

NORTH COUNTRY NATIONAL SCENIC TRAIL



A Handbook for
Trail Design, Construction,
and Maintenance

North Dakota • Minnesota • Wisconsin • Michigan • Ohio • Pennsylvania • New York

A Handbook for Trail Design, Construction, and Maintenance

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North Country National Scenic Trail

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This book is dedicated to the
hundreds of volunteers and partner agencies
whose invaluable efforts made
this trail possible.

PREFACE

The North Country National Scenic Trail (NST) extends thousands of miles. It requires the participation of a myriad of individuals and groups in its layout, design, construction, and maintenance. Understandably, the level of trail experience and expectations of the finished product often differs among those involved. New volunteers commonly ask for trail standards to guide their work. In the past they were given verbal descriptions and, at best, directed to existing trail construction and maintenance handbooks prepared by other trail agencies and groups. Trail standards are fairly consistent across the nation, and these referrals were made with a certain degree of confidence. However, completed sections of the North Country National Scenic Trail are significantly different in terms of trail standards, signing, location in the area's landscape, and maintenance.

The purpose of this handbook is to lay the foundation upon which the North Country NST will achieve a degree of consistency from one segment to another. Public recognition that the trail is becoming a reality will also be gained. Workable trail standards are identified and defined in the following chapters. It is desired that over time the entire trail will utilize these standards. Local innovation is a trait that is encouraged, but ideas and changes should be channeled within the broader bounds of trailwide standards.

The legislation that created the North Country NST acknowledged that the trail's completion required cooperation among all levels of government and private organizations. The 1982 *Plan for the Management and Use of the North Country Trail* noted that total uniformity was not prescribed because of the diverse nature of managing entities. However, the plan realized that as trail use and popularity increased the importance of uniformity also would increase.

The North Country NST has matured since 1982 and more consistent application of standards is required. Increased uniformity is important for a variety of reasons: recognition and public support for the trail, provision for basic levels of safety, a degree of accessibility, improvements of poorly designed trail segments, and easier maintainability. The objective is to have all completed segments recognized as a national scenic trail.

Although total uniformity is not strictly imposed, adoption of consistent trailwide standards is desired. As old segments of trail are reconstructed, and as new trail segments are built, it is strongly recommended that these guidelines be followed. As experience in trail development and maintenance progresses and suggests changes in application, amendments will be incorporated.

It is hoped that this handbook will assist and inspire all who work for the successful completion and maintenance of the North Country National Scenic Trail.

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INTRODUCTION

When completed, the North Country NST will extend from the vicinity of Crown Point, New York, to Lake Sakakawea State Park, on the Missouri River, in North Dakota, where it joins the route of the Lewis and Clark National Historic Trail. The length of the trail is officially 3,240 miles. However, by the time it is completed the trail is expected to exceed 4,000 miles.



Threading its way across the landscape, the North Country NST links outstanding scenic, natural, recreational, historic, and cultural areas in seven northern states. Unlike the Appalachian, Pacific Crest, and Continental Divide NSTs, which follow mountain ranges, the North Country NST journeys through a variety of environments in the northeastern and north central United States. From the grandeur of the Adirondack Mountains in New York, it meanders westward through the hardwood forests of Pennsylvania, through the countryside of Ohio and southern Michigan, along the shores of the Great Lakes, and through the glacier-carved forests, lakes, and streams of northern Wisconsin and Minnesota. Its western terminus lies in the vast plains of North Dakota.

The diversity of landscapes and scenic and historic features along the North Country NST is perhaps its most appealing quality. Large areas of publicly owned lands, such as national forests, major state parks and forests, and the Adirondack Park in New York, offer wilderness and near-wilderness experiences. Remote sections of the trail are especially enjoyable to those who value solitude. A journey through secluded areas offers outstanding scenery as well—for example, in Michigan, Pictured Rocks National Lakeshore's 42 miles of the trail follow Lake Superior's shore and features Grand Sable

Dunes, Twelve Mile Beach, and colorful Cambrian sandstone cliffs. In contrast are the portions which pass through or near villages, towns, and a few large cities. These communities offer access to the trail, lodging and other accommodations, opportunities for resupply for long-distance users, and interesting cultural features.

The North Country NST exists as much for the enjoyment of the casual walker as it does for the challenge of hikers who travel its entire length. Whether used for an afternoon of walking, a day of crosscountry skiing, or a week or month of backpacking, adventure is found along forested pathways, marshes and bogs, waterfalls, sand dunes, tallgrass prairies, old logging railroad grades, lighthouses, Revolutionary War forts, and small rural communities. From the Missouri River in North Dakota to the shore of Lake Champlain in New York, diverse features along the trail communicate how the land was formed, how it has been settled, and how it has been used and altered by man.

Chapter 1

TRAIL HISTORY AND PHILOSOPHY

At a time when our nation was building a bridge to the moon, others envisioned trails crossing our continent. A need for trails and other types of recreation facilities was clearly evident in the post-war boom. The Outdoor Recreation Resources Review Commission was created to assess this need and in 1960 their survey ranked walking for pleasure as the second most popular form of recreation.

On February 8, 1965 President Lyndon Johnson delivered the Natural Beauty Message. He called for development and protection of a balanced system of trails—in the Nation's metropolitan areas as well as in the countryside—in cooperation with state and local governments and private interests. In part, the President said: "We can and should have an abundance of trails for walking, cycling, and horseback riding, in and close to our cities. In the backcountry we need to copy the great Appalachian Trail in all parts of America." In response to President Johnson's message the Secretary of the Interior directed the former Bureau of Outdoor Recreation to spearhead a nationwide trails study.

By December 1966 the study concluded with the report "Trails for America." It provided guidance and definition: "A standard of excellence in the routing, construction, maintenance, and marking consistent with each trail's character and purpose should distinguish all national scenic trails. Each should stand out in its own right as a recreation resource of superlative quality and of physical challenge." National scenic trails are to be landbased (i.e., not waterway routes) and generally are to be continuous. The report also called for federal legislation to foster the creation of a nationwide system of trails. (Earlier that year the Secretary of the Interior had submitted proposed legislation to Congress to accomplish this task.)

Of the three categories of trails proposed, the report heavily emphasized national scenic trails and the role that they should play in meeting the nation's needs for trail recreation. The Appalachian Trail was to become the first national scenic trail. Three others were also proposed: Pacific Crest, Continental Divide, and Potomac Heritage. Five other routes were identified for further study: Lewis and Clark, Oregon, Santa Fe, Natchez Trace, and North Country.

Congress spent two years working on the national trails legislation, with input from public and private interests. On October 2, 1968, President Johnson signed into law the National Trails System Act (Public Law 90-543, 90th Congress). A process was thus set in motion to create a network of national scenic and national historic trails. The call of hikers and others who sought retreat from a hectic world was answered. Opportunities to explore America along scenic pathways, at a walking pace rather than at freeway speeds, became a reality. The act established two national scenic trails—the Appalachian and the Pacific Crest—and requested studies of 14 other routes, including the North Country Trail.

The 14 original studies, and others authorized since 1968, have been completed. The North Country National Scenic Trail (NST) was designated and added to the National

Trails System on March 5, 1980 (Public Law 96-199). Today, there are eight national scenic trails in various stages of development.

As stated in the National Trails System Act:

SEC. 3. (a) The national system of trails should be composed of the following:

(2) "National Scenic Trails, established as provided in Section 5 of this Act, which will be extended trails so located as to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass. National Scenic Trails may be located so as to represent desert, marsh, grassland, mountain, canyon, river, forest, and other areas, as well as landforms which exhibit significant characteristics of the physiographic regions of the Nation."

The trails community philosophy holds national scenic and national historic trails as the elite of the extended trails. National scenic trails are continuous and provide access to outstanding scenery and natural landscapes, and link significant natural and cultural features by means of simple pathways.

The Appalachian NST generally serves as a model or pattern for the concept of a national scenic trail. Its strong image as a footpath through primarily wooded areas sets a tone for others—the simple pathway and outstanding scenery are considered unifying elements. However, each national scenic trail has a character and identity of its own, influenced by the landscapes through which it passes.

The long-term goal for the North Country NST is to establish a continuous trail that meets the federal legislative intent. It is to be developed and managed as a **premier** hiking trail, nationally significant in its scenic and recreational qualities, and closed to motorized use. Segments which meet this intent and other criteria can be certified by the National Park Service as part of the North Country NST. (Some segments of the trail may be open to one or more non-motorized activities in addition to hiking. However, legitimate resource management activities sometimes require motorized use.)

As a "partnership park," the North Country NST should meet local needs and blend with the character of the landscape. It also needs to exhibit continuity in character, quality, and visual appeal sufficient to distinguish itself as a national scenic trail and offer an experience of higher caliber to its users.

Federal, state, local, and private landowners or managers participate in hosting, developing, and/or maintaining segments of the trail. Public land managing authorities may wish to enter into agreements with private volunteer organizations, to carry out trail development and maintenance activities, while retaining overall management control of

their lands. (These organizations include the North Country Trail Association, the Finger Lakes Trail Conference, Buckeye Trail Association, American Youth Hostel-Pittsburgh, and others). Whatever the arrangements, the national significance and integrity of the North Country NST should be clearly recognized and identified in the management objectives.

GENERAL ENVIRONMENTAL CONSIDERATIONS

National scenic trails should reflect a respect for the land and serve as positive examples which demonstrate that respect. Limitations must not be exceeded in trail development. All those associated with the trail, in any way, should exercise care not to damage the very natural and cultural features that contribute to the beauty and significance of the trail. Everyone has a responsibility, to fellow human beings and to the earth, to treat the land that is temporarily in their care with great respect. By following the points listed below, the integrity of the trail's environment will be protected:

- Applicable laws, regulations, codes and standards will be adhered to.
- Trail designers and developers will accept responsibility for cultural and natural resources and insure that they are protected and/or that unavoidable impacts are mitigated.
- The trail will be designed to lay comfortably on the land. To the greatest extent possible, environmentally benign trail locations will be sought.
- Unnecessarily steep, erodible, and/or dangerous slopes will be avoided whenever possible.
- Wetlands will generally be "skirted" or avoided unless there is a very good reason to enter them—such as bringing the user into intimate contact for interpretive or educational purposes, or there is no other equally feasible trail location.
- Locations of threatened, rare or endangered plants or animals will be identified and protected.
- Trail designers and developers should be sensitive of the trails potential impact on broader habitat areas such as flyways or breeding grounds and the trail corridor should be used to enhance bio-diversity. A constant awareness of the trail's potential impacts should be maintained.

USER EXPERIENCE

Protecting the trail's natural and cultural resources is of utmost importance. Secondly, trail designers and implementers must create the best possible recreational experience for the user. The trail experience is multi-faceted—it offers stimulation of the senses, a

place for learning, a feeling of safety, re-creation for the soul, exercise for the body, and overwhelming satisfaction.

The routing of the trail should stimulate the user. Variety is critical—sameness and predictability should be avoided. Around every bend, at the end of every straightaway, over the crest of every hill, through the bottomlands of every valley a new experience should be found. The sounds made by the water in a rocky brook or of a breeze sifting through a grove of white pine, the familiar smell of apple blossoms along a fence row, the relief of the sudden coolness offered by a deep maple woods on a hot, sultry day, the thrill of an unexpected panorama, or an intensely yellow field of sunflowers filtered through the branches of an oak opening, the imprint of sumac against an autumn sky, all singularly or collectively energize senses and fill memories.

The trail is a place of learning, not only about the geographies and natural communities and individual species, both human and non-human, but a place where opportunities exist for understanding life and connectedness. The trail is rich in history and pre-history, both geologically and culturally. These aspects must be present to all who use the North Country NST so that they have the opportunity to come away from their experience enriched and enlightened.

LOOK OF THE TRAIL

The North Country NST should be easily recognized as a national scenic trail. It is important to maintain the aura, reputation, and national importance associated with the NST designation. The public fully expects this and deserves no less. It is important to maintain consistency throughout the entire length via standardized planning, development, implementation and maintenance. Since this is not currently feasible, the following elements will foster consistency and pride in the trail, and visitors will leave with a positive impression:

- Quality construction of the trail, parking lots, rest areas, bridges and other structures.
- Clear and consistent signage with good attention to detail.
- A well-maintained trail with regular mowing or other vegetative control.
- Timely response to problems created by storms or routine wearing out of the infrastructure.
- Regular cleanup of litter.
- Timely response to public concern on trail related problems.

ACCESSIBILITY

Over the past few decades the number of persons with disabilities participating in outdoor recreation activities has increased dramatically. (It is estimated that over 43 million Americans have some type of major disability.) Recent trends in our society, influenced by federal laws, have enabled persons with disabilities to be actively involved in the mainstream of society and participate in such outdoor experiences as hiking, camping, picnicking, fishing, boating, and water-based recreation. The North Country NST offers a broad spectrum of opportunities for all people.

In this handbook, we refer to three general classes of accessibility—fully accessible, barrier free, and not accessible. Because of the length and nature of the North Country NST, there are segments that fall within each area. (Recreation Opportunity Spectrum criteria applied—see Chapter 2.)

➤ **Fully-accessible**

Portions of new trail segments that will be fully-accessible must be considered during the planning process. Opportunities are most likely to occur at trailheads—especially when a scenic overview or attraction is nearby. Other areas may occur on rail-trail segments. These may provide full accessibility since the proper standards are pre-existing. Ohio's Little Miami Scenic Park segment of the North Country NST is an example. Other fully-accessible segments occur in urban settings where the trail is available for multiple use, such as the segments that follow Battle Creek's Linear Parkway and Petoskey's River Walk.

When a trail segment is fully accessible, it is specifically designed to meet full accessibility standards. Incorporating loop trails to view select sites is suggested. A good source of accessibility standards is *Universal Access to Outdoor Recreation*, by PLAE Inc., MIG Communications, 1802 Fifth St, Berkeley, California 94710. (Further discussion about trail construction and design standards is found in Chapter 4—particularly in Figure 1.)

➤ **Barrier-free**

Barrier-free segments of the trail are more accessible than those classed as not accessible, but are less than fully-accessible portions. Parts of the North Country NST should be developed as barrier-free as is practical. Impediments such as steps, waterbars, fords, stepping stones, corduroy, and unusually narrow bridges all tend to create barriers. These types of barriers are often avoidable by choosing another trail location or construction design. Trail segments should be made barrier-free if all it takes is a little extra work or a slightly different location. However, the desired character of the trail must be retained. Standards discussed in Chapters 4 and 5 are specifically designed with the barrier-free objective in mind.

➤ **Not Accessible**

Most segments of the North Country NST are not fully-accessible or barrier-free. Existing natural elements, the remote character of the trail, the use of native material for structures, and respect for the contours of the land all serve as reasons why much of the trail will fall into the not accessible class. Steepness, rocks, and roots are just a few natural impediments. These cannot be altered or eliminated without drastic measures which are insensitive to the environment or destructive to the desired character of the trail.

Chapter 2

RECREATION OPPORTUNITY SPECTRUM: A VEHICLE TO TRAIL LAYOUT AND CONSTRUCTION

BACKGROUND

The great outdoors offers a tremendous diversity of recreational opportunities. Equally diverse are the public's recreational interests and needs. From city parks to pristine wilderness, people look to the outdoors to satisfy their desires, challenge their abilities, and meet their expectations in a particular activity and setting. Recreation researchers have long recognized the importance of the relationship between expectations and settings. Many have suggested that managers should provide a range of opportunities to best serve the diversity of public expectations (Clark and Stankey 1979).

To serve as a framework for inventorying, planning, and managing recreation resources the USDA-Forest Service developed the **Recreation Opportunity Spectrum (ROS)**, in accordance with the Forest and Rangeland Renewable Resources Planning Act of 1974 (PL 93-378), amended by the National Forest Management Act of 1976 (PL 94-588). ROS allows accurate stratification and definition for classes of outdoor recreation environments. It can be applied to all lands, regardless of ownership or jurisdiction (USDA-Forest Service 1982).

Since the time of its development, ROS's use has become widespread among different agencies and groups. The following federal legislation, which requires consideration for accessibility by people with handicaps, documents acceptance for a system such as ROS: Architectural Barriers Act of 1968, Rehabilitation Act of 1973, and Americans With Disabilities Act of 1990 (ADA). The current task force working to respond to ADA requirements is basing their recommendations on the ROS. A logical step for the North Country NST's Handbook for Trail Design, Construction, and Maintenance is to follow ROS. Doing so demonstrates responsiveness to accessibility guidelines depending on the trail setting and provides a common ground for determining degree of trail development.

ROS EXPLAINED

The current ROS of the USDA-Forest Service divides recreation settings into six broad categories which, at times, overlap—urban, rural, roaded natural, semi-primitive motorized, semi-primitive non-motorized, and primitive. In the interest of simplicity and considering the nature of the North Country NST, these are combined into four categories. The recreation settings used throughout the remainder of this handbook are: urban, rural/roaded natural, semi-primitive, and primitive.

Many people associated with the North Country NST tend to think of and manage the trail as if it were semi-primitive throughout when, in fact, the surrounding degree of land development is inconsistent with this more restrictive level of management. At times it is difficult for volunteers and local trail managers to determine the class of an area so that the appropriate trail standards can be applied.

- **Urban** settings are characterized by substantially urbanized and modified natural

environments. Although sites may still appear natural, vegetation is often manicured. Renewable resources (timber, grass, etc.) are modified and utilization practices are designed to enhance specific recreation activities. Sights and sounds of humans on-site are predominant. Large numbers of visitors can be expected, both on-site and in adjoining areas. Facilities for highly intensive motor vehicle use, parking, and mass transit are often available.

Recreation sites and opportunities are convenient and the probability of experiencing contact with individuals and groups is high. Experiencing natural environments, having challenges and risks associated with the natural environment, and using outdoor skills are relatively unimportant. Opportunities for competitive and spectator sports and for passive use of highly human-influenced parks and open spaces are common.

The areas along the North Country NST that offer a fully developed *urban* environment are limited. However, there are places where the trail passes through quaint little towns or medium to large-sized cities. The trail may follow a sidewalk or other highly developed linear parkway trail such as those portions through Lisbon (OH), Mackinaw City (MI), and Valley City (ND), or where it follows developed urban trails such as Battle Creek Linear Parkway (MI) and Petoskey Riverwalk (MI).

- **Rural/Roaded Natural** settings are characterized by a more natural appearing environment with moderate evidence of human activity. Interaction between users is low to moderate. Resource modification and utilization practices are evident but harmonious with the natural environment. Conventional motor vehicle use is common on paved, graveled, and unsurfaced roads.

An approximately equal chance of experiencing contact with other user groups and experiencing isolation from the sights and sounds of humans exists—though the chance for isolation will be much greater in roaded natural areas. Opportunities for a high degree of interaction with the natural environment are common. The challenge and risk associated with more primitive types of recreation are not very important. Practice and testing of outdoor skills are important.

Most of the North Country NST passes through this combined ROS setting. The rural setting has been combined with the roaded natural setting for simplicity because the standards for trail construction are the same in these two settings. However, there are distinct differences between the two landscapes. Generally, the typical flat, rolling, and even hilly farmland and pastoral settings are *rural*. More evidence of human activity (e.g., hay bales, plowed fields, farmhouses, and more frequent road crossings) is present. A degree of isolation is experienced when the trail passes through the isolated woodlots generally interspersed throughout the landscape. Examples of rural ROS are farmlands of southern

New York, western Ohio, southern Michigan, western Minnesota, and vast open areas of North Dakota.

In contrast, *roaded natural* settings are more typical of the predominantly forested areas. Most of the national forests such as Allegheny (PA), Wayne (OH), Manistee (MI), and expansive state, county, and private forests in northern Michigan, Wisconsin, and Minnesota, fall within this setting.

- **Semi-Primitive** settings are predominantly natural environments of moderate to large size. Interaction between visitors is low but there is often evidence of other humans. The area is managed in such a way that the minimum on-site controls and restrictions present are subtle. Motor vehicle use may be prohibited in some semi-primitive areas. Timber harvesting is often present but harvest intensity and schedules are modified. Size of cut areas are smaller, timber harvest may be restricted to once per 20-25 years rather than the normal ten years, access roads are less developed and farther apart, etc.

Moderate to high probability exists for isolation from the sights and sounds of humans. Opportunities are present for independence, tranquility, closeness to nature, and self-reliance through the application of outdoor skills in a setting that offers a high degree of interaction with the natural environment.

Along the North Country NST, there are a few areas that have been formally designated by the agencies as semi-primitive, such as Red Bridge Semi-Primitive Area on the Manistee National Forest (MI). Within the national parks, the term "backcountry" essentially equates to semi-primitive. Some of the trail route through Pictured Rocks National Lakeshore (MI) is backcountry (semi-primitive). Outside of the federal lands, there may be other areas where management is less intense and more semi-primitive. Less developed portions of some state parks, such as the western portion of Itasca State Park (MN) may fall into this setting.

Generally, the semi-primitive ROS class pertains to an area or block of land that is larger than the strip of 1000-foot wide trail corridor. However, a corridor that averages 1000 feet wide and spans a significant distance along the trail could be designated as semi-primitive, particularly on federal lands. Areas of this nature exist along the Appalachian NST, and may be the best long term solution for trail protection.

Whether or not an area is semi-primitive is often a judgement call based on factors such as acreage of undeveloped area, road density, degree of timber management, the intensity of sounds and sighting of traffic, or development observed from the trail.

The following criteria may help determine if the lands in question are

managed as formally designated areas and distinguish them from the more typical forested (roaded natural) areas.

- The area has a definable boundary (roads, streams, etc.).
 - The area has at least 2,500 contiguous acres.
 - Road densities are low—averaging one mile per square mile.
 - The area is generally under one ownership or, if multi-owners, there is management commitment that the area will be managed as a unit.
 - Timber management is of low intensity and frequency. Evidence of management activities is relatively low, consisting of scattered, small, recently regenerated stands.
 - Low standard roads—often gated at the periphery of the area.
 - There is low interaction between users in a predominantly natural or natural appearing environment.
 - Boat and canoe access is generally over trails of varying lengths. Normally, boats and canoes are carried in from the periphery of the area. Some interior lakes may not have developed access.
 - Recreation is low key, light-on-the-land in nature and generally dispersed. Low impact activities such as hiking, hunting, crosscountry skiing, etc. are emphasized. Campsites are dispersed and primitive in nature. Highly developed bicycle or ORV trails are not allowed, but some areas may allow for occasional motorized use.
 - There is owner/manager commitment for this type of management.
- **Primitive** settings are characterized by an unmodified natural environment of fairly large size. Interaction between users is low and evidence of others is minimal. The area is managed to be essentially free of man-made "improvements" and facilities. Motor vehicles and other motorized equipment are not permitted.

Experiencing isolation from sights and sounds of humans is probable. Opportunities for independence, closeness to nature, tranquility, and self-reliance through the application of outdoor skills abound and present high degrees of challenge and risk.

Only formal wilderness areas fall under this ROS setting. These are normally federally designated but can be state designated. Along the North Country NST several are encountered: High Peaks in the Adirondack Forest Preserve (NY), Rock River Canyon Wilderness on the Hiawatha National Forest (MI), McCormick Wilderness on the Ottawa National Forest (MI), Porcupine and Rainbow Lakes Wildernesses on the Chequamegon National Forest (WI), and, perhaps some day, the Boundary Waters Canoe Area Wilderness on the Superior National Forest (MN). The lowest level of trail development exists in these areas.

Chapter 3

TRAIL LAYOUT

BASIC LAYOUT

The North Country National Scenic Trail shall have a treadway that is enjoyable and reasonably safe for hiking. The trail shall be designed, constructed, and maintained to minimize its impact on the natural resources of the surrounding area while taking advantage of scenic, educational, and cultural opportunities. Basic principles to consider are:

- Trail is in a visually pleasing corridor that incorporates as many scenic and other points of interest as possible—including scenic vistas.
- Trail provides for diversity of views and experiences by passing through a variety of geographic, vegetative, and cultural features.
- Trail incorporates existing trails when possible **if** they meet or can be modified to meet the basic standards of a national scenic trail.
- Trail provides connections to other trails, recreation facilities, parks, resource and cultural areas, communities, etc.
- Trail requires minimum maintenance while providing ecological variety.
- Trail avoids the more developed portions of rural areas.
- Trail reflects the mood and atmosphere of the area it traverses.
- Trail has local landowner support.
- Trail has the necessary support facilities.
- Trail makes maximum use of public lands and other large holdings—provided that other desirable trail qualities are present. Public land should not be used solely because it is there. For instance, if it is entirely wetland there is probably a better location.

DESIGN CONSIDERATIONS: USER

USE POLICY

The 1982 comprehensive management plan for the trail specifies the following:

All segments of the North Country NST shall be open to travel by foot, i.e., hiking and backpacking. Other nonmotorized uses, including bicycling, horseback riding, cross-country skiing, snowshoeing, and jogging, may be permitted on a given segment according to the desires and policies of the managing authority responsible for the segment.

Multiple use of the trail for activities other than hiking, those which can take place during the same season and/or those which take place during other seasons of the year, should be considered. A managing authority responsible for a relatively short segment of the trail should consider the uses permitted on adjacent segments of the trail and consult with the responsible managing authority when considering additional uses on its own segment.

Uses other than hiking should be permitted only if the activity will not cause significant deterioration of the trail and surrounding environment and the activity can be safely accommodated, i.e., the trail is constructed according to accepted standards for that activity.

Some have misinterpreted the first two statements to mean that the NPS encourages as much multiple use as possible. Instead, the policies convey the fact that the North Country NST, like the Appalachian NST, is primarily intended to be a hiking trail. However, recognizing that the route of the North Country NST incorporates many existing trails, and the fact that the trail will only exist through the voluntary cooperation of others who see the trail as a help to meeting their own objectives, the decision of permitting other non-motorized uses was left to local managing authorities.

Nevertheless, the policy cautions against permitting other uses which might physically damage trail resources or which the trail was not designed to safely accommodate, including safety of the primary users—hikers. The mention of bicycling as a non-motorized activity which might be permitted by a local managing authority was primarily intended to accommodate existing or future rail-trail segments. It was not intended to specifically permit or encourage bicycle use on a section anticipated as, in most cases, a simple footpath. Bicycle use of simple footpath segments was not originally contemplated by the management policies presented in the plan. The mentioning of horse use was intended to allow the North Country NST to utilize segments already developed that permitted horse use, such as the Shore-to-Shore Riding and Hiking Trail (MI), some rail-trail segments, and a few other hardened trail segments. It was not intended to encourage horse use on the typical woods and field footpath segments, most of which lie on sandy, organic, or occasionally wet soil which cannot handle horse traffic without significant trail tread and resource deterioration.

The following paragraphs reflect the NPS perspective, as overall administrator of the trail on bicycle and horse use. These statements are based on the policies in the 1982 plan and the intent of those policies as explained above.

We believe that bicycling is best accommodated as a use on the North Country NST on rail-trail segments and on other short sections of hardened surface (1) specifically designed for wheeled vehicles, where bikes will not damage natural or trail resources, (2) that are parts of previously established multiple use trails that become part of the North Country Trail route, (3) where bicycles can be physically restricted to the designated section, and (4) where bicycle use will not adversely affect the recreational experience of hikers. These conditions generally are not found on the typical, single-track, forested and rural segments of the North Country Trail.

We believe that horse use is best accommodated on the North Country NST on those segments of trail which have been specifically designed and hardened to withstand such use. These conditions generally are not found on the typical, single-track, forested and rural segments of the North Country Trail. Additionally, horse use is perhaps an acceptable use on most trail segments within the prairies and grasslands of North Dakota and western Minnesota, where the character of the North Country NST changes from primarily a wooded experience to primarily a prairie (big sky) experience, passing through many miles of farms, ranches, and grasslands. Here, the flavor of the trail is more "western" than "eastern" and the dryer soils are more forgiving of horse traffic than in wetter, forested areas. In these areas, there may also be opportunities to establish parallel hiking and horse trails, such as along the McCluskey and New Rockford Canals—horses on the old access road and hikers on a foot trail within the boundary of the canal right-of-way.

The types of use that are allowed on a segment of trail have major implications for the level of maintenance required and the amount of resource impact that must be mitigated. Foot traffic causes the least impact on the environment. Bicycles cause greater impact, and horses even more.

Investigation of sections where bicycle use is considerable shows that bicyclists tend to ride around waterbars, thus widening the trail. Loosening of the trail tread occurs on uphill and downhill portions, accelerating erosion. Trail tread in sandy soils is churned up even on level stretches, making it unpleasant for hikers. Horses cause either muddy conditions or loose sandy conditions—depending on the soils that are present. Both resultant trail conditions degrade hiker experience because they make for unpleasant, difficult hiking. Horses also damage trail structures (e.g., steps, waterbars, etc.) built to withstand the needs of hikers. When horses cannot cross small bridges over streams or wetlands,

they waded through these sensitive riparian areas causing degradation to the water resource.

In regard to motorized use, the National Trails System Act is very clear. It defines national scenic trails as non-motorized trails. Section 7(c) of the Act (16 U.S.C. 1246(c)) limits the types of uses by stating, "the use of motorized vehicles by the general public along any national scenic trail shall be prohibited" This restriction prohibits the use of trailbikes, snowmobiles, ATV's, etc. on the trail. It also prevents the recognition of marked routes of public roadways as the official route of the trail. Following short sections (less than one mile) of public road is permissible in some circumstances, such as when it is necessary to use a public vehicular bridge to cross a major river.

OPEN SPACE

It is important to route the trail so that occasional portions are in the open. This provides stimulating experiences: the user can see the sky, feel the sun and gain a contrast to the woodland experience. It enables the user to view the landform and natural features from a variety of perspectives—both from long distances and more intimate ones. Some routing might be through the middle of a large open space while some might be along the edge. Other routings might take the user into the middle of that same space, then over into the woodland for a short distance, and then back out into the same open space along the edge.

It is desirable that the trail provides a representative view of the area through which it passes. In North Dakota, western Minnesota, and the agricultural portions of the other states, high percentages of the landscape surrounding the trail are, or were, historically open. In these areas sizeable portions of the trail should pass through or next to open areas. In order to provide variety, wooded areas should be sought. In other areas such as southern Ohio, northern Michigan, and Wisconsin, the landscape is almost entirely forested. In these forested landscapes, the trail should be predominantly forested and incidental openings and old fields sought for variety.

While variety is important, wooded areas are most desirable for hikers and volunteers performing trail maintenance due to the heat intensity incurred in open areas. The amount of maintenance required in open areas is greater because the trail must be mowed several times during the growing season. Trail maintenance through wooded areas is less intense and longer lasting. In agricultural areas, farmers are not likely to want the trail to pass through the middle of their cultivated fields. Greater acceptance can be achieved by routing it along fence rows or through woodlots. Benefits of open areas can be provided by routing the trail close enough to large openings to see into them, yet staying far enough in the woods so as to not interfere with farming practices and also avoid the vigorous growth of annuals and perennials found in the opening's sunlight. If a

public trail corridor becomes reality, a vegetative management plan that considers both historical and current vegetation will be prepared.

TERRAIN

It is important that users experience the full array of terrain found along the corridor. The route should be in continuous transition. Portions of the trail should take the user along ridge tops, while at other times the trail should be routed through more intimate valleys. The lengths of upland, lowland, etc. should also vary and should be influenced by the natural landform available. The user should also have some experiences left to the imagination. Every hilltop should not be climbed, nor every valley be entered. When designing the route, care should be taken to avoid overly steep grades where environmental damage is likely. It is important to go with the flow of the landforms. Those too steep or erodible should be avoided.

GLACIAL FEATURES

Glacial features are encountered along parts of the North Country NST. Users should be brought in contact with glacial features because they add interest, variety, and offer opportunities for interpretation. The user should be able to experience glacial features from a variety of perspectives incorporated in the trail layout (e.g., enabling the user to traverse the entire length of one esker, and then parallel another esker from a sufficient distance to allow for good viewing of the landform). The integrity of glacial features such as kames should be protected. Trail development on kames should be avoided because the soils are too fragile and the slopes are generally too steep. Trails should never compromise the integrity of outstanding glacial features. Variety is important—too much routing along the same types of features can result in redundancy and boredom.

DESIGN CONSIDERATIONS - ENVIRONMENTAL

Use is light in many locations along the North Country NST, and even poorly designed trail may cause little impact on soils, water, sensitive plants and animals. However, in high-use areas environmental impact is of more immediate concern. Heavy use can destroy the soil structure of the trail and lead to soil erosion, with possible siltation of streams and eventual fish habitat destruction. It can also turn wet areas into muddy ones, trample plants, etc. One of the early signs of damage is an increased prominence of small stones in the trail tread because the surrounding soil particles have been washed away. As time passes, the stones (paving) in the trail become progressively larger in size as water carries away trail material—soil particles first, then sand and stones. If the situation is not corrected small rivulets appear, followed by ditches and gullies.

The trail must be designed to withstand heavy use without destroying the environment.

It must cross the land without causing soil erosion, path widening, vegetative trampling, or spoiling the natural qualities of the area. Once the trail is designed, it must be built properly to achieve environmental safeguards and maintainability of the trail.

Sustainability and durability are key considerations for all North Country NST efforts. To design and build trail correctly at the onset is a wise investment and more economical than to repair or relocate the trail once damage occurs. Facilities which were constructed by the Civilian Conservation Corps (CCC) in the early 1940's are still used. Many of these (including picnic shelters, lodges, trails, stone work, etc.) are as sound today as they were when they were first built because the CCC used quality construction techniques and materials. Trail construction efforts should pattern the quality CCC examples. Using rocks for trail retaining walls requires more effort and expertise than using logs, but the result is a much more durable wall. Sidehill trail construction is more labor intensive than constructing trail directly up the slope but it is much less erodible and sound.

On state or federal lands, an environmental assessment (EA) or similar document which meets the intent of the National Environmental Policy Act (NEPA) is prepared prior to selecting the trail route or doing actual construction. NEPA compliance is also required on projects that use federal funds or when federal officials are doing the planning. The process involves specialists who understand environmental impacts and how to minimize them. Ideally, the environmental assessment process is adopted prior to action anywhere along the trail. When this cannot be done, trail advocates should take positive steps to minimize potential impacts. The scope of this book does not provide a detailed description of all techniques used to protect the environment. However, the general guidelines listed below should be followed (this list is not all-inclusive):

- Design considerations for trail layout fall into one of two major categories: User and Environmental. These may often be in conflict with each other. When conflict exists, err should be on the side of the environment rather than on the side of user convenience or desire.
- When locating or relocating a trail, key places where the trail must pass should first be identified. These could be campgrounds or campsites, scenic view areas, the best stream crossing sites, historical sites, connection spots with other trails, water sources, etc. Next, these locations should be marked on a topographic map or aerial photo. The best way to connect these features, considering slope, soils, and other factors should then be determined .
- Local experts and agency officials should be contacted to learn what fragile soils, threatened or sensitive species, cultural and historical resources, and other opportunities or concerns occur in the corridor. This consultation process should determine if an EA is necessary and minimize passing through any areas of concern.
- In order to avoid damage or destruction of historic and prehistoric resources, the

project must comply with the requirements of the National Historic Preservation Act and the Archeological Resources Protection Act when it occurs on state or federal lands **or** when it involves federal money or personnel. Project approval regarding historical and archeological concerns usually rests with the State Historic Preservation Office (SHPO).

A cultural resource survey conducted by trained archaeologists is usually required prior to any earth-disturbing activity. In some states an agreement is reached with the SHPO to wait until the initial trail is established before doing the survey, because:

- trail construction normally involves a minimum of earth disturbance,
- most construction is done by hand tools, and
- slight adjustments to the actual alignment are made during the actual construction (to avoid trees, boulders, etc.).

However, whenever more than minimal earth disturbance is contemplated (e.g., when constructing a parking lot, digging footings for bridge abutments, etc.), an archeological survey and SHPO approval is required **prior** to project initiation.

- Quality of trail construction plays a significant role regarding impact on the environment. When a trail is located and constructed so that it requires minimal maintenance, there is less present and future environmental impact. Considerations such as adherence to slope, proper drainage, etc. are important factors.
- The standards for the trail, trail structures, and support structures detailed in Chapters 4, 5, and 6 are designed to protect the environment as well as the user. They should be followed closely to ensure environmental protection.

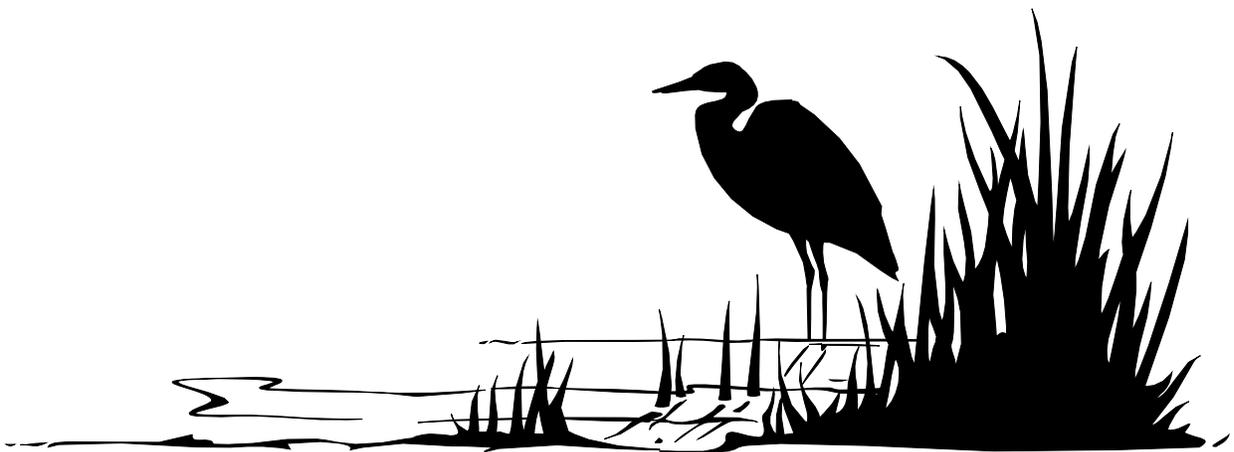
SOILS

When locating the trail, choices must be made between routes that provide more or less soil (trail) stability. The key to locating a trail that is stable and minimizes environmental damage is to find the most stable terrain connecting the key trail

points (see Design Considerations - Environmental section). Areas of heavy, saturated soils or shallow soils should be avoided whenever possible. When the trail must pass through these areas, puncheon or boardwalk should be used (see next section for more detail). Deterioration of the trail from erosion and saturation can be dramatically reduced by designing and constructing the trail on stable terrain.

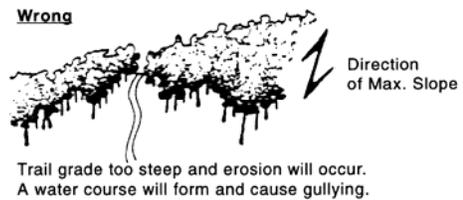
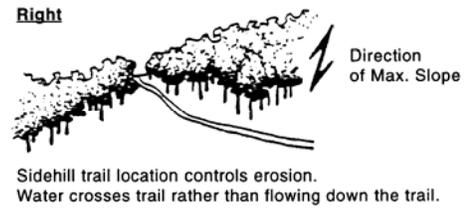
WETLANDS

Wetlands are the transition between open water and dry, upland terrain. The North Country NST passes through wetlands in all seven states—extensively in the Great Lakes region. Defined as "areas with shallow standing water or seasonal to year-long saturated soils," they can be subdivided into a number of categories such as sedge meadow, shallow marsh, deep marsh, shrub swamp, wooded swamp, bog, etc. Wetlands are fragile sites and often contain an abundance of sensitive species such as orchids, pitcher plants, and other unusual plants and animals. Passing through wetlands presents obvious problems—soil stability, damage to sensitive species, the possibility of changing the natural water levels, etc. For these reasons, wetlands are usually avoided. However, wetlands can provide variety and interest to the trail, and it may be desirable or even unavoidable to incorporate them on occasion. When it is desirable to cross a wetland, do so at its narrowest point and incorporate an appropriate trail structure such as puncheon or boardwalk. Most states require permits for altering a wetland. Appropriate officials should be contacted prior to any wetland activities.



SLOPE LOCATIONS

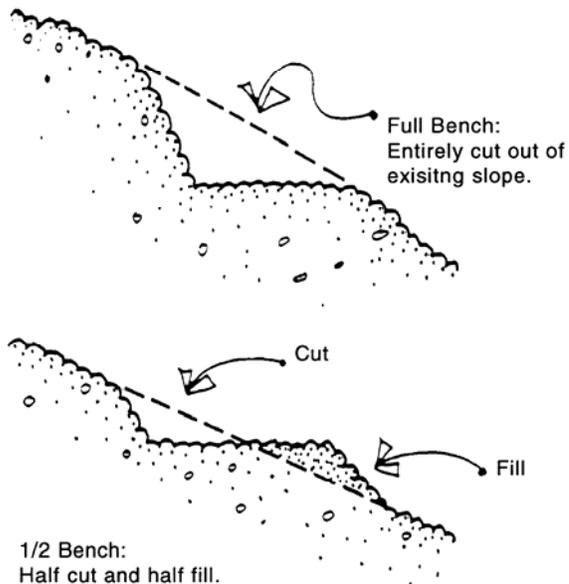
Another key factor in determining the stability of a trail is slope location. The best way to prevent erosion in hilly terrain is to construct the trail on sidehill locations and maintain moderate grades (see Chapter 4). Even on moderate slopes, the trail should never go straight up the slope of the hill. Wending the trail across the face of the hill, gradually gaining altitude by using sidehill trail construction and broad, sweeping switchbacks, provides for a more stable trail because surface water does not run down the trail. Instead, it crosses the trail and disperses on the downhillside. Sidehill construction makes it easier to maintain moderate grades, further reducing erosion.



Sidehill construction requires more skill and initial work. However, in the long run, it provides the most stable trail, less environmental damage, and less work. When employing sidehill trail construction,

it is important to do the job properly. Poorly constructed sidehill trail can cause difficult hiking and sore ankles if the hiker has to walk with one leg higher than the other. The trail tread must be excavated so that it is nearly level with only a slight outward pitch to allow water to cross the trail and continue downhill. This requires builders to construct either half- or full-benched trail tread. A half-benched tread (sometimes called balanced tread construction) means that half of the tread is on solid excavation and half is on the fill. Full-bench tread construction means that the entire tread is on a solid excavated area.

