mount Desert Island's rugged terrain. The Jordan Pond Path offers one of the longest level hikes, other than those provided by the carriage road system. The trail will require substantial improvements, however, to provide comfortable walking all the way around the pond. History shows that most repairs last about ten to twenty years due to the constant flow of water across the trail and into the pond from the surrounding mountains. In many places, the trail route has edged closer to the shore to avoid roots and vegetation. The coping stones that once lined the lower edge of the path were visible above or in the middle of the current route. These stones were often obscured by the soil and thick vegetation that has settled over the path from the slope above. In these locations it is necessary to evaluate whether the trail can be moved back to its original route.

Despite the level of rehabilitation needed, it is recommended that the primary route of the Jordan Pond Path be maintained, with only minor modifications allowed to address erosion, exposed roots, and other problems associated with a pondside trail. Proposed route modifications should not alter the trail's historic character of a easily traversed, pondside loop and they should follow the general guidelines for trail route provided in Section 1 of this document.

2. Vegetation

Most of the trail is through a tree and shrub edge along the steep bank of the pond. The current trail has moved closer to the shore to avoid roots and vegetation. One

Fig. 39-10 Eroded trail and bogwalk on the western side of the pond.

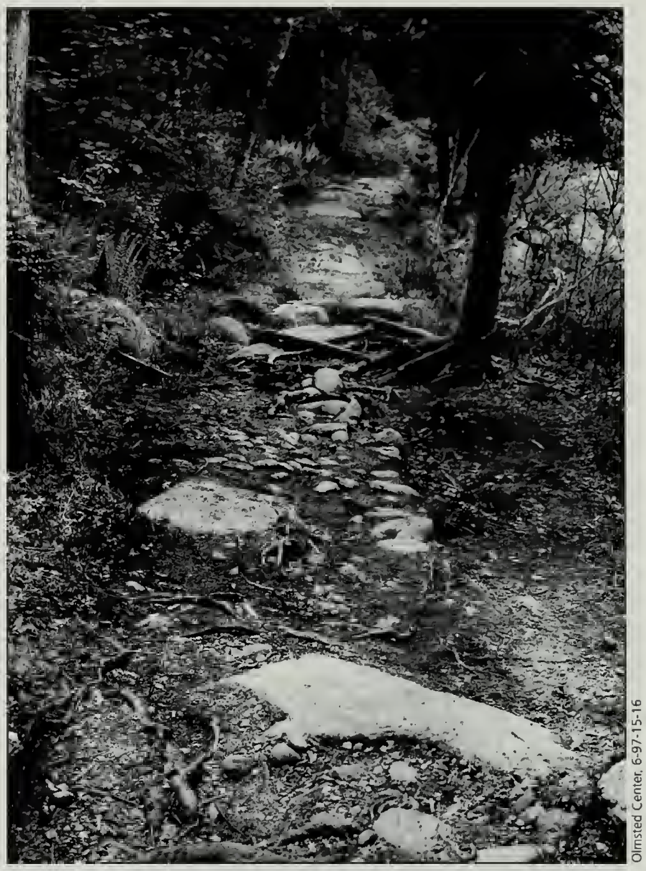


Fig 39-12 Erosion and difficult tread area on east side of pond.

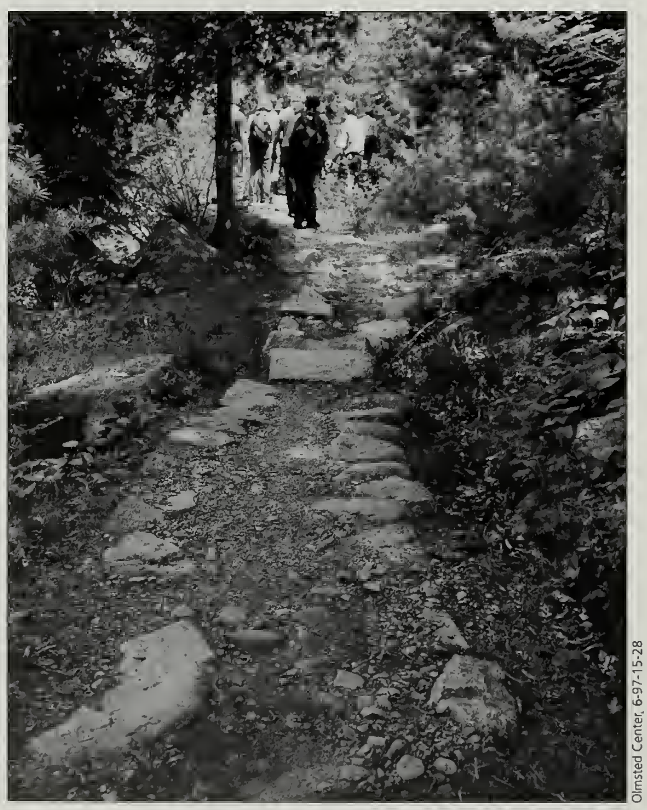


Fig 39-11 Eroded (not original) walled causeway on east side of pond.

Fig 39-13 Gullied section on east side of pond.

option would be to return the path to its original, historic route. The soil and plants that are removed from the original surface could be transplanted to the downhill side of the trail, covering and revegetating the existing trail where it has migrated downhill, close to the pond shore.

The advantages of moving the path back to the original route are:

- The path would be farther away from the shore, reducing impact to the shoreline.

Fig. 39-14 Eroded portions of the trail on the western side of the pond are in need of rehabilitation, including narrowing the trail corridor.

Fig. 39-15 This section of the trail at the bottom of a talus slope is in excellent condition.

- The path would be brought back to its historic route; the existing stones defining the lower edge could be left in place, with minor resetting.

The disadvantages of moving the path back to the original route are:

- A large amount of vegetation and soil now covers the path; this would have to be dug out and transplanted over the current route.
- The disturbance of vegetation and removal of soil would temporarily encourage erosion.

Many sections of trail are excessively wide due to walkers avoiding wet areas. Revegetation is needed to bring the trail back to a width of approximately 4 feet. In many places, walkers are avoiding exposed roots. Roots are awkward to walk over, while excessively high ones may be a tripping hazard.

Roots should not be cut out unless absolutely necessary. Where possible the trail surface should be raised, the gaps between roots filled with rock rubble (apple to

Fig. 39-16 The same view as Fig. 39-5 taken in 2001 showing NPS rehabilitation in progress. The base is in place, but the final application of gravel tread has not been completed.

grapefruit sized), and the trail surfaced with gravel fill. Adding material to the trail surface will not damage the tree by smothering its roots. Once the trail surface is built up and surfaced, if roots are still high enough to be a tripping hazard (2 to 3 inches), they may be removed. Once the trail surface is improved, the edges of the trail may be revegetated. Refer to use of crush wall to fill in around the roots in Chapter 6, and see Figs. 6-49 to 6-51.

3. Treadway

A. **Bench Cuts:** Much of the trail is a bench cut. This is the historic construction and should be maintained.

B. **Causeway:** For pond inlet crossing, retain the stone causeway even though it was a later addition. It is likely that before the stone causeway was built there were single large stepping stones similar to those shown for The Tarn near Sieur de Monts Spring (Figs 5-52 & 5-58). However, the Jordan Pond Path receives such heavy use that single stepping stones across this inlet of the pond would not be suitable or safe for hikers.

C. **Gravel Tread:** Historically, most of the trail was surfaced with gravel tread. However, the heavy use of the trail and site characteristics lead to increased maintenance concerns, raising the question of whether a high quality, 4-foot-wide gravel tread should be maintained around the entire perimeter of the trail, or only a certain distance from the Jordan Pond House. If only partially maintained, the northern sections of the trail could receive a moderate level of surface improvement and maintenance, allowing for some exposed rocks, roots, and a variation in width from 3 to 4 feet, while the southern sections closer to the Jordan Pond House would be rehabilitated to a higher quality.

   To facilitate a decision on tread treatment, four feasible alternatives were developed for park consideration and evaluation. From these, a preferred alternative was chosen that adequately addressed park needs, resource protection, and trail rehabilitation (Figs. 39-17 to 39-21). Guided by the preferred alternative, the rehabilitated trail on the eastern side of the pond consists primarily of new gravel tread (Fig. 39-22). Work on the western side of the pond will include some sections of gravel tread, but will also contain sections of bogwalk and stone pavement (Figs. 39-23 to 39-26)

D. **Stone Pavement:** There is a section of talus pavement on the western segment of the trail. The stones need to be reset regularly due to movement by ice. This work would possibly be reduced in the future by rerouting the trail farther above the shoreline.

E. **Unconstructed Tread:** None.

4. Drainage

Drainage is a significant problem on the Jordan Pond Trail. The trail travels along the base of a slope, crossing many streams and wet areas that drain into the pond. It appears that when originally constructed, the trail was not built to handle the large amount of water crossing the path or the large volume of foot traffic. As a result the trail was patched with an assortment of culverts, wood turnpiking and cribbing, stepping stones, stone causeways, split log bridges, and cut board bridges. The trail is sometimes flooded when the outlet on the south end is plugged. Thus it is important to keep this outlet clean. The restoration of the gravel surface will require good drainage if it is to be durable.

A. **Culverts:** Because there is so much water flowing across the trail, there is a need for many more trail culverts and other drainage solutions. Stone culverts should be used in place of wood because they last longer and are more in character with the island's tradition of stonework. While different methods of construction are needed to handle different flows of water, it is important that there be a harmonious blend of durable construction styles.

   For light cross-flow, allow water to sheet across the trail. For wet areas, use stone-edged turnpiking with finer rubble fill and compacted gravel surface.

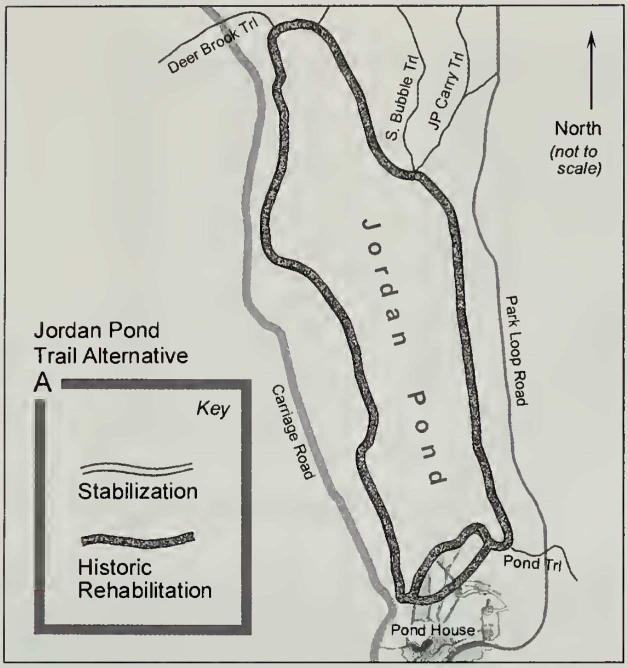


Fig. 39-17 Alternative A is to maintain a high-quality compacted gravel surface for the entire loop trail around Jordan Pond. This would ensure walkers would encounter the same style of path and easy walking, perpetuating the trail's 1920s character. To make the fragile pondside corridor on the west side durable and sustainable would require extensive work and constant maintenance to repair damage from water flow and seep.

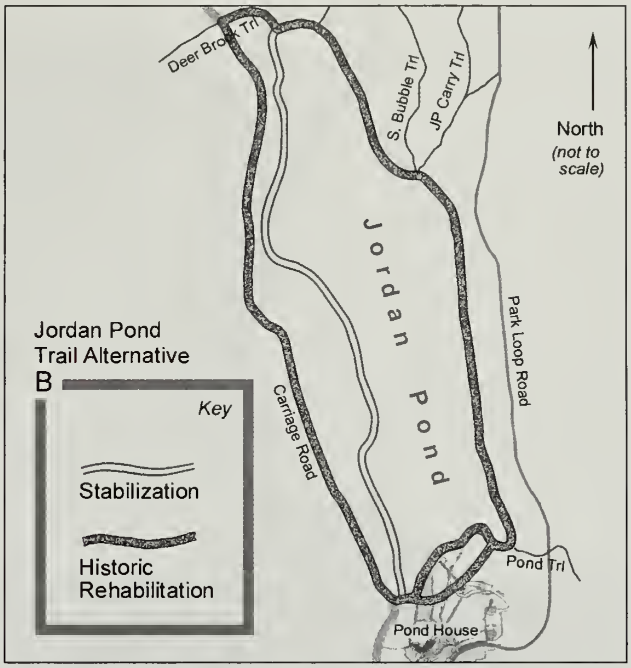


Fig. 39-18 Alternative B is to maintain a high-quality compacted gravel surface on the eastern side of Jordan Pond and improve the connection via the Deer Brook Trail (#51) to the carriage road on the western side of the pond. This alternative would reduce maintenance time and costs of maintaining gravel surface for the entire trail length and would be partially in keeping with the tradition of an easy walk around the pond.

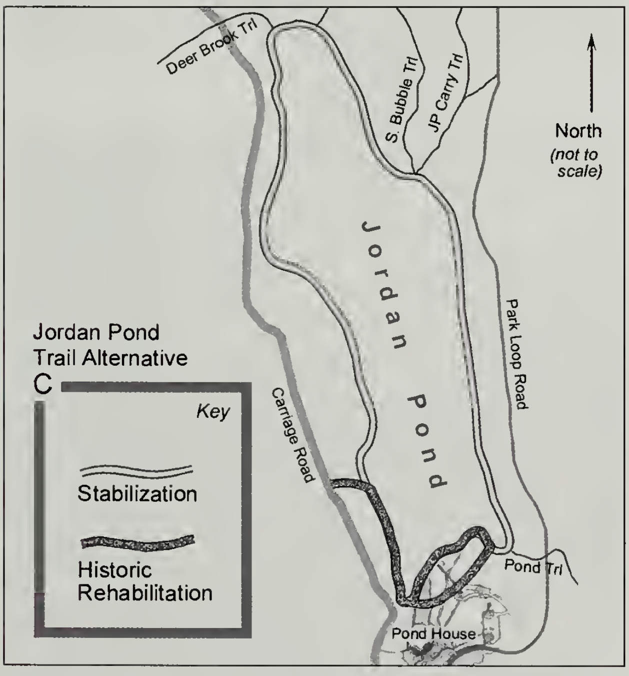


Fig. 39-19 Alternative C is to maintain a high-quality compacted gravel surface on a small section of the trail at the southern end of Jordan Pond, near the Jordan Pond House. The gravel surface would extend slightly up the western side of the pond to the first carriage road connector. It would also include a portion of the Jordan Pond Nature Trail (#45), creating a short loop. This alternative would reduce the time and cost of maintaining a gravel surface for the entire trail length, but not perpetuate the tradition of an easy walk around the pond.

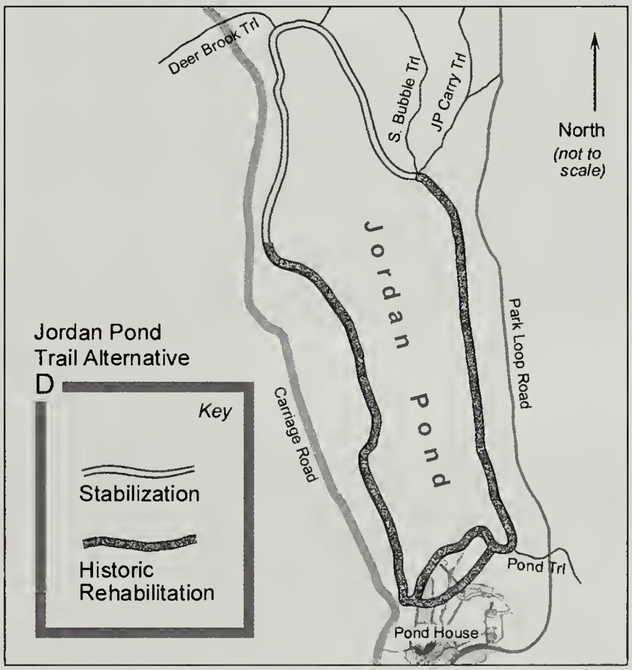


Fig. 39-20 Alternative D is to maintain a high-quality compacted gravel surface for a half-mile of trail on each side of Jordan Pond, north of the Jordan Pond House. Like Alternative C, this alternative would reduce the time and cost of maintaining a gravel surface for the entire trail length, but not perpetuate the tradition of an easy walk around the entire pond.

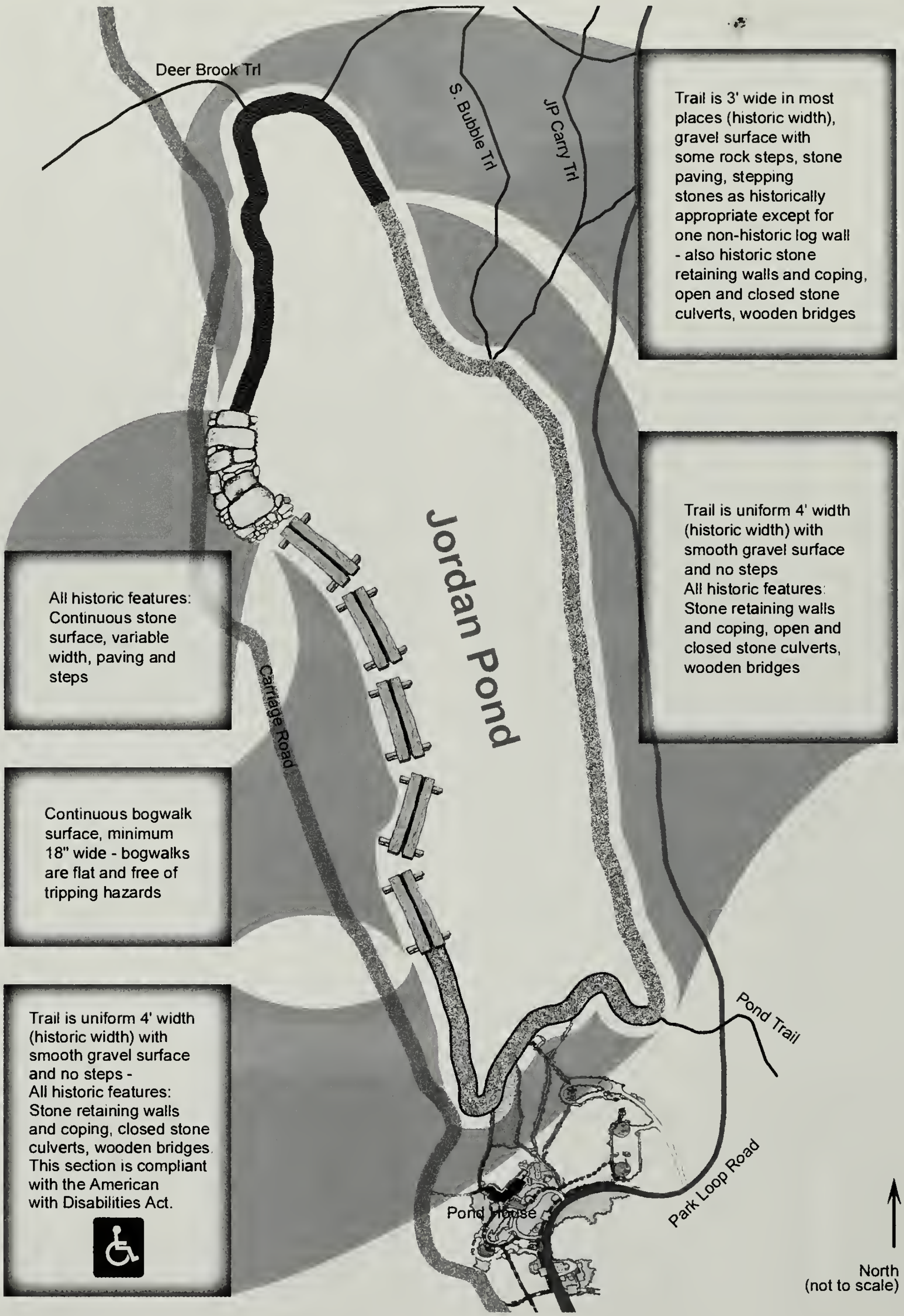


Fig. 39-21 The chosen treatment is a combination of Alternatives A and B. This treatment involves less gravel paving than Alternative A, and more than Alternative B. The remainder of the trail is either rehabilitated stone paving or continuous, wide, flat bogwalk. Thus the tradition of an easy walk around the pond is restored to the Jordan Pond Path.

Although not a historic feature, the 4,000-foot bogwalk section was used for two reasons. First, there is little or no evidence of historic work on this section of trail; and second, this is largely a wetland area, which would be radically altered by the introduction of rock and causeway.

For medium cross-flow, construct small open stone culverts with less than a 1-foot gap in the trail tread without capstones. Open culverts are used in place of closed culverts because small capped culverts can fill with ice in the winter and remain frozen in the spring, resulting in washouts. Where water flow is heavier, the trail tread should be raised and the water directed through cross-drains or larger closed culverts. Covered drains, stepping stones, stepstone culverts, or bridges are also recommended for areas with heavier flow. Water courses should not be redirected but allowed to cross the trail where they would naturally. Where the water comes from different sources, several small culverts should be used instead of one large one (Figs. 39-27 & 39-28).

B. **Subsurface Drains:** Many sections of trail have year-round water slowly seeping across the trail and into the pond. These sections should be improved with the installation of subsurface drains.

C. **Side Drains:** For medium cross-flow, construct a side drain with a few larger culverts. The side drain should be lined with flat stones to reduce scouring and help hold the edge in place.

Fig. 39-22 Newly installed gravel tread on the eastern side of the pond.

Fig. 39-23 Heavily rooted area and deteriorated tread on the west side of the pond.

Fig. 39-24 2002 NPS new stone sidewall, gravel, open stone culvert (with temporary wood planks) on west side near section pictured in Fig. 39-23.

Fig. 39-25 Erosion on the steepest slope at northern end of the west side of the pond.

Fig. 39-26 Wall crib and checks installed by NPS in 2002 in same section shown in Fig. 39-25.

Fig. 39-27 A medium flow of water should be handled with a small open culvert. Closed culverts, although providing better visual consistency to the trail tread, would likely clog and fail regularly due to ice dams and organic debris, requiring increased maintenance.

Fig. 39-28 This step stone culvert was installed on a newly rehabilitated section of trail to handle a heavy water flow.

Fig. 39-29 Bogwalk should be uniform in length and width. For example, this bogwalk on the western side of Jordan Pond is not of uniform width at the joint, making it more difficult for hikers to walk along safely.

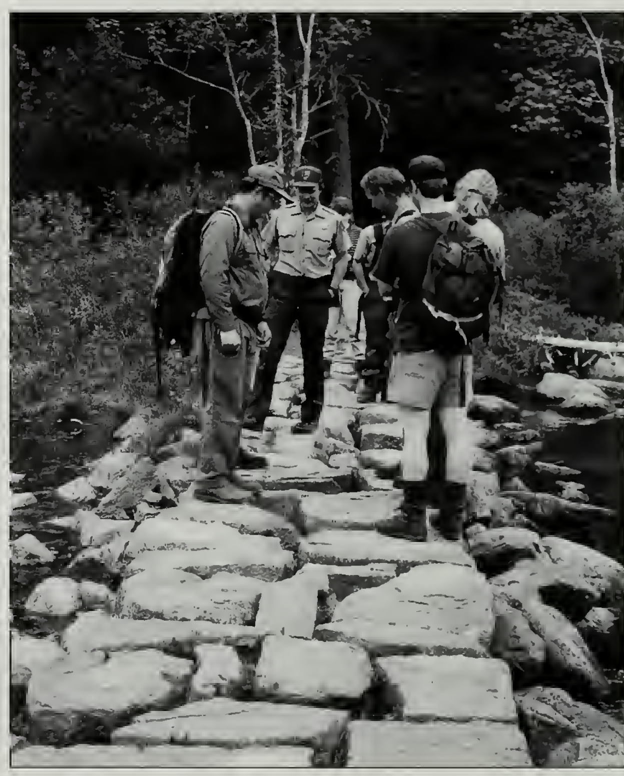


Fig. 39-30 View in 1997 of the stone causeway at the southern end of the pond.

D. Water Bars: None.

E. Water Dips: Since most water is flowing directly across the trail, use of water dips is limited.

5. Crossings

A. Bogwalks: The trail contains extensive bogwalk on the western side. Although not a historic feature, the high use, large amount of standing water, exposed roots, and fragile pondside ecosystem require this treatment. Sections of bogwalk should be built with a uniform length and width (as specified in Chapter 5, Section A) and repaired as needed, so walkers can establish a comfortable rhythm and safely enjoy the pondside scenery (Fig. 39-29).

B. Bridges: Bridges on the Jordan Pond Path include one large, 20-foot bridge at the northern end of the pond and several small bridges scattered throughout the trail. The large bridge should be replaced in kind as it duplicated the bridge that preceded it (see Fig. 39-9). The smaller bridges, currently planed and split log, should be replaced with rustic VIA/VIS-style cedar bridges and graveled-over bridges (see Fig. 39-1).

C. Stepping Stones: Evidence from a historic postcard dating from the 1920s shows that a rough stone causeway crossed the Jordan Pond inlet at the southeastern end of the pond (see Fig. 39-4). However, this was subsequently changed to a wider and smoother stone causeway to provide a safer, more comfortable crossing (Fig. 39-30). At least one run of twenty or so historic stepping stones was also located at the northern end of the pond; these were rehabilitated during 2002. There were some sections of stepping stones on the eastern side, but they were not historic. They have since been removed. New stepping stones should not be added to the trail.

6. Retaining Structures

A. Checks: None.

B. Coping Stones: Historically the trail was defined by a row of coping stones on the downhill or pond side of the trail. As part of the rehabilitation work, historic coping stones should be reset and additional stones may be added as needed.

C. Retaining Walls: Historically, most of the trail was constructed without the use of retaining walls. However, substantial laid and rubble retaining walls were constructed midway along the eastern shore and in the tumbledown area on the northeast corner of the pond. Small rubble walls are also extant along the west side of the pond. Some extant walls are up to 6 feet high and continuous over hundreds of linear feet. Coping, iron, and cut stone were all used. The majority of the square footage of retaining wall was in need of repair, which was accomplished in 2001 and 2002. Much of the work is featured in examples in Chapter 6.

7. Steps:

None.

8. Ironwork

Approximately eight historic pins were found during trail rehabilitation. These pins were holding retaining walls on the east side of the pond in the tumbledown area (see Fig. 39-15). A limited number of pins may be used to secure retaining walls as specified in Chapter 8.

9. Guidance

A. Blazes: The newly rehabilitated sections of the trail are easy to follow and require no blazing. Minimal blazing may be needed on the western side, especially on the section through the talus slope.