Typical Sidehill Construction

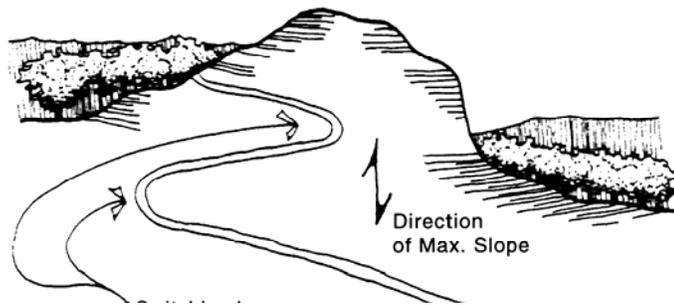


Whenever possible, a full-bench tread should be constructed because it is more stable. The excavated soil is allowed to "waste" below the trail and does not become part of the trail tread. Other labor-intensive techniques, such as rock or log cribbing, may be required in steeper areas.

Maintaining a moderate grade when laying out a trail through hilly terrain can be challenging. Taking the time to locate and flag the proposed route is a time consuming but important first step. Topographic maps should be used to locate key points that the trail must pass. These points could include vistas, campsites, stream crossings, etc. Once key points are identified, a line should be flagged to connect them, while attempting to stay within the slope guidelines shown in Figure 1 (Chapter 4). This flag line may have to be moved several times before the best route is located. This step should not be abandoned in discouragement. It can save future maintenance headaches. (See Appendix 4 regarding eye level survey techniques.)

Several existing trails were laid out without considering slope guidelines. As sections of these trails become problem areas, it may be easier to relocate sections rather than repair the poor location.

Switchbacks are one method that can be used to maintain the grade of the trail while gaining the required elevation—especially when there is limited working area. Switchbacks should generally be minimized in number and frequency because they are difficult to construct and maintain, lengthen the trail, are boring to walk, are difficult to drain, and are often shortcut by hikers—thus increasing erosion problems. A trail with switchback layout is enhanced by increasing the length of trail between switchbacks into grand sweeps and by varying the length and placement of adjacent switchback legs.

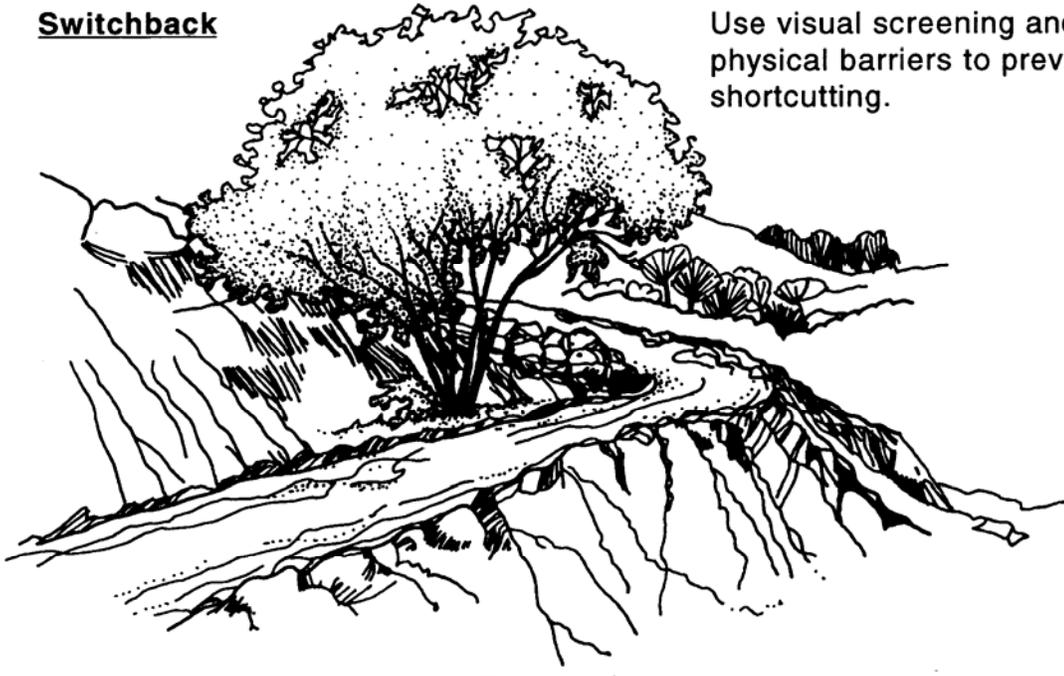


Proper switchback construction requires specific skills (details can be found in Appendix 1). The manner in which switchbacks are placed on the land is critical to creating a maintenance-free section. They must provide the easiest, most attractive route for ascending and descending so that hikers do not shortcut them. Turns should be flat. This requires careful location or additional construction of cut and fill sections or retaining walls. On sideslopes of less than 20 percent, the switchback should be treated as any other section of the trail by following a long, radius curve. If the centerline grade is steeper than desired, the radius should be shortened and a conventional 8-foot radius switchback should be built, with the upper and lower legs meeting at the radius point. Excavation

should start along the upper slope line of the upper leg and be carried down to grade at the radius point before starting the lower leg. To provide proper drainage, the upper leg should be cut well beyond the radius point, then shaped and the turn area completed. Whenever possible, the frequency and visibility of turns should be limited to avoid shortcutting. The layout should vary.

Switchback

Use visual screening and physical barriers to prevent shortcutting.



Switchback legs should be situated so that they are not visible from each other. Turns should be looped around large boulders or fallen trees, or where vegetation obstructs the view of an adjoining leg. If this is not possible, rock or log barriers should be placed between the upper and lower legs of the switchback. To prevent cross-cutting inside the switchback, 15 to 30 feet of barrier should be installed (placed back from the turning point).

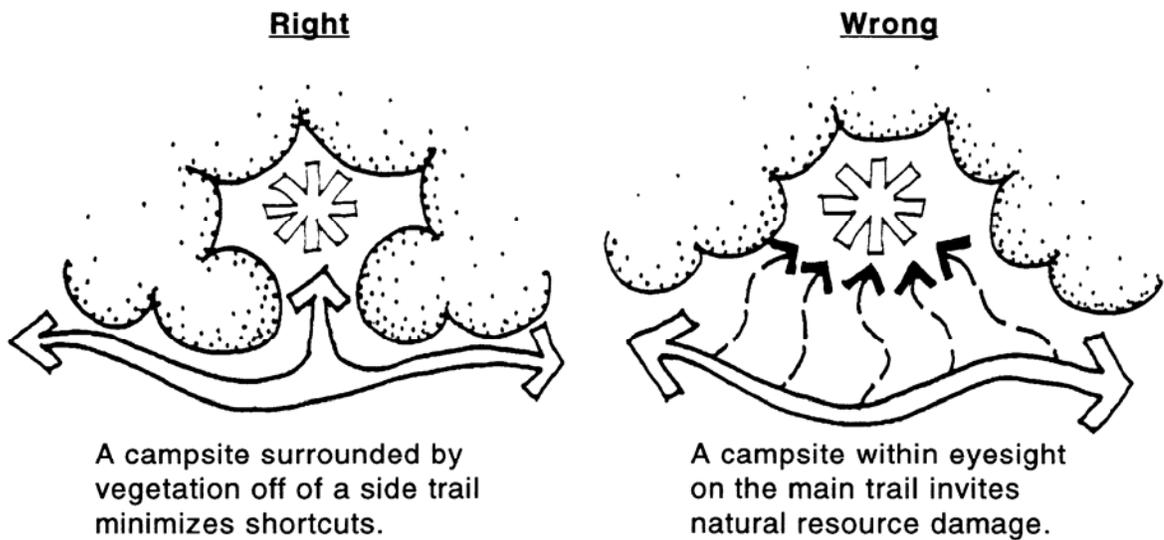
SPUR TRAILS

These are dead end trails that provide access to facilities or features near the main trail such as viewpoints, campsites or shelters, and water. Spur trails can also lead from a trailhead to the main trail. They can enhance the recreation experience by allowing visitors to see interesting features that the main trail misses, and help control overuse of sensitive sites. They force the hiker to make a conscious choice to leave the most direct (main trail) route and double back to it before continuing their journey.

In almost all cases, it is desirable to locate campsites and shelters on a spur trail—out of sight of the main trail. This eliminates widening and trampling of the

approaches to the campsite and provides for less disturbance to campers already using the site. When a campsite/shelter is located within sight of the main trail, hikers gradually widen the approach to it and enlarge the campsite itself by taking shortcuts and destroying the vegetation. If the hiker can see or hear others using a campsite/shelter and the terrain is open, he/she will shortcut.

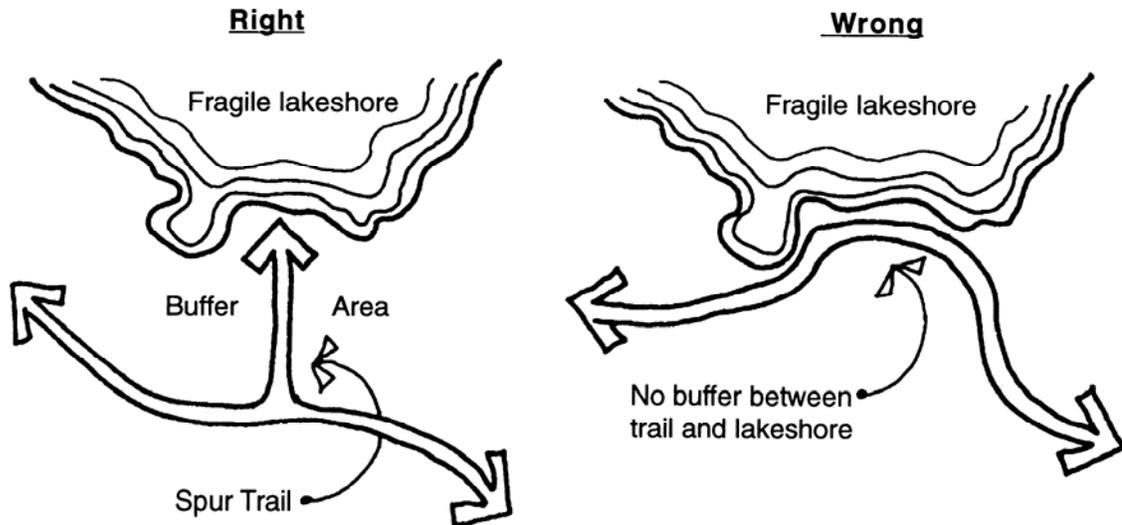
To minimize shortcutting, trail alignments and junction locations that make the established trail the easiest, shortest, and most logical route, should be used. An established campsite/shelter (especially in heavy use areas) should be at least 200 feet off the main trail unless rugged terrain or ownership patterns limit this distance. Less used sites can be a shorter distance away depending on the circumstances.



Drinking water sources, pond and lake shores, fragile escarpment edges, and other areas containing fragile plants or unstable soils are often protected by bypassing the feature. However, if this is done, much of the interest of the trail will be missed and hikers will establish their own impromptu trails to reach the site anyway—often causing more impact.

The best compromise is to limit access to the least sensitive part of the attraction via a spur trail. This reduces the impact by limiting the access to a single point and potentially reducing the number of users. If an existing main trail is causing undue impact to a sensitive area, relocating the trail away from the feature and providing access via a spur trail is a consideration. The main trail should be kept far enough away from the attraction so the sensitive area is not obvious

and impromptu trails do not develop. A new location should be selected where views of the feature will be available from the main trail to satisfy the user, further reducing the number that follow the spur trail.



In order to provide variety and interest along the main trail, spur trails are not always recommended. The main trail can be routed past features that can withstand more impact. Reduction of feature overuse should be tried first by better trail construction, moving the trail to a more stable terrain nearby, or educating users. A balance between the environment and recreation is the goal. However, when questionable conditions occur, the environment should have priority.

Chapter 4

STANDARDS FOR TRAIL CONSTRUCTION

The objective of trail standards is to ensure a consistent look without compromising local initiative, a high standard of quality without over-building, a basic level of safety without removing all risk, accessible portions without compromising the character of the trail, and environmental and resource protection. Standards were developed to meet these objectives without compromising the character of the trail or imposing undue hardship upon those who maintain the trail. Whenever it is possible to retain the foot-trail-through-the-woods character, but still allow a very determined, mobility-impaired individual to get through simply by increasing trail width by an inch or two, it should be done. There are case-by-case exceptions, but every effort should be made to conform to the trail standards when building or rebuilding trail.

The North Country NST passes through a variety of recreation settings (ROS). Therefore, the trail should not and will not look exactly the same from end to end. It is not appropriate to build the trail to urban standards in a semi-primitive setting, nor vice versa. For this reason all standards are based on the ROS setting. Consistency is achieved through signing, blaze color, and the fact that a segment occurring in a particular ROS setting (roaded natural, semi-primitive, etc.) will look similar to a segment in another area that is in the same ROS setting.

Figure 1 on page 33 summarizes the desired trail design standards. If a trail segment is significantly below these standards, it should be gradually improved. However, if no attempt is made to rectify the situation, it may be decertified or closed. Whenever a portion is being reconstructed or receiving heavy maintenance, attempts should be made to bring it up to standard. Although these guidelines do not prevent a particular trail segment from exceeding desired standards, it should not be assumed that doing so is always desirable. Routinely exceeding the standards will adversely impact the character of the trail and hiker experience.

Exceeding trail standards in selected locations may be appropriate, such as the trail segment in the Little Miami Scenic Trail (OH)—a converted rail-trail that accommodates multiple use and is designed as fully-accessible. (See Figure 1.)

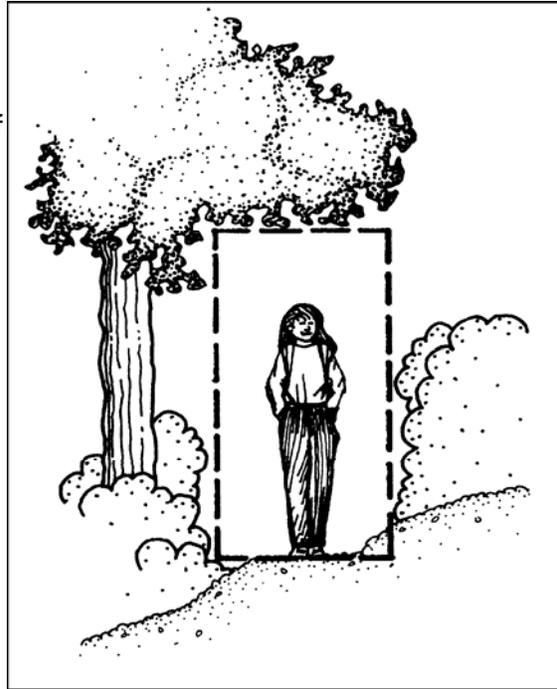
TREAD WIDTH

Tread width refers to the actual walking surface of the trail—whether native soil, grass, or surfaced. Initial tread should be constructed or smoothed to this standard. In less used areas the bare tread may gradually transform into a tread that needs to be mowed. This is acceptable as long as the basic underlying, smooth structure is still in place.

CLEARING WIDTH

Clearing width is the area kept free of brush, limbs, briars, tall grass, weeds, and other obstructions which would slap against the hiker or their pack, or soak them following a

rain or heavy dew. In heavily wooded areas, the clearing width is normally maintained simply by pruning limbs. Here, the area between the edge of the tread and the edge of the clearing is normally leaf litter or short herbaceous plants. While four feet is the average standard width, some variation is allowed and encouraged—it is visually appealing and often more sensitive to adjoining natural resources. In wooded areas there are occasions when it is desirable to narrow the clearing width in order to route the trail between two large, visually interesting trees. Generally, the trail winds between existing medium to large size trees, and is created by cutting only smaller trees and saplings. Narrowing the clearing width below the desired standard is done only for reasons of aesthetics—not merely to reduce trail construction/maintenance efforts.



When the trail is crossing fields or prairies, it is suggested that as a minimum, the entire desired clearing width should be mowed. It may be desirable to widen the mowing to create a variety of gentle clearing undulations. Some of these may highlight a particularly bright clump of wild flowers or a well-developed flowering shrub such as a hawthorn or dogwood.

In selected wooded areas (especially near roads) a common practice is to reduce the clearing width for a short distance (25 to 100 feet) to discourage unauthorized use by ATVs, horses, etc. (When this is done accessibility may be compromised).

Figure 1 (on page 33) shows the clearing width on each side of the tread. On a hiking segment in a rural area, the total clearing width would be the 24-inch tread plus 12 inches on each side for a total of 48 inches (the commonly accepted 4-foot clearing window).

CLEARING HEIGHT

The trail should be cleared to a height of 8 feet (10 feet within Wisconsin DNR properties). At this height, branches that could snag on a tall hiker's extended pack or attachments, such as a fishing rod, are removed. Branches that could restrict the trail when weighted with rain or snow are also removed. If the trail is in an area of deep snow and it receives winter use, clearing may have to be higher. Whatever the reason for a higher clearing height, an overhead canopy of branches should remain to slow the growth of grasses and shrubs that thrive in sunlight.

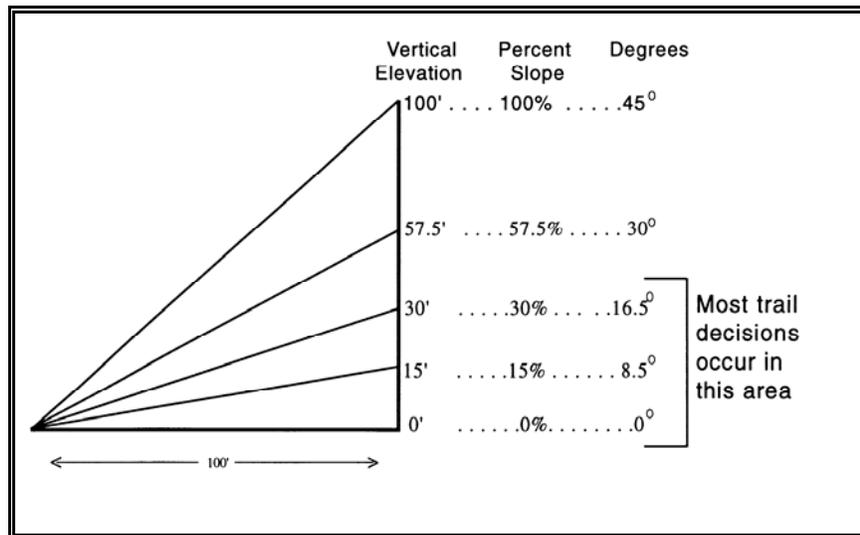
SLOPE (SUSTAINED)

The slope (grade) of the trail may be the key factor contributing to tread stability. Trail grades must be moderate to promote a stable, maintainable tread and a more pleasant hike. The trail should be designed to traverse a hilly area with gentle changes in grade. Grade and slope are interchangeable terms.

To avoid erosion, the slope should normally be less than 10%—even in steep terrain. Grades less than 7% in all soils are ideal, but in sandy soils are almost a necessity to prevent erosion. In flatter areas, trail should be located so that there is some grade to provide for proper drainage. A grade should undulate gently to provide natural drainage and to eliminate monotonous level stretches and long, steep grades that are tiring to trail users.

Slope can be calculated in degrees, but is normally calculated in percent by dividing the vertical distance by the horizontal distance and multiplying by 100 (10

feet of rise/100 feet of horizontal distance X 100 = 10%). An easier, more accurate way to determine slope is through the use of a tool, about the size of a compass, called a clinometer. By sighting through the clinometer, the percent of slope can be read.



SLOPE (MAXIMUM)

While reasonable efforts should be made to construct the trail using the sustained slope guidelines, there are occasions where doing so is impossible. Because of terrain obstructions, such as cliffs, it may be necessary to use a short, steep segment to regain access to more moderate slopes. In these instances, the maximum slope guidelines should be used and additional erosion control measures incorporated. Sections of trail exceeding the sustained grade standards should normally be less than 100 feet. In some areas, it may be necessary to go up a very steep slope for a short distance. In these areas, steps may be necessary but should be considered as a last resort due to the barrier they impose on many people.

CROSS SLOPE

Cross slope is a consideration when constructing trail across the face of a hill (sidehill trail). Some degree of cross slope, or out slope, is desirable so that water moving down the face of the hill continues across the trail. A cupped trail or a trail that slopes back into the hill collects water and is undesirable. However, the cross slope should not exceed the percentages shown in Figure 1. Cross slopes greater than those shown make walking on the trail uncomfortable and serve as an impediment to mobility-impaired individuals. A 5% cross slope on a 24-inch tread amounts to a drop of 1.2 inches.

OTHER STANDARDS FOR ACCESSIBLE TRAIL

These standards apply only when a trail segment is designed to be fully accessible. Figure 1 specifies the maximum distance between passing and rest areas. Each passing space should be 60" × 60". At intervals specified, rest areas are built adjacent to passing areas and may include a bench or other facilities.

TRAIL SURFACE

In most cases, the native material found during trail construction will be satisfactory for surfacing the trail. However, if the material consists of large amounts of topsoil or organic matter, it should be set aside for later use as a cover and planting surface for exposed sub-soil.

Figure 1 shows a range of surfaces that are acceptable in the various ROS settings. While several options are shown for rural/roaded natural areas, the strong preference is for native surfacing. The Accessible Surface Standards apply only when a trail segment is designed to be fully accessible. Wood chips should not be used to correct wetness problems. They only add more organic material to the site and compound the problem when they rot. Also, wood chips can not be used on steeper slopes as they do not stay in place. They are acceptable on relatively level sections of trail to smooth an otherwise rough tread surface and to help retard weed infestation and wear of the natural surface.

**FIGURE 1. NORTH COUNTRY NATIONAL SCENIC TRAIL
TRAIL CONSTRUCTION DESIGN STANDARDS**

Standards (desired)	ROS Class			
	Urban	Rural and Roaded Natural	Semiprimitive	Primitive
<u>Tread Width</u> Hiking Segments Accessible Segments	48" 60"	24" 36"	18" 28"	*
<u>Clearing Width</u> (each side of tread)	24"	12" (WIDNR-24")	12"	*
<u>Clearing Height</u> (min.)	10'	8' (WIDNR-10')	8'	*
<u>Slope(max.sustained)</u> Hiking Segments Accessible Segments	10% 5%	10% 8%	15% 12%	*
<u>Slope (max.)</u> Hiking Segments Accessible Segments	15% for 100' 8% for 30'	20% for 100' 10% for 50'	30% for 100' 10% for 50'	*
<u>Cross Slope (max)</u>	3%	5%	8%	*
<u>Other Accessible Segment Standards</u> Passing Spot Int.-max Rest Area Interval-max	N/A 1200'	600' 1200'	1200' 1/2 mile	N/A N/A
<u>Surfaces</u>	Asphalt. Concrete. Stabilized- aggregate. Screening(1). Wood Chip. Sod.	Native. Wood Chip(2). Stabilized-aggregate. Screening(1).	Native	Native
<u>Accessible Surfaces</u>	Asphalt. Concrete. Stabilized- aggregate.	Asphalt. Stabilized-aggregate.	Native. Stabilized- aggregate.	Native

*In Primitive ROS (wilderness), human impacts and changes to the scenery are meant to be less obtrusive—when entering a wilderness area, one accepts greater personal risk. Trails in primitive areas lay "light-on-the-land." Because of this, no hard standards have been established. Generally, the tread is more faint, the grade varies depending on the terrain, etc. However, it is still important to consider trail design standards which protect the environment. Because trails in wilderness areas may receive less frequent maintenance, designing a trail that requires little maintenance is of utmost importance.

- (1) Limestone screenings include the fines.
- (2) Not in wet areas—adds to the problem.

Chapter 5

TRAIL STRUCTURES

Trail structures discussed in this chapter refer to those which are necessary for trail passage. Trail structures normally respond to user safety and environmental protection issues—not user convenience issues. In this context, almost all structures refer to passing through or across wet areas or open water such as bridges, puncheon, or boardwalks. Steps and stiles apply to passage of topographical or human-caused barriers. Standards for trail structures are summarized in Figure 2 (page 50).

Trail structures are necessary to meet the demands of various situations. However, those required to correct a problem also require a major commitment in terms of both initial and subsequent costs, time, and maintenance. Therefore, it is recommended that alternatives be considered. The most simple technique to correct a problem should be tried and utilized for a year or two to see if it works. If the simple solution proves unworthy, a decision can always be made to incorporate a structure. For instance, digging a small drainage ditch to drain a mudhole may be tried first. It may take a year or so for a long-existing mudhole to firm up. If it does, the solution was easy, quick, and inexpensive. If it doesn't, the complexity of the solution is elevated. Perhaps a few well-placed, flat stepping stones or a small section of puncheon or turnpike will do the trick. Another alternative to a structure is to re-route the trail. Even this seemingly major action may be the best long-term solution. However, there are situations when the decision to construct a structure is obvious and can be made immediately.

Trail structures should be built of quality, long-lasting material and designed to harmonize with the surrounding environment. Minor structures such as puncheon, turnpike, retaining walls, culverts, and small bridges can be built of suitable native material, if it is available. Rock—as used by the CCC—makes a longer lasting retaining wall, bridge sill, or water bar than does wood. Certain species of wood are more durable than others. The most durable material should be used, and time taken to work with it will pay off in the long run. When native materials are used, the source site should be left in as natural a state as possible.

Whenever possible, the trail route should be located to avoid areas with seasonal or year-long water problems. Trail construction in these areas is both difficult and expensive. In addition, permits are usually required for crossing officially defined wetlands or navigable streams. Where wet areas are unavoidable, structural improvements should be used to provide a dry, stable treadway for the North Country NST. Regarding wet areas of the trail, a "dry boot" philosophy is the goal, except within ROS primitive areas and during inclement weather or heavy dew. Hikers should not normally have to wade through streams or saturated wetland areas—this is not only unpleasant and dangerous, but potentially damaging to the environment.

BOARDWALKS

Boardwalks are employed to cross areas that have deeper water than can be crossed by puncheon. Typical locations are where the trail has to cross a cattail area, deep marsh, or other water body that has little fluctuation in its level and flow. The distinction between a boardwalk and puncheon is that the surface of a boardwalk is constructed of boards that are perpendicular to the direction of the trail, and the entire structure is supported by posts driven or anchored into the bottom of the wetland, similar to a dock.



Boardwalks do not rest on sill logs.

Another distinction is that puncheon is normally less than a foot above the surrounding wetland, while a boardwalk can be 2 to 3 feet above the water—like an elongated dock. Wetland crossing permits will almost surely be required.

Boardwalks are normally made of treated material. If they cross areas of fluctuating water levels, the support posts need to be driven deep into the substrate or anchored in concrete to prevent the boardwalk from lifting or warping. Since boardwalks are a major, long-term investment, and they often cross moderately deep water, the standards specified in Figure 2 are designed as an accommodation to safety and provide for wheelchair passage. A kickplate is required to reduce the chance of falling into the water when the boardwalk is slippery due to rain, frost, or ice. The kickplate also makes the boardwalk safer for wheelchairs. The width should be a minimum of 28 inches between the kickplates. Depending on the situation and the desires of the local manager, handrails are optional. (The formula shown in footnote 1 in Figure 2 should not be attempted. It does not apply because, in this handbook, a boardwalk is not considered a bridge).

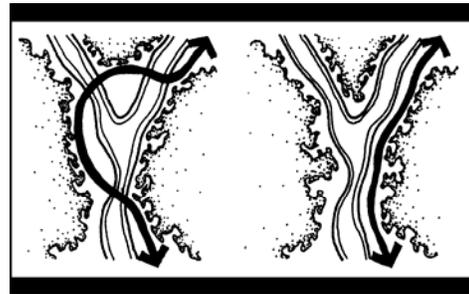
BRIDGES

Bridges are structures for crossing permanent and seasonal streams, dry ravines or gorges, and other obstacles in a safe, environmentally sensitive manner. The use of bridges to cross streams and ravines is strongly encouraged. On the other hand, constructing and maintaining a bridge is a major, long-term investment. Bridges are expensive to build, require regular inspections, and need frequent maintenance. All stream crossings should be reviewed to determine whether or not they are really necessary. Perhaps the trail was originally laid out to cross a stream several times

because it simplified construction. Evaluating the route may show that the number of crossings can be reduced. The possibilities should be studied carefully. Relocation may often be safer and less expensive than building a bridge. Each state has its own rules regarding bridge specifications and placement. It is necessary to work closely with responsible state agencies to ensure that all specifications are met and all the required permits obtained. Plenty of lead time is critical as this can be a lengthy process, depending on the stream being crossed and the complexity of the bridge.

BEFORE

AFTER

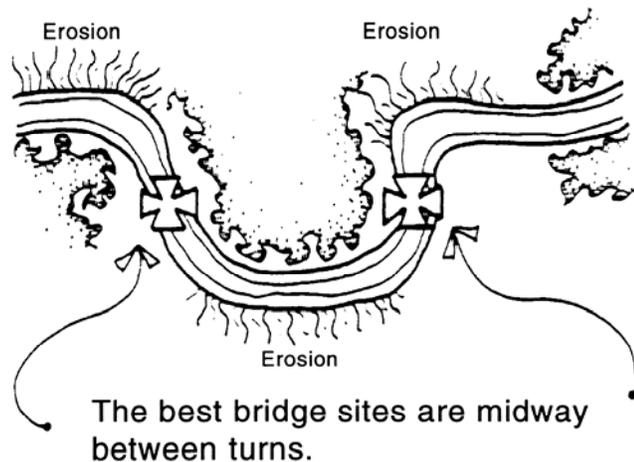


It should be noted that some of the bridge standards in Figure 2 (width, railing requirements, etc.) do not apply to other water-related structures such as puncheons or boardwalks and there is no clear way to distinguish between bridges and other structures. A bridge is defined as something that spans a definable stream, ravine, or other obstacle, rather than resting on a long series of sills (puncheon) or posts (boardwalk). However, a bridge can have one or more piers. Common sense should be used when defining a bridge. A bridge should not be confused with puncheon or boardwalks when looking at the standards shown in Figure 2. In this context, "bridge" is not the correct name for something crossing a widespread area of wet soils or general surface water such as that found in a wetland. However, a wetland often has a stream flowing through it that requires a bridge. In such a situation, there may be a boardwalk across much of the wetland with a bridge across the stream in the middle.

Safety of the user is a primary reason for building any bridge and a consideration in the design of the bridge itself. Not only can it be unsafe to ford a stream (see section on fords), but descending steep, often slippery stream or ravine embankments can also be dangerous because of slipping and falling hazards. The steeply descending trail is a source of erosion that can degrade stream quality. For these reasons, a bridge is often appropriate when crossing even small streams or dry ravines. Certainly, it provides for less wear and tear on the legs of a pack-laden hiker.

When a bridge is necessary, alternative locations should be carefully evaluated. The clearance of the bridge must provide for passage of high water, ice, and debris. Only bridges built with an adequate opening to accommodate such flood waters will survive. Generally, the highest reasonable height above the stream should be sought. A location that is narrow and has a high bank or ledge to anchor the ends of the bridge is best. Such a site can eliminate the need to construct cribs.

The volume of flood water and the bridge height needed can be estimated from careful observation and research. However, observation will probably only yield information on recent high water levels, not historical peak flows. Determining peak flows is a complicated process which considers specific elements such as the size of the watershed and historic precipitation—it is best done by someone trained in this area. In addition to safety considerations, this is one reason why the standards shown in Figure 2 call for engineering design on all bridges that are greater than 25 feet in length or higher than five feet. Assistance should be sought from agency partners, the Natural Resources Conservation Service (formerly the Soil Conservation Service), private engineering consultants, or other qualified personnel.

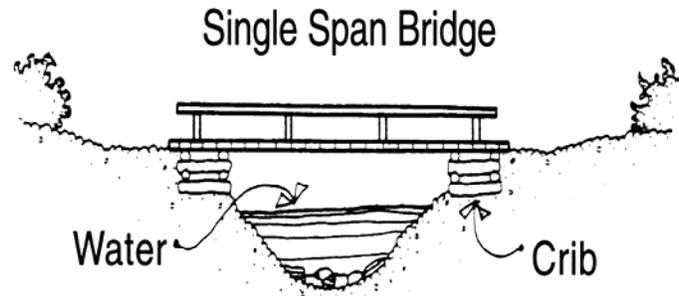


Whenever possible, the entire wet area should be spanned, or ramps used to get onto an elevated bridge. This eliminates the need for steps which are an accessibility barrier. As seen in the section on steps and perrons (later in this chapter) it is recommended that steps be minimized.

Type of bridge - There are many different bridge designs that ensure adequate public safety at stream crossings while maintaining the appropriate ROS setting of the trail. It is not the purpose of this handbook to undermine the traditional creativity of volunteers. Rather, it is expected that creativity will be channeled to design a bridge which meets the standards shown in Figure 2. All bridges should incorporate high quality materials and workmanship. There are three major categories of bridge designs—(1) puncheon type, (2) single span stringer bridges, and (3) multi-span bridges, suspension bridges, and other more complicated designs. The height and span of the bridge, plus the applicable ROS setting, determines what kind of bridge structure to build and what materials to use. (Several bridge designs are included in Appendix 1.) When the span is less than 10 feet and the bridge is not subject to flooding, a simple puncheon type bridge may suffice.

Crossings over 10 feet wide can often be crossed with a single-span bridge. These normally require the construction of cribs or fills on each bank, two to three solid timber or laminated support beams, a board deck, etc. Depending on the circumstances and dangers, a railing may be required.

In areas where the span becomes too long for a single span bridge, the design becomes more complicated. Multi-span bridges with a support structure(s) in the middle of the stream, or a suspension bridge, may be necessary.



Bridge width - Because bridges provide passage over a trail barrier, and because they are long-term investments requiring substantial commitment of funds, they should not become a barrier in and of themselves. If a mobility-impaired individual has successfully negotiated a segment of trail, the bridge should not be the bottleneck that is impossible to cross because of its width. Therefore, the minimum clearance width should be as shown in Figure 2. These widths were selected to minimally accommodate accessibility, even on trail segments that are not specifically designed to be barrier-free or fully accessible.

Bridge railings - A railing is often necessary for visitor safety and to increase the comfort level of users. Considerations such as depth or swiftness of water, height above the ground or water, length and width of the bridge, desired experience level, and other factors help determine when railings are necessary, and whether one or two railings are installed. Weather related factors such as ice, snow, frost, rain, and the increased chance of slipping and falling from the bridge need to be considered. Besides the element of danger, another consideration is that there are some trail users who are simply frightened of walking across what they consider to be a narrow structure. Some agencies will insist that railings be placed on every bridge because of their concern for liability. These and other factors argue for railings.

In some situations railings may actually increase the risk of someone falling. This train of thought follows that if a railing is present, a user will linger longer on the bridge rather than hurrying across to solid ground, thus increasing their exposure to the hazard. Another consideration is that railings are often considered to be the weak point of a bridge. Depending on the method used to fasten the railings to the bridge deck, trapped moisture can lead to decay of the railing support or the main beam of the bridge. If this goes undetected, it could lead to a railing giving way if someone leaned on it. In situations where there is little danger, the inclusion of railings can change the character of the trail and the user experience—it is not desirable to over-build. These and other factors argue against railings.

Everyone's perception of dangers is different—one person may say a railing is a definite need, another person may say it is unnecessary. To establish a degree

of uniformity along the North Country NST and to provide some direction to trail volunteers and others, use of the bridge railing formula shown in Figure 2 is recommended. Revisions may be necessary as experience dictates. Bridge builders may decide to be more strict than the formula and install railings anyway, depending on the hazards.

Bridge rail height - When railings are necessary, 42 inches is the standard height adopted by a number of state and federal agencies. It is a common height that provides for a fair degree of visitor safety and therefore is the accepted standard for the North Country NST.

Bridge engineering design - Bridges must be designed to provide for visitor safety, withstand snow loads, accommodate flood waters, etc. A bridge is a major investment and it is common sense to seek engineering consultation for certain bridges—those greater than 25 feet in length or greater than 5 feet in height (above the water level or the bottom of the dry ravine). All trail bridges should be designed to bear a load that meets or exceeds current management standards for architectural design and engineering of pedestrian structures. To achieve this standard, qualified personnel, such as engineers, should review the elements of proposed designs (stringer size, strength, snowload, peak flows, etc.) and approve them prior to installation. The National Park Service, the Forest Service, and other agencies generally require that an engineer either develop or review all bridge plans. While it is specified that engineering design or review is required only on certain bridges, agency partners should be consulted because they may have more stringent standards. The intent of this policy is to ensure professional review of proposed bridges or bridge reconstructions. Before providing funding assistance, such as Challenge Cost Share proposals, on any bridge project where the standards call for engineering design, a project sponsor must provide adequate details showing the need for the bridge, a map showing the location, and construction drawings that show the bridge's span, height, materials used, and other details. If qualified engineering expertise is available, either through an agency partner or trail club member, their review and documentation is suggested when seeking NPS approval or funding.

Bridge clearance above navigable waters - Navigability is defined by the individual state. At least one of the trail states bases their determination on a historical use of the stream—can a log be floated down the stream? Generally, if a canoe can be floated down the stream during spring flows, it is considered to be navigable. The trail states require the issuance of a permit before spanning a

navigable stream and will specify the clearance heights. Generally, this is 5 feet above the water surface, but it is recommended that this be confirmed with state agencies and necessary permits be obtained.

Bridge inspection and maintenance - Bridges require periodic maintenance to insure their stability and safety. Debris should be cleaned from cribbings, bolts checked and tightened, sills inspected for rot, etc. Bridges should be carefully checked by trail maintainers and all major bridges (>25 feet long or > 5 feet high) should be inspected by qualified personnel at least once every three years. This inspection should be documented. In addition, trail club members should be alert to the development of hazardous conditions between inspections, and should also routinely inspect smaller bridges.

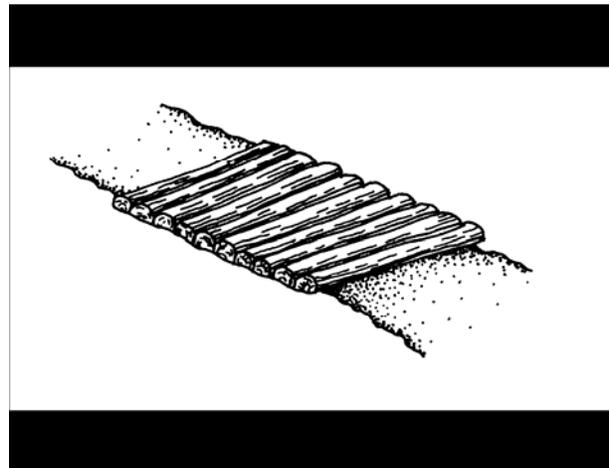
CAUSEWAY OR TURNPIKE

When enough rock, gravel, or earthen fill is available, the trail tread can be elevated through poorly drained areas by using a causeway or turnpike. This permanently hardens the tread and is a useful technique when soils are poorly drained but do not have standing water as found in a wetland. A typical causeway is built by first defining the width of the trail tread with parallel rows of rocks or logs. The defining rows also serve to retain the fill. When in place, the filling process should begin with medium-sized stones that will allow water to pass under the causeway. A fill of small stones, gravel, soil, or a mixture of materials should be continued to create the elevated causeway and ensure a smooth walking surface. The surface should be rounded 2 inches above the elevation of the defining logs or rocks to provide better drainage and to allow for settling.

A ditch can be dug parallel to and on both sides of the causeway to improve drainage. This variation is often called a turnpike. The material excavated from the ditches can be used to help fill the causeway.

CORDUROY

Corduroy construction is basically a primitive type of puncheon. It consists of laying native logs perpendicular to the trail to harden it through areas of unstable or saturated soil. If corduroy is left exposed, it provides uneven, slippery footing that is uncomfortable for the hiker, and does not convey the impression of a well designed trail. Consequently, on the North Country NST, exposed corduroy is not acceptable, except as a temporary measure until a more permanent solution



can be installed—and then only in areas that are not defined as wetlands. Puncheon is a better alternative.

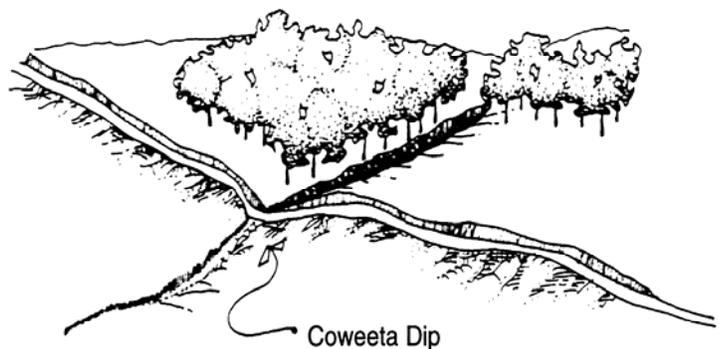
In some parts of the Lake States, roads were often constructed across boggy areas using corduroy and covered with soil. The log base provided the required degree of flotation and the soil cover provided the smooth driving (in this case walking) surface and kept the logs from rotting. While still employed to some extent, geotextile material now takes the place of the logs. The use of this technique can provide a suitable trail structure, but the ramifications of its use should be carefully considered. A corduroy bog structure can change the natural flow of water through the wetland, change the water level, kill the upstream vegetation, or change the species composition. Covered corduroy involves considerable modification to the site and is not recommended in the types of soils/sites where corduroy is typically employed. Wetland permits are usually required. Other alternatives such as puncheon or boardwalks are less intrusive on the site and easier to construct.

COWEETA DIPS

Coweeta Dips, or grade dips, are created when a short section of the trail is built with a grade slightly opposite to the prevailing grade. These are one of the most effective drainage techniques in trail construction, blend aesthetically into the landscape, and are almost maintenance free. They are cost-effective in controlling erosion and reduce the monotony of long, sustained grades.