B. Cairns: None.

C. Directional Signs: Signage should conform to park-wide standards.

D. Informational Signs: Signage should conform to park-wide standards.

E. Scree: None.

F. Trail Names: The trail was initially called the "Jordan Pond Trail" by the VIA/VIS in the 1915 path guide (p. 32) and as "East Shore of Jordan Pond" and "West Shore of Jordan Pond" in the 1928 path guide (pp. 16–17). The CCC referred to it as the "Jordan Pond Trail." The Park Service referred to it as the "East Side Trail" and "West Side Trail" in the early 1950s and the "Jordan Pond Shore Trail" in the late 1950s. The name was changed to the "Jordan Pond Loop Trail" in the 1990s. Given the trail's history of highly crafted construction, and its current level of rehabilitation on the eastern side, the recommended historic name for the entire loop trail around Jordan Pond is "Jordan Pond Path" (see Appendix C). This name is now in use again.

10. Monuments and Associated Structures

A. Monuments: Two monuments are located along the trail. A bench with a commemorative plaque, in memory of Sarah Cushing, is located at the south end of the pond near the boat ramp (Fig. 39-8), and a boulder with a commemorative plaque, placed in memory of Joseph Allen, is located by the shore towards the north end of the pond near the southern base of South Bubble (Fig. 39-7). No additional monuments should be added to the trail.

B. Associated Structures: The Jordan Pond House is an important destination and trailhead associated with this trail. This connection should be maintained. No additional structures should be added to the trail.

ENDNOTES

59 *Bar Harbor VIA 1896 Annual Report.*
60 *Bar Harbor VIA 1898 Annual Report.*
61 *Seal Harbor VIS 1921 Annual Report.*
62 *Seal Harbor VIS 1923 Annual Report.*
63 CCC Records, National Archives, Waltham, MA.
64 *Seal Harbor VIS 1952 Annual Report.*

Acadia Trails Crew, 2004

Fig. 48-1 Repair work on the steepest section of the Jordan Cliffs Trail.

JORDAN CLIFFS TRAIL (#48)

JORDAN CLIFFS TRAIL (#48)

Characteristic of VIA/VIS summit trails, this challenging route winds along the ledges of Jordan Bluffs, then ascends to the north by a steep ravine to the open ledges and summit of Sargent Mountain (Figs. 48-1 & 48-2). A lack of built features, however, on the northern section has resulted in substantial erosion and unsafe conditions. Rehabilitation efforts must focus on the addition of features, which are in keeping with the VIA/VIS style, to ensure durable and safe tread.

REHABILITATION PRIORITIES

- Repair damaged section of trail north of Deer Brook. Reset step-shaped rocks—currently used in scree—as steps. Use stone in the talus field for coping and retaining wall, characteristic of VIA/VIS style.
- Bring eroded sections of trail back to their original 2- to 4-foot width by adding checks, improving drainage, treadway, and placing barriers along trail edges, such as infrequent coping stones.
- Re-mark closed section with fresh blazes and cairns.
- Add gravel surfacing in short sections from local borrow pits where material has been lost.
- Determine whether the trail should be renamed the Bluffs Path and East Cliffs Trail.

HISTORY

Jordan Bluffs, later referred to as Jordan Cliffs, is one of the steepest cliffs in the interior of the island; it offers dramatic views of Jordan Pond and the surrounding mountains. On the earliest path map prepared by the VIA/VIS in 1896, the Bluffs Path is marked from near the outlet of Jordan Pond, up and north along the base of the ledges, up to a spring, then up the bluffs to the shoulder of Penobscot [Jordan] Mountain (48-3). The trail was possibly laid out by Waldron Bates, according to the 1893 Bar Harbor VIA Annual Report: "Mr. Bates has done much valuable work upon the Jordan Pond end of the Sargent mountain path." In the 1920s, as first shown on the 1926 path map, another path was added to the Bluffs, extending further north across the Bluffs, to cross the Deer Brook Trail (#51) and ascend to the summit of Sargent Mountain. This addition, now known as the Jordan Cliffs Trail, was named the East

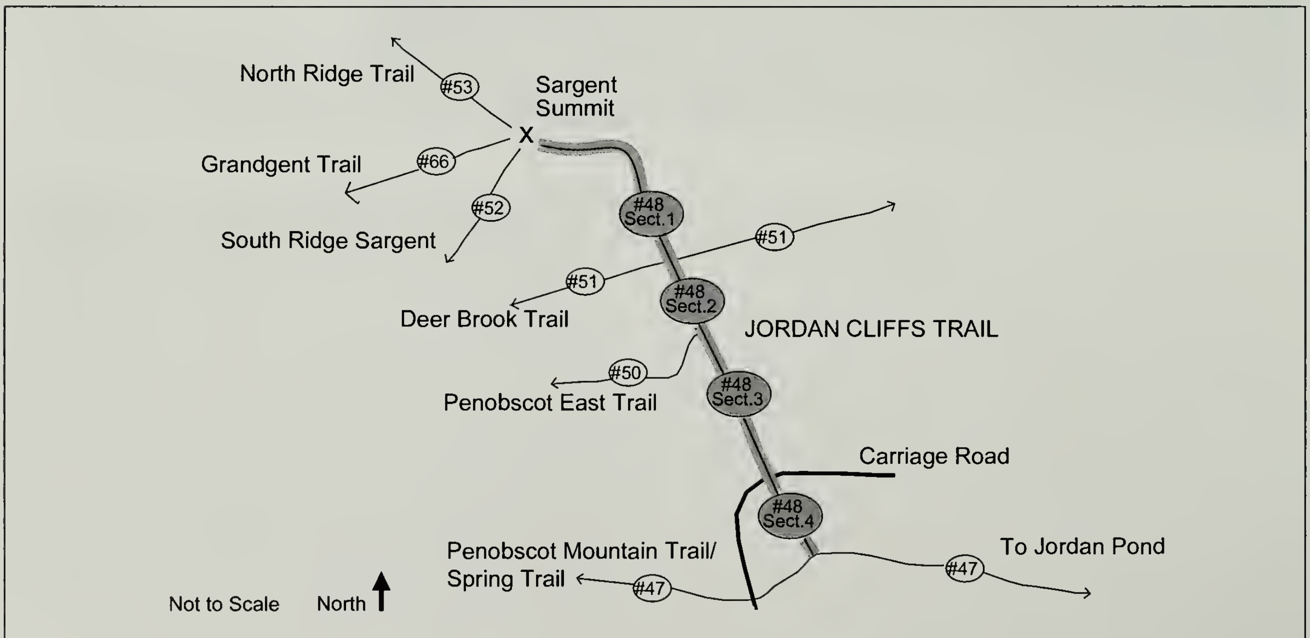


Fig. 48-2 Jordan Cliffs Trail (#48).

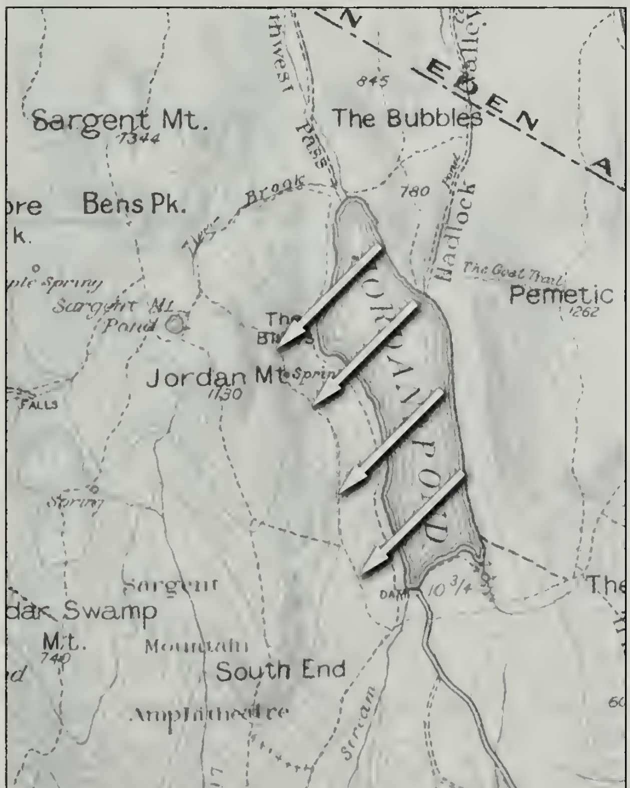
Cliffs Trail in the 1928 path guide and described from the south end to the north end: (Fig. 48-4)

> Just beyond Bluffs at fork and signpost, go straight ahead on trail marked "Sargent Mt. Summit via Deer Brook." Follow cairns along cliffs then descend into woods to intersection near Deer Brook. Go straight ahead. Cross trail and brook, and ascend this very steep trail. On emerging from the trees, ascent becomes easier, and continues by easy grades to the summit of Sargent Mt.[65]

This section of the trail, from the Bluffs eastward, is also described as a "new" trail in 1932 by Seal Harbor VIS Path Committee Chairman Joseph Allen.

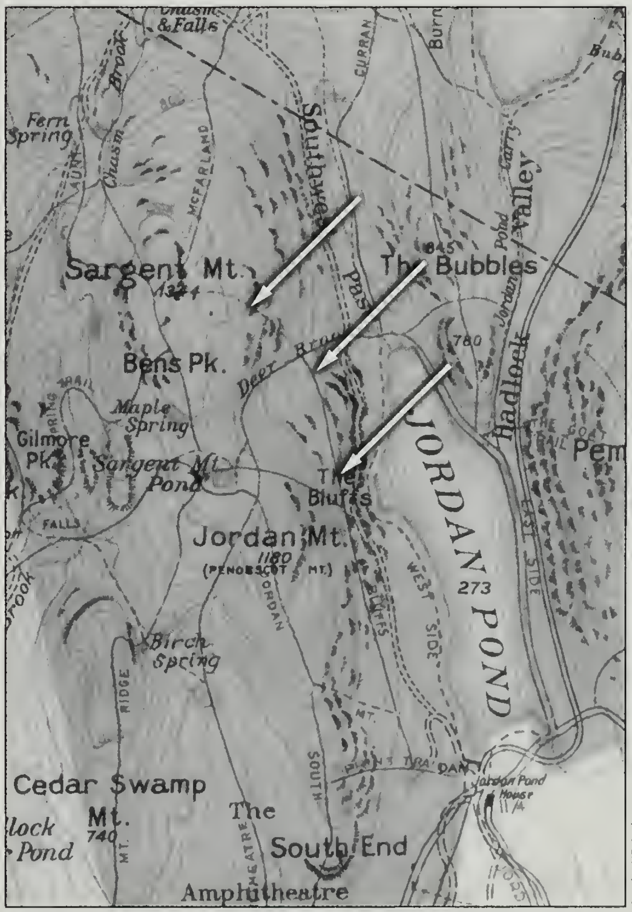
> Attention is called to one new trail which is expected to prove very popular. It leaves the Jordan Bluff trail at about two-thirds of the way up, and crosses the face of the east cliffs on Jordan Mountain, reaching the top of the bluff at its northerly end. This gives fine views of cliffs, over Jordan Pond, out to sea, into the mountains, and without very arduous climbing. It differs in this respect from the ladder trail on Newport Mountain, resembling more the charming Bubble Cliff trail opened last season. It is recommended for all those who have steady heads as a delightful variation in the ways to ascend Jordan or Sargent Mountains.[66]

By 1941 several other trails were added to the Bluffs area, creating a labyrinth of trails (Fig. 48-5). Several trails were subsequently closed by the NPS. In a 1952 path inventory the northern half of the trail, from Deer Brook to the summit of Sargent Mountain, was referred to as the Sargent Summit Cutoff. By the late 1950s, however, the trail was again named the Jordan Cliffs Trail. Since about the 1980s, the southern half of the trail has been closed from early spring to late summer to protect peregrine falcons, which nest on the Bluffs not far from the trail (Fig. 48-6). In the 1990s, the northern half of the trail was closed due to unsafe trail conditions in a steep section of trail with loose rock (Fig. 48-7).



Northeast Harbor Library

Fig. 48-3 Portion of 1896 path map by the VIA/VIS showing the route of Bluffs Path, starting northwest of the dam at Jordan Pond, across the Bluffs to a spring, then to the ridge of Jordan Mountain.



Acadia NP Archives

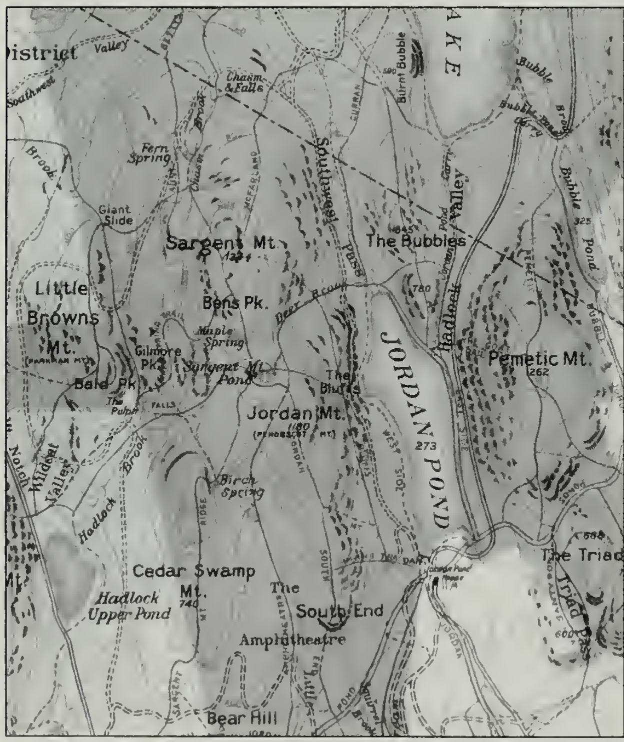
Fig. 48-4 Portion of the 1926 path map by the VIA/VIS showing the trail extended north of the Bluffs, across Deer Brook, then west to the summit of Sargent (north is up).

CHARACTER

Rising above Jordan Pond and the Jordan Pond House, this difficult cliffside trail extends 2.2 miles from the Penobscot Mountain Trail, along Jordan Cliffs. It then drops into a wooded valley, crosses the Deer Brook Trail and Deer Brook, and finally climbs up to the summit of Sargent Mountain. Its southernmost section, from the Penobscot Mountain Trail (#47) to the Penobscot East Trail (#50), is one of the oldest cliffside trails on the island. It contains some iron, one log bridge, stepping stones across Deer Brook, and some stonework. In comparison with other VIA/VIS trails, however, it has relatively few built features. With heavy use, this lack of built features has resulted in substantial erosion, and in some sections, difficult and unsafe tread. As a result, the northern portion of the trail was closed in the mid-1990s.

FEATURES

For detailed treatment guidelines and specifications for each feature, refer to Section 1, Chapters 1 through 10.



Bar Harbor Historical Society

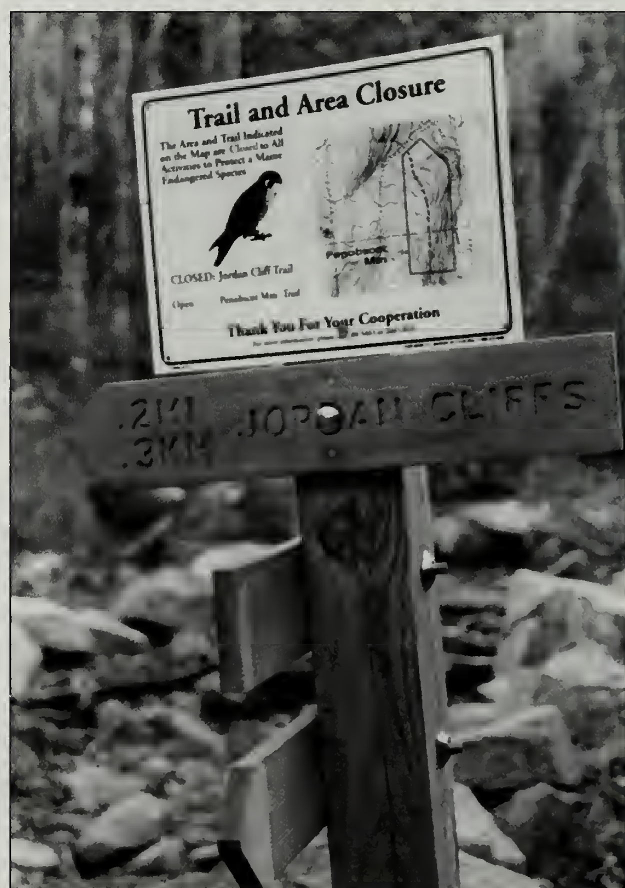
Fig. 48-5 Portion of the 1941 path map by the VIA/VIS showing several additional trails to the Bluffs (north is up).

1. Route

On the section of trail north of Deer Brook, the trail winds up through talus and along ledges. Once above treeline, there are spectacular views from the ledges (Figs. 48-8 to 48-10). The trail ascends to the shoulder of Sargent Mountain and travels fairly directly to the summit (Fig. 48-11). A steep and eroded section located in a talus area above Deer Brook is currently unsafe due to loose falling rocks. This straight section should be rebuilt to wind up through the talus area. The new route should be flagged prior to construction and rejoin the original route above and below the damaged section.

2. Vegetation

There are extensive areas of alpine vegetation along the trail. These should be protected by carefully marking the trail with blazes, cairns, and occasional coping stones where hikers tend to wander. Educational trail literature and maps should also be provided to hikers.



Olmsted Center, 5-01-1-d1

Fig. 48-6 The southern section of the trail is closed seasonally for peregrine falcon nesting.


Olmsted Center, 5-01-d3

Fig. 48-7 Steep eroded section of trail that has been closed for several years.

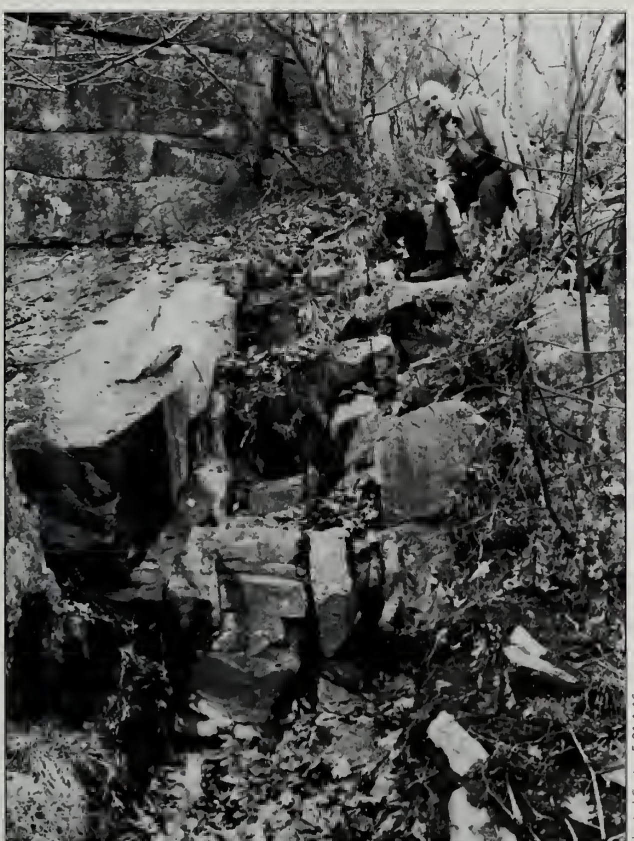

Olmsted Center, 5-01-1-16

Fig. 48-8 Ascending ledges below shoulder of Sargent Mountain. Section in poor condition needs steps and checks.


Olmsted Center, 5-01-1-19

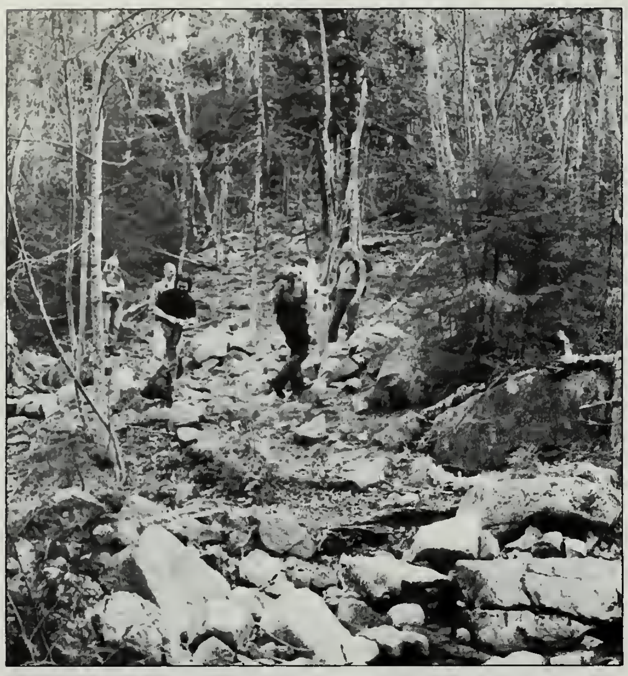
Fig. 48-9 Views from ledges on shoulder of Sargent Mountain.


Olmsted Center, 5-01-1-15

Fig. 48-10 Views from Jordan Cliffs Trail over ledges on shoulder of Sargent Mountain.


Olmsted Center, 5-01-1-21

Fig. 48-11 Trail across ledges to summit of Sargent. Clear trail marking with blazes, cairns and occasional coping is important to protect alpine vegetation.



Olmsted Center, 5-01-1-3

Fig. 48-12 Looking south at jumbled stepping stones in foreground over Deer Brook and intersection with Deer Brook Trail (#51) in background.

Olmsted Center, 5-01-1-10

Fig. 48-13 Section of tread along ledge, a natural bench, with retaining wall.

Olmsted Center, 5-01-d4

Fig. 48-14 The same retaining wall as above, viewed from the side of the trail.

Olmsted Center, 5-01-1-13

Fig. 48-15 A short run of coping stones, steps, and stone pavement on ledges in poor condition.

Acadia Trails Crew, 2004

Fig. 48-16 Tread and slope stabilization in progress in 2004 using winding steps built in the VIA/VIS style.

3. Treadway

A. **Bench Cuts:** Much of the trail extends along bench cuts created by ledges. This should be maintained.

B. **Causeway:** None.

C. **Gravel Tread:** New tread material should be added as needed in accordance with guidelines previously established for gravel tread.

D. **Stone Pavement:** None.

E. **Unconstructed Tread:** The trail contains extensive sections of unconstructed tread across ledge. These sections should be delineated with blazes, cairns, and, if necessary, occasional coping stones to keep hikers from wandering and damaging alpine vegetation (see Fig. 48-11).

4. Drainage

The trail has very few drainage features since most of the trail is across ledges. The northern half of the trail, from Penobscot East (#50) onward, appears to have received minimal attention to construction and drainage. Drainage features, particularly culverts and water bars, should be added to improve the durability, stability, and safety of the treadway.

5. Crossings

A. **Bogwalk:** None.

B. **Bridges:** A two-stringer bridge over a ravine on the cliffs was removed in the 1970s and replaced with a single-notched-log bridge. A handrail was added in the 1990s for hiker safety. No documentation has been found for the original crossing; however, the VIA/VIS bridge style is appropriate for this trail if bridges should be added.

C. **Stepping Stones:** Large stepping stones are used to cross Deer Brook. These should be maintained and reset as needed (Fig. 48-12).

6. Retaining Structures

On the section of trail north of Deer Brook, there are several low retaining walls to provide comfortable tread along ledges. There is also some coping (Figs. 48-13 to 48-15). Additional or new retaining walls and/or checks are needed in sections that are eroded and washed out. The most eroded sections of trail need checks, coping stones, retaining walls, and steps.

7. Steps

On the section of trail north of Deer Brook, there are several sections in poor condition that may have contained steps. Steep eroded sections in poor condition should be repaired with a combination of checks, retaining wall, and steps constructed to be compatible with the general VIA/VIS style. This would include step work in the Bar Harbor VIA, Northeast Harbor VIS, and Southwest Harbor VIA districts. In Bar Harbor, this would include step work on the relocated Curran Path (#315) and several 1920s endowed trails, including the Andrew Murray Young Path (#25), Gurnee Path (#352), Beachcroft Path (#13), Gorge Path (#28), Brigham Path (#366), and Canon Brook Path (#19). The repaired section should be winding rather than straight. The challenge is to create a durable treadway without making this trail appear like the highly constructed endowed trails (Fig. 48-16). Figure 48-1 shows trail rehabilitation with steps in progress.

8. Ironwork

There is iron on the southern half of the trail, including iron pinned logs. The existing ironwork should be rehabilitated as needed. Compatible new ironwork may also be added.

9. Guidance

A. **Blazes:** The entire trail should be marked with blazes.

B. **Cairns:** Cairns should be maintained on the ledge sections of trail, particularly for the section approaching Sargent Mountain summit.

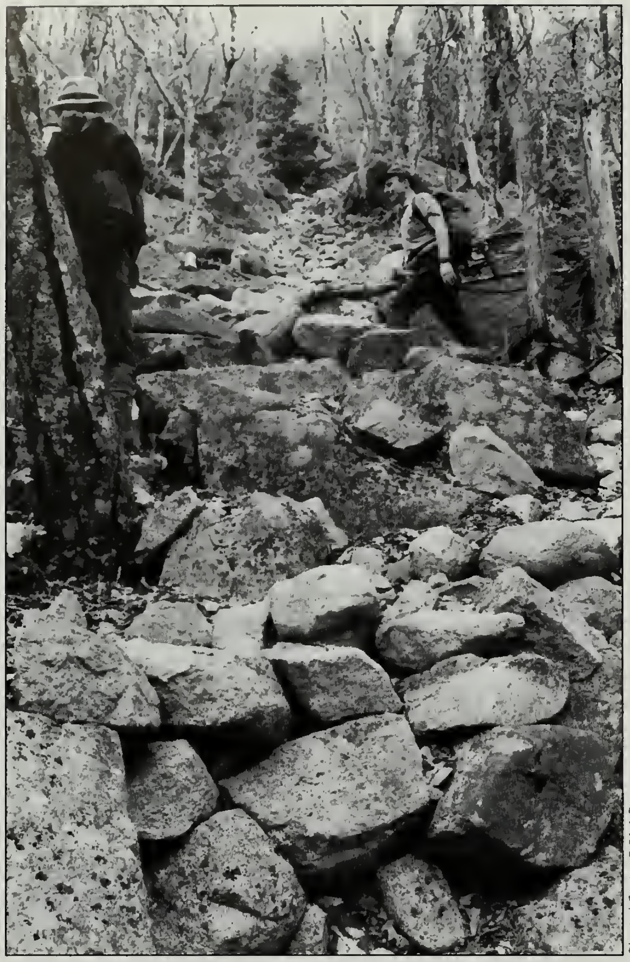


Fig. 48-17 Scree placed in the early 1990s that may have eliminated VIA/VIS steps. Eroded unsafe section above.

C. **Directional Signs:** There are four directional signs on the trail, located at the junction with the Penobscot Mountain Trail (#47), at the junction with Penobscot East (#50), at the junction with the Deer Brook Trail (#51), and at the summit of Sargent Mountain (see Fig. 48-6).

D. **Informational Signs:** Trail closure signs are posted seasonally for peregrine falcon nesting. In 1984 a "Caution" sign was placed at the southern end of the trail. During the spring and summer seasons, signs for trail closure are posted in the three previously described locations. Information signs should follow general sign standards established for the trail system.