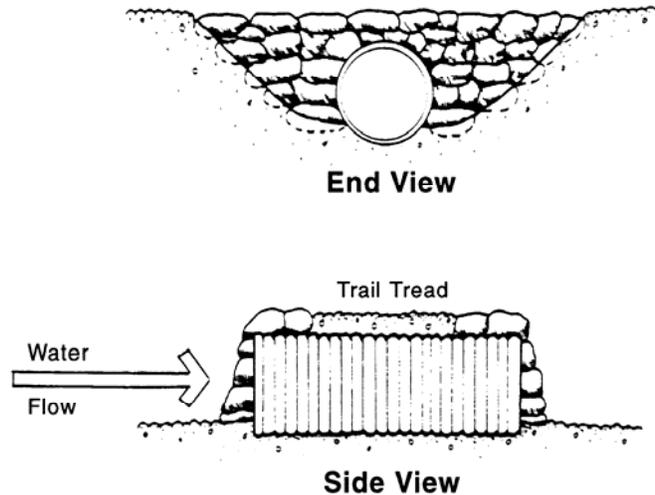
Dips are most effective when built as part of the original trail construction, but can be used when relocating short problem areas if the terrain allows. On an ascending trail segment the trail should level every 50 to 100 feet followed by about 15 feet of **slightly** descending trail before continuing upward. This almost imperceptible descent creates a dip (low point) and forces water coming down the trail to drain off—less than a foot of elevation is lost for the hiker. The dip itself requires no construction other than careful building of the sidehill trail to establish the dip's alignment.

Since a place is needed to discharge the water, Coweeta Dips usually are best suited on sidehill trails. Coweeta Dips take advantage of the natural roll and drainage of the landscape. They should be positioned naturally into the terrain for maximum function without being obvious. Spacing should be varied to make the trail more interesting.



CULVERTS

Culverts are used to pass water under the trail. They are an excellent alternative to a small bridge and can be used to accommodate water flow from either spring runoff or small permanent streams. Culverts are most effective in natural drainage places where minimum excavation is required. They also can be used in flat areas to provide equalizing, cross-drainage under causeway or turnpike sections, and reduce the damming effect.



Culverts may be more cost effective and less obtrusive than a bridge. They are easier to install in most instances.

They can be constructed of rock, logs, corrugated metal, corrugated plastic, or other suitable material. As stream size increases, engineering advice should be sought to insure that the culvert is sized to accommodate peak flows. If the stream is permanent or is a designated trout stream, permits should be obtained.

While culvert installation sounds simple, there are some basic principles which must be followed for the installation to last. Culverts should be installed with a gentle downstream gradient of around 2% and should be properly bedded to ensure continued performance. If metal or plastic pipes are used, a minimum of 6 inches of soil (free of sharp rocks) is recommended for pipe cover. Pipe diameters less than 12 inches may present frequent cleaning problems.

FORDS

Due to safety concerns, legal implications, and the "dry boot" philosophy, fords should not be used. Fording on new sections of trail should not be accepted and any fords on existing trail segments should be bridged as soon as funding is available. A possible exception to this policy is across very small streams in ROS Primitive areas.

Drownings have occurred when hikers attempted to wade seemingly innocuous streams during high water periods. One unfortunate incident involved an experienced hiker (who had logged over 26,000 trail miles) who attempted to wade what by all appearances was a 25-foot-wide, shallow, Arkansas stream. The creek was not over knee deep and was not cold. However, it was fast flowing and treacherous enough to knock the hiker off his feet and sweep him to his death.

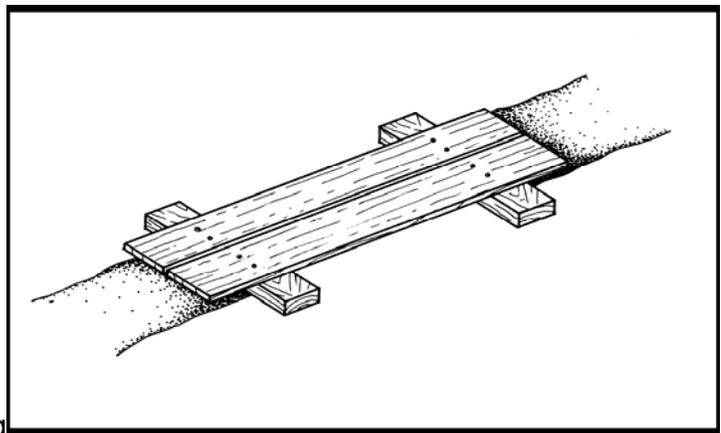
Because of the locations of the North Country NST and long distances through the Lake States, water is more than a short-term springtime concern. Water does not dissipate as quickly as in hillier areas, and lasts well into the summer. Permanent solutions (e.g., bridges) are more appropriate for these areas than fording.

PUNCHEON

Puncheon is an effective way to cross some types of bogs, shallow marshes, and wooded wetlands. It uses sawed, treated lumber or native logs to elevate the trail tread above wet areas that are not feasible to drain. It provides a hardened surface that lasts for many years depending on the material used. The walking surface is parallel to the direction of the trail, and the support structures (sills) rest directly on the ground. The use of puncheon is strongly recommended since a wet, muddy trail and the damage caused from hiking directly through wetlands are undesirable. A puncheon bridge can range from as little as 10 feet to hundreds of feet long for crossing a swamp.

Puncheon can be constructed using either native or milled materials and often is a combination of the two. Most typically, the sill logs are made of long lasting native material (such as cedar, tamarack, locust, etc.) and the walking surface is made of heavy, treated planks. The determination of the material depends on a number of factors—the distance from an access point, ability to haul materials to the site, the availability of native materials, the skills available for the difficult job of hewing native puncheon, the desired length of time between replacement, and the ROS setting.

Once the route through a wetland is chosen and the trail is cleared, the first step is to obtain and place the sill logs. These rest directly on the wet soil and vary in length from about 3 feet to 5 or 6 feet depending on the amount of support provided by the wetland. The stringers (walking surface) are then placed on top of the sill logs and secured in place with large spikes. If native logs are used as stringers, some notching and fitting



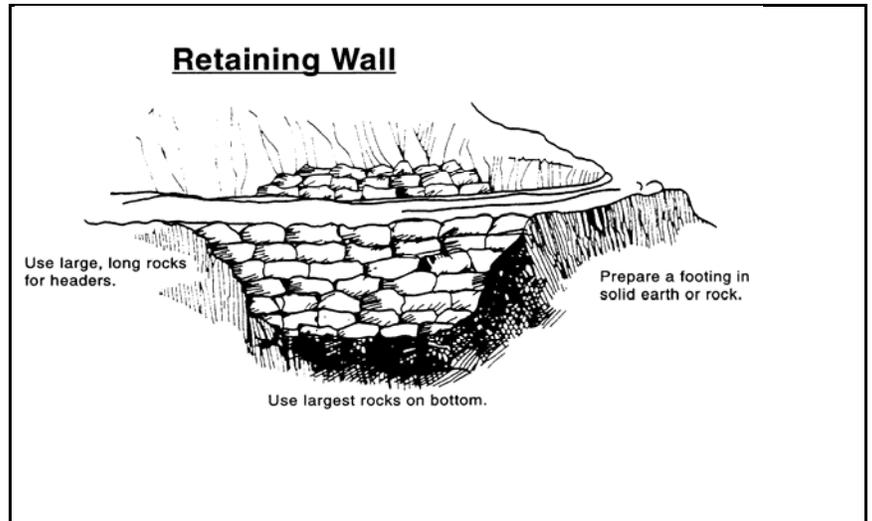
has to be done so they do not rock on the sills. Puncheon is normally built in 8 to 10-foot sections with no more than 6 inches from the end of one section to the beginning of the next. When treated planks are used, the ends typically rest directly on the sill logs—often without gaps between the sections. In this situation, one sill is located directly at the junction between two sets of planks. However, because planks have more flex, a center sill may be needed. In order to achieve the puncheon width specified in Figure 2, two 2" × 8" or 2" × 10" planks will be needed.

The trail tread at both ends of the puncheon must be solid and dry; otherwise, the stepping-off point may become soft and muddy, eventually requiring the construction of an extra section of puncheon. It may be necessary to place several flat stepping stones at the ends of the puncheon to help the soil withstand the impact of hikers.

In areas subject to flooding, such as along streams or near beaver activity, puncheon is not a good choice because it can float out of position or even completely away. In these areas, relocating the trail or using boardwalk should be considered (provided it is protected from spring floods along streams).

RETAINING WALLS

Retaining walls are structures of stone or wood designed to stabilize the trail base on steeper side slopes. They are time consuming to construct but may be necessary to prevent soil slide or slump when sidehill trails are crossing the face of a slope that exceeds 40% to 50%. Retaining walls are a long lasting investment—many constructed by the CCC in the 1930's are still functional today.



Sound, durable rocks with good, angular (rather than rounded) bearing surfaces are the preferred material because of their locking ability and durability. Native decay-resistant or treated logs can also be used if rock is not available. The foundation must rest on solid earth or rock to obtain a rigid, safe retaining wall. The thickness of a rock retaining wall at the base should be at least one half the height of the wall or a minimum of 2 feet if the vertical height is less than 5 feet. The outer face of the wall should have an inward slope of at least 2 to 3 inches for every foot of height. Drainage is required around, beneath, or through the wall so that water will not accumulate behind it and build up pressure which could destroy the wall.

STEPPING STONES

Stepping stones can effectively harden the trail tread across short wet areas or mud-holes. Suitable large, flat stones that are firmly set so that they do not rock—which may otherwise cause hikers to lose their balance—may be the least expensive, most durable solution to a problem area. Cut rounds of log should not be used as substitute stepping stones as they become slippery with moss and are a safety hazard. They are also less durable and convey the impression of poorly designed trail.

Generally, stepping stones should not be used to cross streams unless the stream is very small and requires only a few stones. Then, they can be used only where the bank is solid and will not become eroded. On navigable streams, or streams with a fish population, stepping stones are opposed by many state agencies because they can create an artificial barrier to water flow or modify the fish habitat. Stepping stones also pose a barrier to accessibility and can become slick with moss and water—a falling hazard for all persons. This application should be avoided whenever practical and considered a temporary solution until a bridge can be installed.

STILES

Pastures and other agricultural fields often occur on private lands and are separated by fences. These are primarily in rural/roaded natural ROS settings but also can occur in other areas. While it is desirable to minimize as many fence crossings as possible, they are impossible to avoid altogether. Whenever a fence must be crossed, it should be equipped with a stile to facilitate hiker passage and eliminate fence damage. Gates could serve the same purpose as a stile but they are more expensive to construct and maintain. There is also the likelihood that a gate may be left open allowing livestock to escape. The landowner should always be consulted to ensure that the stile is located and constructed to meet their needs. In areas where user conflicts exist, a stile can effectively serve as a barrier to unauthorized use by horses, bicycles, and ORVs.



Step Stile



Turnstile



Dodgeway

There are a wide variety of stiles in use, including step stiles, turnstiles, and dodgeways or pass-throughs. The stile of choice is often determined by the area's cultural traditions.

STEPS AND PERRONS

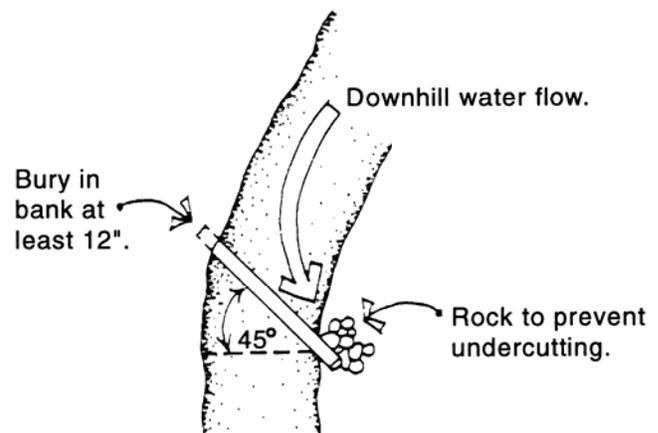
Steps and perrons (elongated steps—more like a series of connected platforms) should be avoided. In most cases, proper trail layout can alleviate the need for steps. These structures are difficult and time consuming to properly construct and often create an unnecessary impediment. They make an otherwise difficult but accessible section of trail inaccessible. Even persons who are generally considered to be ambulatory, but who may have knee or hip problems, find steps more difficult to negotiate than gradual inclines.

In some cases there may be unavoidable topographical barriers—such as where an escarpment separates two moderately sloped grades—or land ownership patterns that restrict where the trail can be built, forcing it to traverse a hill at a much steeper-than-desirable grade. In these types of circumstances, steps may be the only alternative.

Step construction details are not provided (other than Appendix 1) since use of steps is limited. Local experts and a copy of the Appalachian Trail Conference's *Trail Design, Construction, and Maintenance* by Birchard and Proudman are good references.

WATERBARS

Waterbars are rock or log structures that divert water off of the trail. Other innovative materials which offer more accessibility, such as rubber belting, have been used on some trails in recent years. However, these innovations take away from the natural character of the trail. On the North Country NST, traditional rock or logs are to be used—except on those segments of trail designed as fully-accessible. During new trail construction, the use of waterbars can be minimized through careful attention to the grade of the trail and use of Coweeta dips. On older trails, or where it is necessary to use steeper trail grades, waterbars may be the only effective way to divert water from the trail. Where water flowing down the trail is anticipated, it is better to install waterbars immediately than to wait for erosion to occur.



➤ **Spacing**

Waterbars keep the speed, volume, and distance water travels down the trail to a minimum. The actual number and spacing of waterbars depends on the amount of water entering the trail, the steepness of slope, the construction of the treadway, and the availability of places to divert the water.

Final placement of waterbars is dictated by terrain. They must be placed where diverted water does not return to the trail. If this is not possible, a waterbar should not be installed (e.g., where the trail lies in a high banked swale that requires extensive excavation in order for the waterbar to function properly).

The greater the slope and the more water channeled by the trail, the greater the need for waterbars. They should be placed below all points where a significant amount of water enters the trail. On uniform sustained grades, waterbars should be placed near the top of the hill to divert water before it does damage with others constructed periodically down the grade to keep water flow to a minimum.

Frequency of Waterbars

Material Type	Grade (percent)						
	2	4	6	8	10	12	15
Loam	350'	150'	100'	75'	50'	*	*
Clay-Sand	500'	350'	200'	150'	100'	50'	*
Clay or Clay-Gravel	-	500'	300'	200'	150'	100'	75'

* These grades not recommended in this soil material.

- No diversion required for soil stability.

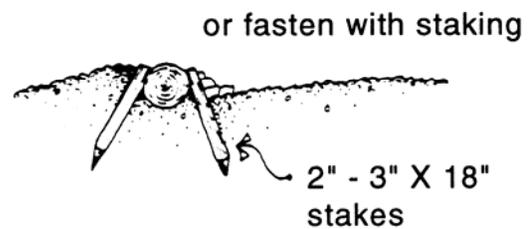
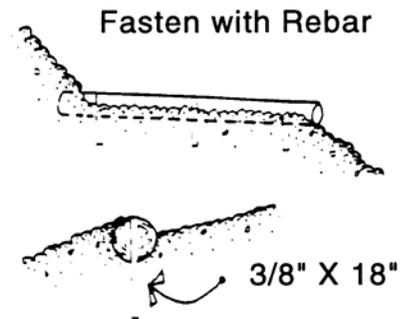
➤ **Construction**

After waterbar spacing and location is determined, a trench should be dug across the trail at about a 45° angle. Waterbars may slow water too much causing it to clog with silt and debris if less than 30°. Those placed at 45° or more will tend to be self-cleaning. The trench should be deep enough to contain about ½ of the diameter of a log waterbar or ¼ of the height of the rocks used for a rock waterbar. The waterbar should be a minimum of 4 inches above the level of the ground on the uphill side and should extend 12 inches into the side of the hill and 6 inches beyond the side of the trail on the downhill side. The waterbar should be securely fastened in place using one of the techniques illustrated in Appendix 1, or with stakes obtained on site.

Re-bars are often used to fasten log waterbars in place. When used, holes are drilled through the log at a slight angle and the re-bars driven so that no portion protrudes above the log. If using native material for stakes, a tree 2 to 3 inches in diameter should be cut into 18-inch pieces.

The stakes should be driven on each side of the log waterbar, with the tops of the stakes slanting over the bar, so the stakes tend to pin the log to the ground. The stakes should be flush with the top of the waterbar—excess should be trimmed to prevent a tripping obstacle or their loosening from being kicked.

On the uphill side of the waterbar the tread should be graded several feet down into the trench. All excavated soil and rock should be placed on the downhill side of the bar and packed so the tread is flush with the top of the waterbar. Waterbars require regular maintenance so that they continue to function properly. Accumulated soil and debris must be cleaned out at least annually.



**Figure 2. NORTH COUNTRY NATIONAL SCENIC TRAIL
DESIGN STANDARDS FOR TRAIL STRUCTURES**

Standards (desired)	ROS Class			
	Urban	Rural and Roaded Natural	Semiprimitive	Primitive
Bridges (width) Hiking Segment Accessible Segment	60" 72"	36" 48"	28" 36"	*
Bridge Railings Hiking Segment Accessible Segment	Y Y	Formula (1) "	Formula(1) "	Formula(1) N/A
Bridge Rail Height	42"	42"	42"	42"
Bridge Engineering Design	Y	If length > 25 ft. or height > 5 ft.	Same as at left.	Same as at left.
Clearance above Navigable Waters(2)	5'	5'	5'	5'
Bridge Kickplate Required (3) Hiking Segment Accessible Segment	Y Y	N Y	N Y	*
Other Structures Puncheon (4) Hiking Segment Accessible Segment	N/A N/A	16-18" width N/A	16-18" width N/A	*
Boardwalk(5) Hiking Segment Accessible Segment	60" 72"	36" 48"	28" 36"	*
Corduroy Hiking Segment Accessible Segment	N/A N/A	(6) N/A	(6) N/A	*
Culverts(7)	OK	OK	OK	*

(1) Railings are required if: $(\frac{1}{2} \text{ length} \times \text{height}^2) / \text{width} \geq 40$

(2) Navigability as defined by the individual state. Clearance requirement may vary.

(3) Kickplates are often included for safety when handrails are not required.

(4) Puncheon rests on sills and is generally less than 1' high.

(5) Boardwalk is generally less than 2' above water level and should have kickplates.

(6) Generally not acceptable—but can be used as a temporary measure in areas not defined as wetlands.

(7) Length must be calculated to provide for 2:1 fill slope beyond the normal trail clearing. Size (engineering consultation) to accommodate peak flows. Water crossing permits often required.

* In Primitive ROS (wilderness), structures are provided only for visitor safety or resource protection—not for visitor convenience or comfort.

Chapter 6

SUPPORT STRUCTURES

Support structures provide for hiker convenience, comfort, or sanitation. They are not necessary to construct the trail itself. Structures should be built of quality material to provide longevity and should be designed to harmonize with the surrounding environment. If native material is used, the site from which it was obtained should be left in as natural an appearance as possible. Figure 3 includes standards and explanations of some structures. Others are more fully explained in subsequent text.

FIGURE 3. NORTH COUNTRY NATIONAL SCENIC TRAIL STANDARDS FOR TRAIL SUPPORT FACILITIES

Standards (minimum)	ROS Class			
	Urban	Rural and Roaded Natural	Semiprimitive	Primitive
<u>Primary Trailhead</u> (1)	As needed.	Spacing 5 miles or <u>less</u> when actual or desired use is high. Spacing 10 miles or <u>more</u> when actual or desired use is low.	Spacing 10 miles or more.	*
<u>Campsite/Shelter</u>	N/A	Spacing 8-15 miles. Especially needed when dispersed camping along the route is not permissible.		*
<u>Developed Water</u>	Obtain from public facility or home.	Spacing 10-15 miles when potable or treatable water is not available.	Spacing 20-30 miles when potable or treatable water is not available.	*
<u>Toilet Facility</u>	As needed.	At high use areas, campsites, trailheads, and other public areas as necessary.	As needed for resource protection.	*
<u>Bench</u>	<u>May</u> be provided at selected view spots or rest areas.		Not applicable.	*

(1) Primary trailheads provide parking for a number of vehicles and contain a bulletin board or kiosk for trail information. They may be part of an existing recreation facility or can be located where the trail crosses a highway or major road.

Secondary trailheads may also be established. These have one or two small vehicle spaces or parking is not provided/discouraged because of safety considerations. They may include a small bulletin board or kiosk with trail information. Generally, these will be used when it is necessary to gain access to the NST via other trails. The secondary trailhead should be located where the named trail intersects the NST or at the beginning of the access trail. Secondary trailheads may be found in remote areas where major roads are far apart.

* In Primitive ROS (wilderness) structures are provided only for visitor safety or resource protection—not for visitor convenience or comfort.

Trailhead Parking

Parking areas should be located on public lands, when possible, and provide a suitable day-hiking experience with access to more prominent natural features along the trail. Access trails can be used to connect parking areas with the main trail. The distance between trailhead parking areas can vary considerably depending upon the need. Typically, they are between 5 and 15 miles apart.

Campsites or Shelters

In many areas, particularly publicly-owned forests, dispersed camping is allowed. Hikers may camp at any point along the trail as long as they follow certain guidelines (e.g., how far off the trail they should camp and practicing minimum impact camping techniques). In areas such as state and national parks or wildlife refuges, camping is restricted to designated sites or developed campgrounds. When the trail crosses private land, camping of any kind is usually prohibited by the landowner. In large areas of public land, developed campgrounds may be located near the trail. There are also private campgrounds along the way.

The desired distance between camping areas along the trail is 8 to 15 miles. Contacting an agency or landowner to obtain permission before designation and development occurs provides an excellent opportunity for communication. The choice between developing a campsite or a shelter often is based on local preference. Ideally, needed campsites will eventually be acquired by the trail organization or public agency. Sites for overnight facilities must be selected carefully to withstand user impact. Use should be diverted from heavily eroded, delicate, or impacted sites. Hikers should be directed to overnight sites by maps, guidebooks, and signs.

In selecting a site for a campsite or shelter, the following should be considered:

- Overnight facilities should be located no more than one day's hike apart (8 to 15 miles). Availability of good sites and access to water will influence actual site location.
- Sites should be as isolated as possible to reduce vandalism and other unauthorized uses. Sites should be located at least one mile from public roads.
- Low knolls or gradual slopes that allow water to drain away, and soils that are able to withstand impacts with little erosion are the best choice for an overnight facility. Low lying areas, where drainage may be poor, and areas subject to flooding caused by high water or beaver activity should be avoided.
- Attractive vegetation or topographic features that provide partial shade and shelter from high winds should be a consideration.

- A site that is partially exposed is desirable. Some exposure can provide an interesting view, allow for breezes to disperse mosquitoes, and perhaps catch the first rays of the morning sun. However, a campsite should not stand out or detract from a neighbor's view.
- Facilities should not be located in areas that present high safety risks, such as on a cliff, or in areas subject to flash flooding, rockfalls, lightning, or other natural hazards.
- Campsites or shelters should not be located directly on the shorelines of lakes or other water bodies, and should not be readily visible from the water. A glimpse of the lake or water body from the campsite is ideal.
- Overnight facilities should be located at least 200 feet from the main trail unless topography or ownership patterns dictate otherwise. Some agencies require the campsite to be even farther from the trail. A small sign or marker on the main trail should indicate obscure sites.
- The site should accommodate no more than 7 to 10 persons. One or two flat tent sites should be included or constructed.
- An adequate, year-round source of water for cooking and washing is essential. While close proximity to water is desirable, hikers will accept sources up to ½ mile away. For sanitary purposes, it should be no closer than 150 feet from the actual campsite.
- Some type of privy or wilderness latrine (a wooden box and seat or fiberglass riser over a pit) should be provided. This should be located 100 to 200 feet downwind and at least 200 feet from the drinking water source and any surface water. It should also be located so that the land does not slope toward the drinking water source.
- A fire ring or fire pit may be provided, especially at heavier used sites where wood supply is abundant. This is preferable to several impromptu fire sites.
- Trash receptacles should not be provided. All trash should be carried out or burned.

Water

Potable water is extremely important to backpackers. It can be obtained from domestic pump or pressurized water systems at developed camp and picnic grounds,

administrative sites, roadside parks, homes along the route, or from filtered or chemically treated natural sources of water.

In addition to a water source near campsites and shelters, a source should be available about every 5 miles along the trail. When planning the trail route, a water source is one of the key features that should be identified. Trail should be located to allow hikers periodic access to clear, permanent streams, lakes, or springs which will not quickly clog a portable water filter.

If an area does not have a clear, natural, or domestic water source available, one should be developed according to the schedule shown in Figure 3.

Chapter 7

SIGNS

In earlier times, Native Americans lashed the limbs of maple saplings or bent the entire sapling and tied it in place to mark a trail—thus leaving a sign for others. In traveling to the inland fur-gathering areas, French-Canadian voyageurs created "lop trees" to mark the portages and guide them through the maze of waterways along the Minnesota-Ontario border. These early signs were a basic form of communication.

Just as the Native Americans and voyageurs used signs to find their way through difficult areas, today's trail users rely on signs and symbols to find their way and to better understand the area. Signs identify and label facilities and points of interest. They warn hikers of dangers and unusual trail conditions. They educate hikers in the proper use of the outdoors and promote the protection of nature. Signs explain and interpret interesting natural and cultural features and management activities along the trail. They also list regulations and guidelines and serve to control unwanted or illegal activities. Perhaps most importantly, they direct the hiker by providing destinations and distances along the route.

Signs are probably the quickest and easiest way to leave the trail user with a positive impression. If the signs are high quality, well maintained, and properly located, other trail problems which are harder to solve are often over-looked (e.g., wet areas). Consistent signs are the quickest way to increase the trail's identity and the public's support for the trail.

Other objectives are to:

1. Provide positive exposure of the trail to attract more users,
2. Educate the user about the trail through trailhead kiosks,
3. Reassure the user that he/she is on the right trail and will not get lost, and
4. Control trail usage and create a safer, more enjoyable, environmentally friendly experience.

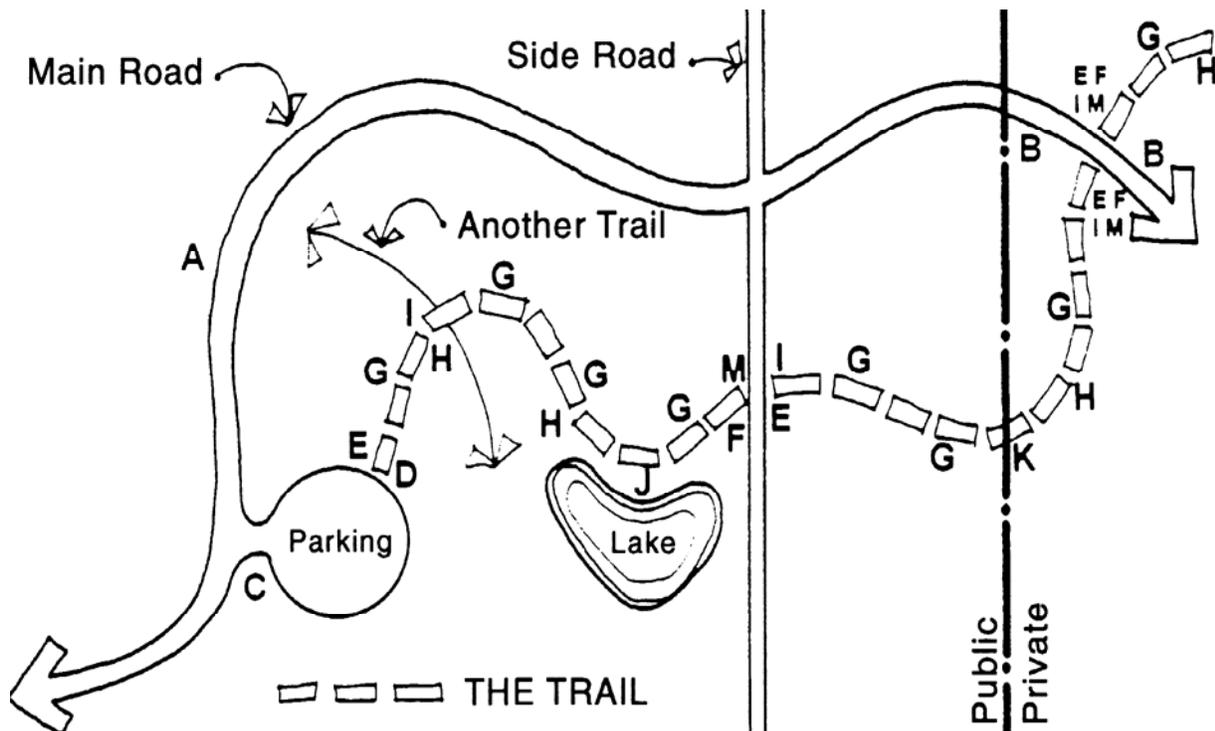
These objectives are to be balanced with aesthetic considerations to avoid "sign pollution."

The public agencies and private organizations that manage segments of the North Country NST often use a variety of signing methods. Standardization of the types and locations of signs along the trail is desired. While these standards call for new signs to replace some currently in use, this does not need to occur until the existing signs are no longer in a suitable condition. Managing authorities are urged to identify signing needs as part of the annual trail assessment process. An inventory of existing signs should be regularly updated. It is recommended that as new signs are needed—or existing signs need replacement—the uniform signing standards suggested in this chapter be followed.

TYPES OF SIGNS

The following types of signs and markers will be discussed in this chapter. See Location of Signs diagram for their relative locations.

- A. Information signs for highway users
- B. Warning (Pedestrian Crossing) signs for highway users
- C. Entrance sign
- D. Trailhead Information sign/Kiosk
- C. Regulatory (usage control) signs
- D. Road Crossing signs
- E. Reassurance markers/blazes
- F. Direction change indicators
- G. Confirmation/Identification signs (trail logos)
- E. Interpretive signs
- F. "Crossing Private Land" signs
- H. You-Are-Here signs
- I. Destination signs
- N. Boundary signs
- O. Adopter signs



A. Highway information signs

These are the typical white lettering on brown background recreation-related signs seen along highways. They can only be installed with the approval of the responsible highway department or agency that controls the road—such as the Wisconsin DOT or the Minnesota DOT. Highway departments often perform their own design work and have their own personnel install these signs. Some departments will provide the signs while others will expect to be reimbursed.

The recommended wording is: "North Country National Scenic Trail - 1000 Feet." Highway departments calculate the size of the sign and the distance from the parking lot based on the posted highway speed limit and the Manual of Uniform Traffic Control Devices (MUTCD).



B. Warning (Pedestrian Crossing) Signs

These are standard MUTCD Warning Signs. They have black lettering on a yellow background. These should be installed in advance of trail crossings where trail use and road conditions warrant. These signs are especially important where visibility is limited due to road curvature, vegetation, or hills. If these signs are needed, the highway department should be contacted for concurrence. They may or may not install these signs.



C. Entrance Sign

Entrance signs should be installed at all primary trailhead locations where parking is available. Preferably, the entrance sign should be two-sided and placed perpendicular to the highway, located just off the right-of-way and near the entrance road. This increases effectiveness in directing the user to the trailhead. However, because of site conditions, some entrance signs may be one-sided. If in the right-of-way, a permit must be obtained from the responsible highway department.



Entrance signs should be the standard NPS-type metal signs with white lettering on a brown background and read "North Country National Scenic Trail," with the trail logo on the right hand side. They should be approximately 3' x 6'—or another similarly proportioned size—and be mounted on solid, well designed, wooden, stone, or combination sign support structure. Optionally, a matching metal segment name strip could be mounted underneath the main sign to indicate a local trail name. If done, the lettering and color should match the main sign.

There may be other locations and situations where this sign or a smaller version may be appropriate to call attention to the trail—such as at a major recreation site.

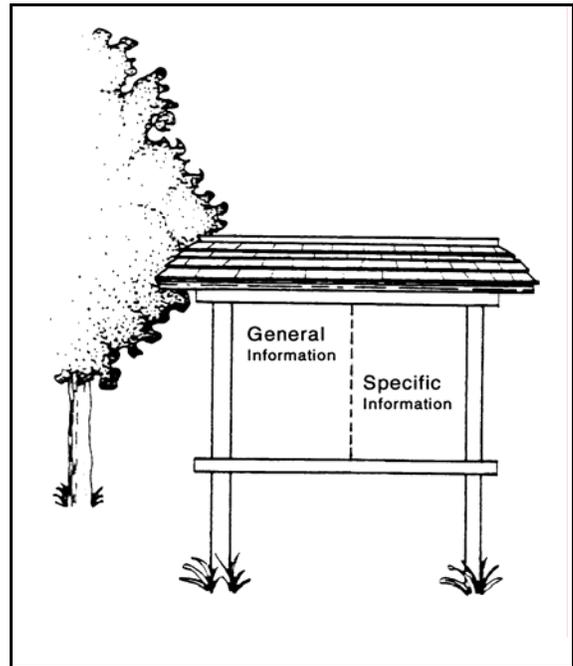
D. Trailhead Information Sign/Kiosk

A trailhead sign or kiosk should be installed at all primary trailhead locations (see Chapter 6) where parking is available. This structure should be built within 50 feet of where the trail leaves the parking lot and should include a roof and a double or triple bulletin board structure. Some agencies on the North Country NST have adopted a triple bulletin board constructed with a roof. A well designed and maintained trailhead kiosk presents a variety of information and serves to consolidate signing clutter that otherwise would be more spread out along the trail.

The left display panel should contain general information about the trail (the seven-state map)—similar to the map and information shown on the NPS brochure. It should depict the general location of the trail in relation to other major landmarks, such as the Great Lakes.

The right display panel should contain specific information about the trail segment, including local trail interpretation. A map should show the trail as far as the next trailhead in either direction. It should also include regulatory and safety information and information about temporary trail detours.

All kiosks should be either weather-tight to protect permanent information such as maps and regulations, or utilize weather/vandal resistant materials such as waxed poster board, fiberglass embedment, or other long lasting materials. Cluttering the kiosk with quickly prepared information on short lasting paper should be avoided. Frequent, regularly-scheduled maintenance of kiosk displays is imperative for maintaining a professional appearance. Replace faded display materials as necessary, remove spider webs, dead bugs, accumulated moisture, and so on. Additional interpretive information can be included on the segment map panel. Kiosks are good locations to install trail registers. Design specifications for *one style of* kiosk are shown in Appendix *3*.



E. Regulatory (usage control) Signs



While kiosks should contain information on the kinds of use allowed on the trail in a positive tone, it is recommended that all trail segments have signs which show acceptable and unacceptable uses at entry points. This is especially important where problems have occurred.

There are two options for regulatory signs. (1) Carsonite type posts with strip decals as shown at left, *and in Appendix 3-2* or (2) larger format signs mounted on Carsonite or wooden posts—to be used where the standard 3"wide vertical decals are not prominent enough, such as at busy trailheads or major road crossings. This strip decal should be placed directly below a trail identification emblem (see item I) *and can be found by any managing agency's or organization's logo (e.g., the USFS shield, the Buckeye Trail Association emblem, etc.). *

In order to avoid over-signing, these will emphasize the permitted use. On a particular segment where non-permitted uses are experienced, international symbols with a "slash" can be added lower on the post to help control the problem.

These signs should be placed at all access points such as trailheads, road crossings, junctions with other types of trails, etc. Further usage control measures, such as barriers or stiles, may have to be employed in those areas where the trail is subject to illegal use.

F. Road Crossing Signs

These provide information to the hiker, *increase trail identity and help create a “look of continuity”*—not the vehicular public. Road Crossing signs actually refer to a location—not a new category of sign. Road crossings call for a collection of other types of signs found in this chapter. At many road crossings, signing may be subtle if calling attention to the trail is not desirable. This is especially true where unacceptable parking situations could develop. Carsonite posts should be used at these locations, and where the trail crosses other significant trails, logging roads, or low speed township or county roads. They should contain:

1. Trail logo.
2. Directional arrows if there is a short jog in the trail.
3. Usage signs.
4. Name of road being crossed (optional).

At major road crossings, it may be appropriate to add a 9" trail emblem. If used, these should be mounted on a post facing and parallel to the road at the edge of the right-of-way.

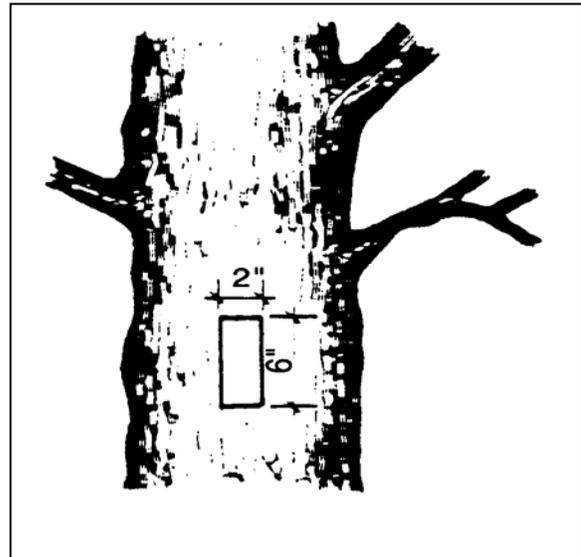
G. Reassurance Markers/Blazes

It is not cost effective or desirable to use the official trail logo as the sole marker along the trail. Other types of markers which are less costly, less visually obtrusive, and less prone to vandalism should be used between points where the official trail logo has been placed. Reassurance markers are the paint or nail-on "blazes" that mark the trail.

Blazes are placed on trees or posts, slightly above eye level so that hikers can see them easily when traveling in either direction. In areas where the trail receives winter use, blazes are placed higher so they are visible above the snow. Blazes should be within "line of sight"—when standing at a blaze marker, the hiker should be able to see the next one. Blazes should be placed on trees that "strike the eye." One well placed blaze is better than several that are poorly placed.

Blazes should be continuous—even along road segments and other unmistakable parts of the trail. Blazes should be placed immediately beyond any trail junction or road crossing—even if there is a directional sign. A second blaze (for safety) should be placed within another 50 to 100 feet. Otherwise, it is not desirable to have more than one blaze visible in either direction at any one time. However, exceeding 100 yards between blazes is not desirable. Striking a balance so as not to "over-blaze" or "under-blaze" is the key. (An exception to the continuous blazing policy occurs in ROS primitive areas where blazing is not generally allowed.)

Painted blazes are often more vandal resistant than nail-on blazes, but may require more frequent maintenance. Edges and corners should be crisp and sharp. If paint is used, dripping paint, blotches, and over-sized blazes should be avoided. On rough barked trees, the tree will first need to be smoothed using a paint scraper, wire brush, or draw knife. Once the bark is smoothed, there are a number of successful paint-blazing techniques. Some trail maintainers paint free hand—using a 2" brush. Others use a sized stencil and apply the paint with a brush, sponge, dauber, etc. A high quality, glossy, exterior acrylic paint such as Sherman Williams Metalatex or Nelson Boundary Paint should be used for long durability. Spray paint is discouraged as it is more expensive and does not last as long. Neatness counts.



Vegetation should be pruned from in front of the blazes to ensure visibility in all seasons. If nail-on blazes are preferred, the NPS has a limited ability to provide them to non-federal trail managers. If affixing nail-on blazes to trees, only aluminum nails should be used. On private lands, landowner's should be contacted for preference.

North Country NST Blaze Standards

Public agencies and private organizations which manage trails incorporated into the North Country NST route have established various methods of marking trails. Their blazes and other markings are a variety of shapes, sizes, and colors. To achieve as much consistency as possible the following standards are preferred:

1. Both paint and nail-on type blazes should be 2"× 6" vertical rectangles.

The 2"× 6" rectangular shape is large enough to be seen easily without being visually obtrusive and is the most universally accepted style of trail blazing. The 4" × 7" diamonds used in some areas are acceptable, but not preferred, and should be phased out whenever possible. To facilitate this movement, the NPS can supply (limited) plastic or aluminum blazes with color (as shown in item 2 below) to non-Federal partners choosing to use nail-on blazes (see Appendix 3 for a true-to-size blaze).

2. Throughout the trail, the color of choice is medium blue. The ideal blue color is available in a long lasting paint, specially formulated to last on trees (Nelson Paint Company, P.O. Box 2040, Kingsford, MI 49802; 906-774-5566). The paint is Nelson's Boundary Marking Paint, blue brush-on type *(Pantone 308)*. Nelson can also supply white boundary paint. Nelson paint can also be obtained from Forestry Suppliers, Ben Meadows, and other forestry supply sources. One current exception to the blue color is on the Manistee National Forest (MI) where grey/white blazes are required. Hopefully this can be changed in future forest plan revisions.

In New York, the North Country NST follows the Finger Lakes Trail for approximately 350 miles. The Finger Lakes Trail is blazed with white paint. Therefore where the two trails coincide, the color of choice is white. Eventually as the North Country NST nears completion, it may be desirable to mark the Finger Lakes/North Country Trail with both colors.

3. In non-forested areas, blazes should be placed on wooden or Carsonite posts 4 to 5 feet above the ground. Round posts are acceptable for blazes only. Treated 4" × 4" posts or Carsonite posts are required if emblems or other signs/decals are to be attached.

4. Spur trails should be distinguished by white paint (except along the Finger Lakes/North Country Trail where they will be painted the blue color shown in item 2).

H. Directional Change Indicators

These are necessary in places that require extra hiker alertness (e.g., important turns, junctions with other trails, and other confusing locations). They should be used sparingly so that they do not become meaningless or visually obtrusive. They are unnecessary at gradual turns and well-defined trail locations such as switchbacks. A reassurance marker should be placed so that it can be seen from the direction indicator. Signing for hikers coming from either direction should be done.

North Country NST Direction Indicators

Double blazes are the turn indicator of choice for the North Country NST. Again, because of the great diversity of this trail, flexibility in the use of directional markers is allowed. Several options and combinations of one or more of the options are acceptable. Directional markers are shown below in order of preference.

1. Along the trail where major turns are encountered, the normal way to indicate them will be through the use of two blazes—one placed 2 inches above the other and offset in the direction of the turn. Arrows are a less preferred option.

2. At trail junctions and where the trail jogs for a short distance down a road, a double blaze is preferred, but an arrow is acceptable. At all turns, but particularly at trail junctions when turning along a road, a single reassurance marker should be visible from the direction indicator.

3. If Carsonite posts are used, the standard Carsonite arrow decal is acceptable (3" × 3", cream on brown). However, the NPS will investigate the possibility of obtaining a blue arrow on brown background in order to carry out the overall blue color scheme. If a directional arrow is nailed to a tree or wooden post, the sign should be 4" × 4". The color of the arrow is the same color as the blazes being used along the trail, on a brown background.



I. Confirmation/Identification Signs (official trail emblems/logos)



On certified sections of the trail, the 3 1/2" trail logo should be placed at all road crossings (even drivable woods roads), intersections with other trails, and periodically along the trail.

Generally they should be about ½-mile apart, but frequency should increase in areas where there are numerous roads and intersections. These markers are made of plastic or aluminum for nailing to trees posts. They are also available in Carsonite decal format. In Carsonite format, they should be used in conjunction with mileposts—if mileposts are used—and the Carsonite usage strip decal (shown in item E) at access points and road crossings. Confirmation markers will be supplied by the NPS to all non-federal trail managers.

The larger 9" emblem is typically used at trailheads, major roads, and other locations where more visibility is desired.

J. Interpretation Signs

All interpretation should be done to quality standards which complement and enhance the prominence and identification of the trail. Simple identification signs (item J-1) are relatively inexpensive and can be placed as conditions warrant.

Interpretive Signs (item J-2) and wayside exhibits (item J-3) represent a major investment in time and money and should not be installed without a coordinated, inter-segment interpretive plan—which may involve the formation of an interpretive planning team. Complete details of the interpretive planning process can be found in the 1995 Handbook-*National Scenic and National Historic Trails-Wayside Exhibit Guidelines*, available through the North Country NST manager. This handbook also contains detailed information on the content and look of Wayside Exhibits. With long, linear sites such as the national trails, the importance of continuity in design is perhaps much greater than in a small, consolidated park. Using the directions found in the handbook reduces cost, saves time, and allows the public to easily identify the trail as part of a nationwide group of scenic and historic areas. Caution should be used to avoid over-interpretation. Interpretive waysides should follow the NPS wayside exhibit specifications, and the NPS should be involved in interpretive planning and exhibit design whenever items J-2 and J-3 are being considered.

It is often preferable to provide interpretive information at the trailhead kiosk or in brochures rather than on signs along the trail. The installation and maintenance of items J-2 and J-3 is expensive and these items are subject to vandalism. However, there are places where their placement along the trail is warranted.

1. Identification Signs: Identification signs label features along the trail. They are simple, routed wood, identification signs which allow the hiker to find their location on a map in relation to what they are seeing. It is also appropriate to use this type of sign to identify where the trail enters an area of public land if it is not otherwise marked by the agency. They are short and concise —normally only one or two words.



In most cases they consist of a name only, but may on occasion include a date. Generally, an identification sign is appropriate for all sites listed on destination signs.

Examples of appropriate signs are:

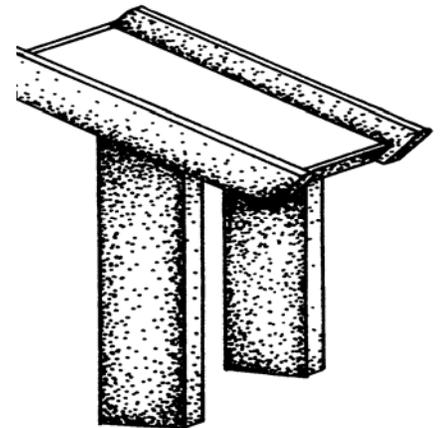
Sunrise Lake	Big Iron River	Paul Bunyan State Forest
Parnell Esker	Bibler Spring	Red Pine planted 1955
Woodtick CCC Camp 1942-44		

These signs should be 1¼" blue letters on natural colored 4" wood boards. Paint color should match the blue Nelson boundary paint used for blazes (as close as possible). They can be preserved with clear, protective coating, if desired.

2. Interpretive Signs: These provide an interpretation option that is not as complex or expensive as wayside exhibits (J-3). They are smaller in size and do not have as complex a mounting system. However, they include graphics as well as descriptive text and, thus, are true interpretive signs—in contrast to item J-1 which merely labels features. They are intended to interest and educate the hiker and to interpret specific sites, fauna, or flora where a minor statement is

to be made—briefly showing details and giving descriptions of sites or objects without lengthy interruption of the visitor's trail tour. These signs should be high quality and constructed of durable material such as fiberglass embedment. The color should be blue or multi-colored on buff background. The size varies, but is typically from 15" × 18" to 24" × 36". If there is a need for recurring signs along the trail, these are a cost effective option—the first sign costs the most. For example, it may be desirable to interpret an esker or a kettle lake in a dozen or so locations.

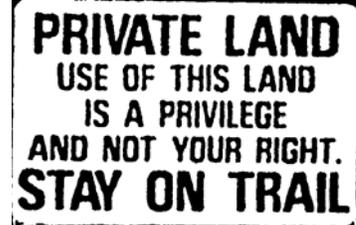
3. Wayside Exhibits: These are the largest, most complex, and expensive of the interpretation options. Significant natural features or cultural resources may warrant the larger size and more complete interpretation which can be presented in this format. Like item J-2, these are intended to interest and educate the hiker and may be used to more fully explain historical events or sites, glacial landscapes or features, plant and animal communities, etc.—where a major statement regarding the subject can be made. Their intended use is to show details, action, etc., which are not clearly visible to the visitor upon casual observation. Major exhibits will occur much less frequently than either J-1 or J-2 for a number of reasons. They are expensive to develop and maintain and, if used too frequently, can take away from the character of the trail. (In addition to the graphic above, see Appendix 1 —mounting examples from the NPS Wayside Exhibit guidelines for National Scenic and Historic Trails, and a sheet from a supplier such as GS Images showing typical mounts for both J-2 and J-3).



K. "Crossing Private Land" Signs

The North Country NST crosses private lands in many locations. At the current time, the NPS does not have authority to purchase lands or easements for the trail. Other agencies are acquiring limited amounts of land and a few permanent easements are being donated. Until such time as acquisition authority is available, trail passage is at the mercy of the landowner and is dependent upon their cooperation. Therefore, efforts to foster and collectively maintain good-will must be practiced. One way to assist in this effort is to educate hikers about proper conduct when crossing private lands and to notify them when they are entering private property. This sign is intended to serve that purpose and must be located accurately.

The top portion of the sign should read, "PRIVATE LAND, USE OF THIS LAND IS A PRIVILEGE AND NOT YOUR RIGHT. STAY ON TRAIL."



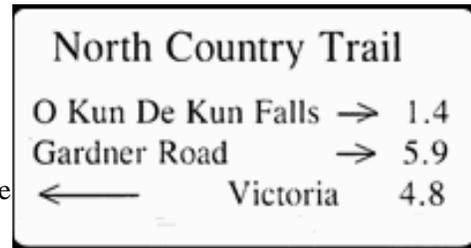
The lower part of the sign may contain smaller text such as the following: "The North Country NST depends on the cooperation of many private landowners. Please respect the land you travel through. Foot travel only is permitted. Camping, fires, hunting, and straying from the trail is prohibited. Enforced by the County Sheriff." This sign is yellow with brown lettering.

L. You-Are-Here Signs

These map signs are optional. They may supplement maps at trailhead kiosks and other key locations, such as at trail intersections, along the route. You-Are-Here signs are most likely found in state parks or other places that have a highly developed, complex, or confusing trail network. The other indicated methods to mark and identify the trail make You-Are-Here signs generally unnecessary. On the North Country NST, they are the exception rather than the norm.

M. Destination Signs

Destination signs show direction and distances to various spots along the trail. They are an important source of information both for long distance hikers and day hikers, and can serve to increase the use on under-used sections of the trail. If someone knows that there is a waterfall, lake, or other attraction down the trail,



they may be tempted to hike to it and thus become intrigued with the trail idea. Destination signs supplement the identification signs shown in paragraph J-1. They are optional but desirable. These signs will have blue letters on natural wood-color background.

The trail name will be 2" letters and the destination names will be 1" letters. Appropriate places for these signs are: trailheads, major roads, shelters, trail junctions, and spur trail junctions (to indicate distance to water or shelter). They may contain the following information:

1. The name of the trail,
2. Significant destinations such as rivers, road crossings, shelters, campsites, waterfalls, etc. along the trail,
3. The direction to these destinations indicated by arrows (arrows may not be needed, depending on sign placement—for instance if a sign is placed on each side of a road), and
4. The distance to the destinations in miles and tenths.

N. Boundary Marker Signs

In those locations where a corridor or easement has been acquired, these signs are used to permanently mark the trail corridor boundary. They are not necessary where the trail passes through large areas of public lands. White Carsonite type posts with blue decals and white lettering should be used. One side of the post should say "Private Land Behind This Sign"—similar to Carsonite decal PL-260, except for coloring. The other side should say "Property Boundary, National Scenic Trail Corridor Behind This Sign"—similar to Carsonite decal SP-401, except for coloring. Currently, off-the-shelf decals with the coloring and wording specified above are not available. Therefore, illustrations are not included. The National Park Service will work with a supplier to develop these decals when the first request for their use is made. Requests for these decals can be made to the North Country NST manager.

O. Adopter Signs

While these signs are optional, it is often appropriate to identify the volunteer(s) responsible for the maintenance of a particular segment of the trail and recognize their efforts. Trail adopters typically are assigned a segment of trail between two identifiable points—such as road crossings. Adopter signs will normally be affixed to the post which holds the Road Crossing Signs (item F). A variety of formats, including discs that recognize the efforts of a group (such as the North Country Trail Association, the Finger Lakes Trail Conference, the Buckeye Trail Association, etc.) or a small strip or sign recognizing the efforts of an individual are acceptable. If used, the coloring should be blue lettering on a white background.

P. Connector Signs

Certified sections of the trail are marked to the standards shown earlier in this chapter. Other temporary segments of the route which currently follow roads or other types of trail which are uncertifiable are generally not marked. To further the goal of marking the entire trail for public use, connector signs have been developed. These decals are shown in Appendix 3. The emblem shown at the top of the decal is also available in plastic, nail-up format.

The North Country Trail Association has developed a policy and explanation of the end-to-end marking concept. See Appendix 3.

Figure 4. NORTH COUNTRY NATIONAL SCENIC TRAIL SIGN SUMMARY

Sign Type	Material	Background Color	Letters	
			Color	Size
Highway Information Signs	Aluminum or HDP	Brown	White	MUTCD-varies
Warning Signs	Aluminum or metal	Yellow	Black	MUTCD-varies
Entrance Signs	Aluminum or HDP	Brown	White	MUTCD-varies
Trailhead Kiosk	Wood	Brown	NA	NA
Regulatory (Usage) Signs	Decal, Alum., Plastic	Brown	White	varies
Blazes	Paint, Alum., Plastic	Medium Blue	NA	NA
Trail Emblems	Aluminum, Plastic	NA	NA	NA
Interpretation #1	Wood	Natural Wood	Med. Blue	1¼ inch
Interpretation #2 and #3	Fiberglass Embedded	Buff	Multi-color	varies
Crossing Private Land	Plastic, Aluminum	Yellow	Brown	NA
Destination Signs	Wood	Natural Wood	Med. Blue	Trail Name-2 inches Destinations-1 inch
Boundary Markers	White Carsonite® Post	Medium Blue	White	NA
Adopter Signs	Decal, Plastic, Aluminum	White	Med. Blue	NA
Connector Signs	*Decal*	*Brown*	*White*	*Varies*

HDP = High Density Plywood

MUTCD = Manual of Uniform Traffic Control Devices

NA = Not Applicable

Sign Maintenance

Sign maintenance is critical to the operation of a quality trail system. Well maintained signs that are repaired promptly convey a sense of pride and reduce further vandalism. Signs are a highly visible representation of the quality of the trail. Their maintenance or lack of maintenance leaves the visitor with a positive or negative impression about the trail. Signs convey many kinds of information and it is critical that they be in good shape. Special attention should be given to those that are damaged from shooting and other factors, those that are faded or brittle from long exposure, and those that are simply missing. All signs that are damaged or weathered so they no longer convey a good impression or serve the intended purpose should be repaired or replaced. Periodic painting and other maintenance is a necessity and will prolong the life of a sign.

Priorities for sign maintenance are:

1. Signs required for user safety,
2. User restrictions and advisory signs,
3. Destination and identification signs, blazes, and trail logos, and
4. Informative and interpretive signs.

Chapter 8

SAFETY CONSIDERATIONS FOR TRAIL WORKERS

National scenic trails have had impressive safety records over the years. With so many volunteers contributing thousands of hours each year, under arduous conditions, this is remarkable. Most volunteers and crew leaders understand the importance of being safe and are mindful about protecting themselves and others. Still, it is easy to become lax and forget basic safety rules. It is impossible to cover all aspects of safety in this handbook—there are entire books written on the subject. Crew leaders and others are encouraged to investigate more detailed sources of information such as agency specific safety handbooks, manufacturer's instructions accompanying individual tools, and on-the-job training from more experienced workers. The purpose of this chapter is to remind trail workers of some basic common-sense rules and offer brief insights for a continued safe work record.

Above all else is attitude! Crew leaders should not make the assumption that everyone thinks the way they do. Considerable time should be spent going over safety rules before each work-outing.

SAFETY RULES

1. Tools should be carried in the safest way. The tool should be gripped by the handle about 6 inches behind the head (or at the balance point) and carried to the side, on the down-slope side of the body rather than over the shoulder or as a walking stick. This prevents injuries due to falling on the tool, since it can be easily tossed away when carried correctly. Tools with sharp blades should be carried with the blade facing the ground and equipped with a sheath to prevent accidental cuts and to retain their sharp edge. The sheath should remain on the tool while it is carried to the worksite and removed only when used. Bulky or clumsy items should be held with two hands or carried by two people.
2. Plenty of room should be allowed between volunteers for walking and working—generally 10 feet between each crew member.
3. Crew members should always be aware of what others are doing and take full responsibility for their own safety and the safety of others.
4. The right tool should be used for the job.
5. The "Scan-Shout-Swing" order of doing things should be implemented. Crew members should look around to make sure no one is in harm's way and there is plenty of room to swing safely. If necessary, brush or limbs first should be cleared to avoid injury from a deflected tool. Second, intentions should be communicated and third, when all is clear, crew members may proceed.
6. Trail hazards should be removed as they are encountered, or their presence communicated to other workers down the line—either verbally or with a

temporary sign (for instance, a temporary sign could warn others of a nearby yellow-jacket nest or a poorly supported leaning tree). Hazards should be removed as soon as practical to prevent others from being harmed.

7. Dehydration, heat stroke, lack of energy, and hypothermia are life-threatening concerns. First aid supplies should be kept on hand and every crew member should know what is available and where it is kept. If working in remote locations, someone should know the crew's location and expected time of return.

8. *Machismo* should be saved for the football field—it's easier to be carried off a football field than it is to be carried out of the woods.

9. Crew members should be aware of their physical condition and limitations—weariness can lead to accidents.

LEADING A WORK-OUTING

Safety is the number one priority in all volunteer trail operations. Crew leaders are responsible for briefing crew members to maintain a safe working environment and instilling in them a sense of responsibility. Every work leader should learn and teach his/her crew safe work habits and see that these practices are adhered to. Every tool is a potential source of injury and everyone can not be watched, at all times. Therefore, ground rules must be established at the beginning and taught by example.

The correct tools for the job should be selected and inspected. Blades should be sharp, handles smooth, and heads securely fastened. Tools should be properly cared for and used correctly. Crew leaders should demonstrate proper carrying and handling techniques before leaving the parking lot. See some suggested safety guidelines in Chapter 10 - Selecting the Right Tool.

Careful planning will prevent problems during the outing. A checklist of supplies and safety-briefing points is a must.

Sample Checklist

First Aid kit	Tools (list)
Insect repellent	Other personal protective equipment (PPE)
High energy food (list)	Compass
Water (adequate amount for conditions and crew members)	Topo maps
Individual water containers	Project maps and plans
Extra rain gear or plastic garbage bags	Trail brochures
Extra gloves	Membership information
Hard hats	Copies of "Safety Rules"
Eye & ear protection	

All potential participants should be told what they are expected to bring prior to the work-day. Normally, participants are responsible for their own footwear, rain gear, and gloves. There will always be a few who need an item, so crew leaders should bring extra, if they are available.

Sometimes people will bring their own tools. This is fine as long as their tools are in good condition and appropriate for the project. Inexperienced workers, for instance, seem very fond of hatchets. They are ineffective for trail work when compared to loppers, bow saws and other trail tools. Crew leaders should be firm about leaving such tools behind, and should check all personal tools for soundness.

Just because a person has brought a tool from home does not mean that he/she knows how to use it correctly. Time should be taken to discuss proper use of all tools that are going to be used that day. If there are more tools than people, the determination has to be made as to which ones are really necessary and which ones should be left behind. In most cases crew members should not carry more than one tool, except when walking in to major project sites. An exception to this is when small tools such as wire cutters for old barbed wire can be carried in a pocket or day-pack. In addition to teaching basic rules, a crew leader must also discuss other precautions (see poisonous pests below).

Crew leaders must be aware of any signs of fatigue, dehydration, or heat stroke among crew members. If someone seems to be having trouble, crew leaders do not need to draw undue attention to it, but should not ignore it either. Crew leaders should ensure that everyone is getting enough rest periods and water.

Finally, this should be a good experience for everyone—if the experience is positive, people will come back for the next work-outing.

Special Considerations When Working with Youth

If supervising young people (especially teens who have a history of problems) crew leaders should take a deep breath, sit back, and relax. Crew leaders of youth are to be congratulated for having accepted such an important and challenging endeavor. The first prerequisite is to learn stress reduction and relaxation techniques. The following tips may be helpful:

1. Safety is priority from the very beginning. Crew leaders should let members know that mishandling of tools or abusive behavior toward others is not tolerated—the reason being that they genuinely care about the crew members, the continuation of the program, and performance quality.
2. Crew leaders should establish a rapport by doing things with the teens that are fun (like jumping in a lake, or picking berries) and by being tolerant of other

bothersome things the youth might do (like when they start making fun of the functional clothes crew leaders wear).

3. It is essential for crew leaders to have a sense of humor.
4. Crew leaders should be impeccable role models—but not afraid to admit their own mistakes.
5. Crew leaders should empower the youth with a can-do spirit—not a spirit of invincibility but one of humble self-reliance built upon cooperation.

Working with youth—especially those often referred to as "at-risk", is not something that is for everyone. It is a job that can be both extremely rewarding and extremely frustrating. However, it is clear that teaching youth the importance of respecting themselves and each other, by practicing safety and strong work ethics, can make a real difference in their lives and in the life of the trail.

USING THE RIGHT TOOL FOR THE JOB

Using the right tool for the job is directly related to safety. Using the incorrect tool for the job can lead to tool breakage, slips, and injuries. For instance:

- A shovel should not be used to chop away at a large root in the ground. Shovels were designed for digging and moving dirt—not chopping solid wood. A cutter mattock, pulaski, or axe should be used for chopping.
- A small hammer should not be used to drive spikes into railroad ties. Carpenter's hammers (16-ounce claw hammers) are made for nails—not spikes. A 4-pound hammer or sledge should be used to drive spikes.
- A bow saw should not be used like a weed cutter. Bow saws are designed to cut through wood—not be swung at weeds or brambles. A Suwanee Sling or other weed cutter should be used to cut weeds.

Using tools improperly is one of the chief causes of accidents. Chapter 10 should be studied to understand which tools can best do the work that awaits the crew.

FIRST AID

Ideally, all crew leaders should be certified in first aid by the American Red Cross. A first aid kit should be checked, complete, and large enough for the crew and the job at hand. Above all, it should be taken along on the job, and crew members advised of its location. Professional assistance may be hours away.

POISONOUS PESTS

Ticks - Wood ticks are a nuisance, but seldom pose medical problems. Skin and clothing should be checked and any ticks that are found should be removed.

Deer, or bear ticks, on the other hand, are potentially very dangerous. These ticks, which are much smaller than wood ticks, can carry the bacteria that causes Lyme Disease. Generally, only about one percent of all deer ticks are infected with the Lyme disease bacterium. However, in some areas more than half of them harbor the microbe. Most people with Lyme disease become infected during the summer, when immature ticks are most prevalent. Except in warm climates, few people are bitten by deer ticks during the winter months. Ticks should be removed from clothing and body as soon as they are observed. Research suggests that a tick must be attached for many hours to transmit the Lyme Disease bacterium, so prompt removal can prevent the disease. A thorough tick-check at the end of the day is advised. Immature deer ticks are only about the size of a poppy seed and may easily be mistaken for a freckle or a speck of dirt. The risk of developing Lyme Disease from a tick bite is small—even in heavily infested areas. Most physicians prefer not to treat patients bitten by ticks with antibiotics unless they develop symptoms of Lyme Disease.

Tips for Personal Protection

- Wear light-colored clothing so ticks can be easily spotted.
- Wear long-sleeved shirts and closed shoes and socks.
- Tuck pant legs into socks and tuck shirt into pants.
- Apply insect repellent containing permethrin to pants, socks, and shoes, and compounds containing DEET on exposed skin. Do not overuse these products.
- Walk in the center of trails to avoid overgrown grass and brush.
- After being outdoors in tick infested areas, remove, wash, and dry clothing.
- Inspect your body thoroughly and carefully remove any ticks.
- Inspect pets for ticks.
- Your local health department and park or agricultural extension services may have information on the seasonal and geographic distribution of ticks in your area.

How to Remove a Tick

- Tug gently but firmly with blunt tweezers near the “head” of the tick until it releases its hold on the skin.
- To lessen the chance of contact with the bacterium, try not to crush the tick’s body or handle the tick with bare fingers.
- Swab the bite area thoroughly with an antiseptic to prevent infection.

Mosquitos - Like wood ticks, mosquitoes are a nuisance but they are not particularly a safety hazard. Repellents should be used and/or long sleeved shirts and long pants worn. Herbal repellents can be used to cut down on the amount of DEET found in other repellents, if workers prefer.

Poison Ivy - Some people are extremely allergic to this easily identified plant. If seen, others should be alerted to its location so they can avoid it. A line of Technu ® products, available in most drug stores, can help prevent contracting the poison.

Poisonous snakes - Poisonous snakes are infrequently encountered. Their presence along the trail varies tremendously, depending on the state and the location within the state. Generally, snakes will move away from people if they hear them coming. The danger from poisonous snakes is greatest when the snake is surprised. In poisonous snake country, there are several precautions which can be taken to decrease the chance of being bitten. Gloves should be worn when moving fallen logs or other debris, high-top leather boots should be worn, stepping over large logs should be avoided and crew members should take care where they put their hands and feet.

If working in poisonous snake country, a first aid class should be taken or first aid books made available to crew leaders and members so appropriate action can be taken in case someone is bitten. Generally, if a doctor can be reached within one to two hours, drastic measures of treatment such as incisions and tourniquets should be avoided. The person with the bite should be kept calm and escorted to the nearest doctor immediately. The injured should not run as this will cause the heart to more quickly pump the poison throughout the body. From many locations it is feasible to reach a doctor within the one to two-hour time frame. If a crew is working in a remote area, members should be prepared to administer first aid.

Spiders - Like snakes, poisonous spiders are infrequently encountered and are no more common in the woods than in a typical backyard. However, the brown recluse spider may be present in some areas, so an inspection of seldom-worn clothing is recommended prior to dressing. Sleeping bags should also be shaken out before use.

Deer Flies and Black Flies - Wearing hats and long sleeve clothing is the best preventive measure for these nuisances.

Yellow-Jackets and Hornets - These pests can cause painful stings and more serious allergic reactions. Persons who know they are allergic should carry a complete sting kit including antihistamine inhalants and other supplies. Crew leaders should check with crew members to see if anyone is allergic and to be sure they have their kit with them. The crew first aid kit should also be equipped with both "sting-kill" ampules and treatment for allergic reactions.

All members should be aware of insect nests and warn others of their presence. It is often the second and later crew members who get stung, as the first person who steps into or bumps a suspended nest has moved out of harms way by the time the insects attack. Yellow jackets typically nest in the ground while hornets build their nest in bushes and trees. If the pests cannot be killed and the nest destroyed, work elsewhere until a later date. If a nest is discovered the area should be marked with flagging or a temporary sign to alert others.

At certain times of the year and in certain kinds of weather, yellow jackets seem to be more aggressive. Generally this is in late summer and fall and during periods of dry weather. During these times, yellow jackets are attracted to food and drink. All members should be alert when eating or drinking pop to avoid getting a yellow jacket in the mouth. A sting in the tongue is particularly serious as the tongue can swell and quickly block the airway.

SIMPLE PRECAUTIONS

Crew members should work in clothing that covers most of the skin. Good quality work boots (best if they have a steel toe), a hard hat and gloves should be worn. With power equipment (like a chain saw) safety goggles, ear protection, and high quality chain saw chaps should be used.

Frequent water and rest stops are recommended. Crews should use common sense and not try to do more than is prudent.

Chapter 9

MAINTENANCE

The objectives of trail maintenance are to: provide for user safety, access, and convenience, protect adjacent resources, and preserve trail investment. Maintenance begins immediately following trail construction and is a continuous process.

Sometimes questions arise whether seldom used stretches of trail are worth the time and effort required to maintain them. However, if the trail is not maintained, why should anyone hike it? All trail should be maintained in the best condition possible—a well-maintained trail is self-perpetuating.

TRAIL ASSESSMENT AND INVENTORY

Trail assessment

For routine maintenance, a detailed trail condition assessment may not be necessary. However, there may be sections of the trail where it is not possible to complete all maintenance immediately or where more help in terms of labor and/or money is needed. For example, during a routine walk through, a severely-eroded, rather lengthy trail section may be noted. Since the best solution for a severely eroded trail section may be to relocate it, the work is not within the capabilities of an individual maintainer to correct immediately. In that case an assessment is needed so that the major needs can be made known to the local managing authority and the NPS. With this information at hand, funding or labor may be found to assist in correcting the problem. A maintenance assessment can also serve as a basis for applying for Challenge Cost Share funds. One way to accomplish an annual trail assessment and document heavy maintenance needs, or to just provide information on the condition of the trail, is through the use of a trail assessment or inventory form. An example is shown in Appendix 2. (Agencies or clubs may use their own, if available.)

Inventory

A more detailed inventory of trail features and required maintenance is desirable as the trail moves closer to completion, as trail managers become more knowledgeable, and as the NPS or the North Country Trail Association (NCTA) and its affiliates increase management oversight capability. An electronic database is capable of generating various reports including maintenance needs. An inventory similar to either the Appalachian Trail Conference's TREAD database, or the proposed Ice Age NST Trail Inventory and Assessment Process (as shown in Appendix 2-B) should be considered. At this point it is beyond the scope of this handbook to develop a database format or require the various local trail managing authorities to use it. This level of detail may be necessary someday. If current managing authorities desire a detailed inventory, they are encouraged to proceed—keeping in mind that the selected format and the computer software should be compatible with other authorities, and that the data be easily convertible to those electronic software programs.

There are two ways to collect data for this type of database:

➤ Paper Forms

Persons using this method walk the trail and enter the data on a series of forms. The data from the forms is then manually typed into the electronic database back in the office. This method is shown in Appendix 2-B.

➤ GPS/GIS

Persons using this method walk the trail with a Global Positioning System (GPS) unit, keying in the data points and mapping the trail as they go. Back in the office, data from the GPS unit is simply downloaded to a computer and linked to a Geographic Information System (GIS). This method is the wave of the future, and not only provides a detailed inventory of various trail features, but also produces a very accurate trail map. Eventually, the master records and maps maintained by the NPS will be in a GIS.

Some agencies are already using GPS/GIS technology in their trail management activities. As this technology becomes more widely available, others will begin using GPS to inventory and map the trail. When the NPS achieves full GIS capability, data collected by others will be used. At that time, it will be important that the various trail managing authorities have been inventorying similar kinds of trail features and collecting similar data. Therefore, a GPS Data Dictionary is shown in Appendix 2-C. It will be helpful for those who are using GPS technology to duplicate this data dictionary and collect the information shown, **if** it occurs on that segment of trail.

MAINTENANCE ACTIVITIES

When assessing trail maintenance needs, the following groups of general maintenance categories should be considered. Some of the more common maintenance activities required to remedy deficiencies identified during the annual trail evaluation could include:

Trail Maintenance-Vegetation:

- Brushing/clearing areas
- Remove fallen trees/branches
- Hazard tree removal
- Slope revegetation
- Backslope grooming
- Vista maintenance
- Poison Ivy removal (herbicide)

Sign Maintenance:

- Sign repair/rehabilitation
- Sign replacement
- Blaze repainting and maintenance
- Cairn repair
- Barricade/closure device repair

Drainage Maintenance:

- Cleaning/repairing structures
 - culverts
 - waterbars
 - Cowetta dips
 - drainage ditches
- Replacement of existing structures
 - culverts/underdrains
- Install additional drainage structures
 - waterbars
 - culverts
 - grade dips

Structure Maintenance:

- Bridge repair
- Cribbing/retaining wall repair
- Barrier/guardrail repair
- Steps/perron repair
- Fence/gate/stile repair
- Shelter repair

Tread Maintenance:

- Grading tread
 - slough and slide removal
 - slump repair
 - filling erosion ditches
 - grubbing rocks/ roots/stumps
- Spot surfacing
- Turnpike section repair
- Surface replacement (similar material)
- Surface repair
- Remove loose rocks

Litter Clean-up:

- Old dumps near trail
- Current discarded litter

Trail Maintenance-Vegetation: All side branches extending into the trail clearing should be cut flush with the parent branch or stem, leaving no stubs. This is safer, lasts longer, and also allows for the wound to heal naturally.

Small trees and shrubs within the tread should be grubbed out to prevent tripping. Holes should be filled and compacted.

Trees and brush outside the tread (but inside the trail clearing) should be cut as close to the ground as possible, leaving no sharp pointed stumps or stems. Consideration may be given (especially on exotic species) to treating these cut stumps with herbicide — after obtaining proper approval.

Unless prohibited because of ROS setting, using power mowers in open grassy areas or power brush saws in brushy areas should be considered.

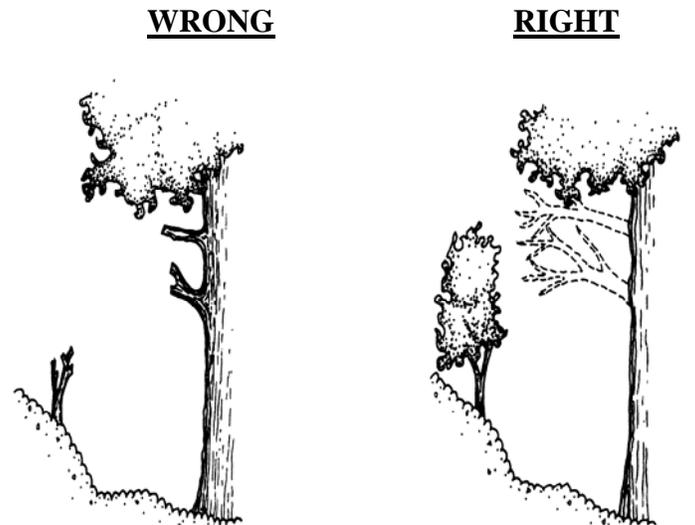
Fallen branches and trees should be removed except for a few large trees/logs near access points (see maintenance tips). On larger logs, remove a section only the width of the tread to further restrict unwanted use.

In high use sections of the trail or near camping areas, dead or dying trees that have a possibility of falling across the trail or camping area should be removed. In Primitive ROS areas, only those trees that may be a serious hazard to users should be removed.

Tread Maintenance: When tread repair is needed, it should be restored to the original design condition, free of loose stones, rock points, stumps, and roots. Attention should be given to dips and outsloping so that water does not collect on the trail.

Drainage Maintenance: Proper drainage protects the trail from erosion damage. Trails should be routinely inspected to ensure that all culverts, dips, waterbars, drainage ditches, etc. are free of debris and ready to function properly at all times—especially during the rainy season or spring runoff. Routine maintenance is not only necessary, but valuable in terms of labor, material, and money saved on emergency repairs, and in the number of days the trail is useable. If repairs are necessary, they should meet or exceed the original construction specifications.

Trail and Support Structure Maintenance: The major consideration in structure maintenance is safety. Bridges, stiles, boardwalks and all support structures should be routinely inspected in order to ensure safe conditions and intended function (see bridge



inspection requirement in Chapter 5). Minor maintenance of structures should be provided by the adopter or trail crew. Deficiencies requiring major efforts should be planned as a separate project. Unsafe structures must not remain unattended. If work must be temporarily deferred, an alternate trail route should provide a bypass of the hazard.

Sign Maintenance: (see discussion in Chapter 7).

FREQUENCY OF MAINTENANCE

Most trail segments need maintenance about three times per year.

Prior to Memorial Day - This may be the maintenance period that involves the most work. The objective is to get the trail ready for the spring hikers. In addition to general trail cleanup, some of the more important tasks are to:

- Remove tree limbs and fallen trees from the trail, and prune encroaching limbs as needed.
- Repaint or replace the blazes if they are faded or missing. (Be sure that they are not obscured by vegetation—consider growth that occurs before the next maintenance).
- Make sure that all signs and trail emblems are in place and well maintained.
- Inspect for water in the trail and take corrective action.
- Carefully inspect all bridges—immediate safety needs should be met and tasks which are too large for immediate action noted.
- Maintain all trailheads, campsites, and other support structures.
- Keep a list of larger jobs or those that require different tools that will require attention at some other time.
- Schedule time for major projects that were identified—round up tools and helpers.
- Pick up litter.

Mid-Summer - Early July is a good time to take care of annual growth so that the trail is kept clear and relatively easy to hike. The hiker should not be assaulted by weeds and briars. Some of the key jobs for mid-summer are to:

- Mow or cut all weeds, brambles, briars, and high grass encroaching on the trail. On sections of the trail that pass through fields or other places receiving direct sunlight, mowing may have to be done on a more frequent basis—perhaps monthly throughout the summer. Brambles and briars may need to be grubbed out by the roots to prevent rapid regrowth.
- Prune all brush and overhanging limbs that have grown into the trail clearing—all blazes and signs must be visible.
- Complete the larger jobs that could not be accomplished the previous spring.
- Maintain and improve water bars, drainage ditches, and all trail structures.
- Be alert for noxious or exotic plant species—remove, kill, or inventory them for future vegetative management projects.
- Pick up litter.

Fall - Fall maintenance is geared toward preparing the trail for the winter months. This is a time to:

- Finish any uncompleted jobs and recheck blazes and signs—replace and repair as necessary.
- Be sure that campsites and shelters are clean and in good repair.
- Contact landowners to thank them for their support.
- Pick up litter.

ORGANIZING THE CREW

Experience and knowledge of the trail will help determine what tools to take and how many persons to recruit. The most efficient way to manage trail crews goes by various names—the "overseer" system, the "trail sponsor" system, the "adopt-a-trail" system. The key is that one person is responsible for a particular segment of trail on a permanent basis, if possible. It is their responsibility to see that the trail segment is maintained, either working by themselves or by recruiting helpers. The advantage

of this system is that the adopter becomes well acquainted with the segment, can deal efficiently with problem areas, and can judge how much and how often work is needed to keep the segment maintained. A disadvantage of this system is that a segment can become so familiar that problems are overlooked or it becomes boring for the adopter. One way to overcome this problem is to rotate adopters between segments every few years . A good reference on crew organization is the Appalachian Mountain Club's *Organizing Outdoor Volunteers*.

The annual trail evaluation or a pre-workday trip by the adopter can serve as an assessment of the work to be done and will facilitate crew organization. Two to four persons can usually maintain 3 to 5 miles of trail per day—depending on the individuals, terrain, vegetation, and the number of maintenance problems.

The exact kind and number of tools for a crew varies from one part of the country to another. In general, tools which are capable of cutting weeds, pruning branches, removing logs, digging and leveling trail, and cleaning waterbars are desirable. It is advantageous to rotate tools among trail workers to provide relief from repetitive motion and effort (see Chapter 10 for tool suggestions).

CLEANUP

The trail must be cleared of all debris following clearing or heavy maintenance. Maintenance results should appear neat and hardly noticeable to a hiker. Inadequate clean-up can spoil even the most thorough clearing job. One person on the crew should be assigned responsibility for this job. All cut growth should be carried off the trail and scattered—not piled. If eroding gullies are nearby, the cut material can be placed in the gully to slow the flow of water and catch sediment (see the third item under maintenance tips-clearing).

All flagging, construction stakes and debris, litter, etc., should be removed.

MAINTENANCE AND CONSTRUCTION TIPS

Work should be organized so every section of trail is left as complete and finished as possible.

Use should be found for as much disturbed material as possible. On every trail there are points where excess material must be removed and sections where material will be needed. Rock and soil removed from a cut on one section can be used as fill on another nearby section. A trail does not have to be worked progressively from beginning to end. Priority should be given to sections needing the most attention. The cut sections may be worked first, followed by the fill areas. Water diversions should be installed prior to trail surfacing work to allow for natural drying and easier working

conditions. If two crews are working along the same trail, work assignments and locations should be scheduled to allow for exchange of equipment and materials.

When constructing new trail, a short, unworked section should be left next to access roads until last—this helps eliminate premature use.

As construction and maintenance is finished in a segment, clean-up should also be completed. Postponing trailside cleanup until later is poor procedure—it seldom gets done.

Time should be taken to do the job correctly the first time around to avoid having to repeat the task.

Clearing

Flagging should be carried for temporary trail marking or to identify work to be done.

For light pruning work that is within reach, hand pruning shears (like those used by a gardener) are quicker and easier than long handled loppers.

A stout but flexible forked sapling (about an inch in diameter at the base) that has been cut about 4 ½ to 5 feet in length (with about a 10" fork at the end) is a very useful tool for flinging small limbs out and away from the trail. When following someone who is using a power brush saw, it is also an excellent tool for flinging the cut brush out of the trail. Used like a pitch fork, it scatters the brush so that it is not visibly concentrated, and is much more efficient than bending to pick up and discard each piece by hand.

A couple of large down logs should be left near trail entry points to discourage wheeled use. Farther down the trail, a section the width of the trail tread can be cut out of large fallen logs for the same purpose.

All main stems or trunks should be cut as close to the ground as possible—or grubbed out. It is very important to avoid leaving short stubs (trippers) as they are a safety hazard. Cut hardwood stems resprout easily, therefore, grubbing is the preferred method as it is a one time treatment.

Larger logs should be carried to the downhill side of the trail and placed perpendicular to the face of the hill to prevent them from rolling and creating a safety hazard.

If a branch needs to be pruned, it should be cut next to the trunk. If not cut next to the trunk, these safety hazards tend to develop suckers or side branches which will have to be cut again and look unnatural. Large limbs should be undercut first to prevent peeling the bark from the main stem when the branch falls.

Conifer branches and weak trees, such as alder, are easily weighted with heavy snow or rain and may require extra clearing.

Painting

Clean, neat ways to carry and apply paint should be practiced. The following suggestions should be considered:

- A 1" wide brush spreads wider during painting. Some prefer using a 2" brush and little pressure so that the blaze doesn't get too wide.
- To illustrate the proper blaze size, a dollar bill is very close to 2" × 6".
- Flat grey or brown spray paint should be carried for use in obliterating old trail blazes.
- Old gloves, a wire brush, and a 2 ½" paint scraper are handy tools.
- Paint can be kept in an old, snap-top detergent bottle. Applying small amounts of paint to the brush can ensure a neater job..
- A paint brush and a small can (to hold paint) are easily carried inside a gallon paint bucket. For comfort, a piece of hose can be slipped over the paint bucket handle or it can be replaced with a wooden handle.
- Cans lined with plastic bags make for easy cleanup.
- Extra plastic bags kept in the vehicle are handy. Brushes can be wrapped in plastic so they won't dry out until cleaned at home. Another method is to bring along mineral spirits or water (depending on type of paint used) to cover the length of the brush bristles. This can be stored in a sturdy, sealable container. Extra care should be taken to avoid leakage.

Signs

When using Carsonite posts, the optional anchor at the bottom should always be installed. This makes them even harder for vandals to remove from the ground while adding little expense.

When installing wooden posts, a piece of scrap lumber should be nailed to the lower part of the post. It is easier to nail it parallel to the post—this method is just as effective as a perpendicular arrangement and allows for a smaller post hole.

Chapter 10

SELECTING THE RIGHT TOOL

A wide variety of tools are available for trail use. Local and individual preferences often dictate the kinds of tools which are chosen for various tasks. Some of the most commonly used tools and their functional purpose are identified in this chapter. A few tips on using the tool safely and effectively are also included. Every trail maintainer needs to learn how to choose the correct tool for the job, use it effectively and safely, care for, and store it properly. Purchasing high quality tools initially is more cost effective—long-term performance exceeds those of lower quality.

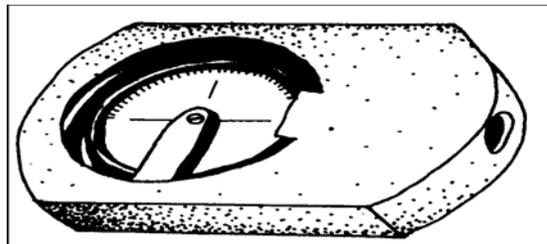
The right tool should be used for the job. Substitutes are dangerous and ineffective. Tools should be kept in good condition—throwing them on the ground can damage them. A file should be carried for spot-sharpening edges throughout the work day. Tools should be carried with the appropriate guards in place. At the end of the work day, all tools should be cleaned, sharpened, lightly oiled, and stored properly.

HAND TOOLS

Clinometer

Uses: A clinometer is an essential tool when locating and laying out a trail. This compass-sized tool allows the user to measure the slope (grade) of a hill or trail.

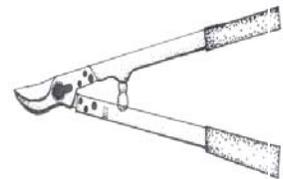
Tips: Both eyes must be kept open when sighting through the clinometer (see Eye-Level Survey Techniques in Appendix 4).



Lopper

Uses: Cutting selected limbs or saplings during construction and maintenance phases. Larger models can cut limbs approaching 2" in size.

Tips: High quality loppers with replaceable parts should be used. Saplings should be clipped flush to the ground and limbs flush to the tree. Loppers must not be thrown on the ground as this may clog the head and dull the blades. At the end of the day, the blade should be cleaned and wiped with light oil.

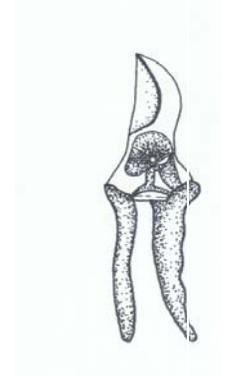


Safety: Leather gloves and a hardhat should be worn. Eye protection is also recommended.