E. **Scree:** A section of trail north of Deer Brook was repaired with scree, possibly dismantling VIA/VIS steps. The section is now in poor condition. Scree is not appropriate for use on this trail, and steps and coping stones should be used in place of scree (Fig. 48-17).

F. **Trail Names:** The current trail consists of two historic trails, one south of Deer Brook along Jordan Bluffs, and one north of Deer Brook up Sargent Mountain. It is recommended that the name of the trail reflect this. The southern half of the trail should be called the Jordan Cliffs Trail, while the northern half should be called the Sargent East Cliffs Trail, as it was called in the 1928 VIA/VIS path guide (see Appendix C).

10. Monuments and Associated Structures

None.

ENDNOTES

65 Harold Peabody and Charles Grandgent, *Walks on Mount Desert Island* (1928), 53, also 46.

66 *Seal Harbor VIS 1932 Annual Report*, 14.

Acadia Trails Crew, 2004-d

Fig. 127-1 Outer loop on the Ship Harbor Nature Trail.

SHIP HARBOR NATURE TRAIL (#127)

SHIP HARBOR NATURE TRAIL (#127)

As a Mission 66 trail, this trail does not fall within the period of historical significance for the development of the trail system. However, many of the guidelines developed in the treatment plan may be applied.

REHABILITATION PRIORITIES

- Make the first 1,300 feet of trail ADA accessible, from the trail entrance, along the eastern half of the northern loop, to the intersection with the southern loop, then west to the harbor inlet.
- Define the terminus of the ADA-accessible section at the inlet with a sign, bench, and widened circular area.
- Bring trail back to its original 5-foot width by improving drainage, treadway, and placing barriers along trail edges, such as infrequent coping stones, natural logs, and vegetation.
- Remove log crib steps and water bars.
- Replace 1990s log checks that are tripping hazards with stone checks.
- Replace corroded 8-inch steel corrugated culverts in-kind and re-dig associated side drains and ditches.
- Add walled or wall-less causeway over low, wet sections that are difficult to drain.
- Add gravel surfacing where material has been lost.

HISTORY

A protected cove, Ship Harbor is named in memory of an American privateer who sailed into the harbor to hide from the British during the Revolutionary War. The land bounding Ship Harbor became part of Acadia National Park in 1937. At this time, Park Superintendent George Dorr directed improvements to the Ship Harbor area in an effort to open it for public use. This work included clearing of understory vegetation and deadwood, termed "fire hazard removal," and the development of a fire road on the west side of the harbor. In the 1950s, as part of the Mission 66 program, the park constructed a self-guided nature trail on the east side of Ship Harbor. Construction of this trail fit well within the Mission 66 program to add "well planned trails"

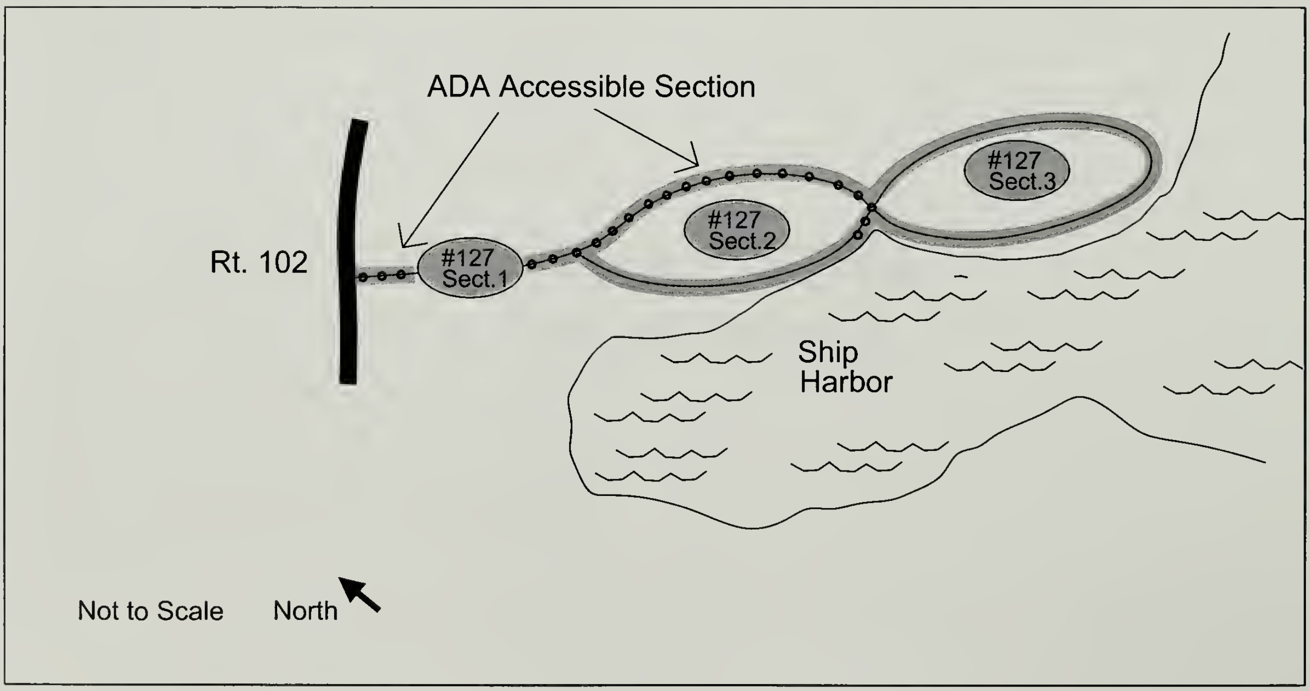


Fig. 127-2 The Ship Harbor Nature Trail (#127).

for "enjoyment-without-impairment." Specifically, the park added trails for interpretive purposes for an increasing number of visitors. A 1961 document also proposed that ranger-led tours would travel from the Seawall Campground to trails along Wonderland and Ship Harbor. The Ship Harbor Nature Trail, as designed by the Park Service, provided a 5-foot-wide gravel tread, with nearby parking and an easy grade. Corrugated steel pipes were installed for drainage. A self-guided trail with fourteen numbered posts and a brochure was developed in 1968, while John Good served as the park superintendent. The brochure has been reprinted, most recently in 1995 through Eastern National Park & Monument Association. The posts have also been replaced. The trail is used heavily and one of the easiest in the trail system (Figs. 127-1 to 127-5).

CHARACTER

With a parking area right at the trailhead, this 1.5-mile loop trail offers a relatively easy walk through thick coniferous forest, along ledges exposed to the ocean's pounding surf, and along the shore of a cozy, tidal harbor with no development. The Ship Harbor Nature Trail is the only self-guided nature trail on the western side of Mount Desert and is similar to the Jordan Pond Nature Trail (#45) on the eastern side.

The trail's intent is to offer easy walking, provide opportunities for appreciation of the coastal scenery, and interpret the area's natural and cultural history. However, the intent is somewhat hindered by the poor condition of the trail. There are many areas of exposed roots, water puddling, and trail erosion. In some locations, the trodden path is almost 30 feet wide. Additionally, vandals have damaged an interpretive sign that once existed at the southern-most vista on the trail's lower loop.

FEATURES

For detailed treatment guidelines and specifications for each feature, refer to Section 1, Chapters 1 through 10.

1. Route

The loop trail departs from a parking area and creates a figure eight with northern and southern loops. The trail's proximity to ocean and harbor afford the hiker magnificent views. There is a park-maintained vista at the southernmost part of the trail. The trail's original route should be maintained with portions upgraded for ADA accessibility (Fig. 127-6).

2. Vegetation

The trail winds through an old orchard and thick coniferous forest, past interesting trees with burls and snake-like trunks, and along the rockweed-strewn coast. In thick forested areas, much of the trail is undefined and widened due to a lack of understory vegetation (Fig. 127-7 & Fig. 127-8). This variety in vegetation character should be maintained along the trail by keeping the original route. Trail widening should be addressed with coping stones and/or the placement of fallen logs sporadically along the trail edges.

Acadia Trails Crew, 4-99-33-1

Fig. 127-3 Entrance to the Ship Harbor Nature Trail, with the harbor in the distance.

Olmsted Center, 7-97-24-17

Fig. 127-4 Self-guided trail post on ledge overlooking Ship Harbor.

3. Treadway

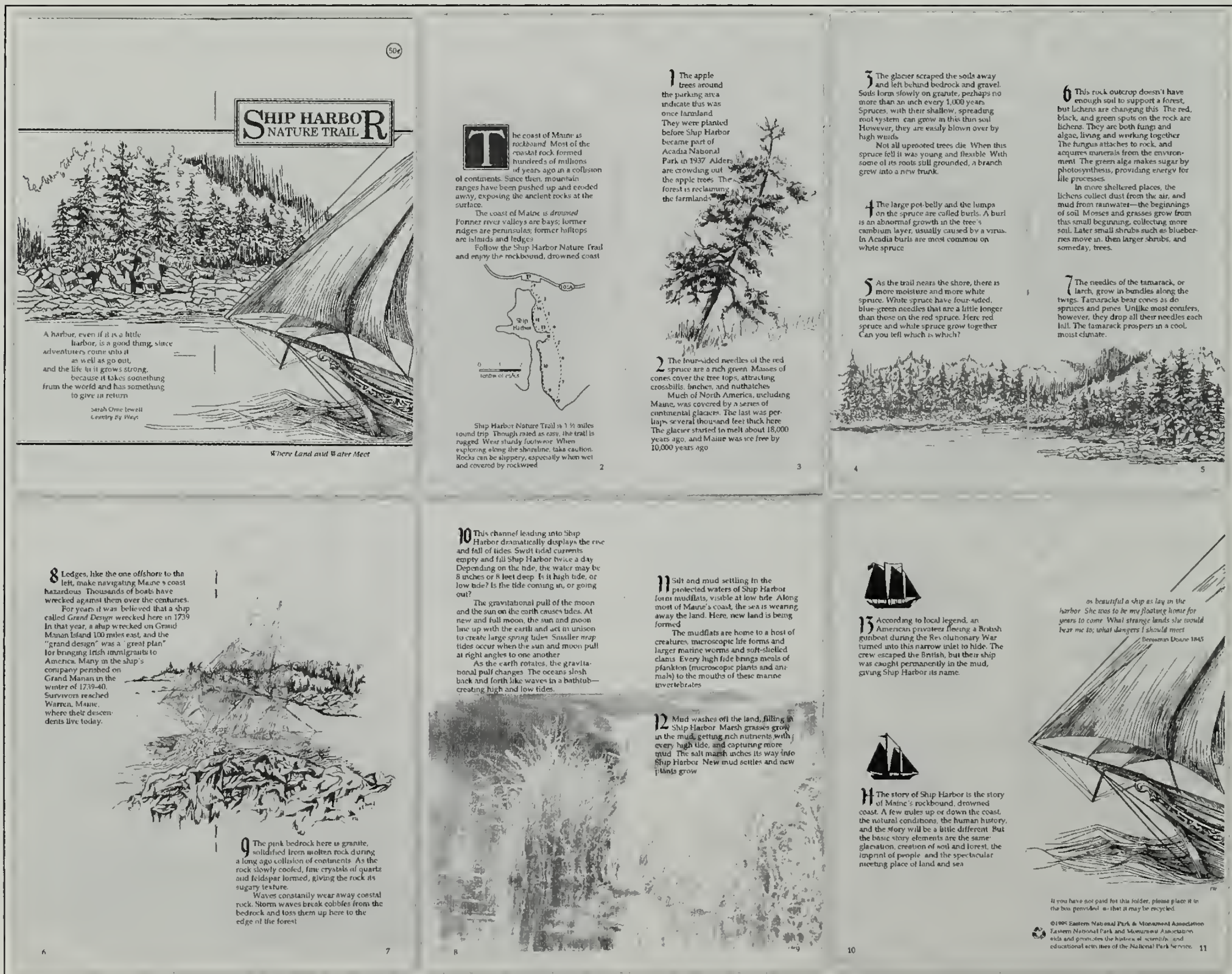
A. **Bench Cuts:** About one-third of the original trail was constructed with half bench cut. Subsequent erosion makes it difficult to identify bench cuts. New bench cuts may be constructed, if needed, to stabilize the trail.

B. **Causeway:** Many eroded sections should be improved with causeway.

C. **Gravel Tread:** The original trail was 5 feet wide and gravel-surfaced by Mission 66. Much of the gravel has washed away and the eroded surface has exposed roots. Once drainage problems are dealt with, new gravel tread should be applied (Fig. 127-9).

D. **Stone Pavement:** One 50-foot section through a rock jumble has step stones set in gravel functioning as stone pavement. This section was built in 1992 by a volunteer group. It may be retained until it needs rehabilitation, then it should be replaced with causeway.

E. **Unconstructed Tread:** There are sections of unconstructed woodland forest floor and ledge. Sections that are low and wet require constructed tread. Along the first half mile that will be ADA accessible, causeway should be built. Causeway is also the preferred alternative for other low and wet portions of the trail; however, boardwalk may also be constructed if needed to address accessibility. At the terminus of the ADA accessible section of trail a wide area of raised tread should be established as



Eastern National Park & Monument Assocation, 1994

Fig. 127-5 Interpretive brochure for the Ship Harbor Nature Trail (#127).

an overlook and turnaround point. This would be similar to the CCC overlook constructed at Otter Cliffs.

4. Drainage

A. Culverts: The trail contains 8-inch steel corrugated pipe culverts with stone headwalls at each end. Side drains and ditches have silted-in and become ineffective, so water remains on the trail. Pipes should be replaced and reset for positive drainage. Associated side drains need to be re-dug and maintained (Fig. 127-10).

B. Subsurface Drains: (see Fig. 127-6).

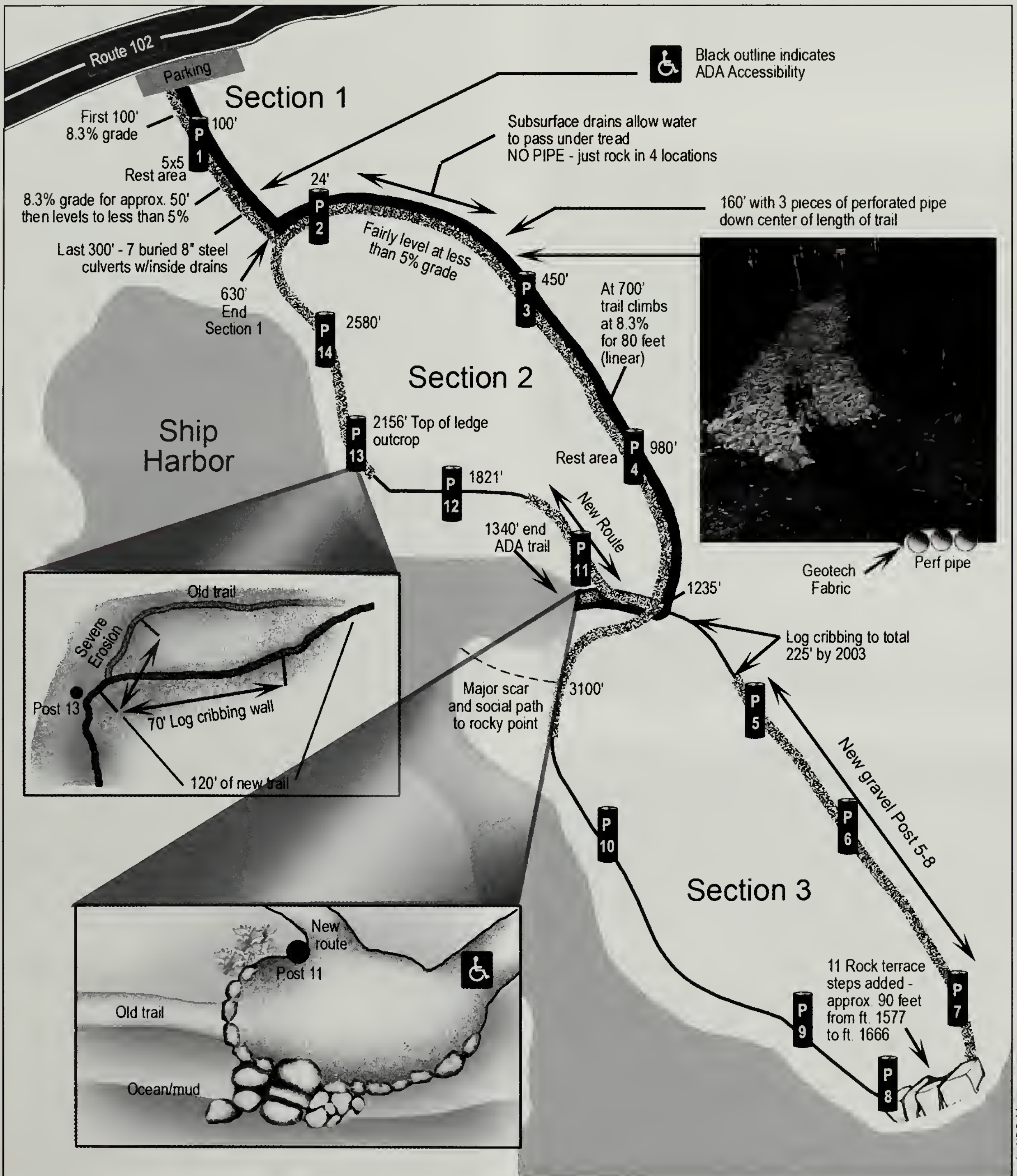


Fig. 127-6 Ship Harbor treatment detail.

Acadia Trails Crew, 4-99-33-1

Fig. 127-7 Eroded section of trail that is approximately 30 feet wide.

Acadia Trails Crew, 4-99-33-5

Fig. 127-8 Undefined woodland tread.

Acadia Trails Crew, 4-99-33-9

Fig. 127-9 Typical 5-foot gravel treadway.

Acadia Trails Crew, 4-99-33-1

Fig. 127-10 This original pipe culvert is in poor condition. It is exposed and clogged with no side ditches available for outlets.

Acadia Trails Crew, 4-99-33-8

Fig. 127-11 Original coping.

C. **Side Drains:** Original side drains have filled in and are no longer effective. These should be re-dug and maintained annually.

D. **Water Bars:** Water bars were added in the 1990s. These should be removed for the ADA-accessible section of trail and replaced with water dips or side ditches and pipe culverts. For other sections of the trail, water bars should be maintained annually.

E. **Water Dips:** Some water dips exist on the trail. Water dips may be added to the trail where needed, particularly on the ADA-accessible section of trail.

5. Crossings

None.

6. Retaining Structures

A. **Checks:** Several log checks are in poor condition and are tripping hazards. These should be removed and replaced with stone checks.

B. **Coping Stones:** Small pieces of original coping stones remain (Fig. 127-11). Coping is square, broken chunks of local basalt, set mostly in the downhill side of the tread, with some set on both sides. Coping should be added where trail widening is a problem. Stones should be dispersed ten feet apart and placed in conjunction with natural fallen logs and revegetation.

C. **Retaining Walls:** Several sections of original retaining wall are still visible, consisting of angular chunks of local basalt laid with a batter to hold tread on the downhill side. Wall is usually under 1 foot high and protrudes above the tread due to erosion. Many wall sections have collapsed or been obliterated by subsequent scree work. A 1992 section built by University of Maine volunteers is approximately 8 feet high by 20 feet long. Another section of new wall, constructed in 1993 by the YCC, is constructed of single stones, averaging 2 feet square, set into the beach to hold tread along the ocean (Fig. 127-12). Collapsed and dismantled retaining walls should be rebuilt. Additional walls should be constructed as needed to repair eroded treadway.

7. Steps

At the trail entrance, a series of log crib steps were added in 1992. These are 5 feet wide with 10-inch risers (see Fig. 127-3). There is also one short stone staircase, added in 1991, consisting of four slab-laid steps of local basalt, measuring 2 feet by 4 feet, with a 1 foot rise (Fig. 127-13). These staircases should be removed if possible for ADA accessibility. Additional steps should not be added to this trail.

8. Ironwork

None.

9. Guidance

A. **Blazes:** None.

B. **Cairns:** None.

C. **Directional Signs:** A large sign is located at the trail entrance (see Fig. 127-3). At 613 feet along the trail, there is a post for a intersection sign where the loop begins. This sign is stolen often. At the convergence of the two loops, at 1,167 feet along the trail, is a log sign with arrows. Signage at these points should be maintained in a style consistent with the system. No additional directional signs should be needed for this straightforward, easily traversed trail.

D. **Informational Signs:** At the trail entrance is a brochure box and an iron tube with a money slot. Nearby is a large sign with the trail name, map, and quote. There are fourteen numbered posts for the self-guided nature trail (see Figs. 127-4 & 127-5). A redwood interpretive sign describing shipwrecks was located at the southern end of the trail, but the NPS removed the sign after it was vandalized.

The entrance sign and numbered posts should be maintained to coordinate with the self-guided hike. The shipwreck interpretive sign should be replaced with a style of sign that is less prone to vandalism.

Acadia Trails Crew, 4-99-33-16

Fig. 127-12 Retaining wall constructed by YCC in 1993.

Acadia Trails Crew, 4-99-33-14

Fig. 127-13 Slab laid steps built in 1991 of local basalt.

Acadia Trails Crew, 4-99-33-12

Fig. 127-14 Portion of a 50-foot section of step stones serving as stone pavement in gravel, lined with scree, constructed in 1992.

Friends of Acadia

Fig. 127-15 ADA-accessible section of trail completed in 2003.

E. **Scree:** A 50-foot section of trail, repaired in 1992, contains step stones set in gravel with scree along the sides (Fig. 127-14). When this section is rehabilitated, the scree should be removed. No additional scree should be added to this trail.

F. **Trail Names:** The trail was originally named the Ship Harbor Nature Trail. This name should be retained.

10. Monuments and Associated Structures

A. **Monuments:** None.

B. **Structures:** There are currently no associated structures. Benches should be added along the half-mile ADA-accessible section, particularly at the terminus of this section by the harbor inlet (Figure 127-15).

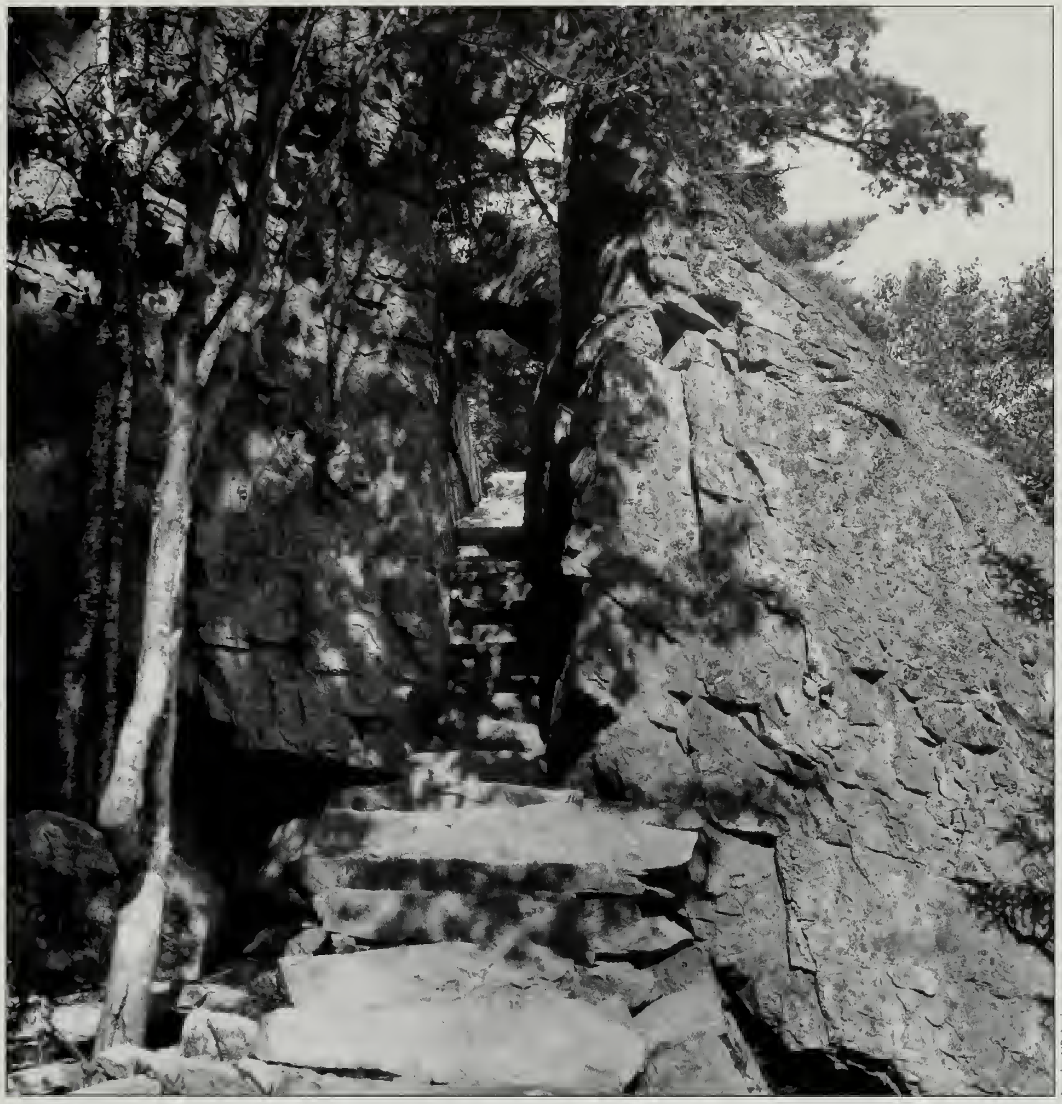

Acadia NP Archives

Fig. 349-1 Historic photograph, circa 1916, of steps and overhead lintel showing the constructed character of the Homans Path.

HOMANS PATH (#349)

HOMANS PATH (#349)

Unmarked since the 1940s, the Homans Path provides an undisturbed example of early-twentieth-century VIA/VIS stonework on its ascent up the eastern slope of Dorr Mountain. As one of the highly crafted memorial trails radiating from Sieur de Monts Spring, the Homans Path is a showpiece of rustic construction techniques (Figs. 349-1 & Fig 349-2). In June 2001 this trail was carefully documented with written descriptions, measurements, and photographs (Figs. 349-3 & 349-4). Information gathered included the location and use of stone steps, shims and blocking, drill marks, "dog" dimples, ironwork, closed culverts, boulders set over the trail, and other stonework.

Park management has decided to reopen the Homans Path. In anticipation of this, the trails crew developed a general plan for treatment of the trail addressing rehabilitation of the trail's constructed features as well as the creation of new access routes at both ends of the trail. Once reopened, marked, and included in the trail system, maintenance will become a priority on this trail. High use will likely cause the slab steps to slip and slump, as has occurred on other stepped trails. To deter this, early rehabilitation work may include the minimal addition of concealed iron pins to help hold steps and coping stones in place. The extensive collection of photos taken during recent trail documentation should be used to monitor the existing trail conditions during each season, noting changes that occur over time. Sections of stonework that are slipping can then be reinforced before they fail and require complete rebuilding.