Hand Pruner

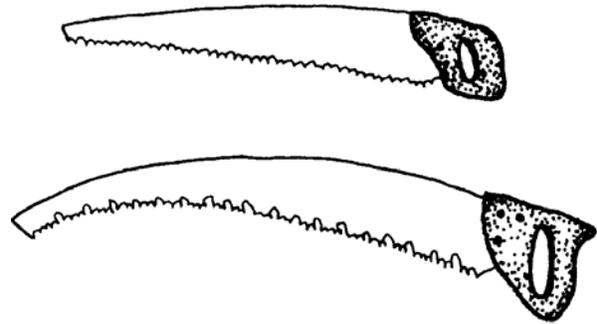
Uses: Cutting small branches encroaching on the trail. Also useful for cutting protruding roots that are tripping hazards. Mostly used for trail maintenance.

Tips: Handier and lighter to carry than a lopper when only minor pruning is needed—it should be carried in hand while hiking to clip small branches as encountered.



Pruning Saw

Uses: Cutting limbs encroaching on the trail. Can also be used for cutting small trees or shrubs at the base and removing small to medium sized windfalls. Pruning saws come in a wide variety of sizes and tooth patterns. They range from small folding models with 6" to 8" blades to those with blades up to approximately 26" in length. Blades are curved and cut only on the back-stroke—a handy feature when removing hard to reach limbs.

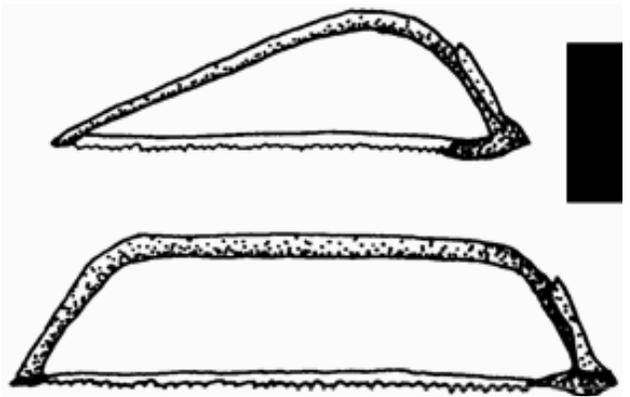


Tips: Pruning saws should be resharpened often. A light coat of oil should be applied to the blade after each use.

Safety: Except for folding models, pruning saws should be kept in a sheath when not in use. A hand holding a limb or sapling should not be crossed beneath the hand pulling the saw—this can lead to a nasty cut when the saw comes through the limb sooner than expected. Personal Protective Equipment (PPE) includes leather gloves and a hardhat.

Bow Saw

Uses: Cutting limbs, small trees, and small to medium sized windfalls—essentially the same as pruning saws except that bow saws can cut larger material. Bow saws have blades ranging from about 21" to 36" in length. The smaller saws are generally triangular in shape and work well for pruning. Their shape limits the length and depth of the stroke to material less than 4" to 5" in diameter. The larger saws are bow-shaped and can cut material up to 8" in diameter, but are more prone to twisting and binding in the cut.

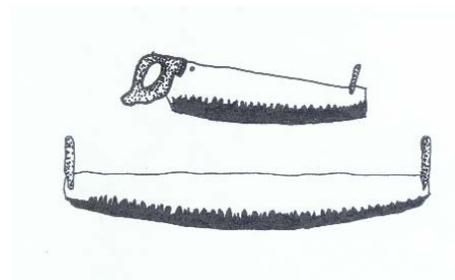


Tips: Bow saws cannot be resharpened due to the hardness of the blade. When the blade becomes dull, rusty, or bent, it should be replaced. It should be wiped with light oil before storing. Smaller saws are more useful—use another tool for cutting large material.

Safety: Same as pruning saws. PPE includes leather gloves and hardhat.

Crosscut Saw

Uses: Cutting large blowdowns and felling timber. Crosscut saws are available in two basic designs—one-person and two-person. The one-person models are generally 3' to 4' feet in length and are perhaps most useful for clearing blowdowns. Even though they are called one-person, an optional second handle can be added. Two-person crosscuts are 5' to 8' in length, with a handle at each end. Both types are useful for constructing trail structures in remote areas. In combination with an adze, two-person crosscut saws are especially good for creating a level walking surface on native log bridges. Crosscut saws (especially two-person models) require special skills and care, but are nevertheless an attractive, lightweight alternative in remote areas. In formally designated Wilderness areas, where power tools are not allowed, crosscut saws are perhaps the



only alternative for cutting large material. In less remote areas, they are used only occasionally as the axe, bowsaw, and chainsaw perform the same jobs.

Tips: One of the biggest problems with crosscut saws is finding someone who is competent in sharpening them—if no one is available to correctly sharpen the saw, there is no use purchasing one. What was once fairly common knowledge has been largely forgotten, except by those individuals who still routinely work in remote areas. Skills in using and sharpening the saws can be learned through on-the-job experience with wilderness rangers, or by participating in a good workshop such as a Wilderness Skills Workshop conducted by the Student Conservation Association. Another source of training is the Crosscut Saw Manual by Warren Miller, U.S. Forest Service Equipment Development Center, Missoula, MT. This is available from the Government Printing Office in Washington D.C.

A crosscut saw should never be placed in the dirt—the teeth should remain clean and sharp. Generally, the saw is leaned against a tree when not in use, but care must be taken to ensure it does not fall to the ground.

Safety: To protect both the user and the saw, a sheath should always be used. These can be manufactured using sections of old fire hose or assembled from plywood. Several good commercially manufactured sheaths are also available. As with any sharp tool, extreme caution should be used to avoid cuts. Required PPE includes a hardhat and leather gloves.

Pole Pruner and Pole Saw

Uses: Cutting overhanging limbs that cannot be reached with bowsaws, loppers, and other short-reaching tools. Pruners and saws are often combined on the same handle to allow for more flexibility.

Tips: When cutting larger limbs with the pole saw, it is best to use a two-step process. In the first step, a 4" to 6" stub is left by making an under-cut and then a cut from the top of the limb. This prevents



stripping the bark from the trunk of the tree. In the second step, the stub is removed flush with the trunk.

Safety: Fingers should be kept out of the pruning head. The rope may snag unexpectedly and cause the blade to close causing a serious cut. When using the saw, eye protection will prevent saw dust from getting into the user's eyes. Required PPE includes eye protection, hardhat, and leather gloves.

Axe

Uses: Clearing blowdowns, limbing trees, felling trees, and hewing flat surfaces. Axes demand a great deal of practice to use safely and effectively and are used less today than they were in earlier times. They have largely been replaced by various saws and other cutting tools, but nevertheless, the axe is versatile, simple to maintain, and in skilled hands can be as fast and effective as other tools. There are two basic kinds of axes—the single-bit and the double-bit. Double-bit axes are generally preferred as they have better balance and allow one blade to be kept razor sharp for cutting while the other blade can be used for chopping roots and cutting in dirty wood. Single-bit axes are sometimes considered to be safer than double-bit axes primarily because there is less chance to fall on an exposed blade.



Tips: Effective axe work requires a great deal of practice, but the skills required are not as demanding as those required for crosscut saws. Skills can be acquired through working with experienced individuals or by participating in a good workshop such as a Wilderness Skills Workshop conducted by the Student Conservation Association.

On downed logs, a notch that is twice as long as the diameter of the log should be made. The blows should progress through the log and alternate from one side of the notch to the other. When removing a limb from a downed tree, the direction of the blow should be made from the root-end of the tree rather than down into the crotch.

Safety: Before cutting, all limbs and brush that might interfere with swinging should be removed. Springy branches or broken limbs that might deflect the blade should be avoided. The user's feet should be separated at shoulder width and firmly planted. When limbing or hewing a downed

tree, the user should stand on the side opposite the one being cut to keep the tree between the blade and the user's shins. When not in use, or when carrying the axe, the blade should be covered with a sheath. PPE includes a hardhat, leather gloves, heavy leather boots, and eye protection. Inexperienced users should also consider wearing shin guards and toe guards or hard toe boots.

Brush Hook or Bush Hook

Uses: Cutting small saplings and brush too heavy for a weed whip. Swung like an axe, the brush hook's long handle and heavy head give it a powerful cut.

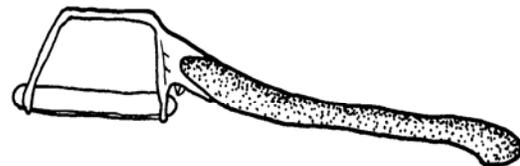


Tips: The blade should be kept sharp using a curved-edge whetstone.

Safety: Because twigs or limbs can catch the blade on the back swing or where space is limited, extra care should be taken to avoid accidents. A good grip on the handle is necessary, and it is important that the user keep clear of other workers. PPE includes a hardhat, leather gloves, and heavy leather boots.

Swede Axe

Uses: Cutting small saplings and brush that are too heavy for a weed whip and for cutting in cramped places. Its shorter handle and lighter weight make it faster, easier to control, and safer than an axe or brush hook. The thin, flat, replaceable blade cuts easily through springy stems and may be sharpened with a sharpening stone or file.



Tips: The blade should be replaced when it becomes badly nicked.

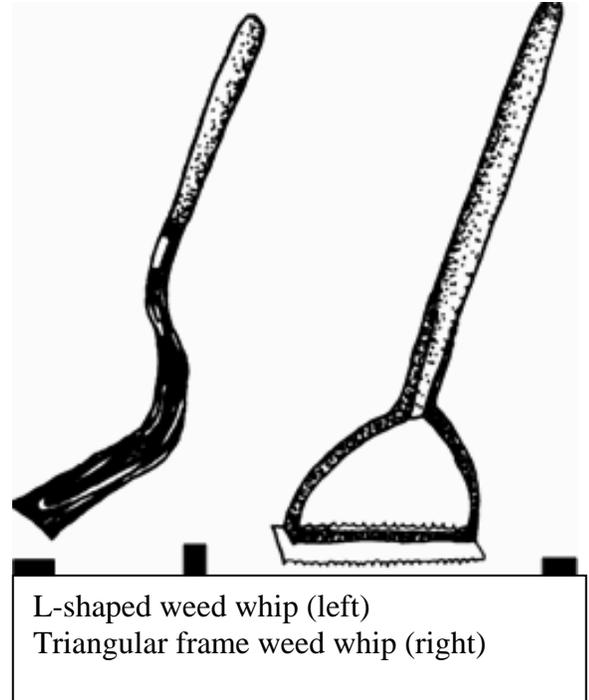
Safety: Same as the brush hook. PPE includes a hardhat, leather gloves, heavy leather boots. Inexperienced workers should also wear leg protection (chaps).

Weed Whip

Uses: The weed whip is swung back and forth like a golf club and cuts grass, weeds, light brush, briars, and small tree seedlings. It is a very effective tool for clearing new growth along the trail.

Tips: Weed whips come in two basic varieties—L-shaped and triangular-framed. The second variety is more stable, cuts larger material, and is recommended. It is fairly easy to break the wooden handle—for this reason, consider the Suwanee Sling.

Safety: Plenty of space should be left between the user and others. The handle should be held firmly in both hands and swung rhythmically back and forth. Strong swings should be made to prevent the blade from bouncing or glancing off springy growth. The tool should be carried or stored with a sheath in place. PPE includes leather gloves and leather boots.



L-shaped weed whip (left)
Triangular frame weed whip (right)

Suwanee Sling

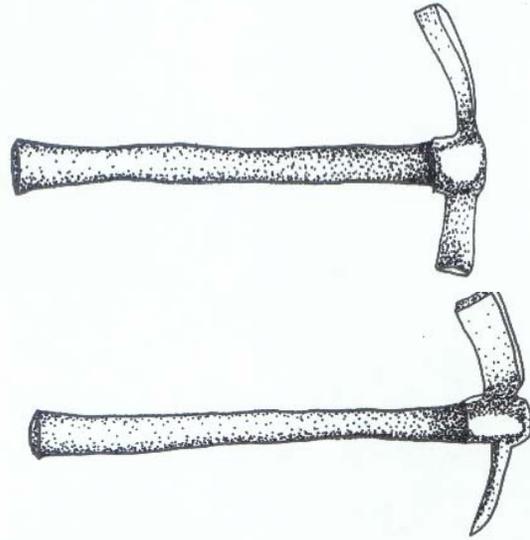
Uses: This is essentially a heavy duty weed whip that also has an axe blade. It does the same work as the weed whip, but can also cut through larger materials that may be occasionally encountered.

Tips: The tool's heavier weight allows it to more easily cut off larger material than a weed whip.

Safety: Same as a weed whip.

Pick Mattock and Cutter Mattock

Uses: A mattock is a heavy, strong, and popular tool that may be used for the roughest of work. Its primary use is for digging and moving dirt and rocks, cutting through roots, and unearthing boulders. It is especially useful when building new trail (especially sidehill trail), installing steps and waterbars, and other heavy work. The mattock's heavy weight allows it to move more material with less effort.



There are two kinds of mattocks—pick mattocks and cutter mattocks. Both have an adze blade, but the pick mattock has a pick, opposing the adze, whereas the cutter mattock has a cutting blade. The pick mattock is most useful in hard or rocky soil where the pick is useful to break up the soil or pry out rocks. The cutter mattock is more useful in deeper, rooty soil where the cutter is needed to sever roots.

Tips: As with other swinging tools, the user should blend force with accuracy.

Safety: Choking up on the handle should be avoided—a glancing blow may strike the user. If breaking rock, goggles should be worn. PPE includes heavy leather boots and leather gloves.

Pulaski

Uses: The pulaski combines the blade of an axe with a narrow grubbing blade. It was developed for fighting forest fires, but is also helpful in trail work. It is not as balanced or safe as the axe, nor as efficient as the mattock for moving soil, but it serves two purposes and saves weight if tools need to be carried long distances. If considerable amounts of axe work or mattock work are needed, the pulaski is a poor choice.

Tips: The axe end is sharpened and maintained like an axe, and the mattock end is sharpened like a true mattock. The pulaski's mattock blade can serve as a substitute adze if it is sharpened to a keen edge. If a pulaski is going to be used as an adze, it should not be used for any other purpose.

Safety: The pulaski can be dangerous due to its two sharp blades. It should always be stored and carried in a sheath. The same safety practices as used for an axe should be followed. PPE includes a hardhat, leather gloves, and heavy leather boots. Inexperienced users should have shin guards and possibly hard-toe boots.

McLeod

Uses: Constructing and maintaining trail. The McLeod is a heavy-duty combination hoe and rake. It has six digging (or rake) teeth opposite the hoe blade. It is useful for removing duff layers and loose ground debris to create a level trail. It can also be used to chop off light brush and roots. It must be supplemented with a mattock or other digging tool when there is considerable digging or heavy brush.

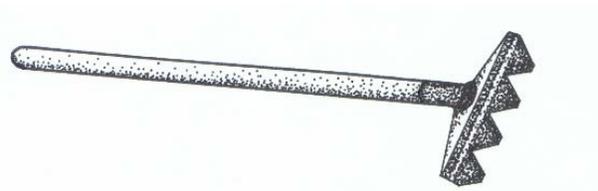


Tips: The hoe blade should be kept sharp.

Safety: Adequate space between workers should be determined before swinging this tool. Leather gloves are recommended.

Council Rake (Fire Rake)

Uses: Constructing and maintaining trail. The council rake looks like a section of sickle bar mower on the end of a straight handle. It is used for the same purposes as a McLeod.



Safety: A sheath should be in place during transport. Leather gloves are recommended.

Shovel

Uses: Digging and moving soil and other granular material. Shovels are used for cleaning waterbars, culvert outlets, and diversion ditches. They are also used for leveling a base for sill rocks, steps, etc. In trail work, long handled, round-pointed shovels are almost exclusively used. A variation is the fire-shovel which has the advantage of being lighter weight and easier to carry.

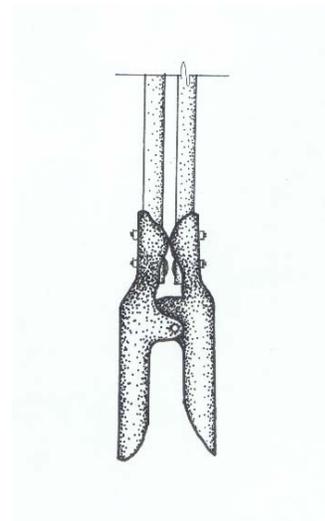
Tips: The blade, including most of the blade's sides, should be kept sharp. A firefighter stance should be taken to more effectively and safely move material—the user should bend at the knees and rest the elbow of the hand holding the forward end of the handle on the inside of his/her knee. This is the power hand. The other hand holds the end of the handle and serves as the guide hand. The user should swing from side to side, keeping the elbow on the knee, cutting the soil with the side of the shovel that is opposite the power hand and moving it laterally with the continuation of the swing. For right handers, the power hand is the right hand and the right elbow rests on the right knee. Cutting is done with the left edge of the shovel and material is moved to the left. This technique does not work when digging a deep hole or ditch. The advantage is that the power comes mostly from the leg muscles—not the back muscles.

Safety: The most common injuries when using a shovel are back injuries. Bending from the knees instead of the waist will help prevent injury. Leather gloves are recommended.

Posthole Digger

Uses: Digging holes for footings, posts, etc.

Tips: There are two basic types of post hole diggers—clam-type and auger-type. The clam-type is the most versatile of the two and can be used in a wide variety of soils. The auger-type works well only in sandier, dryer soils. It will not work in rocky soils and it is hard to clear of excavated material if the soil is wet.



Safety: Soil should be lifted from the hole with leg muscles—not back muscles. If the wooden handles are too flexible or the collar becomes bent, fingers can get pinched when the handles are closed. Leather gloves are recommended.

Sledgehammer

Uses: Breaking rocks, driving posts or stakes, nudging a heavy timber into place, driving large spikes. Sledgehammers are primarily used during construction phases.

Safety: Before swinging, the user should make sure others are clear and obtain a firm stance with feet spread to shoulder width and firmly planted. PPE includes leather gloves. When striking rocks, goggles should be worn.

2½ or 3-Pound Hammer

Uses: Driving survey stakes, spikes, and other uses that are too demanding for a regular claw-hammer, but do not require the heavy duty blows of a sledge.

Crowbar (Rock Bar)

Uses: This is an essential tool for prying and levering large, heavy objects such as boulders, logs, and beams. Crowbars are heavy-duty steel and vary in length, weight and diameter. In general, crowbars have a chisel tip on one end and a rounded handle on the other. They are usually 1" to 1½" in diameter and vary between 40" and 62" in length.

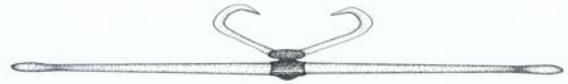


Tips: For most purposes, a 54" size seems to work best.

Safety: Since the crowbar often lifts and moves heavy loads, it can be dangerous. Fulcrums and footholds should be secure. The user should stay out from under the bar and the load being moved, and avoid levering with the bar between his/her legs. Undivided attention should be given during use to avoid mashed fingers and toes or other injuries. As with any lifting device, the user should lift with the legs—not the back. PPE includes leather gloves and heavy leather boots. For additional safety, hard-toe boots are advisable.

Log Carrier

Uses: Carrying and moving heavy logs and timbers. The log carrier looks like a giant ice tong with long wooden handles. It is a two-person tool.

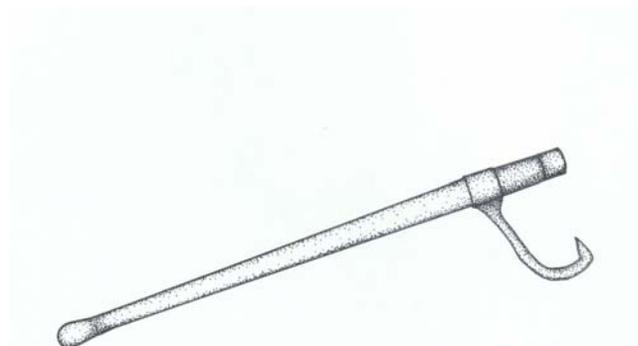


Tips: Many hands make light work. There is no rule that says how many log carriers and pairs of people should be assigned to a log. As many log carriers and people should be used as will comfortably fit along the length of the log to make the load manageable.

Safety: The user should stand behind the handle of the carrier, facing the direction of travel and place both hands on the handle, bend at the knees, and all workers lift at once. Forearms should be roughly parallel to the ground when in the lifting and carrying position. Heavy weights are involved so caution should be used. Feet should be kept from under the log. PPE includes heavy leather boots and leather gloves.

Peavy or Cant Hook

Uses: Rolling and positioning logs and timbers. This includes rolling the log to move it to another site or to rotate it in place. The main difference between these two tools is the shape of the tool's end. Peavys have a straight spike at the end whereas cant hooks have a short gripping tooth. Both are used for essentially the same purpose. Peavys are quicker to reposition when rolling a log some distance and for maintaining momentum. Cant hooks provide for more precise rotating. When arranged as opposing pairs, either tool can serve as a log carrier if a true log carrier is not available.



Tips:

Safety: The user should exercise caution not to roll logs onto his/her (or someone else's) toes. Logs may roll too fast and get away. Potential for severe injury is present whenever heavy weights are being moved. PPE includes

leather gloves and heavy leather boots. Hard-toe boots provide an extra measure of protection.

Wheelbarrow or Two-Wheel Cart

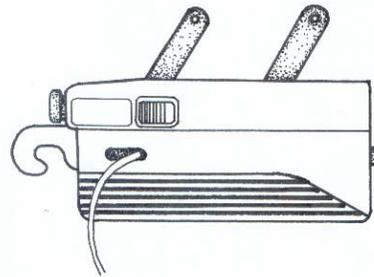
Uses: Moving loose material or supplies considerable distances.

Tips: Two-wheel carts have better balance and can often carry heavier loads—however, they require wider space to maneuver. Whether a wheelbarrow or a two-wheel cart, models should be obtained with large balloon tires. The small-wheeled garden variety is useless for trail work.

Cable Winch

Uses: To drag or swing heavy rocks or logs into place. When construction projects involve heavy stone or wood, ordinary hand tools may be insufficient.

Tips: The most common and simplest winch is the ratchet-and-pawl cable winch, usually known as a come-a-long. These range from \$9.99 hardware store models to more substantial come-a-longs capable of pulling heavier loads. The inexpensive models are useless except for the lightest of jobs. The better models can move substantial loads without breaking but are limited by the length of cable that can be wound around the spool (usually about 25"). Because of this limitation, hauling material a considerable distance requires frequent re-anchoring of the winch.



What seems to be the most popular cable winch among trail workers is a more sophisticated model known as the Griphoist® Winch. In addition to being a very strong winch, its biggest advantage is that it is a continuous

cable puller. In other words, a cable of any length can be used. This allows for long pulls without having to re-anchor. These hand-powered winches use a pair of wire rope grips to pull a separate length of cable through the winch. Using the Griphoist®, a trail worker can stretch a cable all the way across a stream or ravine and pull a bridge timber into place. They also provide the basic lifting power for a “rigging” system.

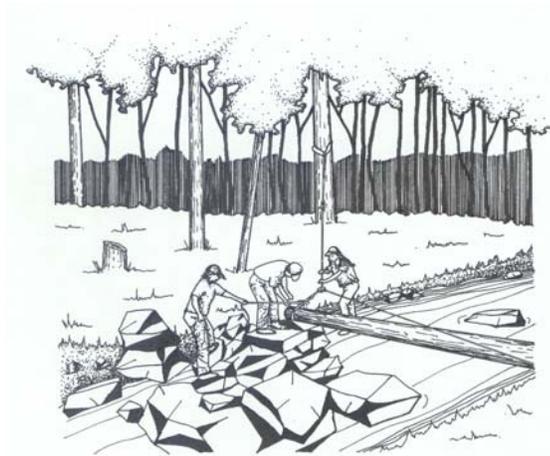
Nylon slings should be used to anchor the winch to a tree and to harness rocks or logs. Chains can also be used, but in most situations the nylon sling can do the same job with less weight and less damage to the anchor tree. The winch cable should be kept freely suspended, rather than dragging it through dirt or rock, to avoid fraying and deterioration of the cable.

Safety: The user should stay out from under the load. Where the load may roll free and tumble or slide dangerously, a barrier should be built to stop it. PPE includes leather gloves, boots, and hardhats.

Rigging

Uses: Rigging refers to a system of cables, pulleys, and winches used to suspend and move heavy loads to a work site or into place. Rigging systems, powered by Griphoist® winches, can empower small crews to do great things.

Tips: The set-up and use of a rigging system requires a sophisticated level of knowledge and special training or experience. It should not be attempted without this knowledge as severe accidents, caused by the heavy loads or a breaking cable, could occur.



Rigging systems are most appropriate when there is a considerable amount of work to do at one site—such as when constructing a bridge, retaining wall, steps, or shelter. On this type of project a crew will not want

to go back to the old method of brute force once they acquire the skill to effectively utilize rigging.

Safety: Similar to the safety practices shown under cable winches, but even more critical with rigging because the heavy loads are suspended and can fall on workers.

Hydraulic Jack

Uses: Raising heavy weights such as a corner of a shelter that has settled, or a bridge beam so that shims can be placed or the abutment build up. Can also be used to level heavy stone steps or any other structure—as long as room can be created to insert the jack under the object.

Safety: When working under heavy objects, there is always the danger of having it fall and crush whatever is under it. Extreme caution should be used when any part of the body is beneath the structure until it is securely in place.

Adze

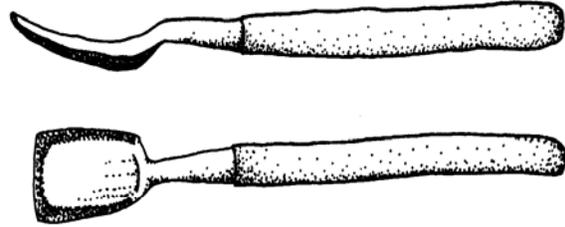
Uses: An adze is essentially a form of a plane. Its use is for finishing (hewing) of beams and logs to form a flat surface—such as the walking surface of a native log bridge.

Tips: This tool should be kept very sharp and used only for hewing. It should be handled very carefully and contact with the ground avoided. It should always be protected with a sheath. A good adze is hard to find—a source is where old tools are sold.

Safety: The user should exercise caution so as not to cut his/her feet or shins. When standing on the log being hewed, the toe of the front foot should be elevated so that a glancing blow strikes the bottom of the sole of the boot. Only the back of the heel of the front foot should be resting on the log. PPE includes heavy leather boots and leather gloves.

Spud

Uses: Also called a bark spud, this tool is used to push and pry the bark from green timbers. Removing the bark slows the rotting process. Although an axe can be used to remove bark, a spud peels much faster, particularly during the spring and early summer.

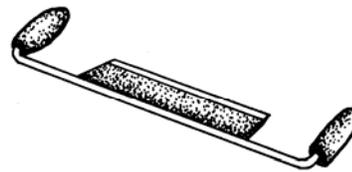


Tips: The spud has three cutting edges. All three should be sharpened on the top side only. A file should be used—a fine edge is unnecessary. Timbers peel much easier during the spring when the sap is flowing freely. Logs can be peeled in the spring and stockpiled for later use during the construction season.

Safety: The user should always push away from the body and keep hands and feet, as well as other workers, away from the front of the blade. Spuds often slip and can make serious wounds. Leather gloves are recommended.

Draw Knife

Uses: Peeling small diameter logs and poles or performing finish work on timber surfaces. Draw knives are normally used on smaller diameter material than are spuds, but on difficult to peel logs can out-perform spuds.

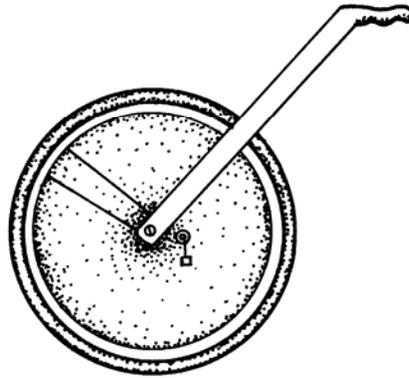


Tips: Users should acquire a true draw knife that has its handles at a right angle to the blade—rather than a bark knife that has handles in line with the blade. Bark knives are meant only for smoothing rough bark—not removing it.

Safety: Draw knives are razor sharp so caution is necessary. Leather gloves are recommended.

Measuring Wheel

Uses: Measuring trail that is completed or under construction.



POWER TOOLS

When the situation allows, the use of power tools is appropriate along much of the North Country NST. In most situations, power tools can substantially increase production. They allow fewer people to construct or maintain a given amount of trail in less time. However, they have certain drawbacks which must be recognized. Power tools can increase the potential for an injury—especially in the hands of unskilled workers. Users must be particularly cautious to prevent injury to themselves or their co-workers and must wear PPE at all times. Power tools are generally heavier to carry than hand tools. They may not be worth the extra effort if long distances are being covered where only incidental work will be performed or the worksites are widely scattered. And, of special importance, they are prohibited in Primitive ROS areas (formally designated wilderness areas).

Chainsaw

Uses: Cutting medium to large size blowdowns, clearing heavy sapling growth during trail construction, cutting trees into pieces for wood construction projects.

Tips: Saws with 16" blades are generally adequate for most trail work. Models should be obtained with chain brakes, vibration damped handles, and high quality mufflers. The user should carry a tool kit in a pack (file, srench, plastic wedge).

Safety: Chainsaws are one of the most dangerous pieces of power equipment. They should be used only by experienced workers (preferably those who have undergone training and are certified for chainsaw use). Required PPE includes leather gloves, ear muffs, eye protection, hardhat, and kevlar (or similar) saw chaps. Chainsaws should not be operated without the above PPE.

Brushsaw

Uses: Constructing and maintaining trail through areas of heavy brush, grass, briars, and sapling sized trees. They allow one person to rapidly clear large areas. In some situations a DR Mower® can accomplish the same tasks easier and quicker—especially in grass and smaller brush.



Tips: Brushsaws come in a variety of sizes. Trail work requires a more powerful unit than one that is used for lawn trimming. Generally, a brushsaw with an engine of 35cc to 80cc and bicycle-type handlebars is recommended. For durability, a known brand such as Stihl, Husquevarna, or Jonserud should be obtained. These saws also come with a variety of blades depending on the material to be cut. Trail work requires a saw type or a universal grass-brush blade—not a string cutter.

The brushsaw is supported by a shoulder harness, but can still become very tiring. Users should work in teams to make the job easier and switch positions regularly. When not cutting, the other person can remove brush from the trail.

A stout, flexible forked sapling (about 1" in diameter at the base) that has been cut about 4 ½' to 5' in length (with about a 10" fork at the end) is a very useful tool for flinging small limbs out and away from the trail. When following someone who is using a power brush saw, it is also an excellent tool for flinging the cut brush out of the trail. Its natural springiness allows it to be used like a pitchfork. This scatters the brush so that it is not visibly concentrated, and is more efficient than bending to pick up and discard each piece by hand.

Safety: The brushsaw's open blade is on the end of a wand, and can snag and swing violently to the side, making it more prone to injure other workers rather than the operator. Other workers should stay clear. Required PPE

is ear protection, eye protection, gloves, leather boots. Hardhats are recommended.

Lawnmower

Uses: An ordinary side-discharge mower can be effectively used for clearing and maintaining trail—except in extremely rocky terrain. For grass, ferns, and weeds (up to knee high) many feel that a lawnmower is more effective than a brush saw. It is more readily available and less expensive than a DR Field Mower®, but not as durable or powerful.

Tips: A mower with a 22" to 24" cut and adjustable wheels seems to work well. Wheels should be set as high as possible. A mower with a universal blade for easy replacement is desirable.

Safety: Rotary mowers can throw objects, injure others, and can cause severe injury to the operator's extremities if a hand or foot gets under the mower deck. The operator should insure that other workers keep a considerable distance from the mower so that thrown objects do not cause injury. Extra caution should be used when operating on slopes, or if the vegetation is wet, to avoid slips and possible operator injury (see owners manual). Sturdy leather shoes (not jogging shoes) should be worn. Ear protection should be worn if using the mower for extended periods or the muffler is louder than 80db.

DR Field Mower®

Uses: This sturdy mower is an excellent choice for cutting heavy grass, weeds, briars, and even saplings up to 1" diameter. A DR Field Mower® is simply a walk-behind brush-hog that is useful during trail construction and trail maintenance. It is more useful than a sickle-bar type mower because the material is chewed up and does not need to be removed from the trail as much as with a sickle-bar mower.

Tips:

Safety: The mower can throw objects and injure others. Other workers should be kept at a safe distance away from the mower. PPE includes ear protection and leather gloves.

Appendix 1

CONSTRUCTION SPECIFICATIONS FOR TRAIL STRUCTURES

Amendment 1

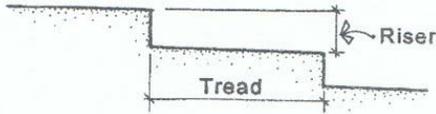
Effective 1/1/97

Appendix 1 provides sample specifications for a number of trail structures. It demonstrates one or more technically correct ways to construct a structure but it is not intended to restrict local creativity. The intent is to provide a suggested method when local plans are not available.

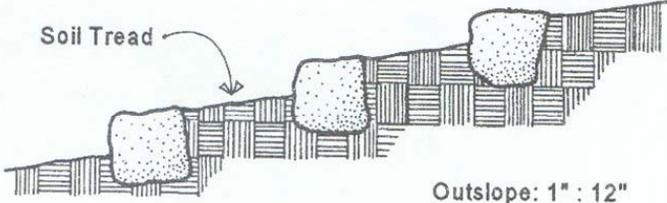
Trail Stairways

Riser - Tread Relationship

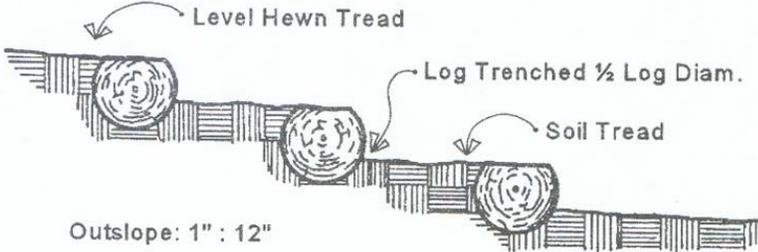
<u>Riser</u>	<u>Tread</u>
4"	19"
5"	15"
6"	12 1/2"
7"	10 3/4"



Rock Riser Stairway



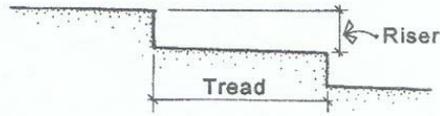
Log Riser Stairway



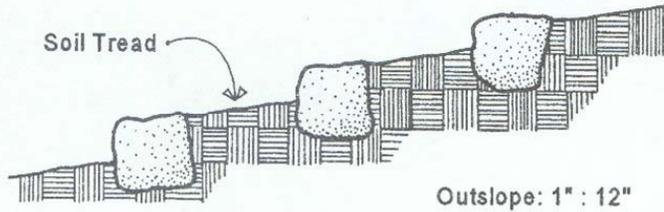
Trail Stairways

Riser - Tread Relationship

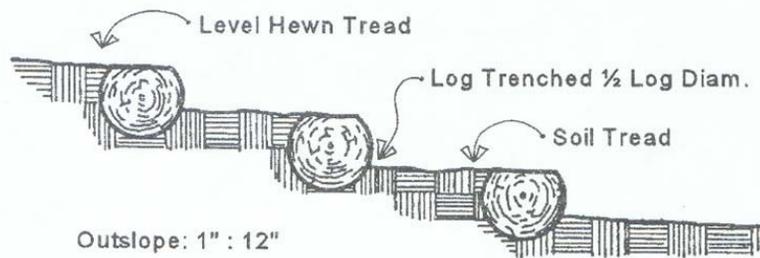
<u>Riser</u>	<u>Tread</u>
4"	19"
5"	15"
6"	12 1/2"
7"	10 3/4"



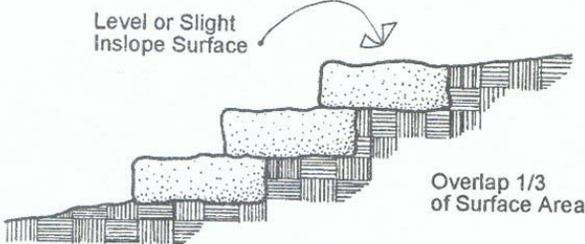
Rock Riser Stairway



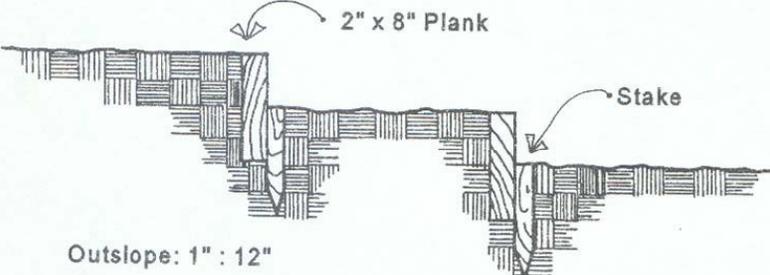
Log Riser Stairway



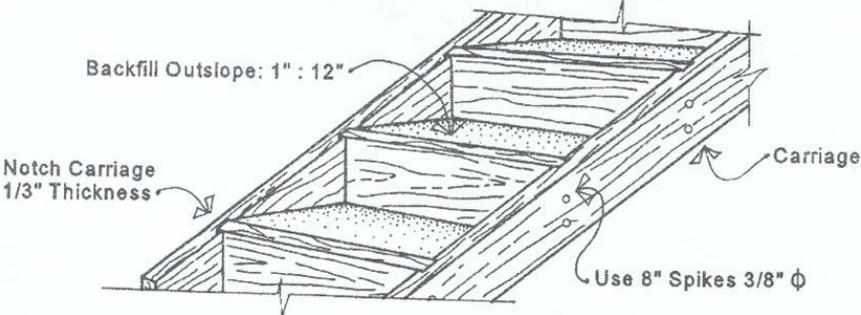
Overlapping Rock Stairway



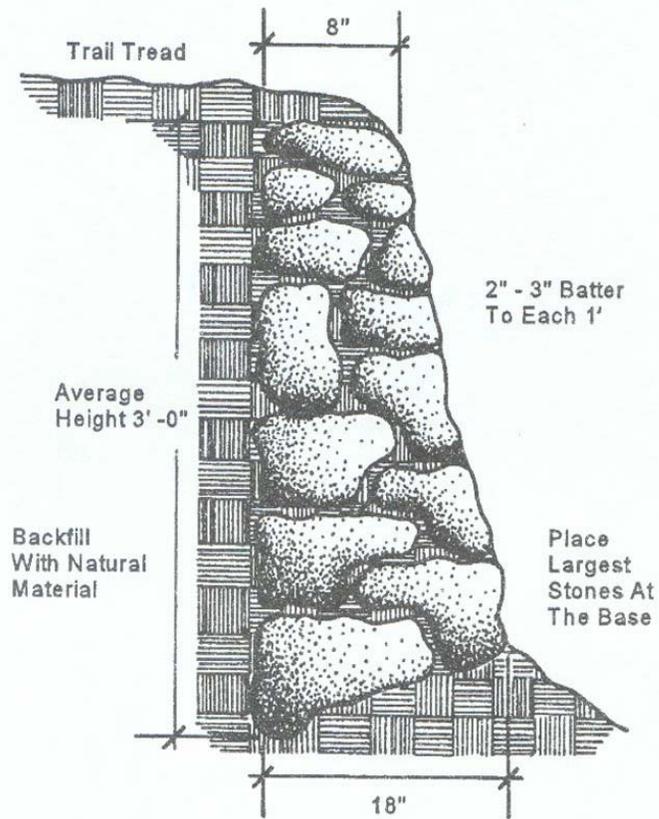
Plank Style Retaining Stairway



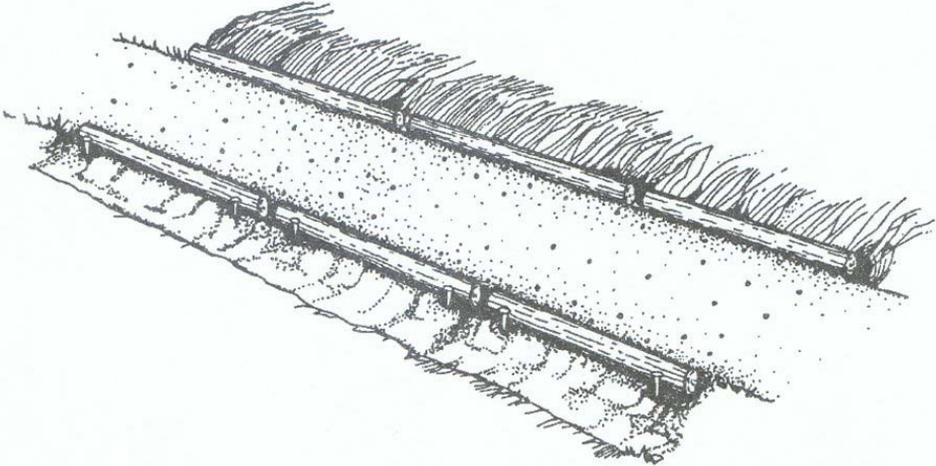
Crib-Ladder Stairway



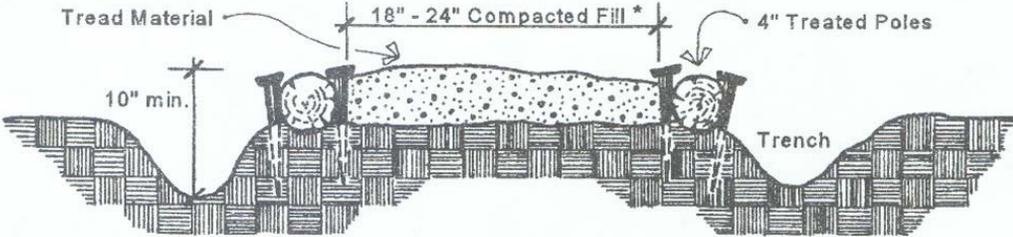
Retaining Wall Section



Turnpike

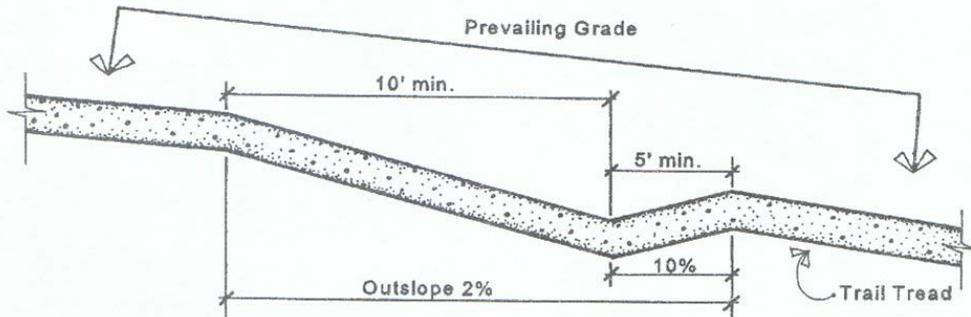


Turnpike Section

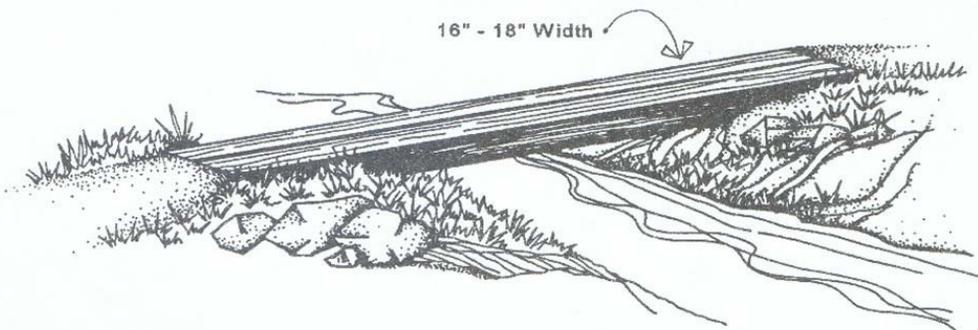


* See Chapter 4, Figure 1 for dimensions.

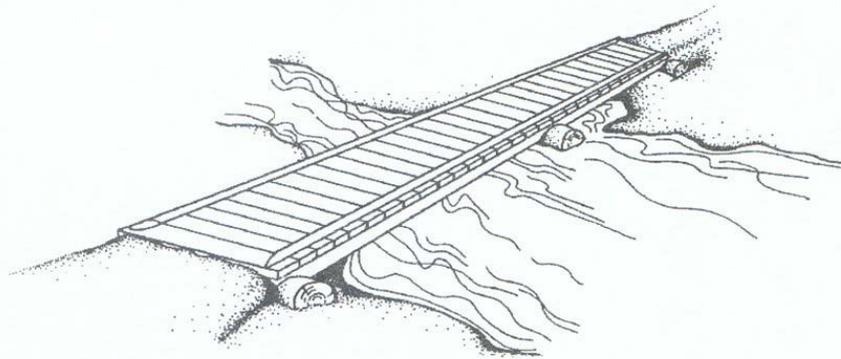
Coweeta Dip Plan View



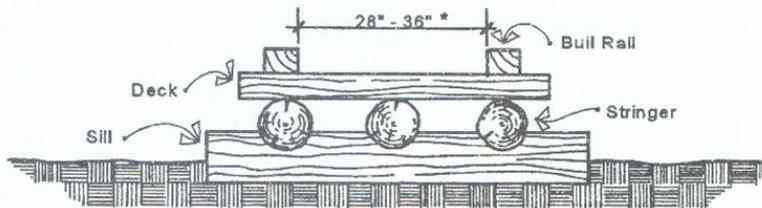
Simple Puncheon Bridge



Built-up Puncheon Bridge

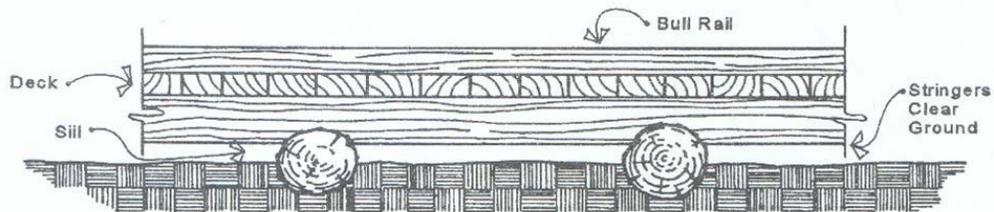


Cross Section

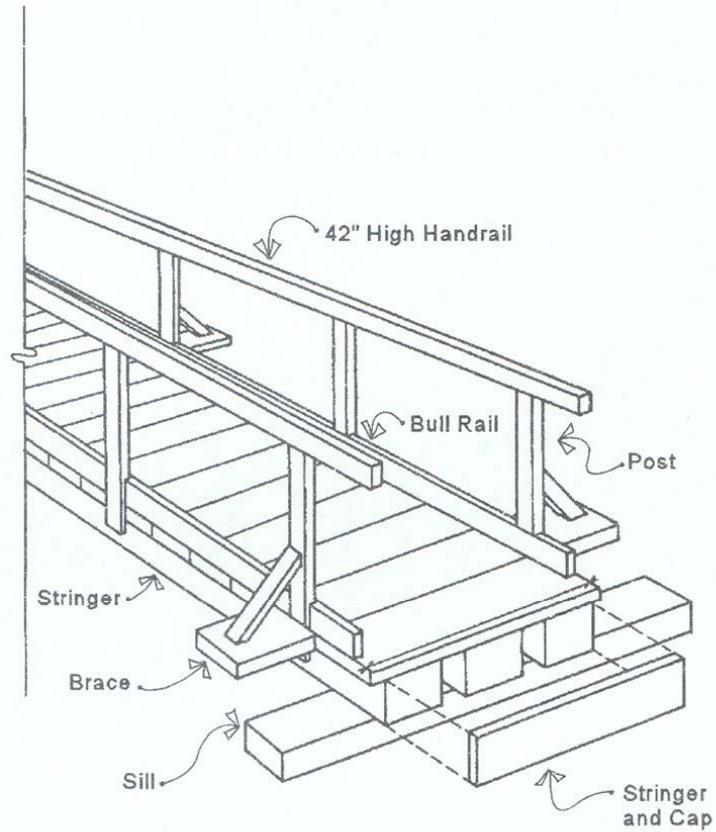


* See Chapter 5, Figure 2 for dimensions.

Linear Section

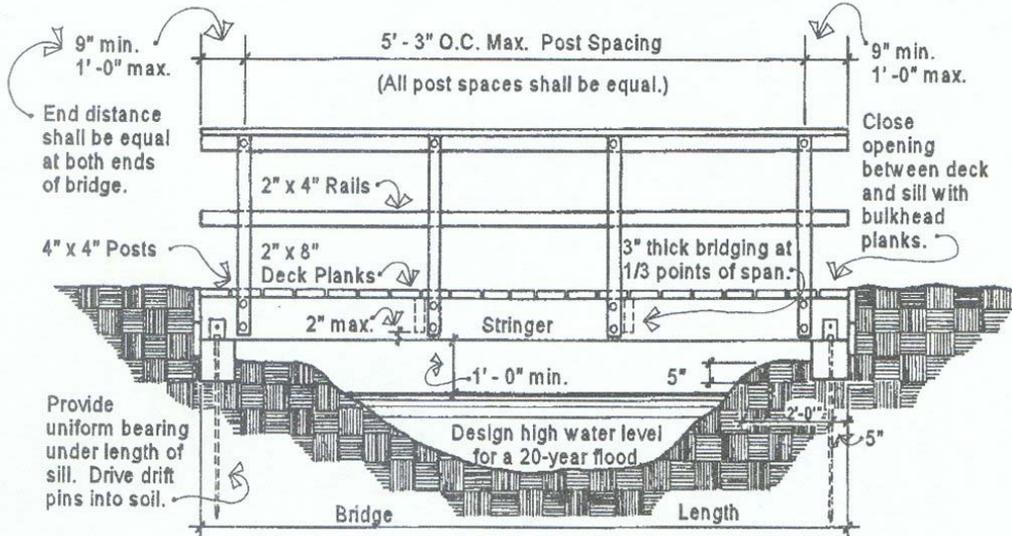


Three Stringer Bridge

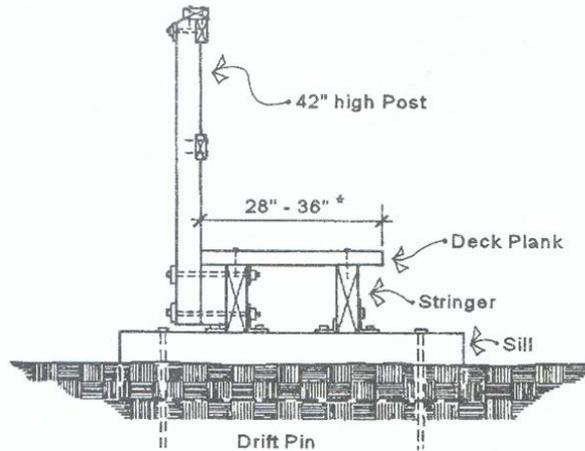


* See Chapter 5, Figure 2 for dimensions.

Single Span Bridge



Railing Detail



* See Chapter 5, Figure 2 for dimensions.

Appendix 2

Trail Evaluation or Assessment Forms

NORTH COUNTRY NATIONAL SCENIC TRAIL CONDITION ASSESSMENT

State: _____ Inspected by: _____ Date: _____
 Managing Authority: _____ Adopter(s): _____ Time Spent: _____ (hrs.)
 Segment Termini: _____ Length: _____

Use this form to evaluate trail conditions. This will enable NPS and NCTA managers to provide more accurate information to the public and to prioritize needs along the trail. It should be completed at least annually and returned to NPS (address below). NPS will provide copy to NCTA.

Help for evaluating and describing the general condition of each kind of trail maintenance can be obtained from trail maintenance manuals such as the NPS Trails Management Handbook, USFS Trail Manual, AT Fieldbook and the NPS Signing Guides for the North Country NST.

Under Condition Summary (Cond Summ) column (far right): WN = Work Needed, WD = WorkDone. Mark "X" in appropriate box or "/" for partially done.

C
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m

W
N W
D

MAPS: North Country NST identified by name on park/forest map? _____ Map adequate? _____
 Comments:

TRAILHEADS: *Well marked on approach road? Consider the attractiveness of bulletin boards, interpretive signs explaining the North Country NST nationally and locally, parking, toilet and water facilities, useful information to hiker, etc.*
 General Condition:

Work Needed:

Est. Person Hours:

TRAIL SIGNING: *Nine inch emblems should be in place at trailheads and at major road crossings. 3½ inch emblems should be at all road crossings and trail junctions, or no greater than 1/2 to 1 mile apart otherwise. Also evaluate condition of any directional or mileage signs.*

North Country NST Emblems in place? (Y or N) 9" _____ 3½" _____

General Condition:

Work Needed:

Est. Person Hours:

REASSURANCE BLAZES/MARKERS: *Reassurance markers should generally be intervisible (spaced so one can easily follow the trail) without being so plentiful as to cause sign pollution.*

Interval OK? _____ Color: _____ Type: _____ (plastic or paint)

General Condition:

Work Needed:

Est. Person Hours:

TRAIL CLEARING: Width (Std=4'): _____ Height (Std=8'): _____

General Condition:

Work Needed:

Est. Person Hours:

TREADWAY STABILITY (Erosion): *Includes waterbars, dips, etc.*

Surface Material: (N=Native, G=Granular, P=Paved): _____ Width: _____

General Condition:

Work Needed:

Est. Person Hours:

(OVER)

TREADWAY DRYNESS (Drainage): Is water running in trail? _____
Is erosion occurring? _____ If so, to what degree? _____
General Condition:

Work Needed:

Est. Person Hours:

BOARDWALK, PUNcheon, BRIDGES, STILES, GATES: *There should be some provision for crossing seeps, wet areas, and streams without wading in mud, getting wet feet, or damaging fragile wetlands. Consider high water levels.*

Est. no. of boardwalk/puncheon sites or length in feet: _____ No. of bridges: _____

No. of stiles: _____ No. of gates: _____

General Condition:

Work Needed:

Est. Person Hours:

SHELTERS AND CAMPSITES: No. of shelters: _____ No. of designated campsites: _____

Is dispersed camping allowed? _____

General Condition:

Work Needed:

Est. Person Hours:

WATER SOURCE: Adequate Frequency? _____

Type/general condition:

Work Needed:

Est. Person Hours:

MOUNTAIN BIKE AND HORSE USE: Bikes permitted? _____ Is evidence of use present? _____

Horses permitted? _____ Is evidence of use present? _____

Damage Occurring? If so, describe:

Work Needed:

Est. Person Hours:

ILLEGAL ORV USE:

Evidence of use present? _____ Describe degree of damage:

Work needed to stop:

Est. Person Hours:

GENERAL IMPRESSION OF SEGMENT: *Rate good, fair, poor or do narrative.*

Litter/clean up needs:

WORK COMPLETED: Date: _____ Person hours expended: _____

Describe work done:

Trail Inventory and Assessment Process

This process was adopted, in concept, by the Ice Age Park and Trail Foundation in 1994, and is based on the ATC Trail Assessment Handbook revised in January 1994. The purpose is to provide the Trail-maintaining Chapters, their agency partners, and the IAP&TF, with a way to analyze trail building, maintenance, and land-management needs and to assess priorities and problems.

1.0 During the feature inventory phase, the Trail-maintaining Chapter will summarize all known permanent Trail "features" in tabular form by mileage from a starting location, in an East to West direction. This information captured on the inventory form can be entered into a computerized database such that it can be sorted in various ways to easily group particular features (type - see Key-Words), such as signs, bridges, water sources or parking areas, or to list features by mileage or category or in some combination. Inventory Worksheets were designed to simplify field gathering of this data for each of the categories listed below:

Trail Management Items	(T)
Natural and Cultural Resources	(R)
Public Use / Incompatible Use	(U)

A fourth category - Property Management (M) - is available, but a special worksheet was not considered necessary. Such data, if any, can be noted and later added directly to the Trail Inventory/Assessment Form.

The information gathered in the field and recorded on the various worksheets should be transferred to the Trail Inventory and Assessment Form for use in building the data base.

2.0 The Land Ownership Worksheet was designed to simplify field recording of the mileage of Trail on public vs. private lands, and, if on private lands, by type of agreement in effect with the landowner. This data should be gathered for each trail segment and used to complete the Ice Age Trail Data Sheet. This data sheet will delineate how much of the Trail is on public and private lands, permitted use of the Trail and (optionally) provide names of political bodies influencing land use and other supportive area people. The importance of having this data will become more significant to trail partners as the difficult process of protecting trail corridor through private lands is implemented. Much of this data can be gathered at the same time the feature inventory is being conducted. With limited funding for land protection, such data is needed to prioritize land protection decisions. An opportunity to purchase land within an existing segment of the Trail, which passes through highly scenic private lands and already has partial protection, might be given higher priority than a segment not yet established.

3.0 The Trail Assessment is a project planning tool. The information recorded on the Trail Inventory & Assessment Form, following the units column, reflects current projects and needs requiring some action by the trail maintenance crews. The actions might have been noted during the inventory phase, or while on a walk through, such as sign repair or replacement, treadway repair, or other management concerns. This form is more commonly used when planning for a new section of trail or for a major relocation. This form has been designed to accommodate both inventory items " Features " that require no action, but should be identified, and " Projects " that require action, such as installing a sign or repairing a section of trail. If an " F " is entered in column 1 of this form, the computer database will know that the information found in the next ten columns (through "Units") is inventory data requiring no action. If the letter " P " is entered, the entire row is required, as this is

a project requiring some action. The sum of all the defined actions represents the Assessment, or plan, which delineates the estimated total cost and hours. This information is usually required when requesting project funding from an agency, other than the local Chapter which performed the Assessment. The priority may become an issue if funding is limited and several project plans require the available funds. Each plan should fully consider the Trail Standards appropriate to the Trail, as represented by this document. This may mean obtaining approval and assistance from the appropriate agency when, in example, crossing a wet land, or designing and building a bridge. The plan may also have to be approved by the landowner, especially if the trail will be constructed on private lands, even if an easement was provided by the landowner. When conducting an assessment for new trail, or a major relocation, mileage data is not initially known. It is recommended that you use the (#, number) column to identify each "feature" or "action". Once identified, these numbers should be placed on an enlarged section of a contour map (8.5 by 11 inches) at the location of the item being defined. The numbers are unique to each Assessment, and simply show the geographical location. Once the trail has been constructed, the mileage data should be added and the features (F) added to the data base.

4.0 The Annual Status Report is used by the IAP&TF to evaluate the overall condition of the Trail. Ideally, each Chapter has designated segment leaders who are responsible for monitoring the condition of their segment of Trail. The segment leaders should be able to complete this form based on their knowledge of maintenance performed during the past year. The report is completed once per year.

Explanation of the Field Headings Used in the Trail Assessment Database.

- F / P The Data Base has been designed to handle Features (F), which are inventory items that should be identified but require no action, as well as projects (P) that require some action. The next ten fields through Units, are used for inventory items, and all fields are used for a project, or issue, requiring some action. Using an alphabetical sort on this field, inventory items can easily be separated from action items.
- # (Optional) Sequential number of item for cross reference to map. This field will normally be used when conducting an assessment for new trail, or a major relocation, when mileage data is not yet known. The numbers simply show the approximate geographical location of the feature or project. The numbers should be placed on an enlarged copy (8.5 by 11.0 inches) of a contour map covering the area of interest.
- Mile The distance in tenths of a mile from a particular starting point to an item. This simply assigns a number to each item listed in the assessment, based on actual on-the-ground mileage. Items should be listed in an East to West order so that this field can be used to geographically sort Trail Assessment items.
- Reg Region 1,2 or 3 as defined for the Ice Age Trail. Region 1 starts at Door County and ends at ends at Walworth County. Region 2 starts at Rock County and ends at Waushara County. Region 3 starts at Portage County and ends at Polk County.
- Cty (County) Each County that the trail passes through has been assigned a unique Alphabetic letter for cross reference to County Locator maps, and for use as a computer identification code.

Region 1	Region 2	Region 3
Door/Kewaunee _____ A	Green _____ G	Waupaca/Portage ___ L
Manitowoc _____ B	Dane _____ H	Marathon _____ M
Sheboygan/Fondulac _____ C	Sauk/Columbia ___ I	Langlade _____ N
Washington _____ D	Adams/Marquette ___ J	Lincoln _____ O
Waukesha/Jefferson _____ E	Waushara _____ K	Taylor/Price _____ P
Walworth/Rock _____ F		Chippewa/Rusk ___ Q
		Barron _____ R
		Polk _____ S

- Seg Segment within County. Each Chapter should assign sequential numbers to segments in an East to west direction, consistent with the numbering order assigned to Regions. Typically, segments should begin or end at town lines, major road crossings, or be consistent with major local features which define the segment name. Segments should be identified, by number, on the County Locator maps. A contour based map should be available for each segment showing the Trail routing, road crossings, highway names or numbers, parking areas, shuttle routes and, optionally, water sources and toilets.
- Location A narrative description or name of property owner(brief) that identifies where the feature or project is found along the Trail or within the corridor.
- C Category Code This one letter abbreviation corresponds to the Trail Assessment Category

in which the item belongs. There are four major categories:

- (T) Trail Management,
- (U) Public Use / Incompatible Use
- (R) Natural and Cultural Resources
- (M) Property Management

The categories help sort the information once the assessment is complete. A complete listing of trail assessment categories and corresponding key words (type) are provided on the accompanying sheet entitled "Trail Assessment Types".

Type	A one-word description or "keyword" identifying the type of an item. The entry in the Type field must be one of the "key words" listed on the accompanying sheet entitled "Trail Assessment Types." Be sure to look the list over carefully to identify the appropriate type.
Comment	A more elaborate description of the project or inventory item that provides the assessment user with a better idea what needs to be done or what is found on the ground.
Units	An estimate of the amount of work needed (i.e. number of feet of footpath to be relocated) or the number or size of features (e.g. " feet of water bars to be installed; "acres" of old-growth forest). See accompanying sheet entitled " Trail Assessment Types " for suggested units.
Action	Quite simply, what needs to be done-usually expressed in one or two key words (such as "install," "move." or "construct"). A more detailed description of the action can be provided in the Comment field.
P r	Abbreviation for "Priority". Once the draft assessment is completed, Trail managers review the projects listed in the assessment to determine the relative importance of each project, using a three-point rating scale: "H" for high, "I" for intermediate, "L" for low. (These abbreviations enable the computer to sort projects by priority.)
Hours	Estimate of time required in man-hours needed to complete a project.
Cost	The estimated cost (if any) associated with a project.
Status	A description of how far a project has progressed. Use one of the following: "No action", " planned ", "Ongoing", "On Hold", "Recurring", or "Done".
Date	The year in which work on a project is scheduled to begin. Use four digits (i.e., 1995). For projects underway use the current year.
Source	Indicate the expected source of funding. This could be the Chapter, IAPTF, NPS, DNR, or a local business or club that has adopted a given trail segment. Add 10% to the total.

General Comments – This Assessment may become a component of a Local Plan. In this case, calculate the total man-hours and cost for all of the defined projects, such as for the construction of a new segment of trail. The name of the segment leader who is responsible for preparing this assessment should be noted in the upper right header along with the date it was prepared.

Trail Assessment Categories and Types

Trail Management (T)	Key Word	Suggested Units
Treadway structures (boardwalk,steps,turnpiking,puncheon)	Tread	
Sign (all signs)	Sign	
Side & Spur trails	Side	Length in miles
Bridges	Bridge	Length in feet
Fords, difficult (unbridged) stream crossings	Ford	Length in feet
Designated campsites	Campsite	# of sites
Undesignated high-use campsite	Bootleg	
Shelters	Shelter	Sleeping capacity
Sanitary facilities (privies, flush toilets)	Toilet	
Improved water system (pumps, faucets, spigots, wells)	Pump	
Parking areas	Parking	Capacity in cars
Trailheads (improved trailheads w/parking, signs, etc.)	Trailhead	
Other Trail management features or projects	Other T	
These key words are used for projects only:		
Critical design problems	Design	
Erosion control (water bars, coweeta dips, side hill)	EC	Length in feet
Footpath maintenance (redigging, clearing, blazing)	Maintenance	Length in feet
Relocations, relocation design - assessment needed	Relo	Length in feet or miles
Correction of public info (maps, guidebooks)	Info	
Public Use/Incompatible Use (U)		
Road crossing (all highways, roads and roadwalks)	Road	Miles of roadwalk
Administrative access route (gated roads, private roads, etc)	Access	
Access control (gates, boulder closures)	Closure	
Dumps	Dump	
ATV, ORV, mountain bike, snowmobile crossing	ORV	
Horse trail crossing	Horse	
Other public or incompatible uses (railroads, ski areas, etc.)	Other U	
These key words are used for projects only:		
Litter or graffiti clean-up	Litter	
Timber or firewood theft problems, clearcuts	Timber	
Natural and Cultural Resources (R)		
Open areas	Open	Size in acres
Vistas, views	Vista	
Threatened, endangered, rare or sensitive species	T&E	
Lakes, ponds, wetlands, swamps	Wetland	Size in acres
Rivers, streams, creeks, brooks	Stream	Width in feet
Unique or unusual geologic or biological feature	Unique	
Glacial features (kames, kettles, eskers, drumlins etc.)	Glacial	
Other natural or cultural resources	Other R	
Property Management (M)		
Structures (incidentally acquired to be retained or removed)	Structure	
Utility lines	Utility	
Public land boundary	Boundary	
Special-use permit (handshake, easement)	SUP	
Other property management features, projects, or problems	Other M	
These key words are used for projects only:		
Exterior corridor boundary survey needed	Survey	
Easement violations	Easement	
Additional acquisition/protection	Protect	
Exterior corridor boundary maintenance	ECBM	

Ice Age Trail Data Sheet

Date _____

The data recorded on this form, if updated yearly, will give us all a better understanding of the degree of protection of each trail segment. Chapters may use this form for the recording of Trail mileage related to land ownership, private versus public property, and by the type of agreements in effect. Use the **Mileage Information Worksheet** when recording data in the field. Transfer mileage data from the worksheet to this form.

Segment name: _____ County _____
Trail on: public lands _____ private lands _____ both _____
Trail Certified (Yes _____). (No _____).

Geographical boundaries of segment : (attach map or sketch) _____

Managing authority : _____

Maintained by : volunteers _____, chapter name _____
public agency _____, name _____

Person completing this Data Sheet _____
Title _____ phone number ____ - ____ - ____
Address _____

Please complete the following questionnaire for :

Trail segments through public or private lands

• Total mileage of this trail segment _____ townships _____

___ this trail segment passes through private lands - () yes, mileage ()

___ this trail segment passes through public lands - () yes, mileage ()
() state land, () county land, () city land, () federal land () township land

• Use in effect (or proposed) on adjacent trail segments (*if known*) - (*check all that apply*)
() hiking, () snowshoeing, () skiing, () biking, () unknown, () _____

• Use in effect (or proposed) for this trail segment - (*check all that apply*)
() hiking, () snowshoeing, () skiing, () biking, () unknown, () _____

• Is location of trail affected by physical constraints of land features or legal easement restrictions : () yes, () no
If yes, please indicate type of restriction

Trail segments through private lands (give length of trail in miles for each category)

• Use permitted by easements _____ license agreements _____ handshake agreements _____
fee title purchase _____ other _____

Percent of Trail with perpetual protection _____. Percent of Trail that does not have long term protection _____.

The following information will be valuable to the: **Land Acquisition Committee**

1.0 Names of political bodies influencing land use. ie: Town Board, Town Plan Commission, County Park & Planning, County Resource Agent - - (provide phone numbers, names & addresses)

2.0 Supportive area people: ie. names of landowners & Realtors and general agencies (phone numbers, addresses, why supportive?)

END OF INFORMATION PROVIDED BY TRAIL SEGMENT LEADERS

Chapter segment leaders should keep the original on file and return a copy to the Foundation Office:

Ice Age Park & Trail Foundation
P.O. Box 423
Pewaukee, WI 53072-0423

Copies will be shared with the appropriate staff and partner representatives.

Staff will review, distribute and comment (if needed) on the recommendations and information provided. Staff will also maintain a file of such Usage Agreements for all Trail segments and use any of the data to update foundation computer files. Such files will be open to review by the various committees that might benefit by having access to this data.

Data Dictionary

A data dictionary facilitates the collection of field information with a GPS unit. It is menu driven and therefore much easier to use than repeatedly typing the information related to each line segment or point feature. Eventually, various partners will use GPS units to collect field data. This data will be shared and fed into GIS programs. GIS programs operate more smoothly if the data coming in (collected through the use of the data dictionary) is consistent. With this in mind, the following data dictionary has been developed for a Trimble Pathfinder Pro GPS unit. It is suggested that parties collecting GPS data duplicate this dictionary or request that the National Park Service provide it via diskette or the Internet.

Line: North Country Trail¹

ROS Class²

- Roaded Natural/Rural
- Semi-primitive
- Primitive
- Urban

Ownership²

- Federal
- State
- County
- City
- Corporate
- Individual
- Unknown

Coincident Feature^{2,3}

- Foot Trail
- Abandoned Road
- Public Road
- Sidewalk
- Railgrade/Towpath
- Power ROW

¹Use Seg key to segment the trail when one of the Line attributes changes.

²Menu choice required except on Segment Name (ie: Copper Falls SP) which must be manually typed.

³What the trail is following.

Pipe ROW
XC Trail
Snowmo/ATV Trail

Surface²

Native Soil
Grass
Puncheon⁴
Boardwalk⁴
Wood Chips
Aggregate
Paved
Limestone Screening

Adjacent Vegetation²

Forested
Old Field
Prairie
Savannah
Pasture
Cultivated
Fencerow
Urban

Segment Name²

Point: Support Facilities⁵

Trailhead
 Primary
 Secondary
Camping
 Campsite
 Campground
 Shelter

⁴Do not create new segment for puncheon or boardwalk unless it is longer than 200-feet. On shorter segments, nest as a point feature under Trail Structures.

²Menu choice required except on Segment Name (ie:Copper Falls SP) which must be typed.

⁵All Point Features can be selected and nested from the menu choices. In addition, the Point Generic feature can be selected and the keypad used to enter the name/description. While a feature is being nested, the Note key can be activated and additional textural information can be entered.

- Water
 - Potable
 - Treatment Required
- Toilet
 - Primitive
 - Modern
- Miscellaneous
 - Bench
 - Telephone
 - Post Office
 - Groceries/Food
- Point: Intersection⁵
 - Road
 - State Highway
 - County
 - Township Road
 - Forestry/Park Road
 - Woods Road
 - Trails
 - Hiking
 - Bike
 - Horse
 - Snowmo/ATV
 - XC Skiing
 - Other
 - River/Stream
 - Railroad
 - Powerline
 - Pipeline
- Point: Trail Structure⁵
 - Bridge
 - Small <25' L or <5' H
 - Large
 - Small - Needed
 - Large - Needed
 - Turnpike
 - Needed
 - Exists

⁵All Point Features can be selected and nested from the menu choices. In addition, the Point Generic feature can be selected and the keypad used to enter the name/description. While a feature is being nested, the Note key can be activated and additional textual information can be entered.

Stepping Stones

 Needed

 Exists

Culvert

 Needed

 Exists

Steps

 Wood

 Stone

Stile

 Needed

 Exists

Puncheon

 Needed

 Exists

Boardwalk

 Needed

 Exists

Other

 Corduroy

 Ford

Point: Signage⁵

 Kind

 Highway Information

 Ped. Crossing

 Entrance

 Trailhead

 Regulatory

 Logo

 Identification

 Small Wayside Ex.

 Large Wayside Ex.

 Private Land

 You-Are-Here

 Destination

 Boundary

 Adopter

⁵All Point Features can be selected and nested from the menu choices. In addition, the Point Generic feature can be selected and the keypad used to enter the name/description. While a feature is being nested, the Note key can be activated and additional textural information can be entered.

Point: Misc. Features⁵

- Vista
 - Existing
 - Opportunity
- Sensitive Species
 - Plant
 - Animal
- Glacial Features
 - Esker
 - Kame
 - Erratic
- Hydrologic Feature
 - Spring
- Cultural Features
 - Historic Marker
 - Historic Structure
 - Cemetary
 - Other

Point: Maintenance Needs

- Kind
 - Trail Vegetation
 - Structure
 - Tread
 - Drainage
 - Litter-Cleanup

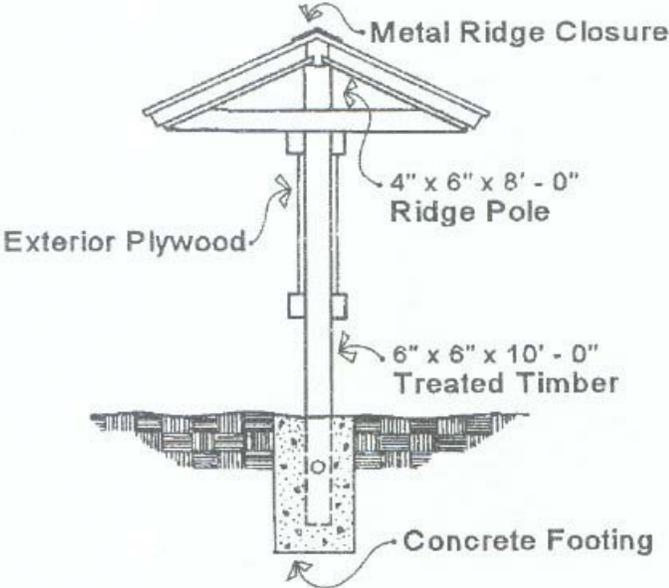
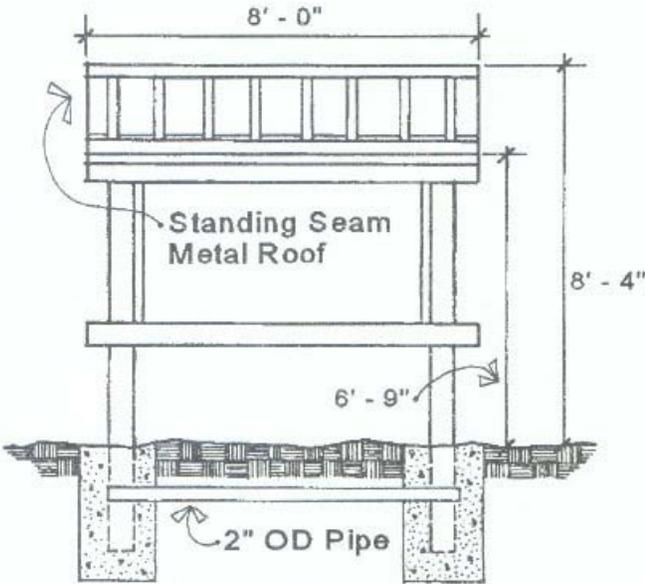
Point: Point Generic

⁵All Point Features can be selected and nested from the menu choices. In addition, the Point Generic feature can be selected and the keypad used to enter the name/description. While a feature is being nested, the Note key can be activated and additional textural information can be entered.

Appendix 3

ADDITIONAL SIGN SAMPLES

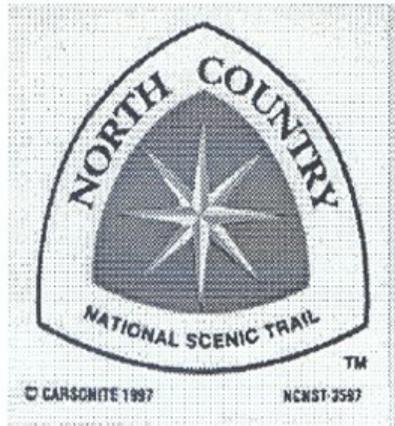
Trail Information Sign/Kiosk Option



Approved Decals and Signs

The following decals have been developed to assist in creating a "look of continuity" along the trail. The small map at the top of several of them helps the public understand the scope of the trail. Decals are available from Carsonite International or in some cases from the National Park Service. It is intended that NCNT-3597 and either NCT-3595 or NYND-3749 is installed at every road crossing or trail intersection.

Amendment #2
Effective 1/30/98



New emblem, NCNST-3597, adopted in 1997. Conforms to the format of other national scenic and national historic trails. Star is now gold and white. Replaces former decal NCT-642.

Regulatory Signs

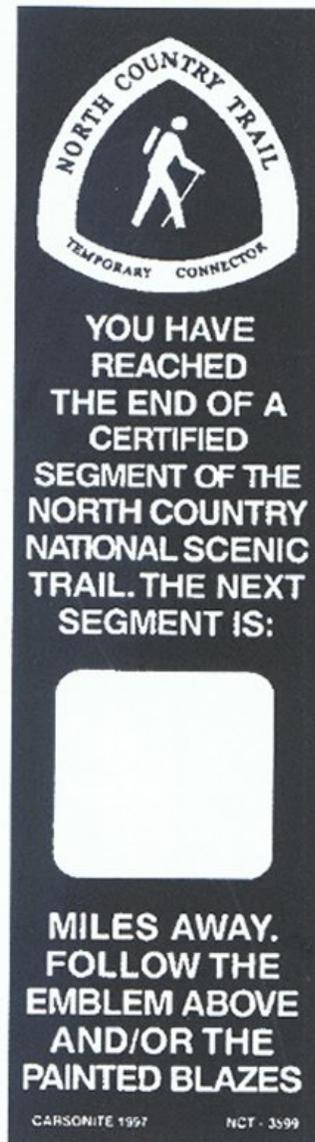


NCT-3595 for use where trail is
Restricted to foot travel.



NYND-3749 for use where other
non-motorized uses are allowed.

Connector Decal



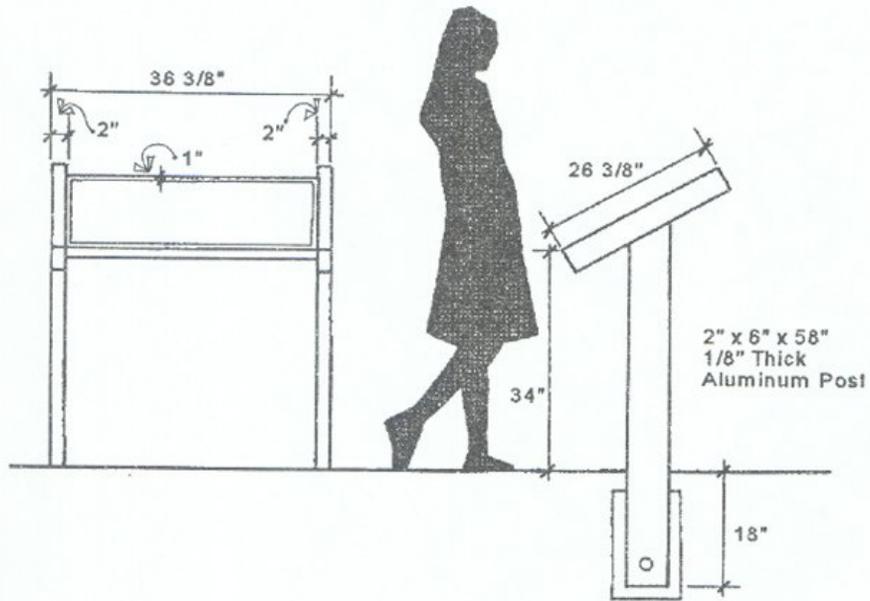
NCT-3599 for use when a non-certified, connecting segment is marked. This decal is to be placed on the backside of the Casonite post(s) marking the beginning of a certified segment. A permanent marker is used to indicate miles to the next certified segment in the white square.

**Road
Crossing
Sign**
Open To Hiking and
Other Non-motorized Uses

Amendment #1
Effective 1/1/97



Wayside Exhibit Format



National Park Service
North Country Trail Association

The North Country National Scenic Trail

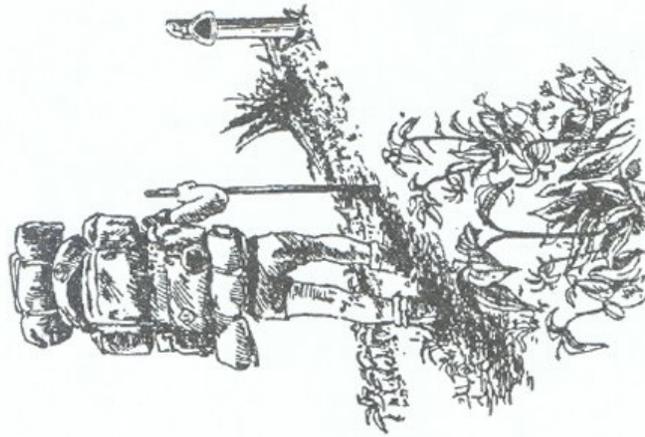


A Trail to Great Adventure

The North Country National Scenic Trail links outstanding scenic, natural, historic, and cultural areas in seven northern states. Some of its 3,240 miles invite easy walking, while other portions provide challenge. But everywhere, the trail offers adventure.

Through the efforts of many people, the trail will become the longest continuous trail in the United States. From the Missouri River in North Dakota to the shore of Lake Champlain in New York, the diverse features along the trail will help users understand how the land was formed, how it has been settled, and how it has been used and altered by humankind. The scenic beauty of the natural resources along the trail is complemented by many cultural features.

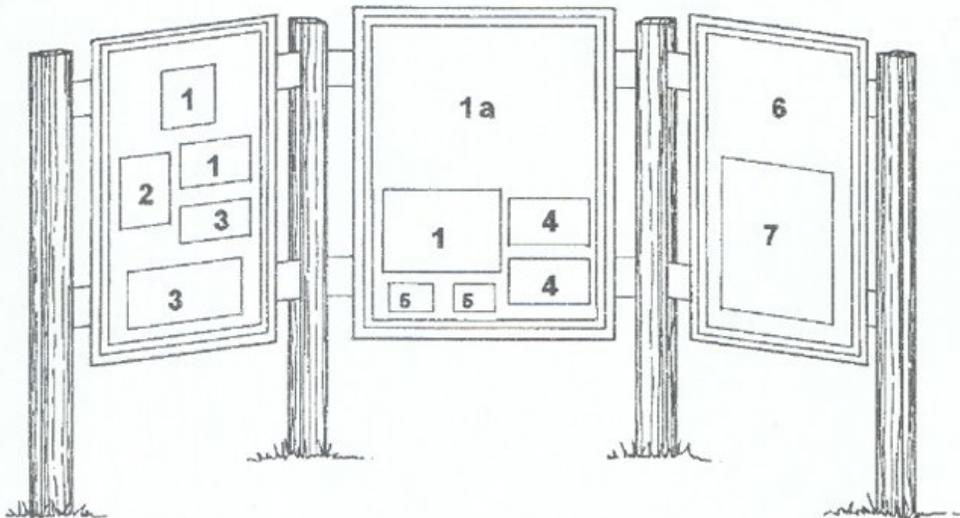
As you enjoy each segment of the trail, you will remember the North Country's lasting images of clear-flowing streams, autumn colors, snow covered branches, sandy beaches, and vast prairies.



A Suggested 3-Panel Display Arrangement

Adapted from *Standards for Forest Service Signs and Posters*

- | | |
|---|--|
| 1) Recreation activity information | 4) User etiquette |
| 1a) Recreation activity information map | 5) Supervisor's directives |
| 2) Visitor registration | 6) Safety/emergency information |
| 3) Environmental awareness | 7) Local interest: weather, community activities, etc. |



Appendix 4

EYE-LEVEL SURVEY

An eye-level survey allows one or two individuals to locate and lay out a trail in hilly terrain. Sometimes called an eye-level flagline, the purpose is to establish a correct grade for the trail. The basic equipment needed is a clinometer and flagging. For a more complete job, or when laying out a trail that will not be constructed for some time, construction stakes, pin flags, and a notebook to record readings are needed.