REHABILITATION PRIORITIES

- Reopen the trailhead and the connection to Sieur de Monts Spring.
- Repair sections of collapsed steps. Reset steps, retaining walls, and coping that have slipped. Add drainage or iron pins if necessary. Document additions.
- Add constructed features to the upper unconstructed section of trail to delineate the route. Use features that are compatible with the rest of the trail—stone pavement, coping stones, and possibly steps as needed. A clearly defined route will prevent trail braiding, tramping of vegetation, and erosion.
- Install a trailhead sign at the base and an intersection sign at the upper end.

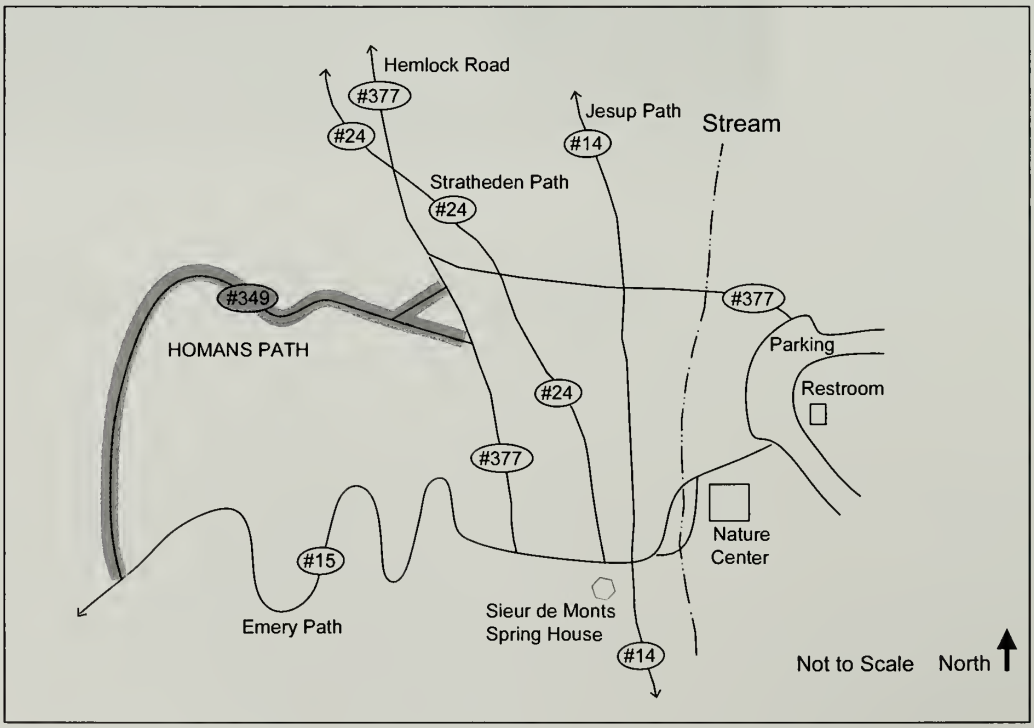


Fig. 349-2 Homans Path (#349).

HISTORY

Beginning in 1913, George Dorr directed the development of a network of memorial paths radiating from Sieur de Monts Spring. Dorr envisioned the Sieur de Monts area as the center of a reservation of protected lands with paths connecting to Bar Harbor and the surrounding mountains. Dorr was able to raise funds for trail construction as an active member of the Bar Harbor VIA Path Committee, the Hancock County Trustees of Public Reservations, as well as the founder of his own philanthropic organization, the Wild Gardens of Acadia Corporation. By the time the reservation was designated Sieur de Monts National Monument in 1916, with Dorr as Superintendent, most of the memorial trails were partially or fully completed, including the Kane Path (#17), Beachcroft Path (#13), Kurt Diederich's Climb (#16), Homans Path (#349), Jesup Path (#14), and Emery Path (#15), with the Schiff Path (#15) added later. All of the trails were highly crafted with extensive stonework.

According to the 1915 path guide, the Homans Path was initially constructed between 1913 and 1915 as part of Kurt Diederich's Climb (#16), which was described as follows:

> from the northern end of the Kane Path to the Sieur de Monts Crag about half way up the eastern face of Dry [Dorr] Mountain with a fine view, it then descends and comes out on the road a little beyond the Sieur De Monts Spring. A path leading from the crag to the top of the mountain is projected.

Subsequent construction of the Schiff Path (#15) to the top of the mountain and the Emery Path (#15) from Sieur de Monts Spring resulted in the renaming of the northern half of Kurt Diederich's Climb (#16) as the Homans Path. Dorr named the path for Mrs. Eliza Homans, the first large land donor to the Hancock County Trustees. The path is one of the least documented in the system and was not endowed with a maintenance fund. It is first shown on the 1916 path map and briefly mentioned in the Bar Harbor VIA 1916 annual report:

> ...the system of Memorial Paths constructed by Mr. Dorr on Dry [Dorr] and Pickett [Huguenot Head] has been enriched by the Emery Memorial Path,...leading from the Sieur de Monts Spring to the Crag above, where it connects with Kurt Diederich's Climb and the Homans Path.

With the completion of the Emery Path (#15), the Homans Path became a parallel but less accessible route for hikers traveling to and from Sieur de Monts Spring. For hikers traveling from Bar Harbor, the Homans Path was one of several options, and it offered a shorter route to Sieur de Mont Crag and the summit of Dry [Dorr] Mountain. But as the Sieur de Monts Spring area became a center of activity and a place for parking automobiles, the use of the Homans Path diminished. The Homans Path was not described in the 1928 path guide issued by the VIA/VIS Joint Path Committee (though shown on VIA/VIS path maps until 1941) and was deleted from maps produced by the National Park Service in the 1940s.

Little if any maintenance was done on the path after its construction. It is possible that the CCC or Park Service crews dismantled the upper section of the path to avoid confusion with the Emery Path (#15). The path remained unused and unmarked for over fifty years. In 1993 the publication *Trails of History,* written by local hikers Tom St. Germain and Jay Sanders, rekindled interest in the trail. The authors described the path's remarkable stone construction with its carefully placed stone boulders, its route past several natural springs, and wonderful views. They also recommended that the path be reopened. A year later, an unknown party, one or more individuals dubbed by park as "trail phantoms," carried out unauthorized work. Trees were cut along the path and moss was scraped from the stone steps. The incident sparked local publicity and spotlighted the uncertain fate of the park's many unmarked trails, most of which were closed by the Park Service in the 1950s. In the *Hiking Trails Management Plan*, the Homans Path is called out as a highly crafted historic trail with high cultural value that should be reopened.

CHARACTER

The Homans Path is similar to other highly constructed memorial paths radiating from the Sieur de Monts Spring area. The trail starts in a woodland setting (see Fig. 349-3) and rises quickly across a series of talus slopes. The choice of route is like other trails constructed in the 1910s—winding, leading through rock fissures, past water features and to viewpoints. The trail consists predominantly of slab-laid stone steps with retaining walls and coping stones of assorted sizes. As part of the third memorial path constructed between 1913 and 1915—preceded by the Beachcroft Path (#13), which was later reworked, the Kane Path (#17), and constructed as part of Kurt Diederich's Climb (#16)—the trail exhibits exceptional craftsmanship, but it is relatively simple compared to the later Emery Path (#15), which contains more coping stones and extensive iron. The Homans Path has only minimal iron, which is used to hold slab-laid steps and support walls onto ledge. The relatively few drainage features are located near the base of the trail, and most of the trail relies on subsurface drainage through underlying talus. Boulders placed over the path at rock crevices, a unique feature on the Homans Path, act as lintels, creating spaces through which hikers may travel (see Fig. 349-1 & 349-5). One of the greatest values of the Homans Path at the time of this report is the pristine quality of its circa-1915 construction, which has been altered slightly by weathering but not by high use (Fig. 349-6). During its fifty or so years of disuse, trail sections that cross intermittent streams or pass by springs have been dismantled by ice and water, though all steps and wall stones are retrievable (Fig. 349-7). The steps—large, occasionally cut, slab-laid and set-behind—are typical of the memorial trails. There are no extant associated trail structures, such as benches, cairns, signs, monuments, or markers.

Fig. 349-3 The entrance to the Homans Path is on an unmarked section of Hemlock Road (#377), marked by two large coping stones. Constructed VIA sonework is prevalent along the trail, and the first features at the trailhead include a capstone culvert over the road's drainage ditch, and followed by a series of steps.

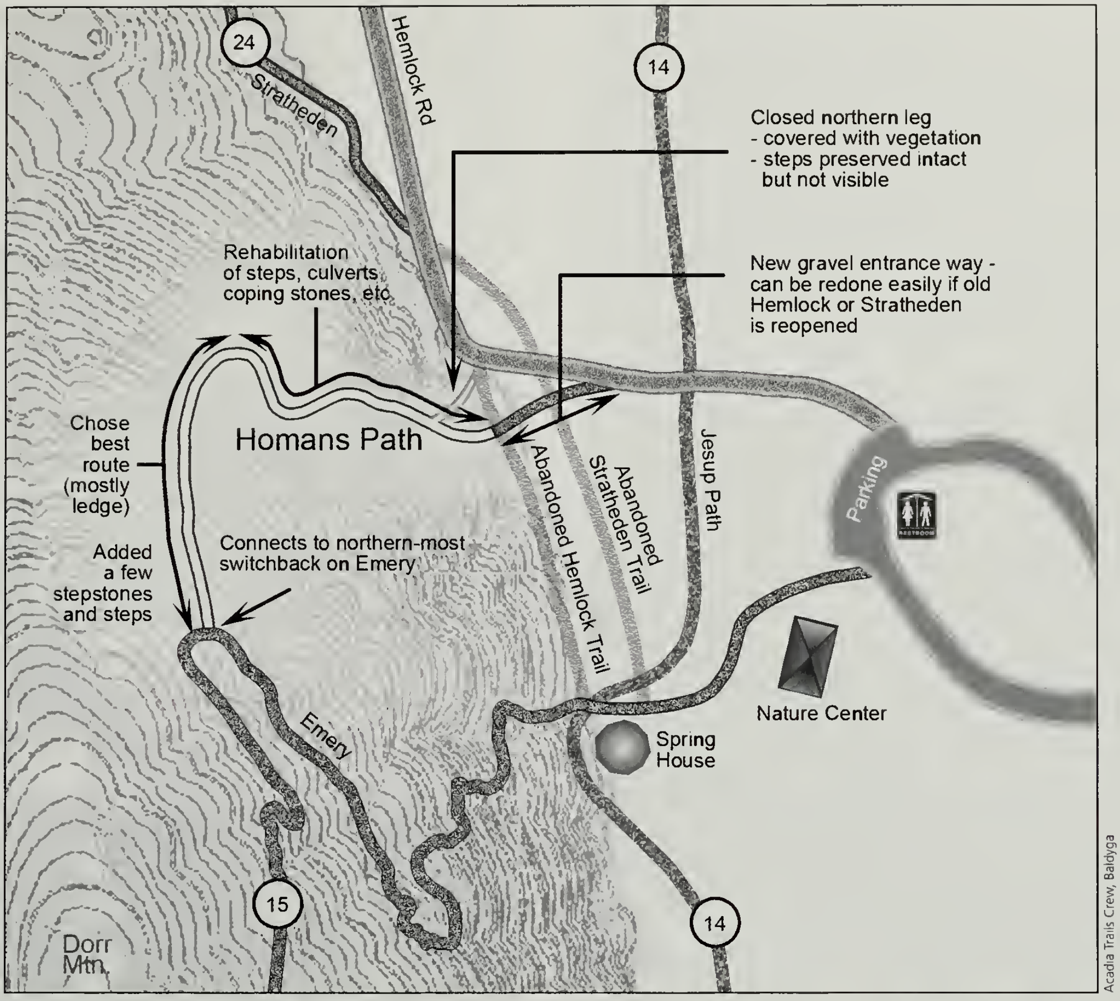


Fig. 349-4 Homans Path treatment detail.

Fig. 349-5 This stone was placed during trail construction to create an interesting feature along the route. It is the same location as shown in Figure 349-1, but viewed from above.

Fig. 349-6 Stone steps and stone pavement through talus slope.

FEATURES

For detailed treatment guidelines and specifications for each feature, refer to Section 1, Chapters 1 through 10.

1. Route

The Homans Path begins at the former Hemlock Road (#377), which is no longer marked, not far from the junction of the Stratheden Path (#24) and Hemlock Trail (#23). The trail has two entrances that join in a fork approximately 160 feet along the trail (Fig. 349-8). The ascent up Dorr Mountain, made up of predominantly stone steps, begins in the woods and winds up past several springs, under boulders and through rock crevices and formations (Figs. 349-9 & see 349-1 & 349-5). Two boulders were placed over the trail, as evidenced by "dog" dimples at the corners of the boulders. Near the upper end of the trail the stone steps terminate, and the last 500 feet are unclearly marked with no built features. Increased use over the past five years has resulted in a trodden "social path" to connect with the Emery Path (#15) along Sieur de Monts Crag.

The historic route of the trail up Dorr Mountain, and the connection to the Emery Path (#15) should be maintained. Connections to both the Emery Path (#15) and the Hemlock Road should be constructed in conjunction with the reopening of this trail (see Fig. 349-4).

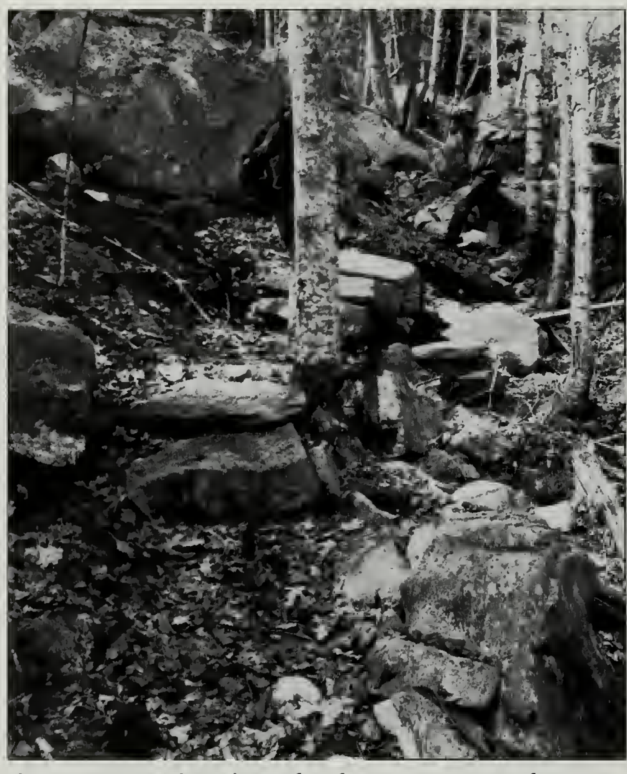


Fig. 349-7 Approximately 230 feet from entrance, a 24-foot section of collapsed tread and uprooted trees shows the abandoned condition of some trail segments.

Fig. 349-8 Fork located about 160 feet up the trail.

Fig. 349-9 Rock formation along the trail route.

2. Vegetation

There is no exceptional vegetation along the trail. The area was burned in the 1947 fire, and some steps and retaining walls were possibly dismantled by the decay and uprooting of large trees killed in the fire (see Fig. 349-7). The area has revegetated with birches. Many birches along the trail were damaged by trail phantoms who were trying to brush the trail in the mid-1990s. The damaged trees should be cut at the base (Fig. 349-10). Any trees and/or roots that are likely to dismantle steps or other stonework should be removed. Along the upper section of the trail, where there is no constructed tread, installation of a clearly defined trail will protect adjacent vegetation (Fig. 349-11).

3. Treadway

A. **Bench Cuts:** Some short sections of the trail extend along benches, but most of the trail consists of steps leading up the slope. Avoid introducing additional bench cuts.

B. **Causeway:** None.

C. Gravel Tread: Most of the treadway consists of steps and stone pavement. Four culverts that were initially graveled-over are located in the first 130 feet of trail (Fig. 340-12). A section of stone rubble at 170 feet up the trail indicates that short sections of trail were once gravel surfaced with borrowed soil or gravel. As the trail reaches the top of Sieur de Monts Crag, there are additional sections similar to this, and also where the trail connects to the Emery Path (#15). During rehabilitation, gravel tread should be reestablished where it was located historically. It may also be added to the upper unconstructed sections of the trail to strengthen the tread and prevent erosion. Locally mined gravel should be used unless the volume needed becomes too large; then the imported gravel mix may be used with care to ensure the gravel color, size, and texture does not detract from the existing historic stonework.

D. **Stone Pavement:** There are short sections of stone pavement and talus pavement throughout the trail.

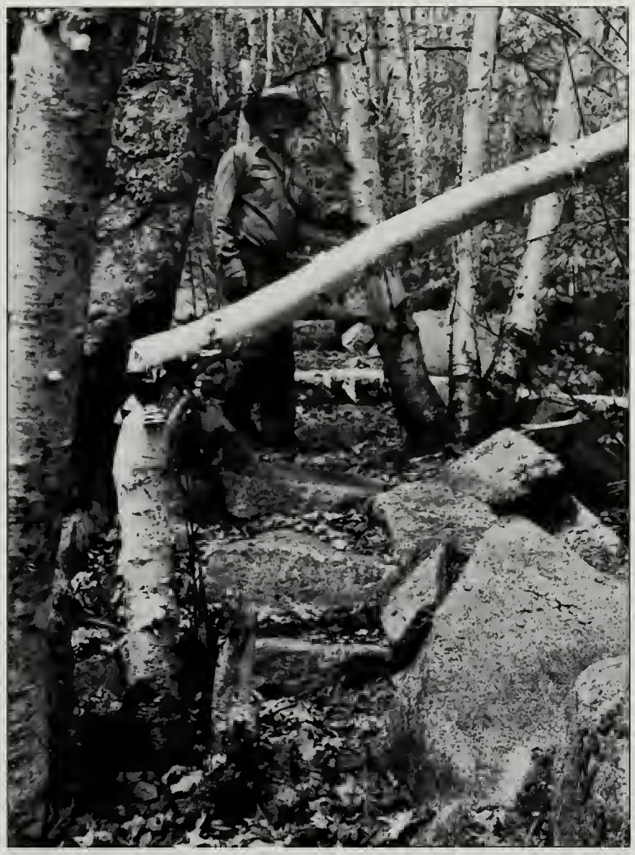


Fig. 349-10 Young birch trees are the predominant vegetation along the lower parts of the trail. Damaged specimens like this one should be removed from treadway.

Fig. 349-11 Unconstructed tread at the upper end of the trail is bounded by sporadic coping stones, blueberry bushes, and other subalpine vegetation. A more constructed tread way would discourage trail widening and damage to adjacent vegetation.

Fig. 349-12 Graveled-over culvert located 60 feet from the trail beginning.

Fig. 349-13 Irregular coping stones are often located along the lower edge of the tread.

Fig. 349-14 Retaining wall, coping and curved steps at about 270 feet up the trail.

Fig. 349-15 Path passing beside jutting boulder, raised with retaining wall and blocking.

Fig. 349-16 Large stone steps.

However, the upper 500 feet of the trail does not contain steps or stone pavement. This section will need reinforcement of the treadway to prevent erosion and gullying, and stone pavement or gravel tread may be used. When applying new stone pavement, consult other memorial trails as models, but make sure the new installation can be differentiated from historic work when complete. Where possible, the trail should be routed along the ledge of Sieur de Monts Crag, both to provide less need for a constructed tread and to access the views from the mountain.

E. **Unconstructed Tread:** Most of the trail relies on constructed tread, which is part of its highly crafted character. Sections of steps are pinned to ledge rather than leading the hiker on the ledge itself. Unconstructed tread at the top of the trail connecting with the Emery Path (#15) should be reinforced with stone pavement or gravel tread (see above).

4. Drainage

A few drainage features are located in the first section of trail. At the entrance, a capstone culvert extends across the Hemlock Road (#377) drainage ditch (see Fig. 349-3). This culvert is the first constructed feature on the trail. About 60 feet up the trail, a graveled-over culvert directs water from an intermittent stream under the tread (Fig. 349-12). Three similar culverts are located within the next 70 feet of trail. The last of these four culverts has exposed lintels. No other culverts exist on the trail. A drainage feature is located 370 feet up the trail, which, according to the trail inventory, consists of "a hold for water to flow into boulders" below a set of steps. Above this point there are no evident drainage features (see Appendix E). One section contains water flowing down the steps, but most sections that cross intermittent streams or pass by springs are in poor condition. These sections should be repaired with capstone or graveled-over culverts, similar to those at the beginning of the trail. Open culverts, pipe culverts, and water bars would detract from the trail's character.

5. Crossings

None.

6. Retaining Structures

A. **Checks:** No checks are used, as they are a contemporary addition to the Acadia trails. Use of checks should be avoided on this highly crafted, historic trail.

B. **Coping:** Coping stones are used to define the trail through the woods, under ledges, and along sections of stone pavement. Coping is also used to anchor steps in talus areas and on top of retaining walls. Most are relocated boulders of irregular sizes (Fig. 349-13). Some coping stones have toppled. These should be retrieved, reset, and in necessary, pinned in place with concealed pins. Additional compatible coping stones may be added as needed.

C. **Retaining Walls:** There are extensive sections of rubble retaining walls, often in combination with coping. Several sections of retaining walls have collapsed (Figs. 349-14 & 349-15). Existing walls should be rehabilitated, and new additions should be compatible with the historic style.

7. Steps

There are extensive slab-laid and set-behind steps on the path (Figs. 349-14 to 349-18). The size of step and riser varies. This assortment of step size, some cut into rectangular blocks, others with uncut ends, helps to harmonize the steps with the natural surroundings. With the exception of steps located near water features, all steps are in excellent condition. Most are laid across ledges or through talus areas, which allow water to seep well under the trail. In order to lead hikers through rock formations, some sections of trail were built up with blocking and retaining walls. There are drill marks on steps and on nearby ledges (Figs. 349-19 & 349-20). Shims were used on some steps (Fig. 349-21). Rehabilitation should maintain the variety of steps currently extant on the trail.

8. Ironwork

There is minimal iron on the trail. The circa-1915 construction of the trail places it during a period when iron use was increasing. The existing iron is used to support slab-laid steps and coping stones on ledge at approximately 850 and 930 feet up the trail (Figs. 349-22 & 349-23). Additional concealed pins may be added to help hold steps in place. For example, a pin may be added to hold the bottom step of a run of steps to ensure that the staircase does not collapse with increased use. Pins should be added to secure stonework prior to reopening the trail where high use will cause the steps to slip. Annual inspections may locate additional locations for pins. Use of concealed pins is preferred, rather than adding stone retaining walls or coping, to avoid altering the character of the trail.

Olmsted Center, 5-01-d17

Fig. 349-17 Steps on ledge near upper end of trail.

Olmsted Center, 5-01-2-22

Fig. 349-18 Several runs of smaller steps without coping and covered with moss are located about 550 to 600 feet up the trail.

9. Guidance

The steps serve as guidance, a technique employed by the VIA/VIS from the 1890s onward. Blazes, cairns, and scree should not be added to the trail.

A. **Blazes:** None.

B. **Cairns:** None.

C. **Directional Signs:** Signs are needed at both ends of the trail. At the lower end of the trail, a vandal-proof trailhead post is needed; possibly two because of the fork. At the upper end an intersection sign is needed.

D. **Informational Signs:** An information sign or brochure box may be added at the base of the trail to interpret the history of the trail and its reopening.

E. **Scree:** None.

F. **Trail Name:** The trail should be named Homans Path with no apostrophe.

10. Monuments and Associated Structures

There is no evidence of monuments or structures associated with this trail, and none should be added.

ROUTINE MAINTENANCE

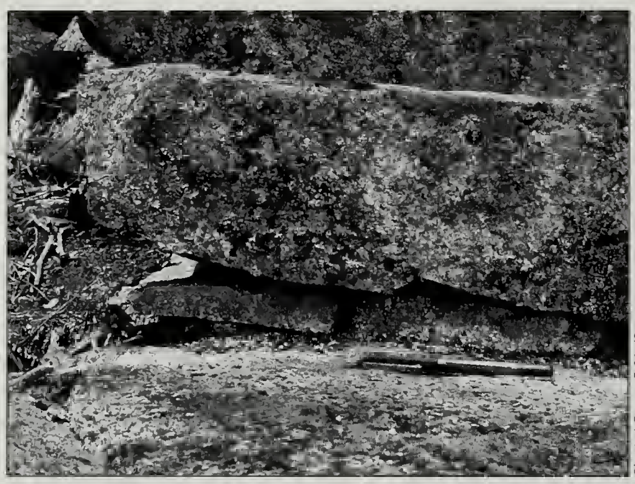
A series of photographs has be taken of the trail's stonework prior to its official reopening in 2003 (Fig. 349-24). Each year the trail should be carefully inspected to determine whether the steps are slipping due to trail use. Altered sections should be repaired as soon as possible, with the addition of concealed pins if necessary. This will prevent long sections of steps from slipping or collapsing.

Olmsted Center, 5-01-d17

Fig. 349-19 Hand showing drill marks on a nearby ledge where steps were quarried.

Olmsted Center, 5-01-d6

Fig. 349-20 Stone step with drill mark.



Olmsted Center, 5-01-d8

Fig. 349-21 Stone step with shims.

Olmsted Center, 5-01-d13

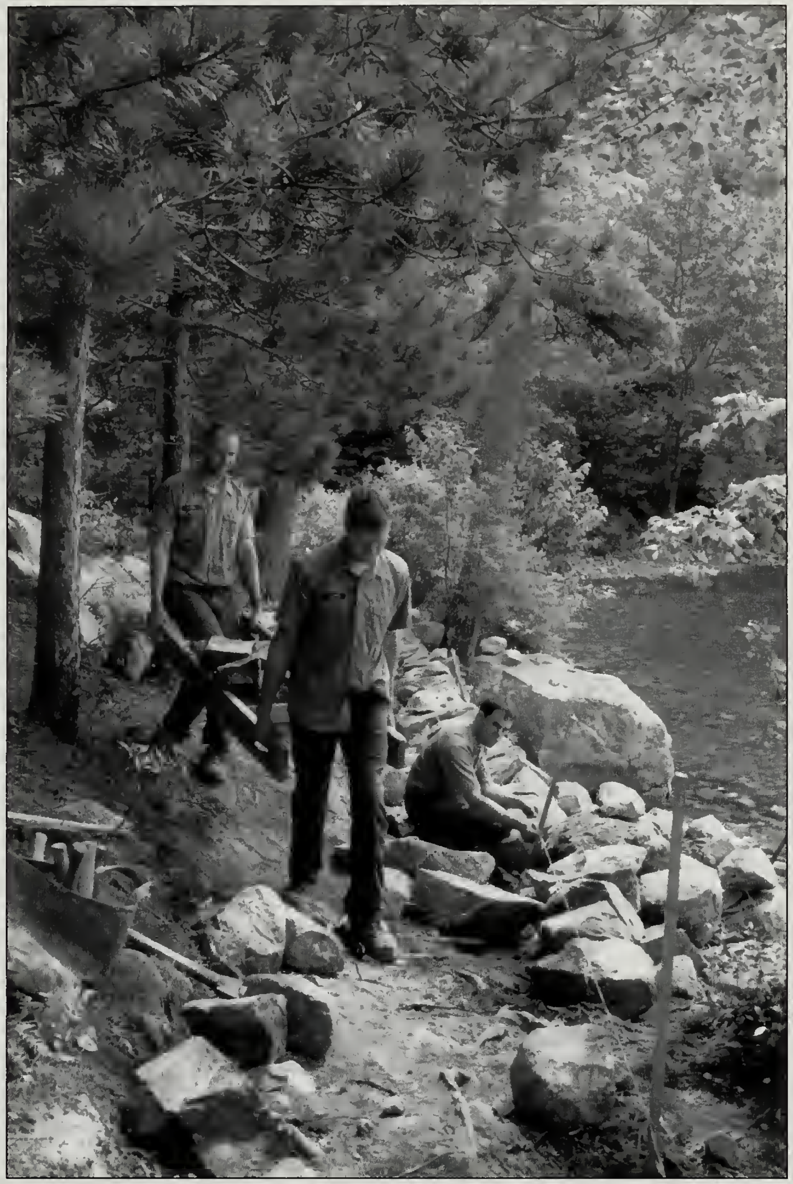
Fig. 349-22 Detail of a pinned step on the Homans Path.