- Step 1: From maps or first-hand knowledge, establish key points where the trail must be located. These include campsites, water sources, scenic vistas, stream crossings, etc.
- Step 2: Scout the trail. Determine the best way to get from one major point, identified in step 1, to another. Scouting merely means to begin at the first key point and walk toward the next key point to determine if a route is feasible. This step may involve several attempts before the best route is found. In places, you may want to hang some temporary flagging.
- Step 3: If after reaching key point number 2, and a feasible route has been found, flag the trail on the return trip to key point number 1. Flagging should be complete enough so that the construction crew can determine the centerline of the trail. When tying flagging on trees, it is recommended to place the knot so that it is facing the trail. This indicates to the construction crew where you intend the trail to be located in relation to the tree. In areas of gentle topography, simply flag the trail location going by what "feels good"—considering all important location factors such as drainage, scenery, gentle curves, variety, maintainability of trail, and ease of construction. Eye-level surveying is employed in step number 4.
- Step 4: Eye-level surveying is used to maintain the correct grade (generally 7 to 10 percent) on hills. If working with a partner, stand face to face in a level area. Sight through the clinometer to determine a feature on your partner's body that is level with your eyes by rotating the clinometer to a zero percent reading. This may be your partner's hairline, nose, mouth, shirt pocket, etc. Remember this feature.

The objective is to establish a uniform trail grade from the top to the bottom of the hill. Begin at the top or bottom of the hill by tying a piece of flagging at your eye-level. If working with a partner, the person with the clinometer stays at this position while the partner walks ahead along what appears to be the feasible trail route. As long as the hillside is uniform, the partner can walk as far away as they can be easily seen through the clinometer. If there are undulations in the hillside, the partner should stop at each break in topography. The person with the clinometer sights the eye-level feature of the partner and has them move upslope or downslope until the desired grade (say 8 percent) is read in the clinometer. The clinometer person then walks forward to the partner's position, and hangs another eye-level flag. The process is then repeated until the hill is

traversed. If working by yourself, walk forward and take readings on the last eye-level flagging. Move up or down slope until the correct reading (8-percent) is obtained.

Repeat the process using eye-level survey on hills and gut feelings in gentle areas until key point number 1 is reached. If the same people who are laying out trail are doing the construction, no further flagging or staking is necessary. Subsequent steps merely refine the staking of the trail so that a trail construction crew can more easily determine what is intended, or to identify and record amounts of work for planning the job.

Step 5: Since the eye-level flagging is tied on a tree or limb, it is generally off to the side of the trail's desired centerline. Consequently, the construction crew may have a difficult time placing the trail on the ground exactly as is desired. To eliminate any confusion, at each eye-level flagging location, sight through the clinometer at the previously hung flagging until a reading of 0 percent is established and drive a construction stake into the ground where you are standing. This is the trail's centerline.

Concurrently, the survey can be refined by writing the survey station number on the stake and recording construction information in a survey notebook. From the beginning point, measure to the stake with a steel or cloth tape. For example, if it is 185 feet, record this number on the stake and in a survey notebook as 1 + 85. Measurements to subsequent stakes are added to the previous measurements so that at the end of a mile the stake would read 52 + 80 (5,280 feet from the beginning). Useful information can be recorded in a simple table that meets your needs. An example is shown below.

Trail Construction Survey Notes					
Station	Percent Grade (1)	Clearing Needed (2)	Grubbing Needed(3)	Excavation Needed	Percent Sidehill
0+00	8	Light	Medium	Light	15
1+85	8	Medium	Medium	Heavy	40
2+50	7	Light	Light	Medium	25

(1) To the next station.

(2) Clearing refers to the amount of trees, saplings, brush, and large fallen logs that need removal.

(3) Grubbing refers to stumps and roots that need to be removed.

Step 6: Use a series of pin flags to show the curvature (centerline) of the trail between the stations.

Appendix 5

WORKING WITH LANDOWNERS

The question of liability often arises when working with local landowners to secure trail passage. Landowners are concerned that if they allow trail passage and someone gets injured they will be liable. Several responses to this concern can be shared with the landowner. The landowner's first line of defense is the liability insurance they already carry. Second, each of the trail states has a Recreation Use Statute. These laws generally exempt landowners from liability (when the recreationist has not paid a fee for the privilege of outdoor recreation).

Another avenue of defense is that the landowner can be offered National Park Service Volunteer-In-the-Parks (VIP) status. In most circumstances, under this program, the landowner can have the power of the federal government and the services of federal attorneys to back them should they be sued. However, to be sheltered by this safeguards, the landowner must sign up as a National Park Service VIP. To receive VIP status the landowner must complete and submit the VIP form on the following page.

The landowner must also enter into a Memorandum of Understanding (MOU) with the NPS regarding trail passage across their land. The attached, generic MOU can be used to fulfill the agreement. All that is required to complete the MOU is: the landowner's name at the top of page 1, attachment of a standard township plat map(s) showing the land and trail route covered in the agreement (see Article II-B-1 on page 4), insertion of the landowner's address in Article IV on page 6, and their signature on the last page.

These documents should be sent to the NPS for approval.

Analysis of State Recreation Use Statutes



North Country NST

State	Year Passed	Duty to Warn	Duty to Keep Safe	Assurance of Safety	Liability for Willful/Wanton Misconduct	Protection Lost if Fee Charged
New York N.Y. Gen. Oblig. Law §9-103	1963	No	No	No	Yes	Yes: fees from land leased to public agency allowed
Pennsylvania Pa. Stat. Ann. Title 68 §§477-1 to 8	1965	No	No	No	Yes	Yes: fees from land leased to public agency allowed
Ohio Ohio Rev. Code Ann. §1533.18 §1533.181	1963	Not Specified	No	No	Not Specified	Yes
Michigan Mi Comp. Laws Ann §300.201	1953 (1993)	Not Specified	Not Specified	Not Specified	Yes	Yes: May charge a fee for U-pick crops, fishing, hunting.
Wisconsin Wi Stat. Ann. §895.52	1963 (1983)	No	No	No	Yes	No-so long as total revenues do not exceed \$2000 annually
Minnesota Mn Stat. Ann. §§87.01-.03	1961	No	No	No	Yes	Yes: fees from land leased to public agency allowed
North Dakota ND Cent. Code §§53-08-1 to 06	1965	No	No	No	Yes	Yes: fees from land leased to public agency allowed

AREA

AGREEMENT FOR INDIVIDUAL VOLUNTARY SERVICES
(Act of July 29, 1970 Public Law 91-357)

NAME, Last, first, middle initial (please print)

TELEPHONE

ADDRESS (Street, city, state, zip code)

Brief description of work to be performed, including minimum time commitment required. (Attach complete job description to this form)

I understand that I will not receive any compensation for the above work and that volunteers are NOT considered to be Federal employees for any purpose other than tort claims and injury compensation, and I understand that volunteer service is not creditable for leave accrual or any other employee benefits. I also understand that either the National Park Service or I may cancel this agreement at any time by notifying the other party.

I hereby volunteer my services as described above, to assist the National Park Service in its authorized work.

Signature of Volunteer

Date

The National Park Service agrees, while this arrangement is in effect, to provide such materials, equipment and facilities as are available and needed to perform the work described above, and to consider you as a Federal employee only for the purpose of tort claims and compensation for work related injuries.

Signature of Park VIP Coordinator

Date

TERMINATION OF AGREEMENT

Agreement Terminated on

Month, Day, Year

Signature of Park VIP Coordinator

MEMORANDUM OF UNDERSTANDING
BETWEEN THE
NATIONAL PARK SERVICE
AND

(landowner)

Article I - Background and Objectives

This agreement is made and entered into, by and between the National Park Service, hereinafter referred to as the "NPS," and the above named landowner, hereinafter referred to as the "landowner," in furtherance of the purposes of and pursuant to the powers and authorities contained in the National Trails System Act of October 2, 1968, as amended [16 U.S.C. 1241 et seq.], hereinafter referred to as the "Act."

On March 5, 1980, Congress amended the Act to authorize and establish the North Country National Scenic Trail, hereinafter referred to as the "Trail," as a component of the National Trails System [94 Stat. 67; 16 U.S.C. 1244(a)(8)]. The trail extends approximately 3,200 miles from the vicinity of Crown Point, New York, to the Missouri River in North Dakota, in the vicinity of Lake Sakakawea State Park and Garrison Dam. The Missouri River is the route of the Lewis and Clark National Historic Trail. The Secretary of the Interior was assigned administrative responsibility for the Trail.

The Act provides, in Section 7(h) [16 U.S.C. 1246(h)], that when determined to be in the public interest, the Secretary of the Interior may enter into written cooperative agreements with States or their political subdivisions, landowners, private organizations, or individuals to operate, develop, and maintain any portion of a national scenic trail either within or outside a Federally-administered area. Such agreements may include provisions for limited financial assistance to encourage participation in the acquisition, protection, operation, development, or maintenance of such a trail, provisions providing volunteer in the park status (in accordance with the Volunteers in the Parks Act of 1969) to individuals, private organizations, or landowners participating in such activities, or provisions of both types.

The Act also provides in Section 7(e), that the Secretary charged with the administration of a national scenic or national historic trail may enter into agreements with landowners, private organizations, and individuals for the use of lands for trail purposes.

This agreement is for the purpose of cooperating in the completion and long-term management of the Trail and clarifying the responsibilities of each party for the Trail.

Because the Trail involves only a small portion of Federal lands and the Act provides that the development, operation, and maintenance of the Trail shall be a cooperative venture, with special emphasis on the participation of private volunteer trail organizations, the Secretary of the Interior has determined it to be in the public interest to enter into this agreement.

The Secretary of the Interior has delegated overall administrative responsibility for the Trail to the NPS. The NPS, in cooperation with other public and private interests, completed a Comprehensive Plan for Management and Use of the Trail in September 1982. The NPS is responsible at the Federal level for carrying out the provisions of the Act as they relate to the Trail by coordinating, guiding, and assisting the efforts of others to acquire, develop, operate, protect, and maintain the Trail in accordance with the comprehensive plan.

Article II - Statements of Work

A. The NPS agrees:

1. To recognize the landowner as a Volunteer-in-Park (VIP) through execution of an agreement for individual voluntary services. The purpose of a VIP agreement is to formalize the commitment of a volunteer to the Trail and provide them with the protection enjoyed by Federal employees in

circumstances of tort claims and injury compensation. Recognition of the landowner as a VIP shall be contingent on their agreeing to meet the record keeping and reporting requirements of the program.

Essentially, this is an annual reporting of any hours spent maintaining the trail.

The Volunteers in the Parks Act (16 U.S.C. 18g) authorizes the Secretary of the Interior to accept the services of volunteers for activities in and related to areas administered by the Secretary. While acting within the scope of their agreed responsibilities, individual volunteers would be considered as Federal employees for purposes of tort claim provisions of Title 28 of the United States Code and with regard to compensation for work injuries.

Individual Volunteers-in-the-Parks (VIPs) receive protection under the Federal Tort Claims Act and the Federal Employee Compensation Act while working within the scope of their responsibilities. Under the Federal Tort Claims Act (FTCA), any tort claim filed by a citizen, against trail club organizations and their members or other individuals who have entered into a Cooperative Agreement with the NPS, for personal or property injury sustained while using the North Country NST, arising from VIP activities, would be handled by the NPS as it does claims against employees. An investigation of facts is made by a designated Tort Claims Officer and reported to the Solicitor's Office for review.

A determination of Federal Government liability in each case is made and any award paid to a claimant(s) is borne by the Government. The FTCA grants jurisdiction for actions on monetary claims for injury, property loss or death "caused by the negligent or wrongful act or omission of any employee of the Government"....

It is also possible that an injured party may choose to proceed against a participating trail club or individual personally, pursuant to the legal action, rather than following the Federal Tort Claim procedure. In this case, we would expect the Department of Justice to defend the action. It is Department of Justice practice to represent Federal officials who are sued personally for actions that arise while within the scope of their employment. This should also be true for VIPs acting within the scope of their volunteer agreement. Therefore, if the claimant chooses to file suit, VIPs should normally be represented in court and court costs covered by the Government...As with Government employees, volunteers are protected for their negligent actions as long as it can be shown that they were acting within the scope of their responsibilities.

2. To provide training and assistance on trail development, operation, maintenance, protection, publicity, and public relations, as needed--should the landowner take an active interest in constructing or maintaining the trail across his/her property,. Much of this will be accomplished by encouraging the local North Country Trail Association (NCTA) chapter or individual members to work closely with the landowner.

3. To facilitate communication and contact between the landowner and local NCTA members or

chapter if it is not occurring satisfactorily.

4. To include the landowner in our address list of individuals who receive the 1-2 issue per year *North Country NST Administrative Update* newsletter--published by NPS.

B. The Landowner agrees:

1. To allow passage of the North Country NST across his/her property. The original route location and any subsequent changes shall be as approved by the landowner. Property is shown on the attached plat map(s). **NOTE:** Please submit along with this agreement to NPS.

2. To allow members of the NCTA to follow the trail route as needed to construct and maintain the trail to commonly accepted standards. Typically, the trail consists of cleared space 4 feet wide and 8 feet high; tread width of about 18 inches; and blue 2 X 6 inch painted blazes or 4 X 7 inch plastic diamonds affixed to trees or posts at reasonable intervals. If affixed to trees, aluminum nails will be used. No trees shall be removed without explicit permission of the landowner except for small saplings and limbs encroaching into the trail clearing.

3. To allow recreational passage by members of the NCTA and the general public free of charge.

4. To protect the trail, to the extent possible, from activities which destroy or damage the tread or the trail markings.

5. To protect the trail, to the extent possible, from unauthorized motorized activities and to report such activities to the local NCTA representative.

6. To restrict activities such as dumping of trash, garbage, and other unsightly or hazardous materials on or in close proximity to the trail and strive to protect the natural scenic values of the area.

7. To provide for the protection of the trail, through contractual restrictions--if timber is cut immediately adjacent to the trail. This could include prohibitions on skidding along or across the trail except at reasonable intervals, slash removal from the trail and an adjacent reasonable distance, and protection of trees bearing the painted or plastic trail markings. It also includes notifying the local NCTA representative of the anticipated cutting so that provisions can be made for temporary or permanent trail rerouting.

8. To provide an annual verbal or written estimate to the NPS by September 15 of the number of hours that he/she has spent actively working on the trail.

9. To permit the removal of trail markings and any other trail improvements (that are removable) within a reasonable time after this agreement expires or is terminated, if and when it does.

C. The NPS and Landowner agree:

1. To coordinate their activities and programs related to the Trail to assure that the efforts of each party complement those of the other.

2. That uses are restricted to foot travel only--including snowshoeing and possibly cross country skiing. Bicycles, horses, and all motorized vehicles are excluded.

3. That the landowner shall have the right to incidental, occasional passage along the trail by

motorized vehicle for non-recreational activities such as the gathering of firewood, routine farming practices, and other similar personal activities.

Article III - Term of Agreement

This agreement shall continue in effect for 5 years from the date of the last signatory party unless terminated at an earlier date in accordance with Article V. At the expiration of this agreement, it may be successively renewed for additional periods by mutual agreement of both parties after reviewing its benefits.

Article IV - Key Officials

The key NPS officials are the Superintendent, Ice Age, North Country, and Lewis and Clark National Trails, and the Coordinator, North Country NST, both located at 700 Rayovac Drive, Suite 100, Madison, Wisconsin 53711.

The key landowner is as shown above, located at _____

Article V - Termination

This agreement may be terminated upon 60 days advance written notice given by one party to the other, or it may be terminated earlier or revised by mutual consent of both parties. Termination of this agreement does not affect any operation and maintenance agreements which either party may have with other cooperators.

Article VI - Standard Provisions

The obligation of the NPS and the Landowner to perform the responsibilities specified in this agreement is contingent upon the necessary funds being available through governmental appropriations or other sources. No legal liability on the part of the NPS or the Landowner to carry out such responsibilities shall arise unless and until funds are available to cover the expenses associated with performing the responsibilities specified herein.

Additional NPS Provisions

Nothing in this agreement shall affect or interfere with fulfillment of the obligations or exercise of the authority of the NPS or any other Federal Agency to manage the lands along the Trail route (within the boundaries of areas they administer) and the programs under their jurisdiction in accordance with their basic land management responsibilities.

No member of or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

During the performance of this agreement, the participants agree to abide by the terms of Executive Order 11246 on nondiscrimination and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex, or national origin.

IN WITNESS WHEREOF, the parties hereto have executed this Memorandum of Understanding as of the last date written below.

Superintendent, Ice Age, North Country, and Lewis and Clark
National Trails, National Park Service

Date

Landowner

Date



United States Department of the Interior



NATIONAL PARK SERVICE

Ice Age, North Country, and
Lewis and Clark National Trails
700 Rayovac Drive, Suite 100
Madison, Wisconsin 53711

IN REPLY REFER TO:

L6017(IATR)
NOCO

JUN 14 1995

Dear North Country Trail Enthusiasts:

The enclosed table listing various land protection options may be helpful in your deliberations about how to best protect any sections of the trail crossing private property.

An earlier draft was reviewed by David Cornell, a retired attorney working with the North Country Trail Association. While he commented that it is generally accurate, he did emphasize that it is not cast in stone since the laws vary from state-to-state. Therefore, before presenting this as an absolute to any of your landowner contacts, you may want to double check with a local expert regarding the specifics of your state laws.

Good luck in your negotiations.

Sincerely,

William R. Menke
Coordinator, North Country
National Scenic Trail

Enclosure

cc:

Pat Allen, 3777 Sparks Dr., SE., Suite 105, Grand Rapids, MI 49546
Derek Blount, 906 North Alexander, Royal Oak, MI 48067
James W. Sprague, 4406 Maplecrest Avenue, Parma, OH 44134
Howard Beye, 202 Colebourne Rd., Rochester, NY 14609
Arden Johnson, 600 Tennyson, Rochester Hills, MI 48307
Gene Elzinga, 12 Middle Island, Marquette, MI 49855
Gaylord Yost, 2925 W. Bradley Rd., River Hills, WI 53209
Hans Erdman, 116 E. Rose Pl., Little Canada, MN 55117
Dale Anderson, RR1, Box 10, Oslo, MN 56744
Arlen Mason, 1045 Draka Rd., Traverse City, MI 49684
Bill Van Zee, 7744 Thornapple Bayou Dr. SE, Grand Rapids, MI 49512

North Country NST - Options to Achieve Permanent Trail Protection

Protection Options [best to worst (1)]	Description	Results	Income Tax Deduction (2)	Estate Tax Deduction (2)	Property Tax Deduction (2)
Conservation easement	Legal agreement between landowner and NCTA or government agency permanently limiting a property's uses.	Trail passage/conservation values permanently protected. Landowner continues to own, use, live on land.	Yes	Yes	Maybe (4)
Outright land donation	Land donated to NCTA or agency.	Organization owns/protects land. (3)	Yes	Yes	Maybe (4)
Donation of undivided partial interests	Land donated to NCTA or agency over several years until organization has full ownership.	Organization owns/protects land. Income tax deductions spread over several years. (3)	Yes	Yes	Maybe (4)
Donation of land by will	Land donated to NCTA or agency at death.	Organization owns/protects land. (3)	No	Yes	Maybe (4)
Donation of remainder interest in land with reserved life estate	Land donated to NCTA or agency, but owners (or others designated) continue to live there--usually until death.	Organization owns/protects land. (3)	Yes	Yes	Maybe (4)
Bargain sale of land	Land sold to NCTA or agency for less than fair market value.	Organization owns and protects land. (3)	Yes	Yes	Maybe (4)
Sale of land	Land sold to NCTA or agency at fair market value.	Organization owns/protects. Expensive. (3)	No	Yes	Maybe (4)
Lease	Trail corridor or land leased to NCTA or agency for a specified number of years--with restrictions placed on how it can be used.	Postpones development. Still expensive.	No	No	No
Memorandum of Understanding and VIP Agreement	A somewhat formal agreement between NPS and landowner allowing trail passage for a specified time period--usually 5-10 years (renewable).	Secures passage. Can be nullified at any time. Need to renegotiate with future owners. May or may not be more effective than options below.	No	No	No
Written Agreement	Between NCTA and landowner allowing trail passage for specified years or until changed.	Secures passage. Can be nullified at any time. Need to renegotiate with future owners.	No	No	No
Handshake Agreement	Between NCTA and landowner allowing trail passage for specified years or until changed.	Secures passage. Can be nullified at any time. Need to renegotiate with future owners--even less permanent.	No	No	No

(1) In terms of land protection only. Not necessarily the most economical. Also, the relative positions are not fixed--they may move up or down somewhat.

(2) Any person contemplating a donation should talk to a tax advisor. The value of any deduction is based on an individual's tax status.

(3) For acquired properties best left in private ownership, the organization may place a conservation easement on the property to provide permanent protection and then resell the property. Any deduction may be subject to a limitation if an attempt is made to take a deduction in more than one category.

(4) Depends on local tax appraisal system.

Appendix 5D is a collection of things that have worked for various trail clubs when dealing with landowners.

Study of Potential Route

Project Leaders should begin their study of the potential new section by examining aerial photographs, USGS topographic maps and property books to learn more about the locale. Location of both ends of the proposed section should be carefully considered so that the trail does not become an isolated section. Driving through the area to become familiar with various land uses and developments is also helpful. Is the land actively farmed? Does it look wet?

Once a potential route has been determined, two jobs evolve:

1. Contacting property owners for permission to cross their land.
2. Developing the footway.

The job of locating property owners can be accomplished by a study of tax records at the County offices. Land holdings may be large or small. Owners may reside on the property or at some other location. Owners of key parcels should not be contacted until some knowledge of their situation is garnered and a successful negotiation is likely. This can often be obtained by visiting neighboring property owners. Personal visits to landowners are a must and it may be helpful to work in teams of two.

During negotiations for trail access, the property owner will surely have lots of questions. Some of these are listed on the following page. You should be familiar with these issues and ready to answer some basic questions. If you don't know, simply say that you will find out.

All agreements with land owners or managers must be made in the name of the North Country Trail Association and are signed by the President. Because of the significant work required to locate and build a trail section, it is important to seek an agreement lasting at least three years. If that is not possible, then, of course, we need to deal with the landowners wish to be able to cancel the agreement easily.

If written agreements are required, the Land Use Agreement attached may be reproduced and used. Copies must be made for the landowner, the Vice-President of Trail Management, and the NCTA office.

Do not enter into such agreements without contacting your State Coordinator for guidance and approval.

Determining Property Ownership

Start with the proposed route on the topographic maps and outline a trail corridor that is generally about 1/10th of a mile wide to give space for dealing with alternative property owners and locations on parcels. Determine Range and Township coordinates and Section numbers.

At the county offices be prepared to ask for assistance the first time and take a notebook to list owners and addresses. Look at the Index Map and note numbers of detail sheets through which proposed trail passes. On detail sheets, obtain parcel numbers.

Look up the names and addresses in the property register. Be sure to inquire about aerial property maps. Copies of the aerial photographs may also be available from the local Soil Conservation Service. Their information will also contain recommendations regarding soil types and recreational suitability.

Questions Frequently Asked By Property Owners

Liability. Owners are afraid they might be sued by someone who is injured while crossing their property. This concern should be expected and you may be able to reassure them in several ways. First, Michigan and other NCT states have recreational use statutes which provide immunity to landowners who grant recreational use of their property. A copy of the statute is included and can be duplicated.

Additionally, the National Park Service can offer private landowners Volunteer in the Parks (VIP) status which would provide assistance with tort claims to the landowner. NPS would only want to give the VIP status to owners willing to grant multi-year or permanent access for the trail. Volunteers who are working on private lands and who report their work hours are also given this VIP assistance for injuries incurred while volunteering.

The record to date shows no successful suits for injuries to hikers on the North Country National Scenic Trail.

Routing. The Association will only place the trail where the owner fully approves. All routing details should be placed on a map before the trail is constructed. You will want to walk the proposed route with the owner if possible.

Access. Trail signs should indicate that the property is private and users must stay on the designated trail. Property owners will continue with the normal use of their property including farming or hunting.

Uses. Trails on private property will normally be constructed for foot travel only. It is beyond the normal budget and skills of the Association volunteers to construct the trail for multiple use including bikes or horses.

Camping. Owners are encouraged to consider whether they will permit camping and whether they wish to designate a camping site. Maps should reflect this information and signs should indicate whether camping is prohibited.

Gates and Fences. If there fences which are to remain in place, volunteers should include construction of a stile as part of the work plan. Gates should always be left as found.

Signs. The NPS and the Association provide and install necessary signs and trail markings. The owner should be advised of the proposed method of signing and any special signs needed.

Enforcement. The NCTA will work with the property owner on enforcement problems. This can include signs, barrier placement, or contact with law enforcement.

Appendix 5D #2

Taken from NCTA Working With Private Landowners Workshop 12/94

Notes from Terry Giarrosso, Finger Lakes Trail Conference

Dear Pat,

There are no set rules for contacting landowners -- so I just put together the enclosed notes.

The County tax office can give you owners name and address. If a post office box is part of the address it is difficult to find owner so you ask neighbors. Landowners are curious about property lines of their neighbors.

The Soil and Water Office keeps current aerial photos of farm land and gave us a copy for our use. By the way, these people know the farmers and can help you find their homes or give info about them. Sometimes you have to research abandoned roads with the Township. Abandoned railroads ownership has to be researched and permission asked. Power lines passed under - permission needed.

I did my calls alone -- but a team of two is ideal. In the FLT manual it says women have good luck in contacts. I did and I met some really nice people. We had some "no" responses but a lot of yes!!

I made up a packet of info and I'd have a rolled up larger plan-type paper that I carried. You look less like a salesperson -- and the landowner should be curious and not just turn you away -- anyway it worked for me.

Rural people are hard to find at home so you need to adjust your calls to their timing. The family dog usually heralds your approach. I'd call out "anyone at home" etc. Many times there is neither door bell or front step! Calling out worked.

With packet ready - I explained who I was and why I was there and used map of the FLT across New York for interest. Asked if they had knowledge of FLT or had seen Trail Head Posters etc. or knew where our trail was located nearby.

Right up front I mentioned the General Obligations Law (liability) because the immediate concern is for liability. I told owners that 60% of our trail was on private land -- I dropped names of nearby landowners that had given permission etc.

Told owners that we would place stiles over active fences on their land. Asked for their ideas of trail after telling them we like to place trail where it is scenic -- along streams next to large trees, etc. Told them we would flag a route and let them know so they could check to see if they approved. Explained how we cleared trail and marked it and also that a steward would be assigned to keep it clear.

When all is agreeable we just do a handshake agreement which can be revoked at any time for any reason. When we have trail finished we send the landowner a letter thanking them and enclosed a postcard for him to return for our records.

Remember, this is the least durable of options. WRM 8/96

SUGGESTED STEPS IN TRAIL PLANNING, BUILDING AND MARKING

1. Make out a Trail Sponsor's application and send it to the FLTC Trails Chairman.
2. Set general route of the proposed trail on topographic maps.
3. Generally select and scout a route on foot. Do not trespass. Let the landowner know what you are doing.
4. Submit the final route on the topographic map to the FLTC Trails Chairman.
5. Determine the ownership of the land in your selected route.
6. Visit the owners and obtain verbal or written permission. Show the owner FLTC trail brochures, newspaper articles, a map of the proposed route and anything else that may help you get permission from him. A receptive landowner should be offered a free subscription to the FLTC News if he wants it. Send his name and address to the FLTC Service Center.
7. If the owner has only given verbal permission, compose and send him a permission letter. (See sample letter in this section for suggested wording.) One copy should be sent to the FLTC Trails Chairman and one kept in the files of the sponsoring organization, or individual. Use the sponsors letterhead or that of the FLTC.
8. Following FLTC approval of your application and the owner's permission to build, proceed to flag the route with strips of cloth or brightly colored survey tape.
9. Review the flagged route with the owner if he wishes.
10. Construct the trail using the FLTC Trail Manual as a guide.
11. Paint-blaze the trail.
12. Install all trail signs and posters that are needed for your section of trail.
13. Measure trail length with a surveyor's wheel. Record the results and send it with any other pertinent information to the FLTC Trails Chairman.
14. Perform maintenance work each spring before Memorial Day and frequently during the hiking season.

NOTE: When the sponsor has completed a substantial portion of the route, he may apply to the FLTC Trails Chairman for Class I membership. If the FLTC Board of Managers approves, the sponsor will then not be required to pay dues so long as he remains a Class I member.

STATE LANDS - A special permit system is required when building on state lands. See page 44 for details.

TO BUILD A TRAIL

There is a general way to go about building a trail route but it is impossible to say that everyone must go about it exactly the same way since different problems arise on different trail sections. However, sponsors are expected to build trail according to FLTC specifications.

Different landowners must be approached in different ways because they have different lifestyles or different personalities. You can't talk to a farmer the same way as you would to someone who has always lived in a big city. In other words, you need to be able to relate to who and what they are.

The people in your own groups having their own personalities must learn to adjust to meeting landowners along the trail in a way that will bring results.

Keeping accurate records about your landowners and your trail section is very important and they must be kept up to date. You never know when the Conference or others may suddenly need accurate information about any part of the trail. When you are recording this information copies should be sent to the Conference and should be kept up to date.

* * * * *

We feel the guidelines on the following pages will be a great help to trail builders. They were developed by Winston Braxton while he was Trail Chairman of the Adirondack Mountain Club-Onondaga Chapter. It need not be followed exactly but is an excellent guide.

For sake of brevity we have only included a part of the data that is needed in order to have good records on the trail you are building.

TRAIL PLANNING AND MARKING

Owner (State and Private) Permits

A first general overview of the territory to be traversed will indicate the route to be followed. In this case you are looking for hurdles you may have to cross such as rivers, bridges, or highways, now obstructing your trail or may in the future.

The latter condition should be detected at an early date and the permanent trail established to generate grandfather rights. The critical and most difficult should be handled first although connecting to existing segments of trail may seem more desirable.

In any event an overall plan of sequential action should be laid out, with dates when various sections might be constructed and priorities established. As time passes priorities may have to be re-directed to suit changing conditions.

In no event should efforts to clear trail be spread in a helter-skelter or opportunistic way. There will be enough owner changes occurring or other reasons for making changes to existing trail that will add unanticipated efforts and delay the best of plans.

It is not unusual to spend 2 to 4 years from the time the first owner is contacted in say a 3 to 5 mile section, until that entire section has received permits and the trail is actually cleared and blazed.

PERMITS, PRELIMINARIES

The first action in asking for either state or private owner's permission to use a portion of the land under their control for the trail, is to know where you would like the trail to be located. It is important that you go to them with as nearly an exact future route location as you can. Too many changes later on may turn the owners against you.

A study of topographic maps and a preliminary survey by road of the area one wishes to pass through is important. Most topographic maps do not indicate recent reforestation and the road survey will prove of the upmost value in cutting down the time required to lay out the trail. This preliminary work can be complemented by studying aerial photographs of the territory as well as geological maps, if these are readily available. Such preliminary studies will permit the trail to be directed to the most scenic points in the area including cascades, waterfalls, gorges and high points for vistas.

OWNERS

The most logical step is to visit the Tax Map Office at the county seat of the area in which the trail is being planned. These tax maps are generally maintained by the Township and the scale is fairly large, so a single map will cover only a small

portion of the trail being laid out. The number codes on each lot refer to a master listing where additional details are kept such as: owner's name, address, tract size, assessed value, etc. These records also indicate lands owned by New York State entities.

A separate record should be made of the owner's name and address by map number and a copy of the section of map you are interested in purchased for your use in the field. Cost varies from about \$2.00 up.

After you have these maps, make copies of them for your use so they can be marked up with the preliminary trail path with the name of the owner added. If possible, pick a route on state land. State land seldom, if ever, changes hands.

If the owner's address is no longer valid due to death or some other circumstance, you may have to visit the Surrogate Court to obtain the very latest data on ownership.

PERMISSION FROM THE PRIVATE LANDOWNER

The private landowner sequence of action is:

- a. Contact and obtain verbal permission.
- b. Flag, clear, blaze (mount signs, stiles etc. as needed).
- c. Write a trail description and final permit acknowledgement.
- d. Obtain signed "receipt of trail description" if needed.

State permits require that private owner permits be obtained, before a state permit can be issued, if access to a public road from state property is over private land. In other words, trail on state land starting and ending at public roads needs no private permit acknowledgement. Very few sections of trail currently being planned fit this criterion.

Private owners generally are rural types interested in the soil and are difficult to reach except in late afternoon and sometimes on weekends. In any event we have found the best way to gain acceptance is a direct contact at the end of a hike or work party.

Owners should be given the FLTC brochure showing the extent of the trail; information on names and addresses of sponsoring organization officials, contact person, etc.; rough sketch (Copy of Tax map) of the proposed trail route and a copy of an extract of the "General Obligation Law" which states that the owner has no responsibility to hikers and other selected users on his land. (see exhibit I)

If the owner cannot be contacted directly, a preliminary conversation by phone may be made. You can then follow this with a mailing to confirm the phone conversation. This may be the case with an absentee landowner and in some cases the contact is made entirely by mail but this is often not very satisfactory.

In all cases, it must be explained that the initial permission is preliminary, and will be confirmed in detail when

the trail is cleared in its final location. The color of blazes or markers, stile locations, private landowners signs, other types of signs and locations should also be spelled out; and that this permission can be rescinded by writing to the sponsor or to the Trails Chairman of the Finger Lakes Trail Conference. If the property is sold, the sponsor is obligated to seek permission from the new owner.

If the private land is to be included in a state permit, then on delivering the final owners permit and Acknowledgement of Receipt of Letter Describing Trail should be signed by the owner. Again, this usually requires a visit to get the landowners signature and receipt. We have not always been successful in obtaining such a receipt by mail, even if we have sent the owner a stamped pre-addressed envelope to put it in.

(see exhibit II for typical Private Owners Permission)

How to secure permission for a trail to cross private property

by Howard S. Beye
Trails Chairman, FLTC
reprinted from *Pathways Across America*

For the past 27 years the Finger Lakes Trail Conference, through its 33 trail sponsor organizations and individuals, has been securing hand-shake agreements from landowners to allow the trails of the Finger Lakes Trail System to cross their lands.

The Finger Lakes Trail System is presently proposed to consist of the main trail of 532 miles -- from Allegany State Park in the southwestern part of New York State to the Catskill Park in the eastern part -- and six branch trails that when completed will total 254 miles. The main trail passes through mostly dairy farm and forest land in its course across the southern tier of New York.

The North Country National Scenic Trail follows the Finger Lakes Trail for 350 miles.

There are now 648 miles of the proposed 786-mile system completed and ready for hiking and backpacking. Approximately 60 percent (390 miles) of existing trail is on private land.

Before Finger Lakes Trail representatives actually contact landowners to secure permission for the trail to cross their land, we make some preliminary decisions on the route. The best general route can be established by using highway, topographic, and (if available) aerial maps. We then determine the specific trail route by driving and walking through the area and contacting local landowners and local and state officials.

We give priority to using local, state and federal land as much as possible for the trail route. We also consider using existing trails, abandoned railroads, and power, pipeline and other rights-of-way.

Identifying the landowners

When we have established the specific route, we secure tax maps. By plotting the proposed route on these maps, we can determine who the landowners are and where they live. If the landowner does not live on the land where we wish to put the trail...

When the route has been plotted on the tax maps it is easier to determine which landowners hold the key to success of establishing the trail. We contact these landowners first so we can make adjustments early in the

process if we cannot secure their permission.

Another advantage of the tax maps is that they enable us to plot a route involving the fewest possible number of landowners. Limiting the number of landowners makes securing permissions much less time-consuming.

The speed with which we feel the trail can be built affects the length of the route we initially try to gain permission to cross. We normally work in sections of about 10 miles. Generally, the processes of obtaining permission and building the trail are ongoing and concurrent. Our experience is it usually takes two to five years to complete a 10-mile section across private land with many owners.

Fact-to-face contact

The initial contact with the landowner is very important. If the landowner is a farmer, we feel the best time to find him around his home is at the end of the day.

Often we attempt to make contact in the late afternoon at the conclusion of a trail route scouting or work session. We try to have two persons work as a team to make the contact, usually including one of our women trail workers. In general, we find women are more successful than men at securing permissions.

What to bring

The contact team needs certain items with them to be successful:

1. A brochure or flyer telling about the organization building the trail. It should mention the fact that the work is being done by volunteers and tell about the trail size and type of use that will be allowed.

2. Maps of the immediate area that show the completed and proposed trail route.

3. A copy of the General Obligations or similar law that provides protection for landowners from claims of those whom he/she has given permission to use the land. The landowner should be given a copy.

4. The signs that would be used to identify and mark the trail. It helps to have a sign that tells of the landowners' generosity in allowing the trail on their land and the courtesies expected of users.

What to discuss

We also discuss the following with the landowner.

1. The material listed above.
2. That the trail is only for foot travel. (If other uses are planned they

must be discussed and detail provided.)

3. That this is a handshake agreement that can be revoked at any time for any reason by the landowner.

4. Any suggestions the landowner has for a route across the property. This makes the interested landowner a part of the process.

5. That the Finger Lakes Trail Association closes the trail the first Monday in February each year to protect the landowners from having a public right-of-way open continuously across their land.

If the landowner gives permission we do the following:

1. Thank the landowner and ask if he/she would like to receive copies of the newsletter of the organization building the trail.

2. Tell the landowner that the route will be established and marked with flagging tape. When that task is completed he/she will be contacted to get his/her approval for the route or to make suggestions for changes.

3. Tell the landowner a letter acknowledging his/her allowing the trail on the land will be mailed. A return receipt will be included with a stamped return envelope.

When securing permissions from second home, non-agricultural, and absentee landowners, the time and method of making contact are different, but the same items need to be covered.

Using these methods, over the past 27 years the Finger Lakes Trail Conference sponsors have secured hundreds of handshake agreements from landowners. Very few of these have been revoked.

For a volunteer organization with limited resources we feel this is the only initial way to secure a trail route across private land. Protection of the route in years to come may require actual purchase of land or securing of conservation easements along selected sections of the trail.

How about a model NCT?

The 118 mile Penn Central railroad grade through the Adirondacks, which may possibly become a route of the NCT, as shown in the article on the rails to trails survey, is very commonly modeled by model railroaders. There have been many model railroad layouts that feature Saranac Lake, Tupper Lake, Lake Placid and surrounding areas featured in *Model Railroader* and *Railroad Model Craftsman*.

Saranac Lake, along the route, is perhaps best known for the many tuberculosis sanitariums in the area during the first half of the century.

Adirondack Mountain Club, Inc.

File L55 C55

Onondaga Chapter
SYRACUSE, NEW YORK



208 Sherwood Drive
DeWitt, New York 13214

May 8, 1980

Mr. Emery Gast
Mariposa Road
DeRuyter, New York 13052

Subject: Hiking Trail

Dear Mr. Gast:

The members of our Club who visited you some time ago enjoyed your hospitality, when we discussed our proposed public hiking trail, which our Club has taken on as a public service volunteer project for the Finger Lakes Trail Conference, Inc. You may recall how we believe this to be a way to help visitors to the countryside to enjoy and protect the things of nature.

We sincerely appreciate your kind permission to construct this footpath across your land, from the east-west old road bed that separates your farm from MR. Arthur Gast's farm, northward to State land.

Attached to this letter you will find Attachment T "Trail Route Description" and Attachment L describes our trail design standards, marking and signs. The paint blaze markers will be white.

If you should ever decide to rescind your permission, you may do so by written notice to the Trail Chairman, Adirondack Mountain Club-Onondaga Chapter, Box 194, Nedrow, New York 13120. If your property should change ownership (we would appreciate your letting us know), it will be our responsibility to request permission from the new owner. Your favor in allowing this permission is appreciated.

Sincerely,

Winston B. Braxton
Chairman, Trails Committee

Attachment T-TRAIL ROUTE DESCRIPTION (for E-1)

L55 C55

The trail length across your property is approximately .9 kilometers(.6 mile).

The trail, which, in the Town of Otselic, follows the old east-west roadbed which separates Mr. Arthur Gast's farm from Mr. Emery Gast's farm, heading westward toward the town line, veers to the right at a small angle into Mr. Emery Gast's land, but stays south of the east-west fence bordering the cultivated field north of the roadbed. The point at which the trail angles off the roadbed is roughly 40 to 50 meters or yards east of the town line. The trail stays south of the gate that is immediately east of the town line, which opens into the cultivated field. At the town line, the trail crosses a north-south fence on a stile, entering a woodlot just north of the roadbed in the Town of Lincklean, on Mr. Emery Gast's farm.

The trail immediately bends right and runs northward through the woodlot, just west of, and parallel to, the north-south fence along the town line. From the northeast corner of the woodlot, the trail continues northward a short distance across open pasture and reaches the southwest corner of woodland. Here, the trail crosses the fence on a stile back into the Town of Otselic, into the woodland, also part of Mr. Emery Gast's farm. After going northward a short distance parallel to, and just east of, the fence, within hardwoods, the trail bends right and goes generally northeast through woods, staying south and east of a low wet area. Beyond this, many hemlocks are mixed with the hardwoods. Before reaching the north-south property line about .24 kilometer(.15 mile) east of the town line, the trail curves left and continues northward through woods, parallel to, and not far west of, the property line, staying within Mr. Emery Gast's land. Not much further, the trail reaches the east-west boundary of State land and crosses the boundary a few meters or yards west of the southeast corner of State land. This ends the section within Mr. Emery Gast's land. (The trail continues northwest and west through State land to Bandbury Road).

Identification and direction signs will be on State land.

Attachment L -- HIKING TRAIL, DESIGN AND MARKING

This footpath is designed for foot travel only. It will resemble the Appalachian Trail or lower-elevation Adirondack trails. Vegetation will be trimmed enough to keep it from touching the hiker or his pack in any season (even if snow-laden), with extra allowance for seasonal growth; and it will be trimmed so that the hiker can see into the trail ahead and see at least one or two markers ahead. We keep the path natural and ungraded, except in seeps and on steep slopes, where some simple and crude design measures may be necessary. We do not cut timber or pulpwood trees, but only ground vegetation, brush, and small trees -- only enough to avoid an unduly twisty trail or to keep the markers ahead visible. Trail markers are short vertical stripes of paint facing the approaching hiker, on trees, posts, and so forth -- to guide the hiker at all points along the trail. At trail heads and trail junctions we provide small signs that identify the trail and that give directions, destinations, and distances. We find it advisable to place posters on private land that remind hikers to observe good manners and to protect property: ". . . Start no fires. Leave no rubbish. Protect trees and crops. Please do not leave the trail"; -- at entrances, and not more than a half-mile apart.

Where necessary (for example, to avoid gates left open or stretched wires) devices for crossing fences will be provided, of A-frame or other design, called "stiles".

ACKNOWLEDGMENT OF RECEIPT OF LETTER DESCRIBING TRAIL

Adirondack Mountain Club Inc.-Onondaga Chapter, Syracuse, New York
For Finger Lakes Trail Conference Inc.