Olmsted Center, 5-01-d14

Fig. 349-23 Stone steps pinned on ledge, side view.

Friends of Acadia/Peter Travers

Fig. 349-24 Reopening of the Homans Path in 2003.



SECTION 3:
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APPENDIX A: TERMINOLOGY

abandoned trail
Trail that is no longer mapped, marked, or maintained.

abutment
A stone, wooden, or concrete substructure supporting the ends of a bridge.

accessible
See **wheelchair** accessible

ADA
Americans With Disabilities Act; this legislation governs the construction of trails for people with disabilities, including physical aspects of the trail and which trails must be built in such a manner; ADA trail refers to a trail constructed according to such legislation to allow use by handicapped persons.

ADA trail
A trail constructed according to the requirements of the Americans With Disabilities Act that allows access by people with disabilities; wheelchair accessible.

alignment
A trail's placement on the landscape; route.

AMC
Appalachian Mountain Club.

apron
The dip on the uphill side of the bar that directs most of the water off the trail before it gets to the bar itself; ideally "funnel-shaped."

backed waterbar
A waterbar "backed" or held in place by steps or checks immediately on its downhill side.

backfill
Fill material behind a structure.

Bates-style cairn
Cairn constructed in the manner of Waldron Bates's cairns, consisting of base stones, lintel, and pointer stones.

Bates-style steps
Steps constructed in the style of Waldron Bates; a rustic method of step construction.

batter
The slope of a wall face; batter is the relationship of rise to run, where rise is the height of the wall and run is the distance from vertical that the face recedes from foundation to top; this relationship is expressed in this document as "rise:run"; hence, a 2-foot tall wall that slopes back on foot is said to have a batter of 2:1. A wall may have a large or small batter, indicating the increasing degree to which the wall is sloped backwards from the base.

bedlog
Support log for the treadlogs of a bogwalk.

bedrock
See **ledge**.

bellying
Technique of constructing steps in which each slab-laid step is shaped so that it "bellies" down behind the step on which it sets, thus locking it in.

bench cut
A side-hill or cross-slope treadway constructed by removing material from the slope to create a flattened surface.

berm
Raised strip of soil, usually vegetated.

blaze
One of a series of marks along a trail that indicates the location of the trail.

blocking
Stones used to support or backfill building stones in a masonry structure; see also **core**.

bog-style stepping stones
Stepping stones used to cross boggy areas; see also **stream-style stepping stones**.

bogwalk
Wooden walkway providing a raised, even and dry tread, usually through a wet area.

borrow pit
Pit along a trail from which material for trail construction was taken.

breaking joints
Principle of stonework in which the seam between any two stones is "broken" or overlaid with a single stone; one over two.

bridge
A structure providing passage over an impediment such as a waterway, gully or crevice.

broad paths
Historic gravel paths in the Seal Harbor and Bar Harbor districts.

Brunnow-style steps
Steps constructed in the style of Rudolph Brunnow, in which steps are laid as the top course of a retaining wall.

brushing
The clearing of brush along a trail corridor.

bullrail
A low barrier, usually not over four inches high, placed along the side edges of a bridge; see **curbrail**.

cairn
Trail marker that is a built or piled group of stones.

cake
(AMC term): way of setting rock so that it is laying down with its greatest surface area flat in the ground; oppose to toast.

cantilever
A beam or member that extends past its support, resulting in an overhang.

capstone culvert
Closed culvert topped with one or more exposed treadway stones.

catch basin
An excavated, constructed area at the entrance to a culvert designed to "catch" debris before it clogs the culvert.

causeway
Constructed treadway raised above the level of the surrounding area; may be walled causeway, wall-less causeway, or stone causeway.

CCC
Civilian Conservation Corps.

character-defining features
Exemplary characteristics of a historic structure, object or landscape that contribute to its historic character and aid in the understanding of its cultural construction.

check
A constructed barrier in the trail that retains treadway material from moving down-grade; may be log, or a row of abutting stones with high contacts.

chinked
Stuffed with the correct small stones to fill gaps left between building stones; process is called "chinking."

climbing turn
Gentle turn that reverses a trail's direction, designed to gain grade on a sidehill trail; the turn is less sharp than in a switchback.

closed culvert
Culvert closed at the top so that it is underneath the treadway.

closed log culvert
Closed culvert constructed of logs, usually surfaced with gravel; see **gravelled-over bridges**.

colored paths
Paths of a system developed under Herbert Jaques in Bar Harbor in the early 1900s in which each path was named for a color, or two colors; ex. "Green and Black Path"; all of these trails have been renamed, though some may be restored to historic color names.

commemorative plaque
In the Acadia trail system, a cast bronze plaque which is mounted on the face of a cliff, into a large boulder or onto a structure to commemorate individuals associated with the memorial trails.

conical cairn
AMC-style of cairn, constructed of a series of circular retaining walls that form a cone.

contact
Touching; a fundamental principle of sound masonry, in which all abutting building stones contact each other; see also **high contact**.

control points
Significant locations the trail is designed to access; primary considerations in the design of its route.

coping retaining wall
Coping wall that functions also as a retaining wall.

coping stones
Stones set at the edge of a treadway (or road) that protrude above the surface and act as guidance; they may be the top course of a retaining wall, assisting with its structural integrity.

coping wall
A continuous row of coping stones.

corduroy
Decking or treadway composed of continuous log rounds, or split logs with the round side up.

core
Interior of a masonry structure, especially a retaining wall, in which it is the material between the face of the wall and the material being retained; provides structural integrity and drainage to the structure.

cradling
Technique of construction, especially as used in shallowly battered walls, in which rocks are trapped partially behind rocks they are set on top of, and thus locked in.

creep
Slow movement of material down a slope.

crib
Wooden structure that retains material and/or acts as a pier for a bridge or bogwalk; see log cribs.

cross-slope
Tread slope perpendicular to trail direction, or, a trail perpendicular to the fall line.

crowned
Refers to gravel paving that is raised in the middle to shed water to either side of the treadway.

culvert
Structure that carries water across or under a treadway.

curbrail
A low barrier, usually not over 4 inches high, placed along the side edges of a bridge, parallel to the treadway; see bullrail.

cut stone
Stone, usually rectilinear, that is the result of splitting a larger stone, usually by drilling and using feathers and wedges.

cyclic maintenance
Maintenance scheduled to take place at a given interval, such as annual drain cleaning.

decking
Walking surface constructed of planking, especially on a bridge.

designed alignment
An alignment laid out with consideration for factors other than control points, such as grade and treadway sustainability.

destination points
The end points of a trail.

dimple
See dog holes.

direct alignment
An alignment that takes the shortest feasible route to its control points.

directional signs
On the trail system, signs which locate and direct hikers.

ditch
Earthen channel to direct water; usually a side drain, outlet ditch, or off-trail drainage.

ditch and fill
A technique used to treat wet areas whereby a ditch is dug along the side of the treadway and the resultant material is used to elevate the treadway; the result is similar to a causeway but less constructed.

dog holes
Dimple-like depressions or shallow drill holes at opposing ends of stones; historically used to move large stones mechanically in conjunction with chain dogs and a derrick.

Dorr-style steps
Steps constructed in the style of George Dorr; a highly crafted method of step construction.

dry-laid
Stonework constructed without the use of mortar or bonding agents; type of construction used in the Acadia trail system.

endowed trails
A specific group of historic trails whose maintenance was funded by an endowment; many of these are also memorial trails.

engraved stone
A boulder, step or stone into which language has been cut; in general, engraved stones associated with trails were located near one or both entrances to the trail and were engraved with the name of the trail.

expansion bolt
A bolt designed to anchor to rock by expanding when it is installed.

eyebolt
A piece of iron anchored into rock that has been bent at the end to form a circle, or "eye" for attaching something.

face
The front, or exposed area, of a retaining wall.

fall line
The direct downhill line; the line which water takes as it descends a slope.

fall-line route
A direct route that follows the fall-line of a slope; a vulnerable route common to the Acadia system.

fines
Very small particles of soil; see silt.

fitted wall
Retaining wall constructed of stones fitted in between existing stones in the landscape, especially in a talus slope.

flat notch
Method of joining logs in which a flat surface is cut in each log, and the logs are joined at the flat surfaces.

flat signs
Planed wood signs mounted on posts; may be pointer signs or square signs.

floor
The bottom of a drainage channel.

footing
Base of a masonry structure, usually well below the surface of the ground.

French drain
A covered channel of stone laid underneath the trail surface or surrounding ground; a type of subsurface drain.

fully constructed side drain
Side drain fully constructed of stone, such as "V"-shaped and "U"-shaped side drains.

geotextile material
Synthetic cloth that allows water penetration while acting as a barrier to silt.

gesture
As a descriptive term for alignment, the way a trail moves in response to the landscape; may be a small gesture or a large gesture.

grade
Slope; incline of a trail, usually expressed as a percentage of rise to run, or as an angle from horizontal.

grade string
See line.

gravel paving
Any treadway surfaced with gravel.

graveled-over culvert
Closed stone culvert overlaid with gravel paving.

guidance features
Features designed to direct hikers along a trail and contain hikers within the treadway.

gully
An eroded channel, usually carrying water.

handrail
A rail at hand height; may be along a bridge or along a steep portion of a trail.

header
Any stone set header style; in a retaining wall, a stone set in the face of the wall that penetrates the core, also called a tie rock.

header-style
Set with the length of the stone into the structure; strongest way of laying stone; as opposed to **stretcher style**.

high contact
Contact at the top of a row of stones; a technique for retaining surface material.

historic
A term used to describe a person, place or object that is significant to a culture.

historic scree
Scree that was constructed in a period of significance; generally more precise and attractive than contemporary scree.

historical
A term that refers to periods or themes in history.

historical significance
Meaning or value based on evaluation criteria for inclusion on the National Register of Historic Places given to a district, site, building, structure, or object. These criteria are based on associations with important persons or events in American history, design characteristics, or pre-history.

hub
A central location at which a number of trails converge by design; such as at Sieur de Monts Spring.

informational signs
Non-historic signs in a variety of styles that convey information of many types about trails; also called "interpretive signs."

inslope
Tread cross-slope against the prevailing grade, i.e., towards the hillside.

insloping
Sloping in towards higher ground, usually into the treadway, or towards the core of a structure; the ideal type of slope for rocks in a masonry structure

ironwork
In the Acadia trail system, constructed iron features affixed to stone, for the purpose of either supporting structures or aiding hikers; such as a rung.

keyed
In setting a rock, it means set into a space in which the rock is secured by other rocks, especially in reference to foundation stones or bottom steps secured by rocks or ledge in the landscape.

laid coping
Free-standing wall laid at the edge of the treadway.

laid wall
Laid retaining wall; retaining wall with a substantial vertical component in which rocks are interwoven.

large gesture
Movement of a trail dictated by design over small-scale features in the landscape; a large-gestured route will have many straight and evenly curving sections.

lead wool
A matted gathering of thin strands of lead, similar in appearance and consistency to steel wool; used to seal holes around iron work and thereby prevent rusting.

ledge
Solid, continuous layer of rock; bedrock; slickrock.

line
Mason's line; high-tensile string used as a reference for construction; string line; mason line; grade string.

lintel
Stone that bridges a gap; part of any closed stone culvert or pipe culvert.

live edge
An edge of a log with the bark left on it.

living wall
Berm of vegetation and soil performing a retaining function; see **wall-less causeway**.

log crib
Retaining structure constructed of logs; may be **wall crib** or **treadway crib**.

log scree
Scree made of logs or brush.

log signs
At Acadia, synonymous with **trailhead signs**; signs crafted from a single log which has a flat face cut on one or both sides on which information is routed.

lowland route
Route that follows the bottom of a contour or traverses a low or flat area.

mason's line
See **line**.

memorial trails
A specific group of historic trails built in memory of deceased persons; e.g., Emery Path.

non-native species
Any species not native to Acadia; no such plants should be used in revegetation.

NPS
National Park Service.

off-set intersection
An intersection at which the ends of two connecting trails, or the segments of a single trail, do not line up at either side of the trail or road they cross.

off-trail drainage
Drainage away from the trail, usually ditching that directs water to trail drainages.

one over two
See **breaking joints**.

open culvert
Culvert with an open top.

open log culvert
Open culvert with log sides.

open stone culvert
Open culvert with stone sides and floor.

outflow drain
see **outlet ditch**

outlet ditch
Ditch at the outflow, or downhill side of a drainage; outflow drain.

outrigger bracing
Bracing that triangulates from the outside of a bridge.

outslope
Tread cross-slope with the prevailing grade, i.e., towards the downhill side.

outsloping
Sloping away from higher ground or core of a structure; outsloping rocks usually weaken a masonry structure.

path
At Acadia, a highly constructed, easily-walked trail developed by a VIA or VIS group.

patio
See **stone pavement**.

pea-stone
Small rounded stone.

perforated-pipe drain
A type of subsurface drain in which perforated pipe is the main drainage channel.

pier
Support structure between bridge or bogwalk spans.

piled coping
See **scree**.

piled wall
Piled stones performing a retaining function.

pin
A straight piece of iron anchored vertically into stone for the purpose of securing other structures.

pipe culvert
Closed culvert, the channel of which is a pipe or pipes.

planking
Decking surface of milled boards.

pole bridges
Temporary bridge consisting of logs laid side by side into a wet area.

pressure-treated wood
Wood treated with chemicals to make it rot-resistant; most types of pressure-treated wood are not allowed for use at Acadia due to chemicals used in them.

raised treadway
Earthen treadway raised above surrounding ground; see causeway.

reconstruct
The act of rebuilding a missing historic feature.

rectilinear
A three-dimensional object with rectangular surfaces.

rehabilitate
To preserve the historic character of a property, while making allowances for new uses; measures are taken to preserve those historic features and characteristics that remain; compatible additions may be made for modern needs.

reroute
A section of trail that has been realigned.

retaining wall
Wall that holds one portion of ground higher than another; may be laid, rubble or piled.

revegetation
Reintroducing vegetation to an area that has been damaged.

Ridge Runners
In Acadia, a group that marks trails and assists visitors on the trails.

ridge-line route
A direct route that follows the top of a ridge.

ripped
Cut in half lengthwise with a saw, pertains to logs used in bogwalks and bridges.

riprap
Technique of trail construction in which a continuous stone treadway is constructed of many abutting, locked-in stones, many of which are individually narrower than the treadway width; riprap may be level, graded or terraced. Riprap is primarily a Western technique, and is not an historically appropriate method of construction on the Acadia trail system. "Riprapped" refers to any random-laid, continuous rock surface.

riprap steps
A series of tiers built in the style of riprap: randomly laid abutting stones; each tier consists of many stones laid so their tops form a single smooth surface.

rise
Amount of vertical distance, usually understood per horizontal distance, or run; see also **slope.**

route
The alignment of a trail; its design, and placement on the landscape.

rubble
Non-building stone used for fill, subgrade, or a drainage floor.

rubble wall
Retaining wall laid less carefully than a laid wall; the face is irregular and the batter more shallow.

run
Amount of horizontal distance, usually understood per vertical distance, or rise; see also **slope**.

rung
A horizontal piece of iron work for climbing; may be anchored into rock itself, or a crosspiece of a ladder.

running joint
Unbroken vertical seam in a masonry structure; a place of weakness; see also **stack bond** and **breaking joints**.

rustic
A term used by Albert Good in *Park Structures and Facilities* (1938) to refer a design style "through the use of native materials in proper scale, and through the avoidance of rigid, straight lines, and over sophistication, gives the feeling of having been executed by pioneer craftsman with limited hand tools. It thus achieves sympathy with natural surroundings and with the past."

saddle notch
Method of joining logs in which a rounded cut is made in one log for the other log to fit into.

scouring
The loss of material due to moving water, especially of a drainage floor.

scree
Stones, logs or other material piled along the sides of a trail to define the treadway; see also **historic scree**.

seepage
Slow-moving underground water.

set-behind
Method of laying steps in which each step is set behind and with the bottom below the top of the step immediately below it; oppose to **slab-laid**.

shim
In masonry, a small rock used to support larger, building rocks in a masonry structure; usually a weak element.

side drain
A drain that runs parallel to the treadway; usually collects water from the uphill side of the trail and connects to culverts that direct water to the downhill side.

sidehill route
A route that travels perpendicular to the fall-line along the side of a slope; a cross-slope route.

sidewall
Single-tier retaining wall that retains tread material, especially in a walled causeway or walled side drain.

sill
A supporting timber set in the ground; a bridge sill sits at either end of the bridge, perpendicular to it.

silt
Fines left by moving water.

siltation
The build-up of fines deposited by moving water; can clog subsurface drainage.

slab-laid
Method of laying steps in which each step is set partially on top of, or overlapping, the step directly below it; as opposed to **set-behind**.

slickrock
Ledge.

slope
Grade; the degree to which a surface is out of horizontal; calculated as rise divided by run, or expressed as the angle out of horizontal.

small gesture
Movement of a trail dictated by, or responsive to, small-scale features in the landscape, such as boulders or trees.

social paths
Paths developed by hikers to shortcut trail routes or access points of interest.

spill point
In a water bar or water dip, the point at which water leaves the trail.

stabilize
To prevent further deterioration of a landscape or structure using the least amount of intervention necessary.

stack bond
Rocks laid with a series of **running** joints.

stacked cairn
Cairn that consists of a single stack of stones.

stanchions
Iron uprights used to support a rail.

step
A constructed feature that is a vertical rise onto a horizontal surface suitable for stepping.

stepped-down railing
Extension of a railing that angles down from the main railing.

stepping stones
Stones set in a single row, a stepping distance apart, used to traverse streams or wet areas; may be bog-style or stream-style.

stepstone culvert
Open culvert with one or more stepstones in the drainage channel.

stone causeway
A causeway constructed primarily of stones and having a surface of stone pavement.

stone pavement
Constructed continuous stone treadway.

stream-style stepping stones
Stepping stones used to cross streams; see also **bog-style stepping stones**.

string line
See **line**.

stringer
A long horizontal timber to connect uprights in a frame or to support a floor.

subgrade drainage
Non-channeled subsurface drainage that consists of clean stone rubble that allows percolation of seepage; an essential element of tread construction.

subsurface drain
Drain hidden beneath the treadway, mainly used to handle seepage; also called “hidden” or “blind” drain.

support wall
Retaining wall that supports the treadway.

swale
Water dip; an angled depression, or reversal in grade, designed to direct water to the side of the trail; as part of a water bar, called the **apron**.

switchback
A designed element of a trail's alignment in which a side-hill trail reverses direction in order to gain grade.

switchback route
A route that primarily consists of switchbacks.

talus
Rock piles and debris reposed at an angle, usually at the base of a cliff; also called a "talus slope" or "talus field."

talus pavement
Stone pavement constructed through a talus field.

terrace
Flat, raised area; checks and terrace steps create a series of stable terraces as the treadway.

terrace steps
Non-abutting steps spaced to create terraces of tread material between them.

tie rock
In a retaining wall, a long face stone that penetrates the core; usually set header-style.

tier
Row of face stones in a retaining wall.

tiered wall
Retaining wall in which rocks are laid on top of other rocks in the face; oppose to **single-tier wall** and **sidewall**.

tiling
Flat stones laid into a drainage floor, then called "tiled."

toast
(AMC term): way of setting rock so that it is straight up and down in the ground so that it resembles a stood-up piece of toast; weakest style of setting stone; opposite of cake.

trail braiding
When multiple paths become used in addition to or instead of the treadway.

trail corridor
The space occupied by the trail and its features, including the brushed area above the treadway.

trailhead signs
At Acadia, synonymous for log signs; signs crafted from a single log which has a flat face cut on one or both sides on which information is routed; or any sign at the beginning of a trail.

tread
The walking surface of the trail.

tread pavement
Stone pavement constructed in a soil treadway.

treadlog
Milled, ripped or topped log used as the treadway of a bogwalk.

treadway
The walking surface of the trail.

treadway crib
Log crib constructed in the treadway, acting as checks and sidewall.

tributaries
Smaller water courses that feed into larger ones.

truss
An assemblage of members (such as beams) forming a rigid framework.

turnpike
A raised treadway supported on each side with logs.

unconstructed tread
Natural treadway with no constructed features.

uncut stone
Stone that has not been shaped; natural stone.

U-shaped side drain
Stone side drain in which rounded or square stones reinforce the sides of a ditch in a U-shape.

varied woodland route
A type of direct route that traverses different kinds of terrain.

veneer wall
Retaining wall in which there is no core and face stones do not penetrate the interior of the wall; a weak structure.

VIA
Village Improvement Association; either Bar Harbor or Seal Harbor.

view
Broad range of vision, expansive or panoramic, usually of scenic elements.

VIS
Village Improvement Society; either Seal Harbor or Northeast Harbor.

vista
The controlled prospect of a discrete range of vision, which is deliberately contrived, typically associated with constructed landscapes, usually of scenic elements.

V-shaped side drain
Stone side drain in which flat stones are set perpendicular to each other in the shape of a V.

wall crib
Log crib, consisting of rail pieces and ties, that acts as a retaining wall.

walled causeway
A raised gravel or soil treadway supported on both sides with retaining walls.

wall-less causeway
Raised gravel or soil treadway constructed without retaining walls; gravel is contained on each side with berm or **living wall**.

water dip
An angled depression in the treadway that diverts water from the trail surface; a reversal in grade.

water bar
A drainage structure consisting of a depression crossing a treadway which is reinforced by a log or row of abutting rocks; the main function of a waterbar is to divert water flowing down a graded treadway.

wedging
Process by which ironwork is anchored into rock; the end of the iron is slit and a wedge inserted that spreads the iron once it is driven into a hole.

wheelchair accessible
Trail constructed according to ADA standards, especially concerning grade, to allow access by wheelchairs; ADA trail.

APPENDIX B: TRAIL LIST

Trail Name	Trail Number	District	Year Built
Andrew Murray Young Path	25	BHVIA	1924
Acadia Mountain Trail	101	SWHVIA	1915
Amphitheatre Trail	56	NEHVIS	1911, 1917
Amphitheatre Trail, north	523	NEHVIS	1911
Amphitheatre Trail, south	528	NEHVIS	1911
Anemone Cave Trail	369	BHVIA	1934 (reopened by NPS 1960)
Asticou and Jordan Pond Path, see Asticou Trail			
Asticou Brook Trail	514	NEHVIS	1979
Asticou Hill (Eliot Mtn) to Little Harbor Brook	517	NEHVIS	circa 1921
Asticou Inn Trail	513	NEHVIS	circa 1926
Asticou Path, see Asticou Trail			
Asticou Ridge Trail	520	NEHVIS	1885, 1914
Asticou Trail	49	NE/SH	circa 1881
Asticou Trail, see Pond Hill Trail			
Aunt Bettys Pond Path	526	NEHVIS	1867, 1900
Bald Peak Trail	62	NEHVIS	1932 (reopened by NPS 1980)
Bar Island Trail	1	BHVIA	1867 (reopened by NPS 1990)
Barr Hill Path	404	SHVIS	1896, 1900
Barr Hill/Redfield Hill to Jordan Pond	403	SHVIS	circa 1896
Bass Harbor Head Light Trail	129	SWHVIA	circa 1900
Beachcroft Path	13	BHVIA	1871, 1890, 1915, 1926
Bear Brook Trail	10	BHVIA	1867, 1890, 1934
Beech Cliff Ladder Trail	106	SWHVIA	1936, 1937, circa 1941
Beech Cliff Loop Trail	114	SWHVIA	1871, 1906
Beech Cliff Trail to Lurvey Spring, see Echo Lake to Lurvey Spring			
Beech Cliff Trail, see Canada Cliffs Trail			
Beech Cliff, path along	604	SWHVIA	circa 1871
Beech Hill Road, see Valley Trail			
Beech Mountain Loop Trail	113	SWHVIA	circa 1906
Beech Mountain Road Path, see also Valley Trail	624	SWHVIA	circa 1762
Beech Mountain South Ridge Trail	109	SWHVIA	circa 1915
Beech Mountain Trail, see Beech Mountain Road Path or Beech Mountain West Ridge Trail			
Beech Mountain West Ridge Trail	108	SWHVIA	circa 1915
Beechcroft Trail (see Beachcroft Path)			
Beehive Trail	7	BHVIA	1916
Beehive, West	8	BHVIA	1874, 1894, 1916
Bernard Mountain Ski Trail, see Bernard Mountain South Face Trail			
Bernard Mountain South Face Trail	111	SWHVIA	circa 1915
Bicycle Path	331	BHVIA	1890, 1895
Bicycle Path Connector	372	BHVIA	1895
Birch Brook Trail	429	SHVIS	circa 1909

Trail Name	Trail Number	District	Year Built
Black and Blue Path	353	BHVIA	circa 1896
Black and White Path	326	BHVIA	1890
Black Path, see Bear Brook Trail, Bowl Trail, and Cadillac Cliffs to Otter Creek			
Black Woods Trail	440	SHVIS	1915
Blue and White Path	337	BHVIA	circa 1893
Blue Path	330	BHVIA	circa 1893
Bluff Trail, see Jordan Cliffs Trail			
Bowl Trail	6	BHVIA	1874, 1892
Boyd Road/Path	449	SHVIS	circa 1893
Bracken Path	307	BHVIA	1890
Bracken Path extension	371	BHVIA	1895
Bracy Cove Road/Path	402	SHVIS	circa 1893
Breakneck Road/Path	314	BHVIA	1777, 1923
Brigham Path/Red & Black Path	378	BHVIA	1925
Brigham to Beehive Connector	366	BHVIA	1925
Brown Mountain, North	521	NEHVIS	1921
Brown Path, upper half, see Bowl Trail			
Brown Path, lower half, see Beehive West			
Brown Path to Beehive Connector	351	BHVIA	1894
Browns Mountain Path, see Norumbega Mountain Trail			
Bubble Mountain Path, see North Bubble Trail			
Bubble Mountain South Cliff Trail, see South Bubble Cliff Trail			
Bubble and Jordan Ponds Path (#20), see Pond Trail			
Bubble Pond Carry	412	SHVIS	1874, 1931
Bubble Pond Path, see Pond Trail			
Bubbles–Pemetic Trail/Northwest Trail	36	SHVIS	circa 1926
Burnt Bubble Path, see Burnt Bubble South End Path			
Burnt Bubble South End Path	413	SHVIS	circa 1896
Cadillac Cliffs Path to Thunder Hole, part of	345	BHVIA	1906
Cadillac Cliffs Trail, see Gorham/Cadillac Cliffs Trail			
Cadillac Cliffs to Otter Creek/Black Trail	346	BHVIA	1906
Cadillac Mountain East Ridge Trail	350	BHVIA	1874, 1919
Cadillac Mountain North Ridge Trail	34	BHVIA	1850, 1931, 1935
Cadillac Mountain South Ridge Trail	26	BH/SH	1874, 1896
Cadillac Mtn. South Ridge Trail, Eagles Crag	27	BH/SH	1905
Cadillac Path	367	BHVIA	1916
Cadillac Summit Loop Trail	33	BHVIA	1933
Cadillac West Face Trail/Steep Trail	32	SHVIS	1919
Cadillac–Dorr Trail	22	BHVIA	1871, 1890
Canada Cliffs Cutoff	632	SWHVIA	circa 1926
Canada Cliffs to Dog Connector	637	SWHVIA	1915
Canada Cliffs Trail	107	SWHVIA	circa 1911