I acknowledge receipt of your letter dated May 8, 1980, describing the following trail:

Name of trail Finger Lakes Trail Kilometers .9
Approximate miles .6

From the east-west old road bed that separates my farm from Mr. Arthur Gast's farm, northward

To State land

Town s Otselic; Lincklaen County Chenango New York State

ADK-ON File L55 C55

(Signature) Emery Gast

Name Emery Gast

Address Mariposa Road

Date June 3 1980

DeRuyter, New York 13052



NORTH COUNTRY TRAIL ASSOCIATION

NATIONAL HEADQUARTERS
P.O. BOX 311
WHITE CLOUD, MICHIGAN 49349

LAND USE AGREEMENT

This land use agreement is between Edward J. Frey Jr. (OWNER) and North Country Trail Association (NCTA). OWNER is the owner and possessor of land on which NCTA wishes to obtain a Right-of-Way. NCTA is a not-for-profit Michigan corporation designated by the National Park Service to build, operate and maintain the North Country National Scenic Trail.

AGREEMENT

- A. OWNER shall permit NCTA to build, operate and maintain a portion of the North Country Scenic Trail across the northeast corner of property identified as: NW 1/4 of Section 11, Little Traverse Township, T.35N-R.5W, Emmet County. A copy of the plat of Little Traverse Township is attached, showing the property involved. A sketch of the property corner showing the proposed route is also attached.
- B. Usage of the trail shall be as follows:
 1. The trail shall be open to the public.
 2. There shall be no fees charged for the use of the trail.
 3. The trail shall be used for hiking, snowshoeing and cross country skiing. Motorized use is not permitted.
- C. Construction of the trail shall be as follows:
 1. The original route and any subsequent changes shall be as approved by OWNER.
 2. Trail shall consist of cleared space 4 feet wide and 8 feet high. Tread shall be 14" - 18" wide and 2" -3" deep where required. No trees shall be removed except for small saplings necessary to obtain clearance.
 3. Assurance markers shall consist of painted blue diamonds 4" on each side, placed at reasonable intervals on trees or posts.
 4. Trailhead markers, private property courtesy signs and signs prohibiting undesired uses shall be installed at pertinent locations. They shall be attached to trees with aluminum nails or attached to posts.

- D. The trail shall be maintained by NCTA to keep the path clear, marked and clean. Maintenance shall be accomplished by regularly scheduled work sessions.
- E. OWNER is protected from liability under Michigan State Public Act of 1974 - No. 177. NCTA shall provide liability insurance for members and volunteers working on the trail.
- F. OWNER may revoke this agreement at any time by giving NCTA reasonable notice.
- G. If OWNER sells the land covered in this agreement, this agreement shall not extend to the new owner. OWNER shall provide NCTA with reasonable notice of intent to sell.
- H. Approval of this agreement is effective upon the following signatures:

<p><u>For Owner</u></p> <p>Date <u>6.6.94</u></p> <p>Signed <u>[Signature]</u></p> <p>Title <u>PRESIDENT</u></p> <p>Address <u>LITTLE TRAVERS BAY DEVELOPMENT</u></p> <p><u>COMPANY, INC. 995 HIDEAWAY</u></p> <p><u>VALLEY ROAD, HARBOR SPRINGS, MICHIGAN 49740</u></p> <p>Phone <u>616-526-9661</u></p>	<p><u>For North Country Trail Assn.</u></p> <p>Date <u>6-19-94</u></p> <p>Signed <u>[Signature]</u></p> <p>Title <u>PRESIDENT</u></p> <p>Address <u>P.O. BOX 311</u></p> <p><u>WHITE CLOUD, MI 48349</u></p> <p>Phone <u>616-689-1912</u></p>
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NORTH COUNTRY TRAIL ASSOCIATION

NATIONAL HEADQUARTERS
P.O. BOX 311
WHITE CLOUD, MICHIGAN 49349

Sample Annual Letter of Thanks

Dear _____,

I am writing to express the appreciation of the members of the North Country Trail Association for allowing a portion of the North Country National Scenic Trail to cross your property (or your park, forest, etc.). This important recreational resource refreshes and inspires those who use the trail.

I am enclosing a copy of our map of the trail across your property (park, forest, etc.) as well as our most recent newsletter to keep you up to date on the progress of the trail. With supporters like you, the trail continues to grow.

Please feel free to call me or your trail adopter if you have any questions. I can be reached at _____.

Sincerely,

Name
State Coordinator

Section _____
Trail Adopter _____
Address _____

Phone: _____

TRAIL ACCESS EASEMENT

THIS TRAIL ACCESS EASEMENT is made this _____ day of _____, 19____, by and between: (i) IRENE SZABO ("Grantor"), having an address at 6939 Creek Rd., Mt. Morris, NY 14510, and (ii) the FINGER LAKES LAND TRUST ("Grantee"), a New York State Not-for-Profit Corporation, duly authorized under the Laws of the State of New York, with principal offices at 121 E. Buffalo St., Ithaca, NY 14850.

RECITALS

WHEREAS, Grantor is the sole owner in fee simple of certain real property (the "Servient Estate"), consisting of approximately 12½ acres in the Town of Urbana, Steuben County, State of New York, more particularly described in **SCHEDULE A**, attached hereto and incorporated herein; and

WHEREAS, Grantee is a publicly supported, tax-exempt nonprofit organization, qualified under Section 501(c)(3) and 170(h) of the Internal Revenue Code, whose primary purpose is the preservation, protection, or enhancement of land in its natural, scenic, educational, historical, agricultural, forested, and/or open space condition; and

WHEREAS, Grantor desires to grant to Grantee an easement (the "Trails Easement Area") across that portion of the Servient Estate, more particularly described in **SCHEDULE B** and shown on the attached Sketch, both being attached hereto and made a part hereof, to maintain a public recreation trail, and Grantee desires to accept said easement; and

WHEREAS, the trail is intended to enhance local and regional hiking and recreational opportunities for the general public by providing an attractive and scenic section of the regional trail known at the time of this grant as the Finger Lakes Trail.

NOW, THEREFORE, in consideration of the foregoing Recitals and for \$1 and other good and valuable consideration, receipt of which is hereby acknowledged by Grantor, the parties agree as follows:

1. Grant of Easement.

Grantor hereby grants, transfers and conveys to Grantee, for the benefit of the public, a perpetual easement and right-of-way (the "Easement") for ingress, egress, and access by the public over and across the Trail Easement Area.

2. Purposes, Conditions, and Restrictions.

a. The Easement is established for non-motorized, passive recreational trail purposes, such as walking, hiking, jogging, running, and cross-country skiing. Should any question arise regarding the propriety of any use of the Trail Easement Area, this Trail Access Easement shall be construed liberally in favor of such use; provided, however, that the Grantee or its designee, in its sole discretion, shall have the right to regulate or restrict uses (including but not limited to those specific uses listed above) which Grantee determines to be unsafe or otherwise detrimental to the continued use and vitality of the Finger Lakes Trail or the condition of the Trail Easement Area.

b. The "trail" shall be indicated on the ground by blazes or other standard markings. The location of the Trail Easement Area on the Servient Estate may be changed from time to time, with the written consent of both parties. Any such change shall be recorded in the official records of the Office of the Clerk of Steuben County, New York State. All costs in connection with such change shall be borne by Grantor unless Grantee waives this requirement.

c. Within the Trail Easement Area, no structures shall be erected by Grantor or Grantee, other than one lean-to or other open-air shelter, not to exceed 150 sq. ft. in footprint; provided, however, that said structure shall be erected only with the written consent of both parties;

3. Right to Suspend Trail Use; Maintenance of Trail Easement Area.

a. Grantee or its designee, in its sole discretion, shall have the right to suspend

public use of the Trail Easement Area from time-to-time.

b. Grantor has no responsibilities for trail maintenance except to the extent necessary to repair damage caused by grantor, nor does Grantee have such responsibilities except as needed to repair damage caused by Grantee.

4. Easement Runs with Land; Successors and Assigns.

This Easement shall bind and run with title to the Servient Estate forever, and shall inure to the benefit of Grantee and Grantee's successors and assigns; provided, however, that any successor or assign of the Grantee must be a Not-for-Profit Corporation qualified under the laws of New York State to hold such easements; and further provided that Grantee may terminate this Easement as provided under Paragraph 5, below.

5. Termination/Modification.

In the event that the Grantee determines that the Trail Easement Area is no longer needed or desirable across the Servient Estate, Grantee may terminate said easement by written instrument duly signed by Grantee and fully acknowledged, and recorded in the land records of Steuben County, New York. This Trail Access Easement may only be modified or amended by written instrument executed by the parties (or their successors in interest) and recorded in the land records of Steuben County, New York.

6. Governing Law.

This Trail Access Easement shall be governed by and construed in accordance with the laws of the State of New York.

TO HAVE AND TO HOLD unto grantee, its successors, and assigns forever.

IN WITNESS WHEREOF grantors and grantee have set their hands on the day and year first above written.

Irene Szabo Grantor

Finger Lakes Land Trust, Grantee,
by _____
Elizabeth D. Darlington
its Director of Land Protection

State of New York, County of Steuben, ss. On this ____ day of _____, in the year nineteen hundred and ninety four, before me came IRENE SZABO, to me known to be the individuals described in, and who executed, the foregoing instrument, and acknowledged that they executed the same.
Before me,

, Notary Public
(Type or print name of Notary)

State of New York, County of Tompkins, ss. On this ____ day of _____, in the year nineteen hundred and ninety four, before me came Elizabeth D. Darlington and, duly sworn, did depose and say that s/he resides at 204 Fairmount Ave., Ithaca, NY 14850, NY; that s/he is the Director of Land Protection of the Finger Lakes Land Trust, the corporation described in, and which executed the above instrument; that s/he knows the seal of said corporation; that the seal was affixed by order of the Board of Directors of said corporation and that s/he signed his/her name thereto by like order.

, Notary Public
(Type or print name of Notary)

FINGER LAKES TRAIL

NEWS

Over 800 miles of foot trail from
Canada to Allegany State Park
to the Catskill Mountains



Volume 33, Number 3

Founded 1962

Fall, 1994

TRAIL EASEMENT #1...OF MANY?

by Irene Szabo

The most fragile features of the Finger Lakes Trail are not its pathways through the delicate soil of hemlock forests or its steep crumbly inclines that shower stone chips under climbing boots. Rather, the trail's most vulnerable spots are its hundreds of miles of private ownership, with permissions granted over a nod or a handshake, often a generation ago. Some of those miles are already *de facto* trespasses due to ownership changes, lost sponsoring-club records, or subsequent owners from the original family who have forgotten what Pop allowed across the south gully back in '65. So the FLTC holds its path...

The unique climb beside the waterfalls of Lick Brook on FLT map M-17 south of Ithaca was a perfect example of the trail's dilemma statewide. Private owners permitted public access, but there was no guarantee for the future until the Finger Lakes Land Trust found a way to OWN that hillside and waterfalls for all time. Of course, that boon depended on owners who wanted to preserve the place. Will every generous but aging farmer who has allowed us to walk through his woods for years now decide to sell, or will he bequeath his land to descendants of a less sharing spirit?

Chenango County's 72 miles of excellent trail are a perfect example of our worst fears: already several old family farms have been sold to two dozen building lot owners or to a developer who wants to plant curving rows of houses on that high field with the great views. Would that we had enough volunteers with enough time and savvy to convey to every local planning board the value of including a recreational greenbelt in each housing development.

Obviously that landowner who likes the idea of walkers enjoying his or her place deserves a third choice, which permits future sale and bequest of the whole property but protects the FLT's passage. The FLTC Board's Long Range Planning Committee identified private owner permissions as a vital but weak link in the continuity of the trail, and began our learning process toward trail protection by inviting the Finger Lakes Land

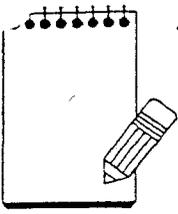
Trust to explain how conservation easements work. However, rather than an easement and therefore restrictions on the owner over the WHOLE property, the FLT wanted only freedom to pass through, preferably not over a paved mall parking lot, just a skinny little wayside through, we'd hope, something scenic. So the FLTC and the FLLT embarked on an experiment to invent a trail easement.

The perfect laboratory was a little chunk of brushy field I own on a hill above Hammondsport, which ownership is the result of a frustrating chain of alternating yesses and no's in attempts to connect the last gap on M-12 across private land. Between the nice lady who said she'd be glad to help out and then even invited the trail to loop past her retreat home to a view up Keuka Lake and the farmer of few words who said, "I don't much care about you being down there," (which I realized in the nick of time meant in country circumlocution, "NO") I had strung together enough permissions to link the Hammondsport Boy Scouts' hard-won section with the Birdseye Hollow State Forest except for one last chunk made up of two lots for sale by a curmudgeonly old lawyer from, no joke, Philadelphia, who had funded his retirement by buying up failed farms for division into country lots. There was no solution except to buy the dammed lots, which I did, fully intending to put them back up for sale again immediately, but of course, I got to liking the deer-berry patches, the white pine grove, and the fall colors in the young maples.

The historic result is that Betsy Darlington and the volunteer lawyers (where are OURS?) of the Finger Lakes Land Trust spent hours fine-tuning a model trail easement agreement, amendable in its small details, that grants the FLT the right forever to pass this way, while allowing the owner to farm, log, play upon, or sell the property. The easement is simple, is recorded at the county clerk's office for a small fee, restricts the landowner very little in usage of the property, but it does guarantee that the FLT can use a defined area as long as it wants to, no matter who owns the land later. Right now, the Land Trust holds the easement on behalf of the FLT, but the process is simple enough that the FLTC can someday hold easements on its own, and it is certainly easier and far cheaper than if the FLTC were to own the land outright. For now, the process

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NEWSLETTER NOTES



*Items from other newsletters
reviewed by Doris Abbott*

Visions of routing the North Country National Scenic Trail onto the Superior Hiking Trail were shattered on January 22, 1994, when officials of the Superior Hiking Trail Association replied to the request with a "Thanks, but no thanks." *The Ridgeline* (Superior Hiking Trail Association)

For all you computer buffs: a Washington State software company has come out with a program, *Best Foot Forward*, which sorts through a database of trails to find the perfect hike to fit your need. After this has been determined, you can print from the program a map to the trailhead and a detailed description of the trail. And if this isn't enough, the software provides such information as permits required, pets allowed, whether or not there is fishing available, nearby restaurants, wheelchair access, which topographic maps cover the trail, and contact names and phone numbers for more information. Currently, databases are available for the states of California, Montana, Oregon, and Washington. The program runs on both Macintosh computers and under PC versions of Microsoft Windows (3.1 or higher). For information, contact GrizzlyWare, 1-800-258-4453. *American Hiker* (American Hiking Society)

Ferry service has once again been made available for Appalachian Trail hikers crossing the Kennebec River in Maine. Hikers are advised not to attempt to ford the river, but to use the ferry instead. The service is free during the summer months, from 10 a.m. until noon. The river crossing is described as "the most formidable along the entire A.T." A recent study completed by the ATC recommended using ferry service rather than installing a bridge or relocating the trail as "more in keeping with the concept of a simple footpath." *The Register* (The Appalachian Trail Conference)

What are the current trends in trail use? An article in the *Colorado State Trails News* reports backcountry trail use has been dropping steadily during the last few decades. Statistics show that fifty to sixty percent of current users are on trails for fewer than two hours. And what do these day hikers want? "...better trail head signs, better directions and parking, better directional signs, better trail maps, loop trails, and rest rooms especially at trailheads." *Trailblazer* (Buckeye Trail Association)

Until ecologists decided last May to burn a grassy patch on Peters Mountain, located in western Virginia, there were only four Peters Mountain mallow plants

growing in the wild. This perennial, which grows to shoulder height and bears pink hibiscus-like flowers, grows only on the mountain for which it was named. Seeds from the endangered plant had lain dormant for decades. A month after the fire, when more than 500 sprouts were poking from the ashes, botanists came to realize that fires were needed to crack the seeds and stimulate growth. Approximately 85 per cent of the 1993 crop survived its first summer. Ecologists have scheduled experimental burns again this summer in hopes of awakening more of the seeds. (Reprinted with permission from *The Nature Conservancy* magazine in *The Register of the Appalachian Trail Conference*)

Would you like to hear the wild howl of the Timber Wolf echoing once again through the New York wilderness? "Our ancestors drove the wolf out," states Scott Thiele. "So we have an ethical duty to restore it. It's time to bring the wolf home." The records show that no wolf pelts have been brought in for bounty money in New York State since 1900. If Scott and his friends at the Adirondack Wolf Project have their way, wolves will be restored in New York State and New England. The group wants the NYS Department of Environmental Conservation and the US Fish and Wildlife Service to take action to restore the wolf to the Adirondack Park and northern New York. If you are interested in finding out more about this project contact: Adirondack Wolf Project, POB 1300, Lake Placid, NY 12946; phone 1-800-310-WILD. *The Green Drummer* (Sounding the Call of New York's Environmental Community)

TRAIL EASEMENTS...

Continued from page 1

seems foreign to trail sponsors, which is why we sought the experience of the Land Trust to create the document and show us how to use it. The REALLY scary part, though, is asking the next landowner to sign away a corridor forever.

So now my little briar patch has a duly recorded trail easement across it, which means at last that one tiny piece of the FLT is protected across private land, and I don't have to saddle the Conference with ownership in my will. Perhaps in a giddy moment we can see this model agreement becoming a useful tool for trail groups, greenway builders, and local planning boards in our mutual attempts to keep significant links and access routes open without outright purchase.

Printed on 100% post-consumer recycled paper



A process for approaching landowners

- 1) Once a preferred route has been identified, property within the preferred route or corridor area should be prioritized.
- 2) Obtain names, addresses and phone numbers of landowners. For local owners, current plat and telephone book will work in most cases. For absentee owners, contact County Treasurer's office. (Sometimes they have a computer for public use that will give you all the addresses you need.) In counties where the Corridor Planning Process is complete, landowner data bank is available through NPS.
- 3) Divide the list up into three categories: the familiar, the unfamiliar and the stay-away- from. Nothing breeds success like success, so start with the familiar list (property owners somebody in your chapter knows, or has already spoken with) and from that list choose several that you have reason to believe would be supportive or interested.
- 4) Send out a letter explaining what the Ice Age Trail is all about, and what you are seeking. Sample is attached. This letter should be on your local chapter's letterhead, with your local address and phone. Never send out more letters to people than you can realistically get back to or meet with (half a dozen is max).
- 5) Follow-up the letter with a friendly phone call about 3 days later. (Never mind that they haven't called you back -- they rarely do!) Ask if you might be able to bring some maps to their house and discuss possibilities. Do not ask for permission at this point, unless you are sure they want to give it. See if there's a day or time that would work best for them. If they tell you they aren't interested and they don't want to meet with you, don't push them. But if it seems appropriate, ask them if they might be able to help you figure out an alternative route, or, if they would like to have the chance to tell you what their concerns are.

NOTE: Reaching somebody by phone first, and then sending a follow-up letter with more details may be more effective in some cases. This is especially true in cases where 1) the party has already heard about the Trail, 2) you feel comfortable and confident in making the calls, or 3) you know the people.

Some people also have had success simply stopping at somebody's house and introducing themselves. This is known as a *cold visit* and it's not generally recommended. However, it can work well if 1) you are already in the area, perhaps working on trail that is in the general vicinity and you happen to drive by and see the landowner outside; 2) the landowner looks at you quizzically, and so as a courtesy you stop and tell him what you are up to; or 3) you are a real people person that people always trust the moment they set eyes on you, or 4) you know the people, and they know you.

But even these visits will still need to be followed-up with letters and most likely another visit as described in 6 a).

6 a.) If they agree to meet bring topo maps, more specific trail info, aerial photos of their property (you can get them through your local ag office or from DOT), but don't show them these materials unless it's clear they're interested. Just make small talk -- try to figure out some things you have in common and comment on their nice fields, buildings or whatever. The first map to show them is where the existing trail is and whose land it goes on. If you can bring with you a real landowner who has given permission and is happy with the trail that is the best situation.

7 a.) At some point you will need to ask the big question, but don't do it if it looks like the answer is going to be no. First, you might ask the property owner if you personally can hike their property some time. (This helps to ensure them that you have never hiked their land without their permission.) Maybe they would be interested in hiking with you

8 a.) Let them know early on what their options are. Tell them that your main goal is just to complete some missing links in the area and so you're just seeking their permission; but that the long term goal would be to permanently protect the trail. To do that, your organization may be willing to buy strips of land, ~~entire parcels of land~~ or purchase conservation easements and first rights of refusal. Emphasize that all of this is strictly on a willing seller basis.

9 a.) If they agree to let us cross their property, explain that it is best to have it in writing so they can be listed under our insurance policy. Have them sign the form!

6 b.) If they don't want to meet with you.... write a follow-up letter thanking them for their time. If there were certain questions or concerns they had and you didn't feel like you responded very well, now's your chance to address these again. Make sure the letter is positive and non-judgemental. If there's any reason you need to apologize for anything, take the opportunity now -- (sorry I caught you during your supper hour the other night...). Promise them however that you will stay in touch, to let them know when the chapter might be sponsoring a hike or whatever, in case they might want to meet some of the other chapter members or just see what it's all about.

7 b.) Should they come to an outing, make sure you welcome them, and introduce them to others. Do not mention their property or your interest in it, and do not raise the issue of permission.

7 c.) Keep on good terms with them, and periodically send information about the trail or some other interest of theirs. Nurture a relationship with them if you can. You will know when the time is right to ask again. It might be 3 months, it might be 3 years. In the meantime, you might want to find an alternative route, even if it's the road in front of their property. Don't do anything however that might jeopardize your relationship with them. How to know? Ask them!

10 b.) If they become receptive, start the process with 6 a.

10 a) If they seem interested in learning more about conservation easements or getting their land appraised for a possible sale to us, contact the IAT Northern Field Coordinator and/or the DNR land specialist for a follow-up visit or phone call.



ICE AGE PARK & TRAIL FOUNDATION, INC.

N35 W23770 W. Capitol Drive, P.O. Box 423, Pewaukee, WI 53072-0423

Phone 414 / 691-2776 Fax 414 / 691-2323

Blair Klein
P.O. Box 8
Buffalo, Wyoming 82834

October 6, 1995

Dear Mr. Klein:

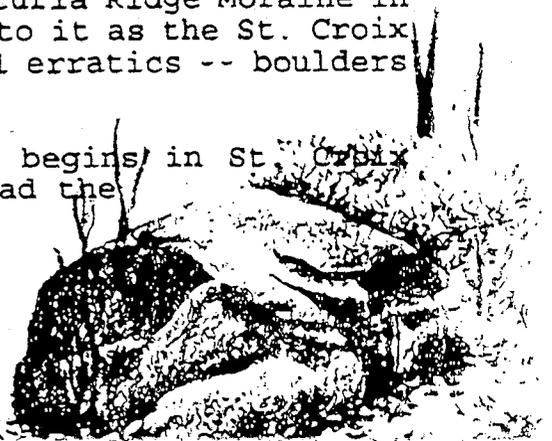
It was a pleasure to speak with you the other day. I'm glad to have the opportunity to provide you with more information about the Ice Age Trail. I'll clear my throat and begin:

12,000 years ago a great river of blue glacial ice, after flowing more than 800 miles from the Canadian Arctic, ground to a halt across Wisconsin. This wall of ice, several hundred feet thick at its edge and over a mile thick further back, sculpted a landscape of remarkable diversity and beauty. Scientists from throughout the world come to study Wisconsin's kames, eskers, drumlins, and other glacial features. The lakes, hills, hollows and fertile soils that sustain our diverse agricultural and tourism economy in Polk County are gifts of the Ice Age.

The Ice Age Park & Trail Foundation is an organization of citizen volunteers dedicated to preserving some of these glacial features for public education and enjoyment. We are doing this through the establishment of the Ice Age National Scenic Trail, to wind 1000 miles across Wisconsin along the moraines and other features left by the ice sheet. The Trail allows people on foot to appreciate first hand the varied beauty of Wisconsin's glacial landscape. 470 miles of this Trail is now open for public use.

My job for the last several years has been to plan the trail route in Polk, Burnett, Washburn and Barron Counties. I worked with two glacial geologists, Dr. Adam Cahow, of the University of Wisconsin - Eau Claire, and Dr. Mark Johnson, Geology chair at Gustavus Adolphus. Both these experts have been enamored with the Big Rock Creek Farm area, even though they have only studied it from topo maps. Mark Johnson has named the area the Centuria Ridge Moraine in his published works, while Adam Cahow refers to it as the St. Croix Ice Margin. The "Big Rocks" are called glacial erratics -- boulders carried by ice for hundreds of miles.

The Western Terminus of the Ice Age Trail begins in St. Croix Falls at Interstate Park. Perhaps you have had the opportunity to hike the Pothole Trail -- that is the first segment of the Ice Age Trail. From there it travels north under Hwy 8 to the top of an esker (behind the



hospital) and then through the city limits to Lions Park. From Lions Park we have built trail along the St. Croix all the way to River Road. What we would like to do is head east from this point, and connect to the existing Gandy Dancer rail trail in Centuria. We are asking your permission to mark a trail through the Big Rock Creek Farm to make this a reality.

We would want to work with you on choosing the best route, and would be pleased to use either an existing trail, or build an entirely new one. We agree to keep it well-maintained and by providing permission you would be protected from any liability through Wisconsin's extremely favorable Landowner Recreational Use Statute (see enclosure).

There are several ways you can give us permission. The most common is simply a handshake or written agreement that says we can cross your land with a trail but you reserve the right to throw us off at any time. More and more landowners are giving us permanent easements -- either for pay (market value) or as a tax-deductible donation (we are a 501-c-3 non-profit). In some cases we purchase the land fee title or put an entire parcel into a conservancy easement to protect the glacial features.

However, you should know that this is a project that exists completely on the cooperation of the landowners. At no point can we or the government force somebody to sell their land or give us an easement. Neither the state or federal government has any authority to condemn land for this project.

We value the relationship we have with landowners and do our utmost to make the trail a positive experience for all concerned. Local chapter volunteers see to it that the trail is well-maintained. The people who hike the Ice Age Trail respect the land they are walking through and very much appreciate the opportunity. And for the safety of our hikers, and for the benefit of the landowner, we close the trail during the gun deer season.

Please don't hesitate to call me if you have any questions. It would be great if I could meet with you when you are in the area again. Perhaps I could even arrange to have one of the glacial geologists meet with you and provide you with some personal interpretation of your land! (I had that pleasure on my 37 acres on Alabama Lake -- it was truly fascinating).

Whatever your decision, Blair, I want to let you know that I appreciate the way the Klein family has for so many years kept that most remarkable piece of property in its pristine state. I commend you for your family's foresight and stewardship of the land.

Sincerely,

Steve Clark
Northern Coordinator



N35 W23770 W. Capitol Drive, P.O. Box 423, Pewaukee, WI 53072-0423

Phone 414 / 691-2776 Fax 414 / 691-2323

Harold W. Sommerfeld
3514 65th Street
Frederic, WI 54837

April 2, 1996

Dear Mr. Sommerfeld:

Thanks for taking the time yesterday to talk with me about the Ice Age Trail. The information I told you I would send is enclosed. You asked some good questions and I hope I was able to answer them in a satisfactory manner. The information enclosed will give you more detail. (Maybe more than you want or need right now...) Some of it may raise new questions.

The main thing I want to emphasize is the extent to which we work closely with landowners like yourself. Our volunteers have planted trees, erected fences and cleared brush upon the request of the landowner. When you're trying to build a 1000 mile trail, you simply cannot afford to have bad relations with landowners. If it weren't for thousands of volunteers and private landowners all across Wisconsin -- the trail would still be only a dream.

As it is, only about half of it is still a dream. We've completed about 500 miles. We're just a few miles short from having a continuous trail all the way through Polk, Burnett, and Barron County. Which is why I contacted you.

Being able to cross somewhere on your two 80 acre parcels would help us complete a gap between the Polk County Forest on the west side of your property and the county forest land just east of County Road E. This gap is one of two remaining in the total 88 mile trail (from St. Croix Falls to just north of Rice Lake) that the local chapter is responsible for. When we meet, I can explain some of the possible arrangements we can make with you -- everything from a hand shake agreement that you can revoke at anytime, to paying you for an easement or outright purchase of some land.

If, for any reason, you are not interested in having the trail cross your land, we will respect that decision. The trail depends upon the willing support of landowners and under no condition will we ever try to pressure anyone to enter into an agreement that they are not comfortable with. While our long term goal is to have a quality trail that helps to connect and protect some of the most scenic areas in the State, it is you, the property owner, who decides the terms.

I look forward to discussing with you the different options and seeing if we can work something out. I'll be calling you some time after Easter to set a time when it's convenient for you to talk further. In the meantime, please feel free to call me if you have any questions. My number is (715) 648-5519.

Thank you very much for your consideration.

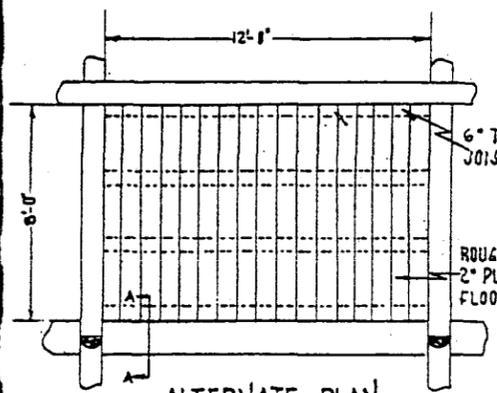
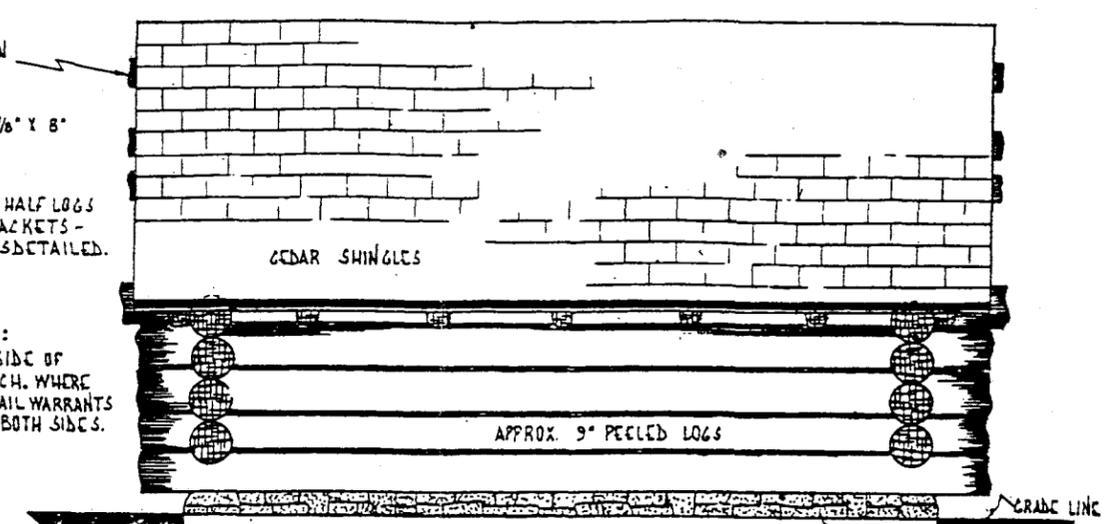
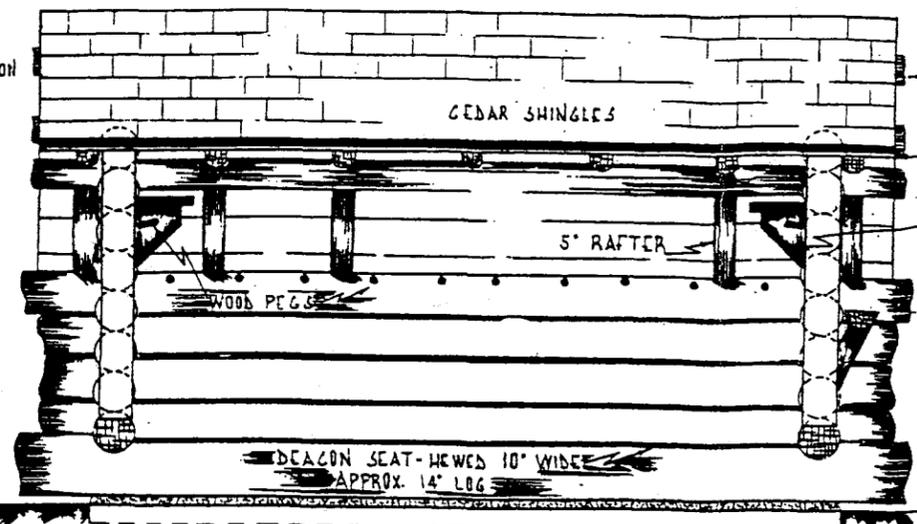
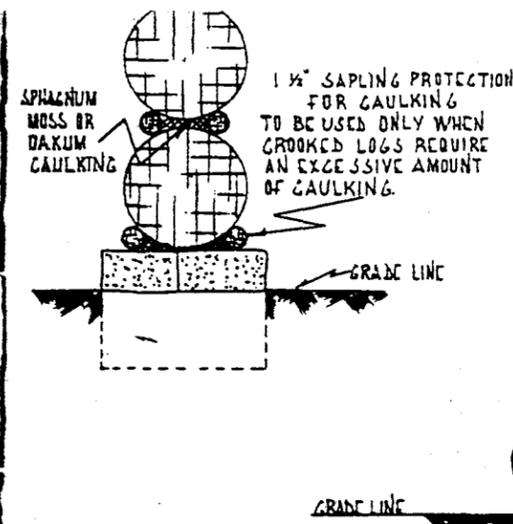
Sincerely,

Steve Clark
Northern Trail Coordinator
2780 230th St.
Cushing, WI 54006

enclosures

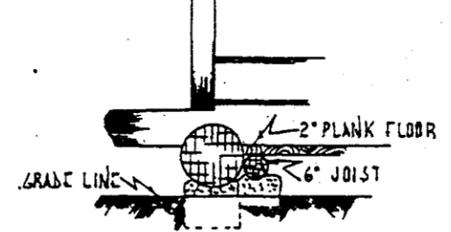
Appendix 6

**CONSTRUCTION SPECIFICATIONS
FOR SUPPORT STRUCTURES**



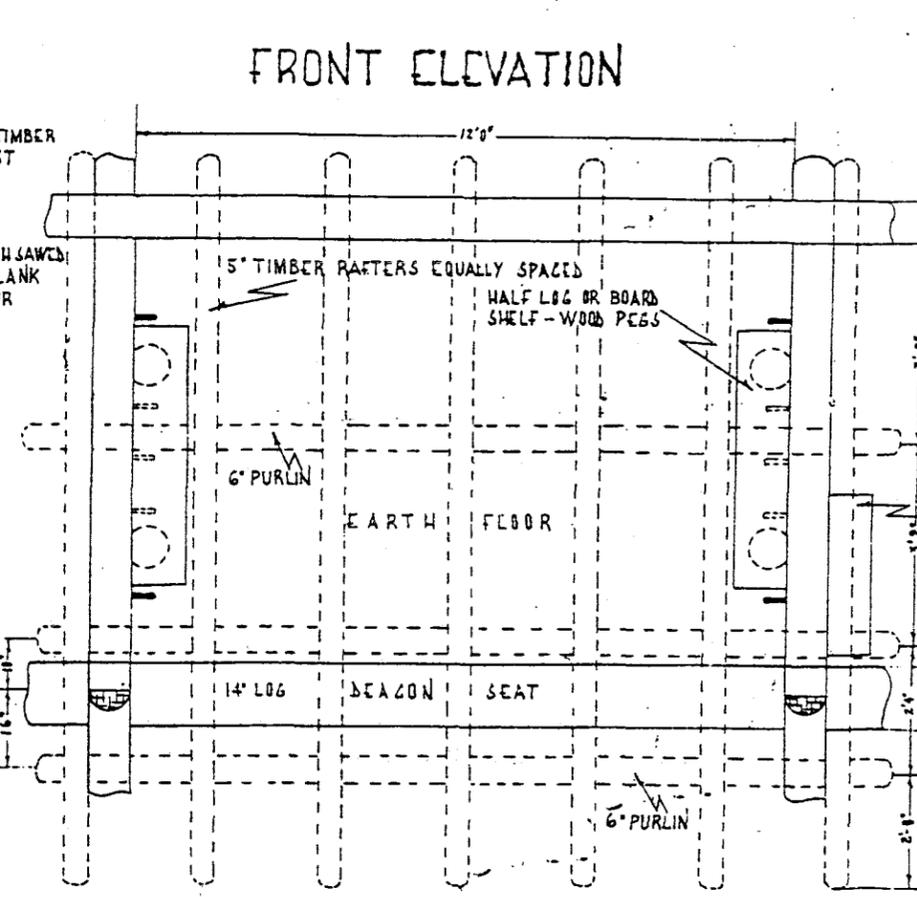
ALTERNATE PLAN
WOOD FLOOR TO BE PROVIDED
WHEN INADEQUATE DRAINAGE
NECESSITATES.

SCALE 1/2" = 1'-0"



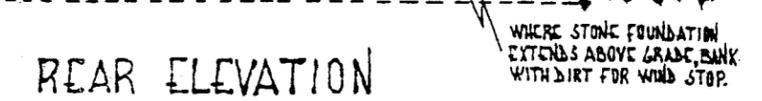
SECTION A-A

FLOOR JOISTS:
4" X 6" SAWED TIMBERS MAY BE USED
WHERE ACCESSIBILITY OF SITE MAKES
USE PRACTICAL.



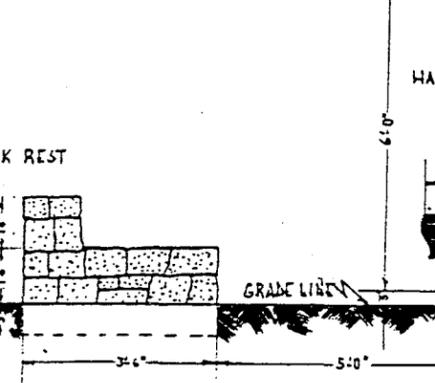
PLAN

ON A CLOSED FOUNDATION, SCREENED
OPENINGS SHOULD BE PROVIDED
FOR VENTILATION.

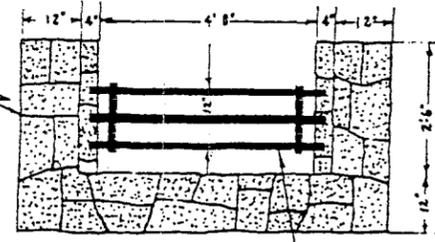


SIDE ELEVATION

LOGS: TO BE OF CEDAR, PINE, HEMLOCK, BALSAM
OR SPRUCE. - MINIMUM DIAMETER FOR
WALL LOGS - 8"
STONE FOUNDATION: OPTIONAL
CAULKING: TO BE OAKUM OR WHERE
AVAILABLE, SPHAGNUM MOSS, WELL
TAMPED IN PLACE.
TIMBER ENDS: SAWED OR AXE HEWED.
LOG NOTCHING: LOGS TO BE NOTCHED
ON UNDER SIDE JOISTS TO PREVENT
ABSORPTION OF MOISTURE.



FIREPLACE DETAIL



ALTERNATE GRATE

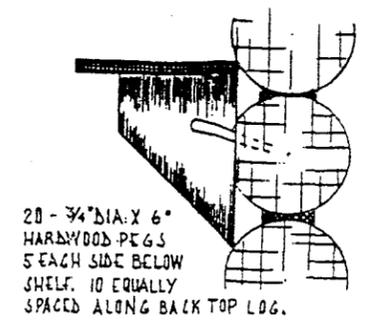
1/2" X 1/4" MILD STEEL BARS, BENT
ENDS, DRILLED & BOLTED - 3/8" BOLTS.
GRATE - 1" PIPE, SEPARATORS -
1/2" RODS, SPOT WELDED OR FASTENED
WITH IRON RIVETING OR BOLTED.

MORTAR MIX FOR STONE
MASONRY:
1 PART CEMENT, 1/4 PART FIRECLAY
3 PARTS SAND

WHEN ACCESSIBILITY PERMITS, FIREPLACE SHOULD
BE LINED WITH FIRE BRICK.

STANDARD PLAN
FOR AN
ADIRONDACK LEAN-TO OR OPEN CAMP
DESIGNED BY
NEW YORK STATE CONSERVATION DEPARTMENT - BUREAU OF CAMPS & TRAILS
SCALE 1/2" = 1'-0" MARCH - 1957
THIS REVISION SUPERSEDES PLAN NO. 108 U.M.B., MAY-1936
C. R. ANDERSON

PLAN NO 184



20 - 3/4" DIA. X 6"
HARDWOOD PEGS
5 EACH SIDE BELOW
SHELF, 10 EQUALLY
SPACED ALONG BACK TOP LOG.

SCHEDULE OF MATERIALS

LEAN-TO

- 2 1/2 SQUARES CEDAR SHINGLES
- 280 BOARD FEET 7/8" X 6" OR 8" Y.P. OR FIR SHIPLAP
- 5 LOGS - DIA. 9" X 16'-0"
- 10 LOGS - DIA. 9" X 12'-0"
- 19 LOGS - DIA. 9" X 10'-0"
- 1 LOG - DIA. 14" X 16'-0"
- 3 LOGS - DIA. 6" X 16'-0"
- 7 LOGS - DIA. 5" X 16'-0"
- IF FLOOR IS REQUIRED - 4 LOGS DIA. 6" X 12'-0"
- 200 BOARD FEET 2" Y.P. OR SPRUCE PLANKING X 8'-0"
- 50 LBS OAKUM

- 100 LBS - 10" SPIKES
- 8 LBS - 60d SPIKES
- 8 LBS - 40d SPIKES
- 10 LBS - 28d NAILS (FLOORING)
- 10 LBS - 8d NAILS
- 10 LBS - 3d ZINC COATED ROOFING NAILS
- FIREPLACE**
- 3 SACKS PORTLAND CEMENT
- 1 PIECE - DIA. 1" BLACK IRON PIPE X 20'-0"
- 1 PIECE - FLAT IRON ROD - 1/2" X 1/2" X 30"
- APPROX. - 6 CU. FT. CONCRETE SAND, 3/4 CU. FT. FIRECLAY

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