Trail Name	Trail Number	District	Year Built
Canada Ridge Trail, see Canada Cliffs Trail			
Canon Brook Trail	19	BHVIA	1900, 1930
Canon Brook Trail, eastern end	333	BHVIA	1900, 1924
Canyon Brook Trail, see Canon Brook Trail			
Canyon Path, see Canon Brook Trail			
CCC Trail, see Spring Trail			
Cedar Mountain Cutoff	527	NEHVIS	1915
Cedar Swamp Mountain Trail, see Sargent Mountain South Ridge Trail			
Cedar Swamp Mountain, path up	515	NEHVIS	circa 1901
Center Trail	623	SWHVIA	circa 1911
Champlain Mountain East Face Trail/Orange & Black Path 12	BHVIA	1913, 1942	
Champlain Monument Cutoff	426	SHVIS	circa 1916
Champlain Monument Path	453	SHVIS	1906
Champlain Trail, to Seal Harbor tennis	428	SHVIS	1915
Chasm Brook Trail, see Chasm Path			
Chasm Path/Waldron Bates Memorial Path	525	NEHVIS	1903, 1910
Church Lane Path	610	SWHVIA	circa 1915
Circular Trail	630	SWHVIA	1919
Cliff Path, see Gorham/Cadillac Cliffs Trail			
Cliff Path to Great Cave	347	BHVIA	1916
Cliff Trail	512	NEHVIS	circa 1930
Cliff Trail, see Precipice Path			
Cold Brook Trail	117	SWHVIA	circa 1893
Conners Nubble Path, see Burnt Bubble South End Path			
County Road Cutoff	425	SHVIS	circa 1893
Cross Roads Path	612	SWHVIA	circa 1915
Cross Trail, Birch Brook to Upland Road	430	SHVIS	circa 1909
Cross Trail, south of Mitchell Hill	443	SHVIS	circa 1915
Curran Path	315	BHVIA	1885, 1930
Cutoff Path	614	SWHVIA	circa 1896
Cutoff Trail between Pond Trail and Seaside Trail 415	SHVIS	1901	
Dane Path	445	SHVIS	1901
Day Mountain Caves Trail/Valley Trail	424	SHVIS	1911, 1916
Day Mountain Trail	37	SHVIS	1896, 1911
Day Mountain Trail, Lower, see Champlain Monument Path			
Deep Brook Trail	601	SWHVIA	circa 1765
Deer Brook Trail	51	SHVIS	circa 1896
Dog Mountain Trail, see Saint Sauveur Trail			
Dole Trail	619	SWHVIA	circa 1915
Dorr Mountain Branch	323	BHVIA	1898
Dorr Mountain East Face Trail, see Emery Path and Schiff Path			
Dorr Mountain North and South Ridge Trails	21	BHVIA	1871, 1890, 1896, 1901

Trail Name	Trail Number	District	Year Built
Dorr property paths	376	BHVIA	circa 1960
Dry Mountain Branch, see Dorr Mountain Branch			
Dry Mountain Path extension	332	BHVIA	circa 1896
Duck Brook Path	311	BHVIA	1760, 1874, 1890
Eagle Cliff Trail, see Valley Peak Trail			
Eagle Crag Loop	27	BHVIA	1905
Eagle Lake Connector	308	BHVIA	circa 1903
Eagle Lake Trail	42	BHVIA	1896
Eagle Lake, East Shore, north section	317	BHVIA	circa 1903
Eagle Lake, West Shore, see Eagle Lake Trail			
Eagles Crag Foot	343	BHVIA	1905
Eagles Crag Path, see Eagle Crag Loop			
East Peak Trail	631	SWHVIA	circa 1917
East Ridge Trail	350	BHVIA	1919
Echo Lake Ledges	126	SWHVIA	circa 1970
Echo Lake Trail	622	SWHVIA	circa 1915
Eliot Mountain Trail to Map House	516	NEHVIS	circa 1885
East Face Trail, see Champlain East Face Trail, Emery Path, Schiff Path, or Mansell Mountain Trail			
East Jordan Path, see Jordan Pond Path			
East Peak from Great Pond	631	SWHVIA	1917
East Peak Trail, see Mansell Mountain Trail			
East Ridge Trail, see Cadillac Mountain East Ridge Trail			
Echo Lake Ledges	126	SWHVIA	1941
Echo Lake to Lurvey Spring	625	SWHVIA	1911
Echo Lake Trail	622	SWHVIA	1911
Echo Point Trail	356	BHVIA	1914
Eliot Mountain (Asticou Hill)			
Eliot Mountain Trail, see Asticou Ridge Trail			
Eliot Mountain Trail to Map House	516	NEHVIS	1885, 1896
Eliot Mountain to Thuja Lodge	519	NEHVIS	circa 1901
Emery Path/Dorr Mtn. E Face Trail	15	BHVIA	1916, 1934
Fawn Pond Path	309	BHVIA	1902, 1907, 1923, 1935
Flying Mountain Trail	105	SWHVIA	1871, 1938
Giant Slide Trail/ Pulpit Rock Trail	63	NEHVIS	1903–1904
Gilley Trail	125	SWHVIA	circa 1911
Goat Trail, Pemetic Mountain	444	BHVIA	circa 1896
Goat Trail, see Norumbega Mountain Trail			
Golf Club Trail	507	NEHVIS	circa 1901
Golf Links to Norumbega Mountain	530	NEHVIS	1914
Gorge Path	28	BHVIA	1871, 1890, 1929
Gorge Path to Kebo, east side	321	BHVIA	1890
Gorge Path to Kebo, west side	320	BHVIA	circa 1903

Trail Name	Trail Number	District	Year Built
Gorge Road Path	365	BHVIA	1760, circa 1913
Gorham Mtn. Trail (formerly Black Path)	4	BHVIA	1906, 1913
Gorham/Cadillac Cliffs Trail	5	BHVIA	1906
Grandgent Trail	66	NEHVIS	1932 (reopened by NPS 1980)
Great Cave Path, see Cliff Path			
Great Head Trail	2	BHVIA	1844, 1867
Great Hill from Cleftstone Road	304	BHVIA	1892
Great Hill from Woodbury Park	303	BHVIA	1892
Great Hill Path	306	BHVIA	circa 1901
Great Hill to Duck Brook	310	BHVIA	circa 1901
Great Meadow Loop	70	BHVIA	1999
Great Notch Trail	122	SWHVIA	circa 1915
Great Notch Trail, see also Sluiceway Trail			
Great Pond Road/Path	615	SWHVIA	circa 1765
Great Pond to Beech Hill	602	SWHVIA	circa 1896
Great/Long Pond Trail	118	SWHVIA	1936
Great Pond Trail	620	SWHVIA	circa 1896
Green and Black Path	358	BHVIA	1901, 1924
Green and White Path	327	BHVIA	1875, 1892
Green Mountain Trail	452	SHVIS	circa 1896
Gurnee Path	352	BHVIA	1926
Hadlock Brook/ Waterfall Trail	57	NEHVIS	1871, 1915
Hadlock Ponds Path, see Hadlock Trail			
Hadlock Trail, lower	502	NEHVIS	1901
Hadlock Trail, upper	501	NEHVIS	circa 1881
Hadlock Valley Path, see Jordan Pond Carry Path			
Half Moon Pond Path	312	BHVIA	1885, 1896
Harbor Brook Trail, see Little Harbor Brook Trail			
Harborside Inn Trail	506	NEHVIS	circa 1901
Harden Farm Path, see Stratheden Path			
Hemlock Road/Spring Road	377	BHVIA	circa 1916
Hemlock Trail	23	BHVIA	1895
Homans Path	349	BHVIA	1916
Huguenot Head to Otter Creek Road	341	BHVIA	circa 1896
Hunters Beach Trail	67	SHVIS	circa 1893
Hunters Brook Trail	35	SHVIS	1919, 1937
Hunters Brook Trail, lower	455	SHVIS	1919
Hunters Brook Trail, upper	454	SHVIS	1937
Hunters Cove, South Ridge Trail connector	439	SHVIS	circa 1896
Indian Path, see Dry Mountain Path extension			
Ingraham Rocks Path	445	SHVIS	circa 1896
Jesup Path	14	BHVIA	1760, 1895, 1916

Trail Name	Trail Number	District	Year Built
Jesup Path to Cromwell Harbor Road	375	BHVIA	1916
Jordan and Bubble Ponds Path, see Pond Trail			
Jordan Bluffs Trail	457	SHVIS	circa 1930
Jordan Brook Path, see Jordan Stream Trail			
Jordan Cliffs Trail/ Sargent East Cliff Trail	48	SHVIS	1896, circa 1926
Jordan Cliffs Trail, see Penobscot East Trail			
Jordan Mountain Trail	411	SHVIS	circa 1871
Jordan Pond Carry Path	38	BHVIA	pre-1760, 1885, 1931
Jordan Pond Carry Spur	40	SHVIS	circa 1980
Jordan Pond House Trail	46	BHVIS	1980
Jordan Pond Loop Trail, see Jordan Pond Path			
Jordan Pond Path	39	BH/SH	1896, 1898
Jordan Pond Nature Trail (current location)	45	SHVIS	1903
Jordan Pond Nature Trail (original location)	463	SHVIS	1929
Jordan Pond Seaside Trail, see Seaside Path	401	SHVIS	1893, 1901, 1903
Jordan Pond to Cliffs	458	SHVIS	circa 1941
Jordan Pond to Pemetic Ridge Trail, see Steepway Trail			
Jordan South End Path	409	SHVIS	1896, 1914
Jordan Stream Trail	65	SHVIS	1760, 1901, 1908, 1931
Kaighn Trail	606	SWHVIA	1906
Kane Path/ Tarn Trail	17	BHVIA	1915
Kebo Brook Path	364	BHVIA	1907
Kebo Mountain Path/Dorr Mountain N & S Ridge	21	BHVIA	1871, 1890, 1896, 1898
Kebo Mountain Trail, from Kebo Valley Club	322	BHVIA	1907
Kebo Mountain, east side	374	BHVIA	circa 1871
Kebo Valley Club to Toll House	319	BHVIA	1902
Kurt Diederich's Climb	16	BHVIA	1915
Ladder Trail	64	BHVIA	1871, 1896, 1935
Ledge Trail	103	SWHVIA	circa 1915
Ledge Trail, South	121	SWHVIA	circa 1915
Little Brown Mountain Path	522	NEHVIS	1921
Little Brown Mountain Trail, see Parkman Mountain Trail			
Little Harbor Brook to Eliot House	518	NEHVIS	circa 1901
Little Harbor Brook Trail	55	NEHVIS	1901
Little Hunters Beach Path from Boyd Road	442	SHVIS	1903
Little Hunters Brook Path to Cove	438	SHVIS	circa 1896
Little Notch Trail, see Sluiceway Trail			
Little Precipice Trail, see Beehive Trail			
Long Pond Road/Trail in Seal Harbor	410	SHVIS	1915
Long Pond Trail, see Great/Long Pond Trail			
Long Pond Trail, see Great Pond Trail			
Lovers Lane	618	SWHVIA	circa 1762

Trail Name	Trail Number	District	Year Built
Lower Hadlock Pond, east side	511	NEHVIS	1914
Mansell Mountain Trail	115	SWHVIA	1765, 1893, 1911
Maple Spring Trail	58	NEHVIS	1914–1915
McFarland Path	524	NEHVIS	1885, 1893
Mitchell Hill Path	407	SHVIS	1901, 1909
Mitchell Hill Road, see West Side Long Pond, Seal Harbor			
Moss Trail, see Bernard Mountain South Face Trail			
Murphy's Lane, see Blue Path			
Newport Mountain Path, see Bear Brook Trail			
North Bubble Trail	41	SHVIS	1871, 1897, 1929
North/Middle Bubble Cliff Trail	459	SHVIS	1929
Northwest Trail, see Bubbles-Pemetic Trail			
Norumbega Mountain Trail/Goat Trail	60	NEHVIS	1881, 1885, 1903
Norumbega Lower Hadlock to Goat Trail	69	NEHVIS	circa 1941
Norwood Cove Trail	617	SWHVIA	circa 1765
Notch Trail	406	SHVIS	1901
Oak Hill to Bernard Mountain	608	SWHVIA	circa 1906
Oak Hill Trail	634	SWHVIA	circa 1937
Ocean Drive Trail, see Ocean Path			
Ocean Cliff Path	340	BHVIA	1896, 1906
Ocean Path	3	BHVIA	1874, 1937
Old Farm Road/Sols Cliff Path	363	BHVIA	circa 1913
Old Trail, see Pemetic West Cliff Trail			
Orange and Black Path	348	BHVIA	1913–1914
Otter Cliff Path, see also Ocean Path	340	BHVIA	1896, 1906
Otter Cove Road/Path	441	SHVIS	circa 1896
Otter Cove, trail to	447	SHVIS	1915
Ox Hill Path	420	SHVIS	1896, 1903
Ox Hill Summit to Day Mountain	421	SHVIS	circa 1896
Ox Hill Summit, east	422	SHVIS	circa 1903
Parkman Mountain Trail	59	NEHVIS	1921
Parkman to Gilmore	61	NEHVIS	circa 1932
Peak of Otter, see Ocean Cliff Path			
Pemetic Mountain Trail/Southeast	31	SHVIS	1871, 1893, 1896
Pemetic Mountain, southeast side, see Valley Trail Connector	461	SHVIS	circa 1917
Pemetic Mountain Valley Trail	462	SHVIS	circa 1917
Pemetic West Cliff Trail/Old Trail	30	SHVIS	circa 1874
Penobscot East Trail	50	SHVIS	circa 1901
Penobscot Mountain Trail/Spring Trail	47	SHVIS	1871, 1896, 1917
Perpendicular Trail	119	SWHVIA	circa 1937
Pine Hill to Bernard Mountain	606	SWHVIA	circa 1906
Pine Hill to Deep Brook	605	SWHVIA	circa 1906

Trail Name	Trail Number	District	Year Built
Pine Hill Trail	633	SWHVIA	circa 1937
Pine Hill Trail, see also Western Mountain Trail			
Pine Tree Trail	405	SHVIS	circa 1896
Pines Path, see The Pines Path			
Pipe Line Path	448	SHVIS	1901
Pond Hill Trail/Asticou Trail	529	NEHVIS	circa 1903
Pond Trail	20	BH/SH	1874, 1896, 1929
Pond Trail to Bubble Pond (original route)	373	SHVIS	1896
Potholes Path	342	BHVIA	1896, 1906
Potholes to Eagles Crag, see Eagles Crag Foot			
Precipice Trail	11	BHVIA	1915
Pretty Marsh Picnic Area Trail/Road	128	SWHVIA	1938–1941
Pulpit Rock Trail, see Giant Slide Trail			
Quarry Trail, Northeast Harbor	505	NEHVIS	1900
Quarry Trail, Southeast Harbor	628	SWHVIA	circa 1915
Razorback Trail	112	SWHVIA	1765, 1915, 1919
Red and Black Path, see Brigham Path			
Red and White Path	335	BHVIA	circa 1893
Red and Yellow Path	355	BHVIA	circa 1896
Red Path	328	BHVIA	1892
Reservoir Trail	504	NEHVIS	circa 1896
Ridge Trail, see Kebo Valley Club to Toll House			
Robinson Road	627	SWHVIA	1874, 1938
Royal Fern Path	305	BHVIA	1890
Saint Sauveur Trail	102	SWHVIA	1874, 1915
Sand Beach – Great Head Access	9	BHVIA	circa 1990
Sargent Brook Trail, see Giant Slide Trail			
Sargent Mountain North Ridge Trail	53	NEHVIS	1903
Sargent Mountain South Ridge Trail	52	NEHVIS	circa 1871
Sargent Pond Trail	456	SHVIS	1896, 1921
Schiff Path	15	BHVIA	1926
Schoolhouse Ledge Trail	503	NEHVIS	circa 1896
Schooner Head Road Path	362	BHVIA	circa 1901
Schooner Head Road to Otter Creek Road, see Bicycle Path Connector			
Seal Cove Pond to Bernard Mountain	607	SWHVIA	circa 1906
Seal Cove Pond to Seal Cove Road	609	SWHVIA	1896, 1906
Seal Harbor Village path	431	SHVIS	circa 1906
Seal Harbor Village path	432	SHVIS	circa 1906
Seaside Path	401	SHVIS	1893, 1901, 1903
Ship Harbor Nature Trail	127	SWHVIA	1957
Shore Path, Bar Harbor	301	BHVIA	circa 1874
Shore Path, Hunters Beach	436	SHVIS	1901

Trail Name	Trail Number	District	Year Built
Shore Path, Northeast Harbor	531	NEHVIS	circa 1928
Shore Path, Seal Harbor	427	SHVIS	circa 1896
Shore Path, see Ocean Path			
Shore Trail, Hunters Beach to Otter Cove	437	SHVIS	1912
Short Trail to Hunters Beach, see Hunters Beach Trail			
Sieur de Monts–Tarn Trail/Wild Gardens Path	18	BHVIA	1913 (reopened by NPS 1990)
Skidoo Trail	509	NEHVIS	1914
Slide Trail	603	SWHVIA	circa 1874
Sluiceway Trail	110	SWHVIA	circa 1911
Sols Cliff Path, see Old Farm Road			
Somes Sound Road, see Southwest Valley Road Path			
Somesville Carry Trail	635	SWHVIA	pre 1760
Somesville Road Trail	629	SWHVIA	circa 1915
South Bubble Cliff Trail	451	SHVIS	1928, 1931
South Bubble Trail	43	SHVIS	circa 1896
South End Path, see Jordan South End Path			
South Face Trail, see Bernard Mountain South Face Trail			
Southeast Trail, see Pemetic Mountain Trail			
Southwest Pass	414	BHVIA	circa 1885
Southwest Shore Trail, see Eagle Lake Trail			
Southwest Valley Road/Path	316	BHVIA	1867, 1893
Spring Road, See Hemlock Road			
Spring Trail, see Penobscot Mountain Trail			
Spring Trail/ CCC Trail	621	SWHVIA	circa 1911
Squirrel Brook Trail	408	SHVIS	1901
Stanley Brook Path	433	SHVIS	1903
Stanley Brook, Seaside Lower Connector	434	SHVIS	1911
Stanley Brook, Seaside Upper Connector	435	SHVIS	1903
Steep Trail	508	NEHVIS	circa 1941
Steep Trail, see Cadillac West Face Trail			
Steepway Trail	460	SHVIS	1917
Stratheden Path	24	BHVIA	1895, 1913 (reopened by NPS 1990)
Strawberry Hill to Otter Creek Road	325	BHVIA	1890
Sweet Fern Path	360	BHVIA	1890
Tarn Trail	370	BHVIA	1934
Tarn Trail, see Kane Path			
Tea House Path	368	BHVIA	1897, 1903
The Pines Path	611	SWHVIA	1896, 1915
Thuja Lodge Trail, see Eliot Mountain Trail			
Tilting Rock, trail to	423	SHVIS	1901
Toll House Path	318	BHVIA	1896
Triad Pass Path, see Triad Pass			

Trail Name	Trail Number	District	Year Built
Triad Pass Trail, see also Van Santvoord Loop Trail	29	SHVIS	1893
Triad Pass, south	418	SHVIS	1893, 1912
Triad Path, east	419	SHVIS	1896, 1912
Triad-Hunters Brook Trail, see Hunters Brook Trail			
Turtle Lake and Jordan Pond Path, see Pond Trail			
Upper Ladder Trail	334	BHVIA	1871, 1896
Valley Cove Trail/Road	626, 105	SWHVIA	1871, 1938
Valley Peak Trail	104	SWHVIA	1871, 1915
Valley Trail	116	SWHVIA	1762, 1930
Valley Trail Pemetic Connector	461	SHVIS	1917
Van Santvoord Trail, see also Triad Pass Trail	450	SHVIS	1915, 1917
Village Path to Ox Hill Ledge, see Ox Hill Path			
Waldron Bates Memorial Path, see Chasm Path			
Waterfall Trail, see Hadlock Brook Trail			
Water Pipe Path	361	BHVIA	pre 1760, circa 1896
Water Pipe Trail/Golf Links to Lower	510	NEHVIS	circa 1901
Water Tower Trail/Harborside Trail, see Reservoir Trail			
West Beehive, see Beehive West			
West Jordan Path, see Jordan Pond Path			
West Side Long Pond, Seal Harbor	410	SHVIS	1914
West Slope Trail, see Cadillac West Face Trail			
Western Mountain Road/Path	616	SWHVIA	circa 1765
Western Mountain Trail	120	SWHVIA	circa 1911
Western Mtn. West Ledge Trail	123	SWHVIA	1937, (reopened by NPS 1993)
Western Mountain West Ridge Trail, see Western Mountain West Ledge Trail			
Western Point, trail to	446	SHVIS	1915
White Path	329	BHVIA	circa 1893
Wild Gardens Path	354	BHVIA	1914
Wild Gardens Path, west	324	BHVIA	1913
Wild Gardens Path, see also Sieur de Monts-Tarn Trail			
Wildwood Farm Trail	417	SHVIS	circa 1896
Wildwood, connector	416	SHVIS	circa 1896
Wire Gate Path	339	BHVIA	circa 1894
Witch Hole Path	313	BHVIA	1906
Witch Hole Pond Loop	344	BHVIA	1910, 1924
Wood Lane over Asticou Hill, see Asticou Ridge Trail			
Woodbury Park Path	302	BHVIA	circa 1896
Woods Road Path	613	SWHVIA	circa 1915
Yellow and Black Path, see Orange and Black Path			
Yellow and White Path	336	BHVIA	1875, 1893
Yellow and White Path, lower half, see Bowl Trail			
Yellow Path	338	BHVIA	circa 1893
Youngs Mountain Trail	359	BHVIA	circa 1941

APPENDIX C: TRAIL NAMING JUSTIFICATION

As discussed in Chapter 9, Section G, many trail names have changed over the past century. However, trail names are used on signs, maps, in guidebooks and other documents. Having one designated name reduces hiker confusion and can reflect the history and geography of the island. As part of this treatment plan, the current names were carefully examined and evaluated, particularly with regard to their historic origin. The following recommendations for trail naming were developed by Acadia's Trail Names Committee (Chris Barter, Judy Hazen Connery, Charlie Jacobi, Gary Stellpflug, Lee Terzis) in February 2002. Sources used during the decision-making process include:

- *A Path Guide of MDI, Maine* (1915, Village Improvement Societies of Bar Harbor, et al.)
- *Walks on Mount Desert Island* (1928, Harold Peabody and Charles Grandgent)
- *Paths and Trails of Northeast Harbor and Vicinity* (1914, Northeast Harbor VIS)
- *Pathmakers: Cultural Landscape Report, Volume 1* (2006, Margaret Coffin Brown)
- Path maps for Mount Desert Island (1896 to present)
- Extant historic signs and photographs that depict historic signs
- Recommendations of David Goodrich (open letter to Friends of Acadia, June 1995, and open letter to Gary Stellpflug, February 24, 2003).

GENERAL CONSIDERATIONS

The Acadia Trail Names Committee established a series of considerations that would inform their decisions as listed below.

Reasons to restore a historic name:

1. To restore another aspect of a trail to its historic character
2. When the old name tells a story, indicating something meaningful about the past
3. When the old name honors someone, especially if funded as a memorial
4. If the currently used name is confusing
5. When the current name is the result of recent caprice
6. If the historic name is associated with physical features, such as carved stone markers or plaques

Reasons not to change a trail name:

1. When the return to an old name would be confusing
2. When the old name was taken from a place name that has since changed or a feature no longer present
3. When a substantial portion of the route has been changed
4. When only a portion of the original trail is being used as part of another route
5. When name restorations would produce many small trail pieces with different names

USE OF "PATH" OR "TRAIL"

The use of the term "path" to refer to walking routes as highly constructed and extensive as those in Acadia may be unique to this trail system. "Path" was used by the VIA/VIS groups, and was a common term in literature and on maps until the 1930s, when the CCC and NPS began calling all walking routes "trails." The VIA/VIS path maps produced in the early 1900s labeled all trails as paths. However, even in early references such as the 1915 and 1928 path guides, not all trails were called paths, and there was inconsistency even within the same guidebook.

During the VIA/VIS period, the prevailing term for a certain kind of route was "path," as evidenced by carved stone markers at trailheads and the very term "Path Committee" used by the groups. A path was typically highly constructed and not too rugged, though not necessarily flat. For instance, the Seaside and Emery routes are "paths," while the Goat and Precipice routes are "trails." An insight into the use of the term can be found on page 35 of Peabody and Grandgent's 1928 *Walks on Mount Desert Island*, describing the route of the A. Murray Young Trail as it becomes flatter and more easily walkable: "After passing small waterfall, trail becomes a path."

In those cases where both terms are used, it seems that "path" was often the proper name of a route, and that "trail" was a general term. Hence, the Bubble and Jordan Ponds Path was usually referred to as such, but the guidebook indicates, "Take the trail to Jordan Pond." To further complicate the issue, some routes in the VIA/VIS period use neither term, but instead, "carry," "climb," or "pass." This wasn't always consistent, either; the Jordan Pond Carry is sometimes referred to as "The Carry Path" in historic references.

We recommend returning to the term "path," and "climb," "carry," and "pass" in those specific cases in which they are appropriate. The term "path" will be used for those trails established by the VIA/VIS builders before 1934, where more or less continuous craftsmanship is evident, which are not rugged climbs, and which were traditionally called paths.

We understand this may cause confusion, especially as all the other routes will be called trails. However, we cite some compelling reasons for the change. First and foremost, the term "path" is unique to Acadia, and refers to trails whose craftsmanship is also unique to Acadia. This term, simply by being unique, will immediately suggest that there is something different about these trails and may lead hikers to a better understanding of the importance of Acadia's trail system. Further, "path" is the term used by the VIA/VIS groups who created most of the system as we know it, and use of that term preserves a part of the history of these groups. Finally, the term is used on a number of historic stone and brass monuments that are still extant on the trails themselves.

NAME TYPES

Below are seven types of trail names currently found in Acadia. The section that follows provides recommendations for preserving this historic typology.

1. Location Names
These trails were named for their location, such as the Jordan Pond Path or the Cadillac North Ridge Trail.

2. Colored Names
These trails were given individual color names, such as the Red and White Path. The colored system was developed at the turn of the century by Herbert Jaques and is located east of Dorr Mountain. Colored names were no longer used after 1959 (Goodrich).

3. Memorial Names
These trails were named in honor of deceased persons, and their construction and maintenance was usually funded with the understanding the trail name would remain consistent. These paths were built in the first two decades of the twentieth century and represent some of the most highly crafted trail work in the system.

4. Person Names
These trails were named after individuals or families that were landowners and were not generally endowed. Examples include the McFarland Path up Sargent, Curran Path along Eagle Lake, and Kaighn Path on Western Mountain.

5. Route Names
These trails were named for the nature of their route. A strenuous route was often so indicated, as with the Precipice Trail and Goat Trail.

6. Feature Names
These trails were named for a specific feature on or along that trail, such as the Hemlock Path, Potholes Path, Giant Slide Trail, Jordan Cliffs Trail, and Spring Trail.

7. Destination Names

These trails were named for one or both destinations of the trail, such as the Seaside Path, which traveled from Jordan Pond to the long-gone Seaside Inn near the beach at Seal Harbor, or the Asticou and Jordan Pond Path, which connects the two mentioned locales.

NAMING RECOMMENDATIONS FOR TRAIL GROUPS

RIDGE TRAILS AND MOUNTAIN FEATURE–NAMED TRAILS

Historically, ridge trails running north–south were generally named for the mountains they ascended, while trails climbing east–west routes, or some other route (such as circling the summit, or taking a route below the ridge), were often not. This is probably because ridge trails were established first, being the easiest ascents.

Use Current Mountain Names: Island-wide, most of the mountain names have changed since the historic period, and mostly the trail names have changed with them. There is little argument for returning trail names to mountain names that are no longer used and do not appear on contemporary maps. Such a renaming would not only be confusing, it would actually go against the historic precedent of naming ridge trails for their mountains.

Eliminate Redundancy: Historically, use of the word "mountain" in trail names has been inconsistent. For instance, Dry Mountain Trail versus Pemetic Trail. In addition, names that refer to mountain features, such as ridge trails or "face" trails, can become a mouthful when the word mountain is used as well—for example, The Cadillac Mountain North Ridge Trail. In fact, the word "mountain" is redundant when a mountain feature (such as ridge, face, or cliff) has already been specified in the name. We also found that the preponderance of historical names of mountain-feature type did not use the word "mountain," while most names that did not specify a feature of a mountain did use the word "mountain." Hence, we decided to streamline the process and use the word "mountain" in all trails named for a mountain in which a feature of that mountain is not part of the name, and to not use the word when a feature of the mountain is already in the name.

Dorr (#21), Cadillac (#34 and #26), Bear Brook (#10), and Pemetic (#31) North and South Ridge Trails

Recommended names: Dorr, Cadillac, Champlain, and Pemetic North and South Ridge Trails

According to the earliest trail maps, only the ridge route over Cadillac Mountain was divided into two trails, a North and South Ridge Trail. However, a number of trails were referred to in the hiking guides as "north ridge"or "south ridge" trails, and so did historical signs. The problem of whether to continue the current practice of dividing many ridge trails into a "north" and "south" ridge trail was discussed at length in committee. The initial thought was to restore ridge trails to their historic integrity in this regard: for instance, restoring the Dorr Mountain North and South Ridge Trails to one trail, Dorr Mountain Trail, since the original trail was called the Dry Mountain Trail. However, the issue of hiker confusion was raised. With all the trails on a mountain such as Dorr, many hikers would confuse the Dorr Mountain Trail with the other trails converging at the summit. As with most of the ridge routes, the original name referred to the only route up the mountain when the trail was constructed. Thus such confusion is a contemporary problem requiring a contemporary solution. We decided that as a general rule, on mountains that had both a north and south ridge trail, we would name those trails for their respective ridges; this includes Dorr, Cadillac, Champlain, and Pemetic.

Bear Brook Trail (#10)

Recommended names: Champlain North Ridge Trail and Champlain South Ridge Trail

In the case of the Bear Brook Trail, we recommend renaming it according to the ridge-name principle. Currently a destination name, Bear Brook refers to an obscure feature which the trail no longer actually reaches. This is an irrelevant destination for hikers beginning at The Bowl, who are interested in ascending Champlain Mountain. Further, the name doesn't appear on maps until the 1960s, meaning it is not associated with the historic periods of significance. We recommend following the model of other ridge trails, and naming the route for the mountain name. Because of its popularity and the number of summit trails, we recommend Bear Brook Trail be renamed Champlain North Ridge Trail and Champlain South Ridge Trail.

Kebo Mountain Path/Trail (#21)
Recommended name: Kebo Mountain Trail

We have separated the historic Kebo Mountain Path from the Dorr North and South Ridge Trail. However, because of its unconstructed character, we recommend Kebo Mountain Trail instead of Kebo Mountain Path.

Penobscot Mountain Trail (#47) and Jordan South End Path (#409)
Recommended names: Penobscot Mountain Trail (#47 upper end and #409), Spring Trail (#47 lower end)

Currently the ridge trail on Penobscot Mountain is truncated, and has been melded with the Spring Trail, once a discrete, east–west route. The entire trail is called the Penobscot Mountain Trail. The ridge trail was originally called the Jordan South End Path, and with the anticipated reopening of the Jordan South End, we have the opportunity to restore the original ridge route under one name, and would thus also have the opportunity to return the Spring Trail to a discrete route with its original name. Further, the character and level of craftsmanship on the Spring Trail suggests its difference from the ridge trail, and a change of names would highlight this.

For the trail that will follow the route of the historic Jordan South End Path, we considered the historic name Jordan South End. The Jordan South End was in fact a feature of Jordan Mountain noted on old maps. However, this feature is no longer noted on maps. We feel such a name would be confusing and against the general principle of ridge names assuming their mountain's names. Hence, we suggest the name Penobscot Mountain Trail simply be applied to the entire ridge route, which will form a T intersection with the Spring Trail and continue past the summit to the Deer Brook Trail.

COLORED PATHS

A number of the colored paths, in part or in total, are still open, but all have been renamed. The new names are all location or destination names. The use of color names for trails was discontinued by 1950.

Jaques's colored path system was the most comprehensive system of naming trails ever employed in the park. In many ways, it represents the first realization of a coherent network of trails, and the first attempt at naming such a network logically. The trails were marked with metal tags painted the trail's color, and some tags, recent replacements by unknown persons, are extant on abandoned paths. In the case of the Orange and Black Path, the name is associated with the school colors of Princeton University where its builder, Rudolph Brunnow, was a professor, and thus arguably tells part of a story.

However, annual reports of the Bar Harbor VIA mention that the colored system was confusing to hikers even from its initial implementation. None of the trail names give any indication of their locations or destinations. Further, once the primary colors were used, trails that connected two trails were named for both ends (i.e., Red and White), but once the connectors began criss-crossing, the system became convoluted. Today, with only a portion of the colored path system still maintained, much of the design no longer makes sense.

An interesting consideration is that, with the one exception of the Orange and Black, the names have no relation to their trails, or the history of those trails themselves, only to each other. That is, the only reason the Black Path was named thus is because it was an available color. Recommendations for the Bear Brook Trail, formerly part of the Black Path, were discussed above under "Ridge Trails and Mountain Feature-Named Trails."

We recommend not restoring the historic color names to currently maintained trails, for the reasons cited above, mainly the confusion that would result from taking away a name like Gorham Mountain Trail and renaming it Black Path. Further, the reason for the attachment of a name like "Black" to such a trail is not at all apparent, and could cause hikers to ask, "What's so black about this trail?" A significant interpretive program would have to be launched to explain these changes.

Red Path (#328) and Green and Black Path (#358)
Recommended names: Red Path (#328) and Green and Black Path (#358)

However, the desire to keep alive some kind of reference to this important part of the trails' history led us to consider restoring historic color names to abandoned trails that may be reopened, where the colored name could work and should be used. This would consist of the Red Path and the Green and Black Path. The confusion to the general public should be less in these cases, as there are no modern names for these trails. Further, with such a small sample, trail signs could clearly indicate destinations, and interpretive signs could explain the reason for these names, thus allowing us the opportunity to interpret that part of the system's history.

Champlain East Face Trail (#12)
Recommended name: Orange and Black Path (#12 and #348)

Worthy of special consideration is the Champlain East Face Trail. Originally part of the Orange and Black Path, this trail is Brunnow's signature trail, which left from his house, "The High Seas," and was named for his school colors. The trail is one of the most remarkable in the system, for its unique craftsmanship which is characteristic of Brunnow's work, its precipitous route, and its astounding views. Much of the trail was on Brunnow's estate. The name should reflect the trail's history. Champlain East Face Trail seems too utilitarian a name for such a trail and is not historical. We discussed the possibility of renaming the trail the Brunnow Path, but decided the best homage that could be paid this trail builder—and the most accurate portrayal of the trail's history—would be to restore the name Orange and Black Path to this part of the original Orange and Black. The original route included the Precipice Trail from the East Face intersection down, as well as abandoned portions, but restoring the Precipice portion to the name Orange and Black Path would be far too confusing.

MEMORIAL PATHS

With the recent reestablishment of the Homans Path, all the memorial trails are currently being maintained except for two—the Van Santvoord Trail and the Gurnee Path. Of those in use, the Emery Path, Schiff Path, and Kane Path were renamed with location names sometime between 1941 and 1970 (probably in 1959, Goodrich), presumably to forestall hiker confusion. The Emery and Schiff Path became the Dorr Mountain East Face Trail and the Kane Path became the Tarn Trail.

The historic memorial path names honor individuals who were a part of the island's history. Taken as a group, these path names tell a story of how a portion of the trail system came about—a story which is particularly relevant to the philanthropic heritage of Acadia National Park. Funding for trail construction was given with the understanding that the trail names would continue to honor these people. Many extant features, such as plaques and stone markers, are directly connected to the historic names. Additionally, hikers are already familiar with and even use the historic names, which have recently turned up on some trail maps.

However, current location names may be more easily understood by trail users, and a change to historic memorial names could be confusing. Further, the Emery and Schiff Paths are two sections of one continuous route to the summit of Dorr, and it may be confusing to have a name change partway.

Dorr Mountain East Face Trail (#15), Kurt Diederich's Climb (#16), Tarn Trail (#17)
Recommended names: Emery Path (#15), Schiff Path (#15), Kurt Diederich's Climb (#16), Kane Path (#17)

Despite the concerns described above, given the historic importance of the memorial paths, we recommend restoring all maintained memorial paths to their historic names. Any confusion can be remedied with trail signage. Interpretive signs or literature could explain the reasons for these names, though many of the plaques are currently serving that function already. The restoration of both Emery and Schiff seems essential to the integrity of the memorial path system, as each was built in a distinct time period and is characteristically different in construction. The meeting of Emery and Schiff is at an intersection with Kurt Diederich's Climb. This intersection will mark three trails after the name change (Emery Path, Schiff Path, and Kurt Diederich's Climb) instead of the current two (Dorr Mountain East Face Trail and Kurt Diederich's Climb).

JORDAN POND TRAILS

The most important group of paths in the Seal Harbor system radiates from the south end of Jordan Pond in much the same way Dorr's signature paths radiate from Sieur de Monts. With Dorr's paths, the trail names are people names, while in the Jordan Pond area of the Seal Harbor system, destination or location names are predominant.

Asticou Trail (#49) and Pond Trail (#20)
Recommended name: Asticou and Jordan Pond Path (#49) and Bubble and Jordan Ponds Path (#20)

Two trails, currently know as the Asticou Trail and the Pond Trail, were named for the destinations at either end of the trails. These trail names have since been shortened for only one destination. The original names were Asticou and Jordan Pond Path and Bubble and Jordan Ponds Path. The double-destination path names are like no others in the system, as are the paths themselves—smooth gravel walks with signature construction features. The original names serve the purpose of informing hikers as to where they're going. Returning to the historic names would hardly be confusing, as it merely adds the second destination to the currently used destination. It should be apparent to hikers that a trail named for two destinations traverses between them rather than goes around either one. Thus the committee recommends changing the Asticou Trail to the Asticou and Jordan Pond Path and changing the Pond Trail to the Bubble and Jordan Ponds Path.

The route of the Pond Trail, to be renamed the Bubble and Jordan Ponds Path, is a misnomer at this point, as the current route of the Pond Trail goes to The Featherbed as its eastern destination. Historically the route led to Bubble Pond, before part of the route was obscured by a carriage road, and the section leading north to Bubble Pond was subsequently abandoned. Sometime between 1942 and 1970 (probably 1959), the western half of Canon Brook Trail was simply melded with the eastern part of the Pond Trail, under the name of the latter.

Despite the possible confusion, we recommend returning to historical double-destination names. The portion of the Bubble and Jordan Ponds Path route still extant beside the carriage road that leads toward Bubble Pond will be restored, and a T intersection reestablished at the intersection with historic Canon Brook Trail, which will be restored to its name. The rehabilitated section of trail will lead towards Bubble Pond, coming to the road just south of it. Hikers will follow the carriage road over the historic route, and then be able to hike the northernmost segment of the Bubble and Jordan Ponds Path where it separates again from the carriage road at the north end of Bubble Pond.

Jordan Pond Carry Trail (#38)
Recommended name: Jordan Pond Carry (#38)

Another trail in the Jordan Pond area is the Jordan Pond Carry, which has acquired the title of "trail," making the denotation of "carry trail" redundant. We recommend restoring the historic name of Jordan Pond Carry without "trail."

Jordan Pond Seaside Path (#401)
Recommended name: Seaside Path (#401)

Connecting between the village of Seal Harbor and Jordan Pond is the Seaside Path, which was originally named the Jordan Pond Path, for its northern destination. However, maps from 1917 on show "Seaside" in parenthesis, demonstrating that the term Seaside had already become an alternate name for this trail, no doubt due to confusion from the numerous trails in the area bearing the name "Jordan Pond." The Seaside Inn in Seal Harbor was the trail's southern destination.

Renaming the Seaside Path as Jordan Pond Path would restore its historic name. However, Seaside Path was also used in the historical period and may better describe the destination of that particular trail, as many trails end up at Jordan Pond. We recommend continuing the use of the name Seaside Path.

Reasons not to restore double-destination names include the name's length and repetition of names. Seeing the name Jordan Pond on so many trail signs may confuse hikers. Returning the Seaside Path to the Jordan Pond Path would be directional suicide.

Jordan Pond Loop Trail (#39)
Recommended name: Jordan Pond Path (#39)

The Jordan Pond Loop Trail appears on some old maps simply as the East and West Paths. The word "loop" was an ill-conceived addition by the NPS trails crew in the 1990s to avoid confusion, and should be dropped. The 1928 path guide refers to "the path along the east side of Jordan Pond," and "along the west side," but also to a sign which says, "Jordan Pond Trail," meaning that even by that time the route was often referred to as a single route named for the pond. Further, annual reports refer to "Jordan Pond Trail" in 1937. We considered restoring the historic east/west division of the trails, which would indeed reflect the different craftsmanship of each trail, but decided the confusion would be tremendous. Most hikers in this front-country setting want to hike the loop, and already have some trouble finding their way around. A name switch would only further confuse matters. We recommend the name Jordan Pond Path, which reflects the trail's level of craftsmanship with the use of "path."

As discussed above, the Spring Trail, a destination-named trail that radiates from the south end of Jordan Pond (there is a spring in the area marked on old maps), will be returned to its historic name.

WESTERN MOUNTAIN TRAILS

The trails on and leading to Western Mountain, now Bernard Mountain, Knights Nubble, and Mansell Mountain, are a group that warrants discussion as a cluster with its own unifying principles and problems. This group of trails is particularly confusing. It's a tight cluster, and many small sections of trail have their own separate historical names. Hence, what is now considered the Bernard South Face Trail was historically made up of the South Face Trail, Kaighn Trail, and Moss Trail. What is now called the Sluiceway Trail was made up of two sections, one by that name and the other, from the Gilley Trail intersection up, called the Little Notch Trail. The route of the Gilley Trail ends partway up Western Mountain in the middle of the woods, and other trails ascend from there; the historic route included a short loop north of where the trail now ends, and ascended a knoll called Lookout Point, which must have once been open, probably during, and just after, the logging era. On the other end, the Gilley Trail ends at the Gilley field, and the Cold Brook Trail continues the last 0.4 mile to Great/Long Pond. The name Cold Brook Trail is of dubious origin, and may in fact have once referred instead to the fishway trail constructed up Cold Brook by the CCC. Some of the historic names that are still used refer to altered routes. Hence the Razorback Trail ends at Mansell Mountain Ridge, while it used to extend along it to Great Notch.

Names like Gilley and Kaighn honor individuals or families from the area, Gilley was an early landowner while the Kaighn family built a summer cottage on the mountain; Moss may refer to a name or to the vegetation. It seems to be a characteristic of this trail group that short sections of a route are given different names.

However, the area is confusing as it is, and restoring all the historic names would simply add to hiker confusion.

We recommend that any trail name referring to a mountain name which has changed will be changed appropriately, according to the general recommendation above. Routes should be restored so that they make sense. Thus, Mansell Mountain Trail should go all the way to the summit. The Razorback will resume its original destination, Great Notch. The short connection east of the top of the Razorback Trail will be considered part of the Razorback Trail for record-keeping.

Bernard Mountain South Face Trail (#111)
Recommended name: Bernard Mountain Trail

To cut down on confusion, we recommend not breaking the Bernard South Face Trail into its components. Further, since this route now extends to Great Notch, we recommend renaming it Bernard Mountain Trail to lessen confusion. We recommend keeping the Sluiceway route as is, including the Little Notch Trail. We recommend extending the route covered by the name Great Notch Trail north to the intersection with the Long Pond Trail, as it was historically, and extending it farther northwest along what is now the Western Mountain Trail, a roadbed for which we could find no historic name. While the Gilley Trail will still end somewhat illogically, by keeping its current western destination we preserve at least one example of the tendency to switch trail names partway to any destination point. Further, it's an intersection of a number of extant trails and won't seem as odd. Cold Brook Trail will retain its name.

SPECIFIC TRAIL NAME/ROUTE RECOMMENDATIONS NOT ADDRESSED ABOVE

Sand Beach–Great Head Access Trail (#9)
Recommended name: Satterlee Trail

This clumsy name was a 1990s stop-gap. The actual route of this trail, from the Great Head Parking area (not Great Head itself) to the Park Loop Road, turning south and paralleling the road to the Sand Beach parking area (not Sand Beach), is the route of the original Ocean Drive Road, and the trail is the roadbed itself. We considered recommending the name Old Ocean Drive Trail to recognize the trail's heritage, but decided that this would be too confusing, as many people would think the name referred to Ocean Path, which goes along the current Ocean Drive. At the excellent suggestion of David Goodrich, we recommend the name Satterlee Trail, as the Satterlees donated some of the land of this trail corridor and the Great Head area.

Sieur de Monts–Tarn Trail (#18)
Recommended name: Wild Gardens Path (#18)

The name Sieur de Monts–Tarn Trail was chosen in the 1990s when this trail was reopened to identify the trail's destinations. However, this route was called the Wild Gardens Path by George Dorr in the 1910s and the VIA/VISs in the 1915 path guide, then the Tarn Trail by the CCC in 1930s reports when extensive work was done on the trail, and we recommend returning the trail to its historic VIA/VIS period name, in keeping with other path names ascribed by Dorr that radiate from Sieur de Monts Spring. As mentioned previously in the discussion of memorial path names, the Kane Path along the western shore of The Tarn was renamed the Tarn Trail by the Park Service in about 1959. We recommend changing the route back to its historic name, the Kane Path.

Canon Brook Trail (#19)
(No change recommended)

The oldest references to the trail (Rand, et al. maps) and brook spell them both Canón with an accent over the "o." Later maps show a tilde over the "ñ." Some maps put the "y" in, spelling it Canyon, as does the 1928 guidebook. Today, it's spelled Canon with no accent or tilde. The tilde may have been some kind of gentleman's joke on the part of Rand, since there is no Spanish heritage at Acadia; more likely, it was an adoption of a southwestern spelling. However, as Hank Raup has pointed out in a letter to the park, the U.S. Board on Geographic Names (BGN) policy is to avoid accent marks So the choice is between "Canon" (no tilde) and the Americanized spelling "Canyon." The intention was almost undoubtedly "Canyon"—the other word "canon" referring to church decree or a musical form. However, the brook for which the trail is named has also become "Canon" in USGS records, so restoring the original name to the trail would mean having a Canyon Brook Trail that goes up Canon Brook, and would be confusing and against our principle of changing trail names as the feature for which they are named changes. We recommend retaining the current name, Canon Brook Trail, with no tilde. If the USGS can be persuaded to change the name of the brook to "Canyon Brook," we would gladly follow suit.

The historic route of the Canon Brook Trail continued west past The Featherbed, on what is now called the eastern end of the Pond Trail, and formed a T intersection with the Bubble and Jordan Ponds Path where the two are now simply melded together. Once the abandoned section of the Bubble and Jordan Ponds Path to Bubble Pond is reestablished, the historic route of the Canon Brook Trail will be restored, and the intersection will be as it was historically.

Pemetic West Cliff Trail (#30),
Pemetic Mountain Trail (#31)
Recommended names: Pemetic North Ridge Trail (#31), Pemetic South Ridge Trail (#30), Pemetic East Cliff Trail (#31), Triad Trail (#31/part of #450)

The historic route of the Pemetic Trail is the route of the current Pemetic Mountain Trail from Bubble Pond, over the summit of Pemetic, to the intersection of the two trails that descend the southern end of Pemetic Mountain. While the historic Pemetic Trail went south here along the ridge, following what is now called the Pemetic Southwest Trail (a misnomer) to the Pond Trail, the current Pemetic Mountain Trail takes the more recent route to the southeast (a leg historically named East Cliff Trail), continues past the Pond Trail, passes over The Triad following a portion of the Van Santvoord Trail, then descends to the carriage road at the Wildwood Stables Bridge. The 1928 path guide and correspondence from David Goodrich refer to the southern ridge trail as being at one time called the Old Trail. We recommend restoring the integrity of the original Pemetic Trail route, but under the names "Pemetic North Ridge" and "Pemetic South Ridge," in keeping with the ridge naming principle. While we considered naming this leg the Old Trail, we decided that there was not enough documentation of its use, found that this term was applied to other trails in the 1928 path guide, and felt that the name could be misleading. The name East Cliff Trail would be restored as Pemetic East Cliff Trail to the leg from the intersection with the Pemetic South Ridge Trail to the Bubble and Jordan Ponds Path. The trail from there south over The Triad and to the carriage road will be called the Triad Trail, as it is often referred to today.

Cadillac West Face Trail (#32)
(No change recommended)

The old maps show a route similar to the present-day route called Steep Trail. However, this is not the present route of the Cadillac West Face Trail, and therefore should be left intact—old route, old name, old cairns (still extant) together. Cadillac West Face Trail is descriptive, and we see no reason to change it.

Bubbles–Pemetic Trail (#36)
Recommended name: Pemetic Northwest Trail (#36)

Bubbles–Pemetic is a recent change (possibly 1950s), is clumsy, and doesn't describe the two endpoints accurately. The trail ends at the Park Loop Road, a long way from either Bubble. We recommend changing it to the historic name, Pemetic Northwest Trail, which better describes the actual location of the trail.

North Bubble Trail (#41)
and South Bubble Trail (#43)
Recommended names: Bubbles Trail (#41 and part of #43) and Bubbles Divide Trail (part of #43)

As it is, the area is confusing, and the South Bubble Trail in particular is made up of a number of sections that are not linear. Two of them are more or less parallel to each other and will be very confusing when we implement the policy of signing ends of trails with their names. A reversion to the historic division of two trails—one trail over The Bubbles and another crossing the first trail through the notch—makes much more sense, and should be less confusing to hikers. The historic names were the Bubble Mountain Trail and Bubble Divide Trail. However, since this area is now officially called The Bubbles, we feel references to a single Bubble in Bubble Mountain and Bubble Divide would be very confusing. Therefore, we recommend the Bubbles Trail for the route that traverses the summits, and Bubbles Divide for the route that travels through the gap between North and South Bubble. Raup points out that the term "divide" refers to a division of two watersheds, but the maps of the historic period consistently refer to this area as the Bubble Divide and we feel the name to be justified on that basis. Any confusion between North and South Bubble can be easily solved with signage. Signs at either end of the Bubbles Trail will list the two Bubbles in order, with distances, while the sign at the intersection with the Bubbles Divide will have an arrow pointing to each, with phrases such as "Bubbles Trail to North Bubble" and "Bubbles Trail to South Bubble." The use of "trail" rather than "path" reflects the lack of highly crafted construction on these trails.

Jordan Cliffs Trail (#48)
Recommended names: Jordan Cliffs Trail (southern end of #48) and Sargent East Cliffs Trail (northern end of #48)

First, the current name Jordan Cliffs Trail now refers to an amalgamation of at least three different historic trails. South of Deer Brook, the trail that travels along the cliffs and intersects with the Spring Trail follows a route of which the southern part was the Jordan Bluffs Path, built pre-1900. The northern part was the Jordan Cliffs Trail, which was built around 1932 to traverse the Jordan Cliffs (a specific feature) and intersect with the Bluffs Path. There it turned westward to the summit on a route now abandoned, reaching a destination actually called Jordan Bluffs. As Goodrich points out:, "In its present state, the major feature of this trail is clearly the Jordan Cliffs." It is also where the majority of the highly crafted work is located. Hence, after much consideration given to the name Jordan Bluffs Trail, used on some maps for this hybrid route (1952, for instance), we propose leaving the route under the name Jordan Cliffs Trail.

The name of the leg that is north of the Deer Brook Trail and travels north and west to the summit of Sargent Mountain was historically called the East Cliffs Trail. We recommend reestablishing this name as the Sargent East Cliffs Trail, since the current name (Jordan Cliffs Trail) is a misnomer for this section and the recommended name more historically correct. Also, since the trail was constructed at different times than the southern route, and in a different style, it should have its own name.

Hadlock Brook Trail (#57)
(No change recommended)

The 1903 path map refers to the current route as the Hadlock Brook Trail, but maps in the 1910s and the 1915 and 1928 path guides refer to this same route as the Waterfall Trail. The argument to be made for restoring this second name is powerful. It originated at the time of the trail work on this trail, which includes a little-known substantial stone staircase along the waterfall, which is now abandoned but scheduled for rehabilitation. However, during discussion with the committee and conference with other resource specialists, the worry was raised that the name Waterfall Trail might attract a large number of people to an area that is currently in a low-use part of the park. Also, some considered the name misleading, as the waterfall (for which the carriage road bridge is also named) is only present after heavy rain. Because the name Hadlock Brook Trail is also justified historically, the final decision of the committee was to continue using this name.

Norumbega Mountain Trail (#60)
Recommended names: Norumbega Mountain Trail (southwestern end of #60) and Goat Trail (northeastern end of #60)

Locals already call the steep northern part of the Norumbega Mountain Trail by its historic name, the Goat Trail, and Northeast Harbor Signs refer to it as such. We recommend that the park make this change to preserve this historic term for a steep mountain trail.

Flying Mountain Trail (#105)

Recommended names: Flying Mountain Trail (southern end #105) and Valley Cove Trail (northern end #105)

Currently, the route of the Flying Mountain Trail begins at the southern entrance of the Valley Cove Road, ascends Flying Mountain, descends to the northwest, then continues nearly 2 miles further along the side of Valley Cove itself on a section of trail constructed in the 1930s by the CCC. We recommend separating this route into two trails, as it was initially. Flying Mountain Trail will refer to the portion traversing Flying Mountain. Valley Cove Trail will refer to the portion beginning at the head of Valley Cove at the intersection with the spur trail to the round turn and continuing on the CCC trail to the intersection with the Acadia Mountain Trail and the Saint Sauveur Trail where they intersect in the valley between the mountains. It makes sense to divide the Flying Mountain Trail into two parts and resume using the original CCC name for the trail they constructed along Valley Cove. Further, the CCC Valley Cove Trail is highly significant historically and structurally, exhibiting a unique kind of trail construction. Separating it by name will be truer to its physical attributes. Most people still refer to this trail as the Valley Cove Trail, and the name's attachment to the Flying Mountain Trail is purely arbitrary.

Western Mountain Trail (#120)

Recommended name: Great Notch Trail (lower portion of #120)

There is no historic trail name for this old roadbed, and it should lessen confusion to name it for the route it fuses with and its destination.

APPENDIX D: SOUND MASONRY PRACTICES / STONE CUTTING

SOUND MASONRY PRACTICES

- The foundation of a wall, bridge abutment, or other stone structure is anchored on solid material, beneath any organic material. It is set on ledge, solid stone, or stable mineral soil. Wherever possible, it is set beneath the level of the surrounding ground so that the ground holds it in place.
- All rocks of a wall are laid so that they distribute their weight down through the foundation and toward solid material.
- Joints between rocks are broken by any rocks laid over them (principle of "one over two") so that the structure is one continuous weave of rocks.
- All building rocks in the wall or other stone structure have contact with all abutting building rocks.
- Rocks are laid with their length into the structure ("header-style") so that they provide maximum strength for their size.
- Shims and small rocks are not used in the exterior of the structure.
- The interior of the structure is a core of laid rocks, not dirt or thrown material; the core uses plenty of clean rock that allows drainage through the structure.
- All gaps are filled with rocks that are locked in place.
- Interior rocks cannot escape through exterior rocks.
- Top stones are particularly large and well-set to prevent toppling or deterioration, and are submerged under surface material when possible.
- Courses that retain surface material have high contact.

STONE CUTTING

Lessons from Coastal Maine Granite Quarries

by Lester C. Kenway

The Maine coast was home to a flourishing granite industry throughout the 1800s and well into the first half of the twentieth century. High-quality gray granite, formed from igneous intrusions of the Acadian Orogony during the late Devonian Period, was found in numerous locations along the coast. Quarries were opened in Rockland, Hurricane Island, Stonington, Black Island, Mt. Desert, Sullivan, and other coastal villages where quarried blocks of stone could be loaded onto schooners and shipped to the growing cities of Boston, New York, and Philadelphia to be used in the construction of public buildings, sidewalks, and streets.

These quarries cut slabs of granite, up to 20 feet thick, which were then cut into building stone, steps, facade, monuments, curbing, and paving stones. The methods were clever, and exploited the character of the material. Initially, all work was done by hand, later supplemented by pneumatic tools.

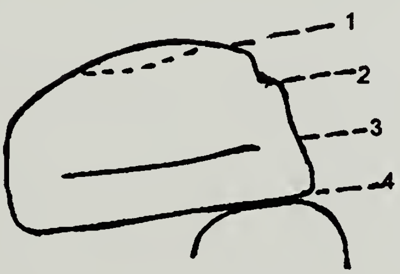
The demand for granite products was all but eliminated by the move to reinforced concrete architecture after World War II. Almost all of the Maine quarries are now closed, with a handful of craftsmen keeping the knowledge of these techniques alive.

Acadia National Park is one location where these skills are still in use. Acadia is engaged in a long-term program dedicated to preserve historic stonework throughout its trail system. This project seeks to duplicate high-standard stone trail work completed by stone masons and CCC crews during the first half of the twentieth century. The Acadia trails crew, in partnership with Gibran Buell, of Sullivan Quarries, has incorporated these traditional techniques into its current methods. The objective of stone cutting is to produce clean, straight splits in the stone in order to provide useful pieces to build with. A summary of these methods follows.

1. Read the grain.

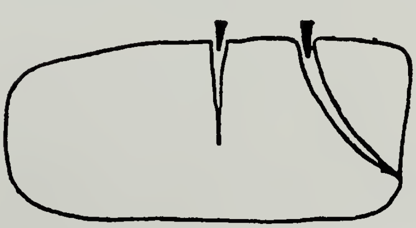
This refers to discovering the three primary directions of likely breakage in a piece of granite by assessing evidence shown in the shape and surface character of the stone. These directions were sometimes referred to as "The Lift" (a plane parallel to the surface of the earth), "The Drift" (a plane perpendicular to the Lift), and "The Hard Way" (a plane at right angles to both the Lift and the Drift). Discovering these directions when stone is still in place in the earth is quite straightforward. Reading grain becomes more challenging when boulders are tumbled down slopes or relocated by glaciers. Evidence of the three directions can be discerned as follows:

1. Flakes on the surface of a rock often run parallel to a splitting plane.
2. Small ledges may indicate one of the planes.
3. Long cracks may indicate one of the planes.
4. The largest flat surface on the boulder is likely to be either parallel or perpendicular to one of the planes. If a boulder is very rounded, evidence will be hard to find. Look especially for two or more indicators to confirm the same splitting direction. These indicators do not have to point to the same exact spot, since numerous potential breaking planes exist in each of the three directions.



2. Plan the split—The 50 percent rule.

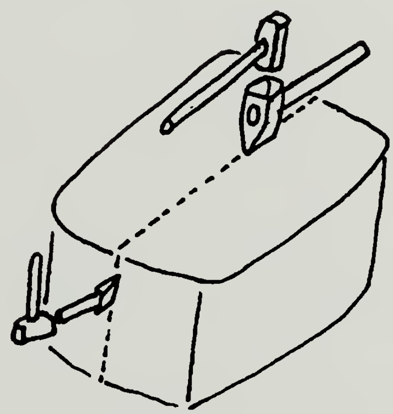
Since granite is a crystalline material, it tends to separate along the path of least resistance. If you should try to take a thin slice from one end, the crack will tend to run out to the parallel face, as opposed to running through to the far side of the rock. This will produce a large unattractive "spalled" surface on the rock and a worthless curved flake.



The safest strategy is to cut each stone into halves. These halves can then be cut in half again, until stones of usable size are produced.

3. Score the line.

Once the direction of split has been chosen, it is marked on the stone with crayon or chalk. Scoring means repeatedly striking along the line with a bevel-edged tool. The scoring serves to send shocks through the crystalline stone, which weakens the stone along the chosen plane. The scoring greatly increases the likelihood of a successful split and reduces the amount of force that needs to be applied with wedges to part the stone. Small stones can be cut without using wedges at all. A tool called a "rifting hammer" can be used to score big stones. One person holds the rifter in place, while a second one strikes it with a second hammer. The two workers score a line back and forth many times until a distinct groove is worn in the stone. Rifters are difficult to strike on a vertical surface, so a tool called a "tracer" can be used by one person to score a line. The tracer is like a wide chisel, and can be held with one hand and struck with a hammer. Tracers can also be used by themselves to cut smaller stones.



4. Drill holes for wedges.

These holes can be drilled by hand with star drills (if you work in a wilderness area) or with various gas-, electric-, or air-powered drills that are available. The holes need to be spaced evenly along the score line and drilled in the same plane as has been defined by the scoring. Experience with the size and type of stone will determine optimum spacing for wedges. Typical spacing for smaller sets (3/4 to 1 inch) would be four to six inches apart, while spacing for larger sets (1-1/4 to 1-3/8 inch) would be 8 to 12 inches apart. The more sets of wedges used in a split, the more pushing power available to separate the stone.

a. Holes should be drilled as deep as the straight part of the shim or feather. Shallow holes will result in the feathers being bent by the wedge (or plug).
b. If holes are drilled deeper than the shim, the wedge can drive the shims down into the hole and straighten out the top of the shim.
c. Feathers can be used to spoon stone dust out of holes and to check the depth of the hole. Do not use a wedge to check hole depth, since it will be difficult to get it out of a hole if you drop it in.

5. Place feathers and wedges and split stone.

a. All wedge sets are placed in the holes oriented so they all push in the same plane in order to push the halves of stone apart.
b. All wedges are driven with a hammer until they are "loaded." This is indicated by each wedge emitting a tone or ringing sound. When all wedges are loaded, the stone is allowed to react to the pressure for 1 to 3 minutes.
c. Wedges are driven equally, a little bit at a time. The sound of the tone of each wedge, when it is struck, can indicate the relative tightness of each wedge. If the wedges seem to be going hard, more scoring can be done between the wedges.
d. Eventually, a crack will begin to show along the scored line. At this point, drive only one wedge so other wedges can be retrieved. You can then drive a lone wedge into the crack and retrieve the remaining wedge set. The two halves of stone can be separated with pry bars.

L. C. Kenway

Deb Hofford, SCA-BSP crew of '97 pounds 6 inch wedges to begin splitting a 10-ton slab of granite.

APPENDIX E: SAMPLE TRAIL INVENTORY

Homans Path (#349), Inventoried May 2001

Trail	Section	Distance	Length	Feature	Description
349	1	0		RF	Trail log from May 2001. Log goes from road west to top of work, then south to intersect with the Emery Path.
		0		RF	Trail runs 320 degrees from magnetic north.
		1		CU	Capstone culvert. Cut stone measures 38x52x6". Crosses drainage in road, begins trail.
		4	10	CW	2 coping stones RHS (right-hand side)
		4	10	ST	Uniform 36" width: slab laid; 24" rise; 2nd step is broken; all cut; one step is completely hidden; one step is a patio set-behind step
		17		CW	RHS, 26" long
		24		CW	RHS, 30" long
		29	39	CW	4 on RHS, jumbled
		38	53	SP	stone patio
		38	100	CW	RHS on top of wall, largest up to 44" long, 16-18" high; is continuous abutting copers; nice straight line along treadway; natural stone
		38	100	RW	Rubble wall RHS up to 42" high, batter 4 to 3.
		54	63	ST	32" rise, most rise 6", avg run 15"; up to 40" wide, narrow as 28"; some cut marks, slab laid
		60		CU	small opening LHS, runs under 4th step; coper fallen into hole; gravelled-over culvert; rock channel flowing into it on LHS; under steps
		62	100	CW	sporadic. intermittent coping stones, LHS
		73	79	ST	mostly cut, 34" rise, run 60"; avg 7" rise; 30" wide, one at 28"
		84		CU	obscure, but must be; plugged; similar to one at 60, w/channel LHS; gravelled-over; under tread, not steps
		92	96	ST	16" rise, 4' run; no cut marks showing
		95		CU	obsure, plugged; similar to last two; channeled LHS at 20 degree angle; gravelled-over.
		100		RF	tread width in here is 28-40"; this is a standard width for this trail.
		100	300	CW	Estimated coping wall; need better figures; intermittent LHS and RHS, with remarkable portions to follow.
		109	113	ST	28-31" wide; 20" rise/ 28" run; no visible cut marks
		110	118	CW	2 large copers, 4' and 4'6" long, 2' wide, 16" high, on rubble laid wall
		110	118	RW	under nice copers: "nice lookin' wall"
		128		CU	obvious gravelled-over w/ exposed lintels; 17" wide opening; 25" wide across trail (stone missing?): 13" deep evenly across; RHS lintel 10x12x36"
		128	135	RW	up to 4' high; rubble
		139	143	ST	28" rise/42" run: 28-30" across
		142		RF	coper on RHS fallen off; strong evidence on this staircase that some cut marks were removed with tool—why?
		155	170	ST	5'6" rise/ 15' run; longest 39", shortest 28"; steps 4 and 5 are double wide w/ adjoining stairs at "Y", 68" wide here
		160		RF	huge boulder LHS

Trail	Section	Distance	Length	Feature	Description
349	1	160		RF	Spur after 11 steps becomes obscure; seems to curve w/ earthen mound to north, some evidence of old bridge abutment at first drainage crossing.
		160		ST	steps on spur at "Y": 1 and 4 are cracked: 5 is cut from boulder in treadway: 6'10" rise/ 17' run: 24-36"wide; 4 coping RHS
		171		TW	rock-filled treadway: baseball to football size: probably smoothed with soil once: held by coping wall
		177		ST	made from boulder riddled w/ cut marks
		179		ST	32" wide: 2" rise
		179	183	RW	16" high rubble wall, leads to large coper to follow
		184	189	CW	LHS, large cut boulder; trail down to 25" wide gap
		189	195	ST	top is boulder cut in place; 12-22" runs, rise 28" total
		196	205	CW	large, nicely set coper
		202	209	ST	3-10" rise: 34" rise/ 7' run: 20-36" wide: evidence of missing coper
		209	214	SP	patio-style flat-laid stones
		211		RF	cut nub LHS
		215		ST	first step is 2 rocks, w/ a 33" run: total rise is 21"/ run is 47"; widest 34"
		224		RF	wall/coper shifted outward on RHS
		226	228	ST	8" and 4" rises: 32" wide: 8" maple on RHS
		230	232	SP	2 flat-laid rocks
		230	254	RF	24' of blowout: area where tree RHS blew over; treadway may have been soil, no wall: ledge now slopes off steeply to RHS: pin or build up wall?
		232	238	ST	27"rise/ 6' run: 35" wide: cut marks: cobbled foundation visible (missing copers?)
		254		RF	large boulder RHS: why is it here. pinching the tread width? fallen or slipped into trail
		254		ST	at end of blowout; natural step?
		260	277	CW	large blocks in coping wall, RHS, appear as if they have shifted, perhaps when tree went over and trail blew out
		270	300	CW	some massive copers in here
		277	283	ST	23" rise/ 6' run: all 2' wide; top step was probably slab that slid back and off; cut marks all
		283	296	SP	rough rock paving
		296		ST	uncut stone
		300	334	CW	small, each side of steps
		300	334	RF	switchback: trail shifts to 220 degrees from mag. north, an 80 degree bend in trail
		300	334	ST	on curving switchback: tallest rise 11", total rise 8'6"/ total run 34'; 36" widest, 23" narrowest; small coping each side; at least one is set-behind
		337	390	RF	throughout, some cut marks on steps and copers: shims and blocking occasionally visible, most steps ok, evidence of heavy water flow throughout
		337	390	ST	beautiful curved steps are 21'3" rise/ 53' run; 1 block is 72" wide; many cut(?), rises and runs vary up to 10" rise; some set-behinds; #2 on shims
		337	395	CW	large copers LHS for steps
		340	380	RF	switchback to ? degrees mag. north: switchback #2
		354		RF	small shifting and blowout LHS

Trail	Section	Distance	Length	Feature	Description
349	1	363		RF	nice large copers LHS
		370	385	GN	a drainage that isn't a culvert: a hold for water to flow into boulders below steps; ample places for water to flow
		372		RF	10' high cliff, LHS, "control point"
		400		RF	Trail to 320 degrees from mag. north
		400	415	CW	large boulders RHS, somewhat haphazard, leftovers?
		400	415	RF	note all the drill marks, LHS, where rocks were cut away for effect
		400	450	RF	trail goes through a defile: width is 30" to base of next steps
		418		RF	rocks have slid into trail from LHS, covering steps, perhaps at 2' grade change under boulders
		440	450	GN	the "overhang"; stack on RHS 7'6" high, 3 large blocks avg 10' long; dog holes top block suggest was set there (on N and E sides); all 3 set?
		440	450	RF	Overhang, cont., overhang itself is 35" wide in the direction of trail, hangs 5'6" over trail from LHS; opening height is 63", tread width: 35"
		450		RF	begin change in direction to 280 degrees mag. north
		450	479	CW	piled coping wall, along steps, up to 24" high, cut marks
		450	479	ST	12' rise/ 29'run: widest is 46", narrowest 24", much moss, water runs right over them, slab laid, steps in good shape in spite of water
		479		RF	310 degrees mag. north
		492		SP	1 flat-laid rock
		492	496	RF	boulder RHS is 3'6" high
		496	503	ST	35" rise/ 7' run: 35" widest, 24" smallest; #4 is slipped out; no coping wall, some cut marks
		510		RF	change direction to 260 degrees mag. north; switchback #3
		510	ST		
		512	541	CW	w/ steps, low, collapsed from 523-527
		512	541	ST	total rise 12'3": 6-10" rises: 43" widest, 24" narrowest; some set-behind: w/ coping to follow
		528		RW	piled retaining wall LHS, almost like scree
		541		RF	direction change to 330 degrees mag. north
		541	548	SP	flat laid stone(s)
		548	552	RW	up to 40" high, RHS, vertical laid wall (?)
		548	556	ST	36" rise: 45" widest, some cut marks
		557	565	RF	large beautiful block 32" above tread on RHS
		563	579	RW	a beautiful fitted wall up to 4' high, worked around massive angled boulder
		566	573	SP	Flat laid stones pieced in, large in middle, small on sides; up to 6' wide, one rock is 40x56", slightly up-ramped
		567	579	RF	Hole along trail LHS is filled w/rubble
		573		ST	8" rise, big cut block is 40x50"
		573	579	SP	second stone is a boulder with a flat place cut in it; it ramps up into its own coper on the RHS
		579	582	ST	10 and 7" rise. cut. set-behind, 51" widest; drop off on LHS is 18", no wall, shims visible
		583	588	SP	rip-rapped pattern, drill marks on the "topped out" boulder; tread is 54" wide

Trail	Section	Distance	Length	Feature	Description
349	1	584	590	CW	RHS actually sticks above trail
		588	592	ST	7 and 8" rises, big blocks up to 37" wide, set behind
		588	598	RW	RHS, fitted, natural looking, how high?
		590		RF	30" drop off LHS
		592	602	SP	592-596 is two large blocks, 596 to end is pieced-in rock
		600		RF	a "pinch" passageway
		602	610	RW	Height? Fitted wall on both sides
		602	610	ST	31" rise; slab-laid
		610	616	RF	one huge flat block set along trail, probably, note rubble fitted wall underneath; block is 6' wide, 7' long
		616		RF	spectacular construction on curve: switchback; to ? degrees; steps, wall, boulders to follow
		616	642	RW	up to 6' high laid and rubble wall; vertical at first, then 1 to 1 battered rubble wall; fitted wall; RHS
		616	642	ST	9'8" rise; largest is 52" wide; probably missing coping RHS; big blocks under steps similar to Brunnow; 1 and 3 have dogmarks
		640		RF	more than a 90 degree switchback, a 40 degree angle; trail heads 175 degrees mag. north; almost due south; switchback #3
		643	649	SP	6x3' rip-rapped patio; note small seat-like rocks, and large 54" high flat boulder, RHS, all framing switchback
		647	672	ST	switchback #4 at 660; total rise 10 feet/ run 25 feet; #4 has small patio behind; #8 cut from boulder in tread; up to 58" w; up to 12" rise
		649	657	RW	Up to 4' high, and up to 2' above trail. RHS; rubble retaining wall; 2 blocks stacked inside switchback
		650		RF	note rock on RHS w/ drill marks, underneath the big slab. Obviously the large pointed slab was set
		657	672	CW	LHS around WB up to 2' high. Nice
		660		RF	large overlook LHS; a flat bench rock 54x37"
		660		RF	switchback to 325 degrees mag. north; 30 degree angle change; switch back #5
		660		RW	How high? Wall around SB on LHS
		664	720	RW	Big rubble laid boulders from 4 to 10' high; wall is 4' high at sb; 1.5 to 1 batter. Very nice. Visible from trail below.
		672	689	SP	some have small rise, step up; ramped up; avg 30" wide
		675		RF	coper missing RHS?
		689		ST	12" rise; cut stone; rock behind it is in cut in place
		695	703	ST	8' long block, 6' across; this large block gains at least 1' elevation; ramped up
		700		RF	note single drill hole on top of ramped-up block; why? Dog mark? Or where the derrick was pinned (good spot for it)?
		703		ST	10" rise; maybe a dog hole ctr, RHS
		704	714	SP	2 stones
		714	835	ST	Wow. Long switchbacked section. 46'6" rise/ 121' run; encompasses 2 switchbacks; mix of slab and set-behind; details to follow
		728	753	RW	LHS, rubble laid wall; height?; 749 to 753, missing piece w/ large rock below it; wall comes under steps w/o coping, like Brunnow

Trail	Section	Distance	Length	Feature	Description
349	1	730		RF	switchback #6, trail goes to 185 degrees mag. north
		730	768	RW	Low, rubble wall, intermittent to RHS; exact dimensions?; large rock at 756
		746	779	ST	all of these set-behind; probably the largest run of this type of lay
		750	765	ST	7 steps in this area are extremely similar: big cut blocks, many drill holes, gapped set-behind (slipped?): large rectangles (dimensions?)
		753	764	RW	up to 6' high, LHS, ties into previous; laid wall w/ blocks, cut stone; batter is vertical—4 to 1?
		753	766	ST	8 steps in a row w/ real shallow rises, almost stone paving
		764	775	RW	Big blocks, LHS, lower batter, 3/2
		768		RF	RHS large 4x4x2.5' block w/ doghole.
		774	796	RW	RHS, nice wall, some large boulders, some coping, lower end. Up to 10 feet high, laid wall: 3.5/ 1 batter: cut rocks throughout: last 10' is tiered.
		775		RF	switchback #7: trail turns to 320 degrees mag. north
		775		ST	steps revert to uncut
		775	789	CW	filled rubble, LHS
		789	798	RW	LHS, directly under steps and into crevice. Laid wall 4' high and 4' back into cave beneath crevice. Similar to "Hanging" steps on Orange & Black Path.
		793		ST	This step is 5'9" wide
		796		RF	steps enter the crevice; 12' tall ledges each side
		796		ST	Steps in notch narrow to 24" wide; all appear cut, slab-laid. uniform 9 to 10" rises; 21 steps in notch; one missing
		813	820	RW	RHS note low wall on top of block of crevice; holds lintel; wall is 16" high, topped by one large flat rock, 7 foot long, 8" high holding up lintel.
		814		GN	The lintel; crosses crevice; 63x10x24" stone.
		828	913	CW	Coping wall, RHS, blocks up to 7 foot long: many with dog marks, many set on wall or other large boulders.
		828	913	RW	Guess at square footage; wall RHS supports massive coping blocks to follow. up to 5' high retaining wall.
		835		ST	End of steps; many in this area have dog marks
		836	844	RF	Large blowout; missing rocks; note large stumps and charcoal; trees probably fell out; missing 18" deep of tread material.
		836	866	TW	Cobbled treadway with some cuts stone in it; "rock filled" tread which probably once was smoothed with soil.
		845		RF	Tread width is 28-36"; right on target
		850		GN	2 pins RHS, 10 and 12" tall, one is bent, hold coping wall, the shims under the coper, too.
		852		RF	Note rocks wedged RHS 4' below trail to support copers/retaining wall.
		863		RW	Wall is up to 5' tall in here
		866	908	ST	Rise 17"; run 42'; widest is 48"; steps at 886 and 890 are cut from natural ledge
		885	894	RF	2 large copers RHS appear to have slid out of place; note dogholes
		895	897	RF	Note two dogholes on this large coping block (6.5x5x2'). This suggests strongly that this was set—therefore those above and below, too.
		904	908	RF	Large block tipped out of wall on RHS
		908	914	SP	3 large patio blocks, one is 6' long

Trail	Section	Distance	Length	Feature	Description
349	1	914		RF	trail turns abruptly le ft, west, uphill
		914	1063	ST	55 ft rise; long curving, final staircase, up to 66" wide; most cut: Brunnow-style blocking; set-b and slab; follow contour of ledge
		933		RF	Step #14 is out of place
		934		GN	Iron pins holding step #15: horizontal pin out of boulder on LHS, 4" x 5/8"; RHS pin out of ledge, curves into side of step like Van Santvoord Trail; 11"
		936	997	CW	LHS, low, often piled coping, mostly not above steps; 972-997 wall is larger. deliberate
		956	963	RF	3 steps blown out. slid forward, #'s 27, 28, 29
		961	964	RW	One coper, RHS
		966		RF	AT large, narrow step (#31), drill marks in ledge 20' to right of trail
		973	988	CW	RHS, nice coper wall, sporadically above trail height.
		993	1098	CW	RHS, at around 1018 it becomes small stuff scattered throughout; at 1055 becomes nicer where steps end, blueberries, bigger stones
		1010	1054	CW	LHS; low rubble at 1017–1022; only one coper is above steps
		1021		RF	At step 56, a double step, LHS, 26 and 30' off trail; 2 blocks w/ drill marks; proof of quarrying here
		1054	1059	TW	Short span of gravel to last 2 steps in series.
		1063		RF	End of stairs
		1063		RF	Wall, both sides, is deteriorated in this area, just lying there
		1098		RF	End of built work! end of wall, RHS; trail must have gone left... social path leads to Emery
		1600		RF	End Homans at Emery Path.

CODE	FEATURE	MEASURE
BR	Trail Bridge	Count
BW	Bogwalk	Linear Feet
CA	Causeway	Linear Feet
CK	Stone Check	Count
CR	Crush Wall	Square Feet
CU	Culvert	Count
CW	Coping Wall	Linear Feet
DG	Ditching	Linear Feet
EP	End Point	
GN	Other	
GP	Gravel Pave	Linear Feet
IS	Intersection Sign	Count
LC	Log Check	Count
LG	Log Cribbing	Linear Feet
LHS	Left-Hand Side	
LR	Ladder	Count
LS	Log Sign	Count
PL	Plaque	

CODE	FEATURE	MEASURE
PP	Perforated-Pipe Drain	Count
RF	Reference Point	
RHS	Right-Hand Side	
RL	Relocation	Linear Feet
RR	Iron Rung	Count
RW	Retaining Wall	Square Feet
SD	Stone Side Drain	Linear Feet
SN	Sign	Count
SP	Stone Paving	Linear Feet
SR	Safety Rail	Linear Feet
SS	Stepstones	Count
ST	Rock Step	Count
SW	Sidewall	Linear Feet
TP	Turnpiking	Linear Feet
TW	Treadway	Linear Feet
WB	Water bar	Count
WD	Water Dip	Count
WN	Work Needed	

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National Park Service
Olmsted Center for Landscape Preservation
Legend
Existing marked, maintained trails
Historic trails no longer marked
Roads and carriage roads
Acadia National Park lands
Approximate scale (miles):
0
1
2

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ISBN 0-9779833-1-5